PUBLIC DOCUMENTS OF MAINE:

1903

BEING THE

ANNUAL REPORTS

OF THE VARIOUS

DEPARTMENTS AND INSTITUTIONS

For the Year 1902.

VOLUME II.

AUGUSTA
KENNEBEC JOURNAL PRINT
1903

SIXTEENTH ANNUAL REPORT

OF THE

BUREAU

OF

INDUSTRIAL AND LABOR STATISTICS

FOR THE

STATE OF MAINE

1902.

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STATE OF MAINE.

OFFICE OF COMMISSIONER OF
INDUSTRIAL AND LABOR STATISTICS,
AUGUSTA, December 31, 1902.

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 1902.

Very respectfully,

SAMUEL W. MATTHEWS,
Commissioner.

INTRODUCTION.

The work of the Bureau during the past year has been largely devoted to the investigation of important industries and to ascertaining the development and extent of trade unionism in the State.

Among the important industries of Maine is that of the manufacture of granite, an industry that is carried on to a greater or less extent in nearly every county. The fact that there are about one hundred and fifty quarries, about fifty being in active operation, shows that the amount of work required for this special investigation was necessarily very great. This investigation shows that this industry is in a prosperous condition. Maine now occupies the leading position among the states of the Union as a granite producing State, having gone ahead of Massachusetts which heretofore has led in this industry. Brief but interesting articles upon the manufacture of artificial stone, a novel enterprise not generally known by the public, and on the manufacture of brick by machinery and the lime industry are included in this report.

Efforts have heretofore been made by the Bureau to obtain statistics relating to trade unions, but with slight success. The commissioner is glad to be able to report that much greater interest and readiness to answer the questions asked by the Bureau has been manifested the present year. The unions have largely increased in numbers, membership and influence, and nearly every trade is represented. While it cannot be claimed that the exhibit made in the report is complete and fully accurate, owing to changes which have been constantly going on during the progress of this investigation, yet it will be seen that trade unionism in Maine has become an important factor in its industrial conditions.

Other features of the report are a compilation of returns from the assessors of the cities, towns and plantations, of factories, mills and shops for manufacturing purposes, enlarged, completed, or in process of erection during the year 1902; an article relating to the railroads in the State; cotton and woolen industries; and agricultural and other statistics compiled from census bulletins.

An extended description of Rumford Falls, the phenomenal development and growth of which, owing to its great water power, has attracted the attention of the country, is published in the report and will be found of great interest.

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

The conditions of labor during the past year have been quite satisfactory and but few labor disturbances have taken place within the State. Labor has been in great demand and employment at good wages the prevailing rule.

The commissioner desires to express his obligations for faithful services rendered him in the prosecution of his work by his efficient clerk, Major C. J. House, and special agent, Francis Wiggin.

THE GRANITE INDUSTRY OF MAINE.

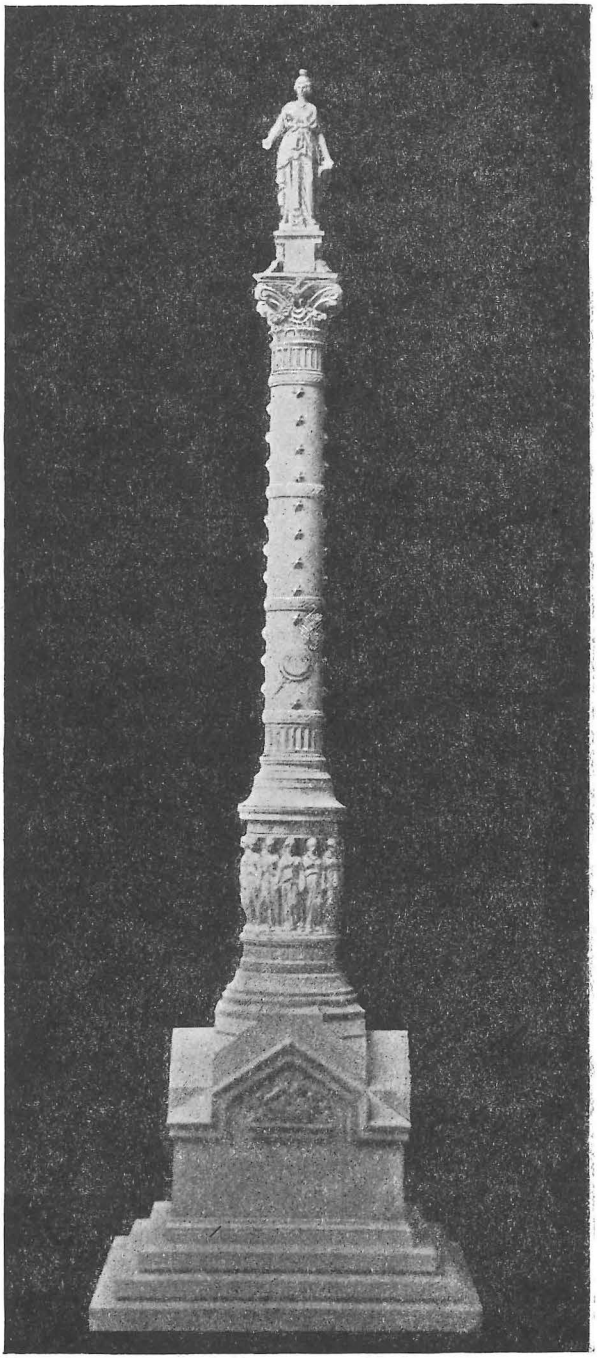
In her magnificent granite quarries the State of Maine has an inexhaustible resource of wealth. It is no exaggeration to say that Maine has granite enough within her borders to supply all the cities of the world with building and paving stone for many centuries to come. The work of fifty years in some quarries in the State has hardly left an impression, while there are countless sites for quarries that have never yet been operated. Like marble or slate, granite becomes of better quality the farther it is removed from the surface; hence, the longer a granite quarry is worked the more valuable it becomes.

Granite may be defined as a crystalline granular rock, consisting of quartz, feldspar and mica, and is usually of a whitish, grayish, or flesh-red color.

Gneiss differs from granite in having the mica arranged in planes, so that the stone breaks readily into large slabs or flags.

In syenite, hornblende takes the place of mica, so that the rock is composed of quartz, hornblende and feldspar. The granite in Island Falls is really syenite. Much of the granite in York county is syenite, as is also part of the red granite of Washington county and Mount Desert island.

It is somewhat difficult for the amateur to distinguish true granite from gneiss, neither is it essential to do so, for both are fitted for the same purposes. The beautiful Hallowell granite is really gneiss, and there are many other quarries of what is known as granite that a geologist would call gneiss. Granite is a general term, however, applied indiscriminately to all three varieties.



YORKTOWN MONUMENT, YORKTOWN, VA.
Built by the Hallowell Granite Works, Hallowell, Maine.

THE ORIGIN OF GRANITE.

The origin of granite remains in doubt and geologists are divided now as of old in regard to the question. The preponderance of opinion at the present time seems to be that granite is a metamorphic rock, that is, a rock that has been formed from other rocks, possibly from shales and sandstones, under the influence of heat and pressure. The heat must have been sufficient to render the original materials so plastic that the primal structure of the rock was wholly obliterated, and then new crystalline masses were formed out of the fused mass. It is not now considered that granite was a primeval rock but that it has resulted from changes in other rocks.

Professor Hitchcock supposes, in the case of granite, an aqueo-igneous fusion, or the combination of a moderate heat with water or steam, and by this view a large proportion of granite rocks may be only metamorphosed schists. One thing is certain, whatever its origin, no rock in the earth's crust is more useful to man than granite. It embellishes and beautifies his haunts while living, and it renders attractive the grounds where sleep the dead.

PERSONAL INVESTIGATION.

The special agent of the bureau of statistics, to whom the collection of data in regard to the granite industry was assigned, visited all the larger quarries and the more extensive granite cutting plants in the State and had personal interviews with the operators, besides observing the extent of the quarry, the color, quality and texture of the stone, the facilities for handling the product and placing it on board vessels or cars for transportation. The agent was received most courteously by all operators and workmen and his questions, both printed and verbal, were fully and freely answered.

To facilitate the gathering of essential facts in regard to the granite industry, a blank was prepared containing the following questions:

1. Name of company or corporation,.....
2. Location, ...
3. When organized,.....
4. Capital invested,.....

5. Value of production during the last fiscal year,.....
6. Whole number of employes,.....
7. Number of quarrymen,.....; stone cutters,.....; paving cutters,.....; blacksmiths,.....; common laborers,.....; other workmen,.....
8. Description of product,.....
9. Number of hours of labor per day,.....
10. Average daily wages of quarrymen,.....; stone cutters,.....; paving cutters,.....; blacksmiths,.....; common laborers,.....; other workmen,.....
11. What is the market for your production,.....
12. Do you consider your quarry practically inexhaustible,.....
13. What State legislation, if any, would benefit the granite industry, ...
14. Are your employes union or non-union,.....
15. What effect on the amount of production does the reduction of the number of working hours have,.....
16. Is the granite industry, as far as your plant is concerned, in as prosperous a condition now as in former years,.....
17. Please give a list of noted residences, public buildings, monuments, etc., built of granite from your quarry.

.....

This blank list of questions was sent by mail to all granite quarries in the State so far as their location could be ascertained, except those visited by the special agent; and although the returns received from such were not so full and complete as those from quarries visited by the agent of the bureau, yet they were in the main very satisfactory. In all, sixty-three returns were received, fifty from quarries in operation and thirteen from those not in operation.

The directory which follows gives a list of 152 quarries in the State. This would indicate that there were 89 from which no returns were received, but these are generally small quarries which are either shut down at the present time or are furnishing small quantities of granite for local use. Those heard from practically cover the granite business of the State.

DIRECTORY OF GRANITE PRODUCERS IN MAINE.

A directory of the granite producers of Maine was issued in 1901 from the office of the United States Geological Survey. We have made such revision as our personal visits and returns would warrant and here present it in its revised form. The list is given alphabetically by towns in which the quarries are located, Pleasant Island, the only exception, being outside of any town limits.

Addison, Pleasant River Granite Company, office at Addison.

Alfred, Charles Bennett, office at Alfred.

Alfred, Oliver G. Nutter, office at Alfred.

Augusta, Augusta Granite Company, office at Augusta.

Augusta, F. E. Garland, office at Augusta.

Augusta, Maine Insane Hospital Granite Quarry, office at Augusta.

Augusta, Howard S. Robie, office at Augusta.

Augusta, Charles Sylvester, office at Augusta.

Augusta, Daniel S. Young, office at Augusta.

Baileyville, Baring Dark Granite Company, office at Baring.

Baileyville, F. H. Hall, post office box 27, Calais.

Benton, J. E. Brown, office at Fairfield.

Biddeford, G. Willet Andrews, Sr., office at Biddeford.

Biddeford, G. Willet Andrews, Jr., office at Biddeford.

Biddeford, A. H. Day and Company, office at Biddeford.

Biddeford, Alfred Goodwin, office at Biddeford.

Biddeford, Gowen, Emmons and Company, office at Biddeford.

Biddeford, L. B. Howe and Company, office at Biddeford.

Biddeford, John Leavitt, office at Biddeford.

Biddeford, Marcille and Wormwood, office at Biddeford.

Bluehill, Bluehill Granite Company, office at Bluehill.

Bluehill, A. M. Carter, office at Bluehill.

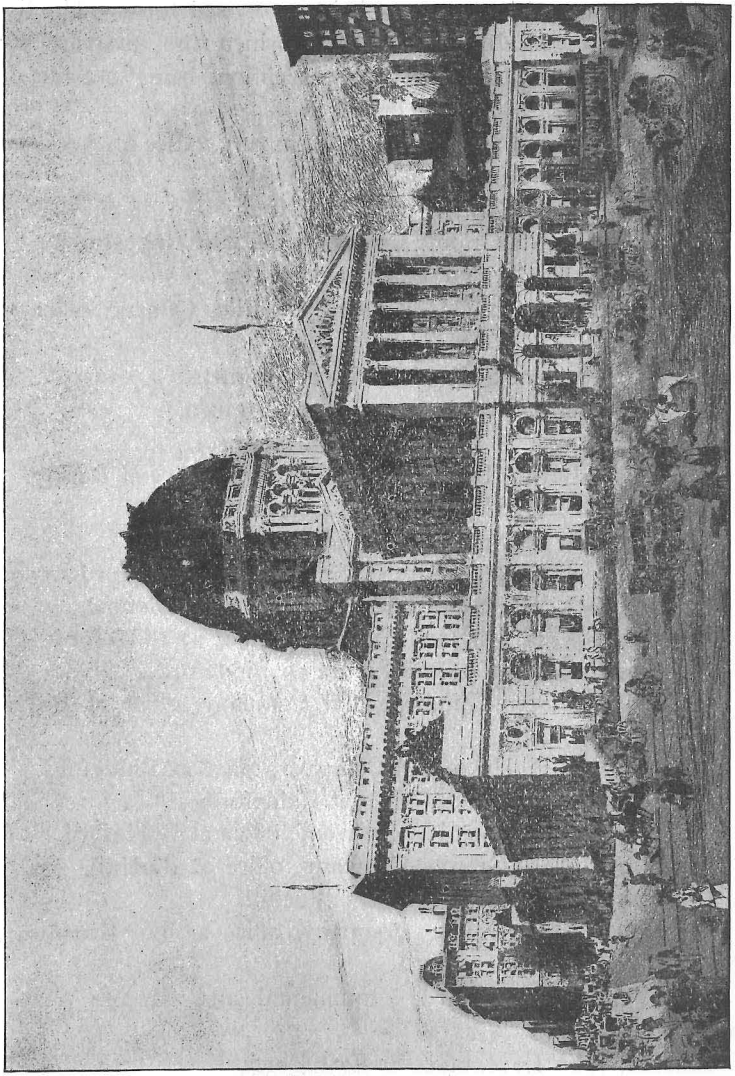
Bluehill, Chase Granite Company, office at 66 Broadway, New York City.

Bluehill, W. M. Howard Monumental and Granite Works, office at Bluehill.

Bluehill, John Love, office at East Bluehill.

Bluehill, White Granite Company, office at West avenue and Newton Creek, Long Island City, N. Y.

Bristol, Peter Swenson, office at Round Pond.
Brooksville, M. D. Chatto, office at South Brooksville.
Brooksville, James S. Condon, office at South Brooksville.
Brooksville, Emery H. Herrick, office at Brooksville.



UNITED STATES GOVERNMENT BUILDING, CHICAGO, ILL.
From Quarry of Mount Waldo Granite Works, Frankfort, Maine.

Brunswick, B. M. Edwards and Son, office at Brunswick.
Calais, Maine Red Granite Company, office at Red Beach.
Calais Charles W. Young, office at Calais.

Canaan, Elwin H. Brawn, office at Canaan.
Dedham, David Brown, office at East Holden.
Deer Isle, John L. Goss, office at Deer Isle.
Eden, Bear Brook Quarry, office at Bar Harbor.
Eden, John Prescott, office at Bar Harbor.
Foxcroft, Hiram A. Brawn, office at Foxcroft.
Frankfort, Mount Waldo Granite Works, office at Frankfort.
Frankfort, Hayward Pierce, office at Frankfort.
Franklin, T. M. Blaisdell, office at West Franklin.
Franklin, W. B. Blaisdell and Company, office at Franklin.
Franklin, Frank Bradbury, office at West Franklin.
Franklin, A. J. Darling, office at West Franklin.
Franklin, John P. Gordon, office at Franklin.
Franklin, Smith Brothers, office at West Franklin.
Freeport, Freeport Granite Quarries, office at Freeport.
Hallowell, Hallowell Granite Works, office at Hallowell.
Hallowell, C. E. Tayntor and Company, office at 239 Broadway, New York city.
Hartland, Joseph H. Baker, office at Hartland.
Hartland, Cyr Brothers, office at Hartland.
Hermon, Horace F. Hanson, office at Bangor.
Hurricane Isle, Booth Brothers and Hurricane Isle Granite Company, office at Rockland and at 207 Broadway, New York city.
Jay (North), American Stone Company, office at Portland.
Jay (North), Frank Lane, office at North Jay.
Jay (North), Maine and New Hampshire Granite Company, office at Portland.
Jay (North), Maine Central Railroad Company, office at Portland.
Jonesboro, Bodwell Granite Company, office at Rockland.
Jonesboro, Booth Brothers and Hurricane Isle Granite Company, office at Rockland and at New York city.
Jonesboro, William M. Gilman, office at Jonesboro.
Jonesboro, N. W. Fish, office at Jonesboro.
Jonesboro, Frank Wallace, office at 81 Nassau street, New York city.
Jonesport, Cape Ann Granite Company, office at Jonesport.
Kennebunkport, G. W. Ross, office at Biddeford.
Lewiston, Charles Lemieux, office at Lewiston.

Lincoln, E. A. Hurd, office at Lincoln.

Lincoln, V. E. Libby, office at Lincoln.

Lincoln, Walter H. Wells, office at Lincoln.

Lincolnville, E. H. Fernald Granite Company, office at Belfast.

Machias, William J. Bovard Granite Works, office at Machias.

Marshfield, G. S. Hooper, office at Machias.

Mayfield, F. Frank Gordon, office at Mayfield.

Milbridge, S. L. Treat and Company, office at Bar Harbor.

Mount Desert, Allen Granite Company, office at Mount Desert.

Mount Desert, Campbell and Macomber, office at Ellsworth.

Mount Desert, Fernald Brothers and Higgins, office at Mount Desert.

Mount Desert, Moore and Savage, office at Northeast Harbor.

Mount Desert, Standard Granite Company, office at Hall Quarry.

Norridgewock (South), The Dodlin Granite Company, office at South Norridgewock.

Northport, Howard F. Mason, office at Belfast.

Oxford, Elie Roy, office at Lewiston.

Penobscot, William P. Bissett, office at Bluehill.

Pleasant Island, Tidewater Stone Company, office at New York city.

Pownal, Freeport Granite Quarries, office at Freeport.

Pownal, Charles H. Knight, office at Yarmouthville.

Pownal, David Miller and Company, office at Pownal.

Prospect, William P. Baird, office at 433 East 95th street, New York city.

Rumford, Greenleaf and Doring, office at Auburn.

Rumford, Metevier and Fisher, office at Rumford Falls.

Saint George (Long Cove), Booth Brothers and Hurricane Isle Granite Company, office at Rockland and at New York city.

Saint George (Clark Island), Clark's Island Granite Works, office at 135th street and 12th avenue, New York city.

Saint George, Crown Granite Works, office at South Thomaston.

Saint George, E. H. Lanny, office at Rockland.

Searsport, Herbert Black, office at Searsport.

Smyrna, Billings and Watts, office at Houlton.

South Thomaston, James Anderson, office at South Thomaston.

South Thomaston, H. P. Babb, office at South Thomaston.

South Thomaston (Spruce Head), Bodwell Granite Company, office at Rockland.

South Thomaston (Spruce Head), C. D. S. Godfrey, office at Spruce Head.

South Thomaston, High Island Granite Company, office at South Thomaston.

South Thomaston, Tidewater Stone Company, office at New York city.

Stonington, S. E. Allen, office at Stonington.

Stonington, Calvin Ames, office at Stonington.

Stonington, G. L. Bray, office at Stonington.

Stonington, Casey and Sherwood, office at Groton, Conn.

Stonington, Chase Granite Company, office at 66 Broadway, New York city.

Stonington, Hermon Eaton, office at Stonington.

Stonington, Charles S. Grant, office at Stonington.

Stonington, Goss and Small, office at Stonington.

Stonington, Green Island Granite Company, office at Stonington.

Stonington, K. K. Knowlton, office at Deer Isle.

Stonington, John McDonald, office at Stonington.

Stonington, P. G. Merrill, office at Stonington.

Stonington, H. M. Thayer, office at Stonington.

Stonington, B. S. Thurlow, office at Stonington.

Stonington, Thomas Warren and Company, office at Stonington.

Sullivan (North), Alonzo Abbott, office at North Sullivan.

Sullivan (North), Crabtree and Havey, office at North Sullivan.

Sullivan (West), Dunbar Brothers, office at Sullivan.

Sullivan (North), William T. Havey, Jr., and Son, office at North Sullivan.

Sullivan (North), Hooper, Havey and Company, office at North Sullivan.

Sullivan (North), Robertson and Havey, office at North Sullivan.

Sullivan (West), Alexander Taylor, office at West Sullivan.
Swan's Island, Matthew Baird, office at Atlantic.
Swan's Island, Crippen and Company, office at Ellsworth.
Swanville, Cunningham Brothers, office at Swanville.
Swanville, Oak Hill Granite Company, office at Belfast.
Topsham (Pejepscot), H. B. Cobb, office at Pejepscot.
Vinalhaven, W. V. Barton, office at Vinalhaven.
Vinalhaven, Joseph S. Black, office at Vinalhaven.
Vinalhaven, Bodwell Granite Company, office at Rockland.
Vinalhaven, Booth Brothers and Hurricane Isle Granite Company, office at Rockland and at New York city.
Vinalhaven, L. M. Crockett, office at Vinalhaven.
Vinalhaven, Crown Hill Granite Works, office at Vinalhaven.
Vinalhaven, George P. Ginn, office at Vinalhaven.
Vinalhaven, J. Leopold and Company, office at 18 Broadway, New York city.
Vinalhaven, National Granite Company, office at Vinalhaven.
Vinalhaven, A. M. Webster Company, office at Vinalhaven.
Waldoboro, Booth Brothers and Hurricane Isle Granite Company, office at Rockland and at New York city.
Waldoboro, Manager Quarry, office at Winslow's Mills.
Waldoboro, William T. Wyman, office at Waldoboro.
Waterville, Alfred Flood, office at Waterville.
Wayne, J. Frank Gordon, office at Wayne.
Wells, L. G. Stevens, office at Wells Depot.
Westbrook, Martin Curran, Jr., office at Deering.
Westbrook, Timothy Pomerleau, office at Cumberland Mills.
Whitefield, E. C. Jewett, office at Whitefield.
Woodstock, Grand Trunk Railway Quarry, office at Bryant's Pond.
Yarmouth, James Edmie, office at Yarmouthville.
Yarmouth, J. L. Libby, office at Yarmouthville.
Yarmouth, Tidewater Stone Company, office at New York

DISTRIBUTION OF GRANITE.

Granite is well distributed over the State of Maine, being found in every county of the State. In some sections the distribution is far more liberal than in others, for sometimes the underlying rock of a whole town or even larger extent of territory is granite, while in other cases only here and there the out-

croppings of this rock are seen. We shall refer to different sections of the State somewhat in detail.

Granite in York County.

The prevailing rock in York county is granite. Outside of Biddeford there are fine quarries in Kennebunk, also in Alfred, Lebanon, Newfield and Parsonsfield. Many of these quarries have never been opened, but the granite is there awaiting the time when better transportation facilities will enable the owners to compete successfully with localities more favorably situated.

In Biddeford there are extensive quarries of granite of beautiful color and texture. The granite appears on the west side of the Saco river and extends to Kittery point. Only a very narrow strip of slate separates it from the river, and there is likewise along the seacoast a bed of slate. Some of the Biddeford granite is very dark owing to the presence of much black mica, but the most of it is of the ordinary gray color. It has a firm texture, which makes it very desirable for building purposes.

In company with Charles E. Atwood, Esq., inspector of factories, workshops, mines and quarries, who is a resident of Biddeford, we spent a day in visiting and examining the granite quarries which extend for several miles along a series of ridges southwest of the city. We visited quarries belonging to the following granite producers: Gowen, Emmons and Company, G. Willet Andrews, Jr., G. Willet Andrews, Sr., Marcille and Wormwood, A. H. Day and Company, L. B. Howe and Company, John Leavitt, and Alfred Goodwin, all located in Biddeford, and that of G. W. Ross, located in Kennebunkport, all of which were in operation.

Although some of these quarries have been operated for a generation, so great is their capacity that hardly an impression has yet been made upon them. Hitherto the rock from most of the quarries has had to be hauled by team from one to four miles in order to reach car or boat for transportation; but an electric road has been chartered, which, when built, will pass near all the quarries, thus affording much needed facilities in this direction. The road will extend to Biddeford pool, near which an extensive wharf will be built. On completion of the

proposed electric road and the other improvements in contemplation, there will be no reason why the inexhaustible resources of Biddeford's granite quarries cannot be properly developed.

Considerable granite from the Biddeford quarries, at the time of our visit there, was designed for the immense dry dock which the United States government is now building at Kittery Navy Yard.

Granite in Oxford, Franklin, Cumberland, Kennebec and Sagadahoc Counties.

The beautiful high mountains of Hebron and Peru are composed of granite. Woodstock is mostly underlain with granite and the rocks over which the Androscoggin river falls in Rumford are also granite. In general all the high peaks in Oxford county may be said to be granite, and granite is found in every town in the county.

Granite is abundant in Franklin county. Immense deposits are found in North Jay, where several quarries are being worked. Saddleback mountain, near Phillips, is composed of granite, also Mount Bigelow in the northeast corner of the county. There is granite in Farmington, Chesterville and many other towns in the county.

In Cumberland county granite is found at Yarmouth, Westbrook, Freeport, Brunswick and other localities.

In Kennebec county, outside of Hallowell where granite is notably abundant, large deposits are found in Augusta, Gardiner, Belgrade and several other towns.

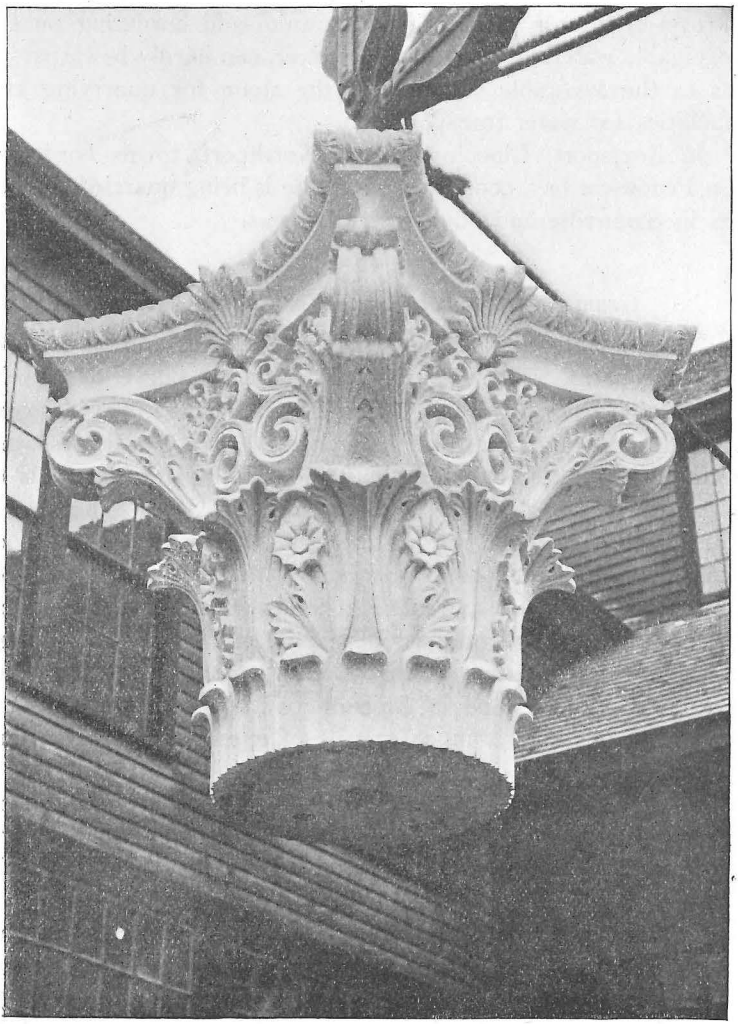
Bowdoinham and other sections of Sagadahoc county contain deposits of granite.

Granite in Knox and Lincoln Counties.

The towns of Saint George and Friendship in the county of Knox, together with the adjacent islands, contain immense deposits of granite, where many quarries are being worked.

In Lincoln county large deposits of granite are found at Pemaquid point in the town of Bristol, at Monhegan island, which is composed almost entirely of granite, and at Waldoboro, where several excellent quarries are being worked. The Maine Central railroad runs near these quarries, which are located about one mile from Waldoboro village. The ground descends from the

quarries to the harbor, where vessels of the largest size can load in safety. In these counties granite is not confined to the coast, but is found in large quantities in many of the inland towns.



CAPITAL OF PULLMAN MONUMENT.
Made by Hallowell Granite Works, Hallowell, Maine.

Granite in Waldo County.

Waldo county is rich in its deposits of granite. Mount Waldo and Mosquito mountain in Frankfort and Heagan mountain in Prospect, literally mountains of granite and bordering on the navigable waters of the Penobscot river, can hardly be surpassed as to the favorable situation of the stone for quarrying and facilities for water transportation.

In Searsport, Lincolnville and Northport, towns bordering on Penobscot bay, considerable granite is being quarried, as well as in Swanville and other interior towns.

Granite in Hancock and Washington Counties.

The amount of granite in Hancock and Washington counties is very great. There is first the immense curve of granite mountains from Bluehill to Mount Desert island; then it is continued along the coast to Jonesport. From Calais westward into the wild lands there extends a granite range upwards of twenty miles in width. The granite at Buck's harbor in Brooksville, near Castine, is the first occurrence of this rock east of the Penobscot. The rock is rather coarse grained, but free from impurities, and makes a handsome stone when dressed. There are extensive quarries of granite in Bluehill. At Long's cove in this town the granite is of a light color and very fine grained. Long island in Bluehill bay is more than one-half granite, and there is much granite of excellent quality at East Bluehill.

The southern part of Deer Isle was set off in 1897 and incorporated as the town of Stonington. At Green's landing in this town and on some small islands in the vicinity are some of the finest granite quarries in the State. One island is simply a mountain or hill of sheets of granite, and so approachable that large vessels can lie close to the shore and receive their loads of granite from the derricks located near the water's edge. The new town is appropriately named "Stonington," for many of the houses in the village are literally founded on a rock and one church has an immense granite ledge for its foundation.

The greater part of the town of Sedgwick is underlain with granite. The granite formation extends northerly through

Surry, Penobscot and Orland, and continues eastward to Ellsworth. In the town of Franklin are fine quarries of granite. As these quarries are for the most part situated along the shores of Taunton bay, the facilities for transporting the product are excellent.

Nearly the whole of Mount Desert island is composed of granite. All along that wonderful inlet called Somes sound, granite of good quality is found in vast quantities. Near the south part of Eden there is a beautiful development of red granite, largely composed of small crystalline fragments of red feldspar. The lofty summits which make the scenery of Mount Desert island so famous are immense piles of granite; the highest elevation, Green mountain, is a mass of coarse red granite.

In the town of Sullivan are some of the best granite quarries in the State. The granite is an excellent building stone and it lies in such large and accessible sheets that blocks of any desired size can easily be obtained. A little way to the north are Bald and Tunk mountains, also composed of granite.

Passing over to Marshfield in Washington county, we find another range of granite which extends through Cooper, Meddybemps, Charlotte, Robbinston, Calais and Baring. Southward we find black granite in Addison, gray granite in Jonesport, and red granite in Jonesboro and at Red Beach in Calais.

Granite in Northern Maine.

Most of the granite in Maine is found in its western, southern and southeastern counties, yet it is found in large quantities in some parts of northern Maine. The region of Mount Katahdin shows an immense development of it from Moosehead lake to the east branch of the Penobscot river.

In the southern part of the town of Lee, and in township No. 3 adjoining, are immense ridges composed almost entirely of granite, but its distance from lines of transportation renders it at the present time of little commercial value.

In Bald Mountain township, Somerset county, which lies just west of the town of Blanchard in Piscataquis county, there is an elevation called Bald mountain, which is composed entirely of gray granite of fine quality lying in sheets of different thicknesses. Judging from appearances this mountain of granite is

equal to anything of the kind in the State, not excepting Mount Waldo or Mosquito mountain. This mass of granite, lying in the wilderness at present, only proves what we have stated elsewhere, that the granite of Maine is inexhaustible in quantity.

There is a range of granite extending from Island Falls on the Mattawamkeag river to Linneus and New Limerick. There are extensive granite quarries in the town of Smyrna as we show elsewhere; and there are boulders and veins of granite in northwestern Maine, but the eastern and northern parts of Aroostook county are for the most part destitute of granite. In Island Falls there is a mountain of granite of excellent quality as a building stone or for bridge work.

DESCRIPTION OF SOME OF THE LARGER GRANITE PLANTS.

So great is the amount of good granite in the State that it would require a large volume if we should undertake to describe fully all the different quarries, therefore we shall give a brief description of a part of them.

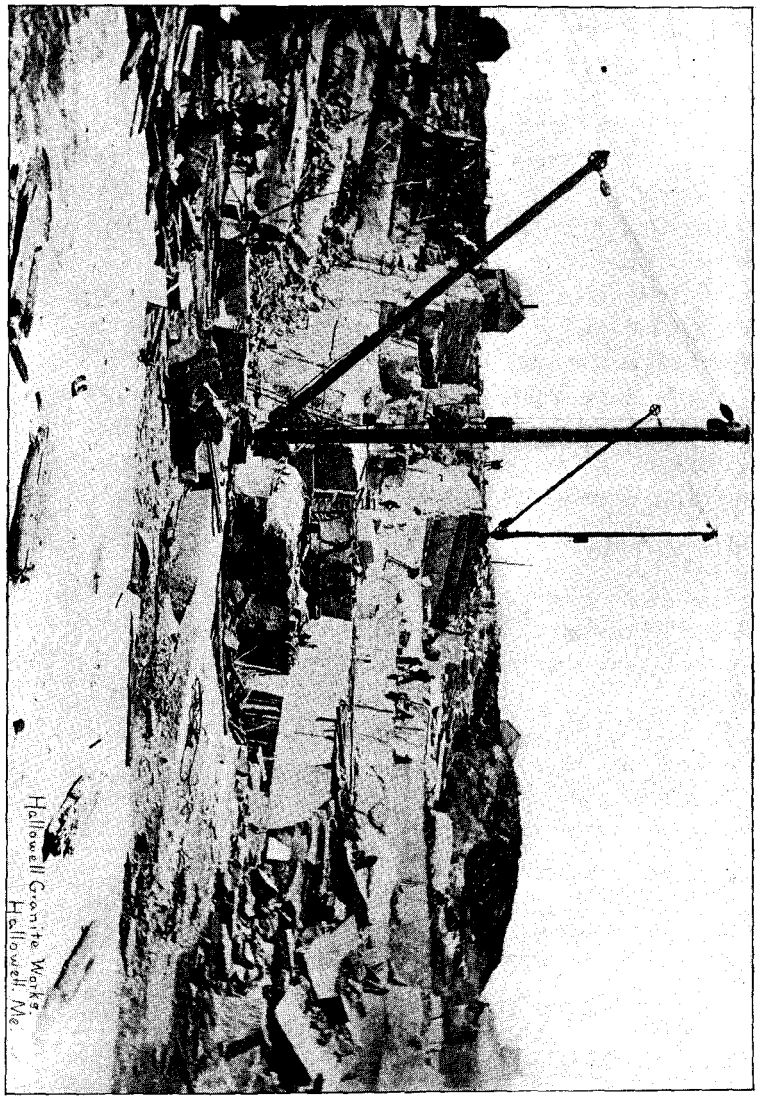
The Hallowell Granite Works, Hallowell.

The granite of Hallowell has long been noted both as a building and as a monumental stone. It is composed of white feldspar, silvery gray mica and but little quartz, the feldspar predominating. The crystals of mica are arranged with their axes in the same plane, so that the rock splits very easily in the direction of these axes. The granite is very white, appearing at a distance, when smoothed, almost like white marble.

The quarries are about two miles west of the city, on an elevated ridge. These quarries are very extensive and are practically inexhaustible. Near the quarries the company has a fine stable for its twenty or more powerful team horses, a large boarding house for those men who do not reside in the vicinity, a large blacksmith shop, a carpenters' shop, and various other buildings, such as wagon house, store house, office, and several tenements that are rented to workmen. Steam power is used in operating the numerous derricks, and steam drills are in evidence in every direction. Electric power is also used.

The ground is descending towards the city, so that very heavy loads of stone can easily be hauled; but as the Augusta, Win-

throp and Gardiner electric road runs close to the quarries, it is probable that a contract will be made with the road to transport the stone from the quarries to the cutting sheds and the company's wharf at Hallowell at some time not far distant.



QUARRY, HALLOWELL GRANITE WORKS, HALLOWELL.

The cutting sheds and the Hallowell office are close to the line of the Maine Central railroad in Hallowell. The sheds are very

long and spacious, affording ample room for hundreds of workmen. The sheds are well equipped with modern appliances for handling, cutting, carving and polishing granite.

The officers of the company are, J. F. Bodwell, president; C. W. Tilden, treasurer; L. D. Merchant, secretary; J. P. Hunt, superintendent of works. A son of Mr. Hunt is superintendent of the quarries. There is an office in New York city, with John Pierce, manager, and an office in Boston, with C. F. Cheney, manager. The company was organized under its present title in 1885.

Out of the immense number of different structures into which granite from these quarries has entered, we mention some of the more important ones.

Capitol building, Albany, New York. More than a million feet of Hallowell granite has already been used in this structure.

Equitable Insurance building, New York City.

Mutual Life Insurance building, New York City.

Mutual Life Insurance building, Boston, Mass.

Mutual Life Insurance building, Philadelphia, Pa.

Metropolitan museum of arts, New York City.

American surety building, eighteen stories high, New York City.

Empire building, twenty-one stories high, New York City.

Hall of records, now finishing, into which have gone 350,000 feet of Hallowell granite, New York City.

Bank of North America, New York City.

Bank of Commerce, New York City.

Merchants' bank, New York City.

Manhattan bank, New York City.

New York State monument, Gettysburg, Pa.

Yorktown monument, 105 feet high, Yorktown, Va.

Pilgrims' monument, Plymouth, Mass.

Soldiers' monument, Boston common.

Soldiers' monument, Dayton, Ohio.

Stonewall Jackson monument, New Orleans, La. This monument has a statue portrait of the general on a horse.

George M. Pullman monument, Chicago, Ill.

John Wentworth monument, Chicago, Ill.

Richard M. Hunt memorial, New York City.

Albany savings bank, Albany, N. Y.

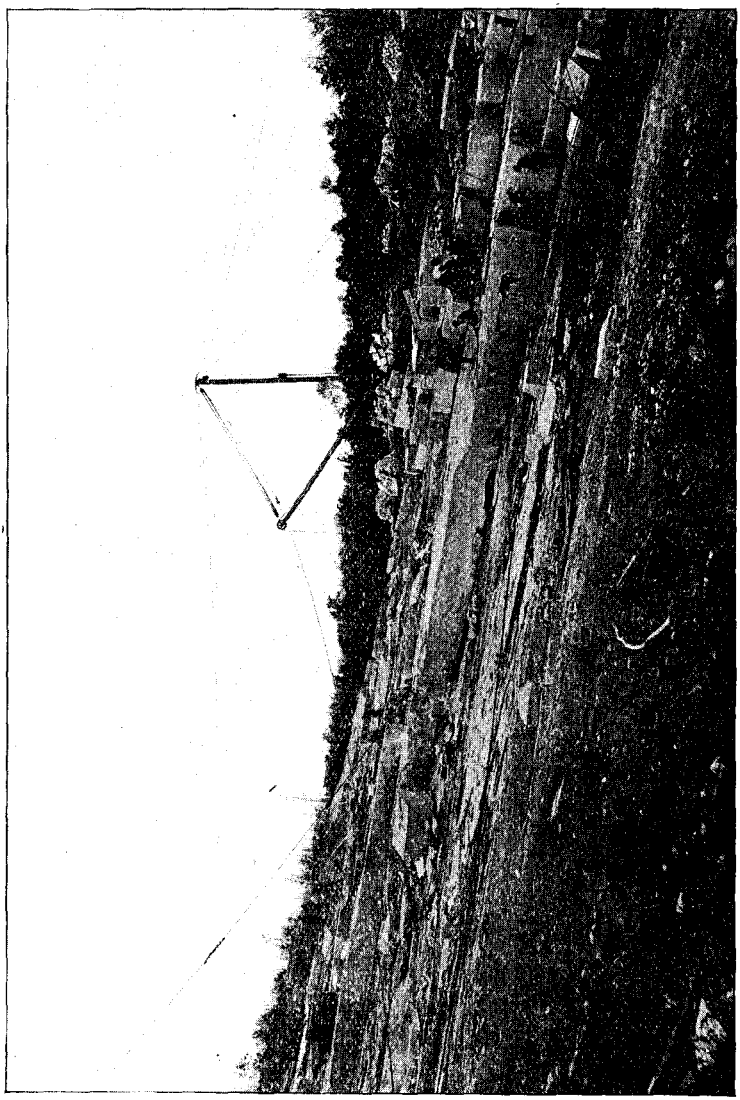
Brooklyn savings bank, Brooklyn, N. Y.
Union trust building, New York City.
Marshall Field building, Chicago, Ill.
Brokan residence, New York City.
Higginbotham residence, Chicago, Ill.
Governor Hill's residence, Augusta, Maine.
Soldiers' monument, Augusta, Maine.
Soldiers' monument, Gardiner, Maine.
Soldiers' monument, Hallowell, Maine.
Soldiers' monument, Auburn, Maine.
Soldiers' monument, Boothbay Harbor, Maine.
Soldiers' monument, Bath, Maine.
Soldiers' monument, Lincoln, Maine.
Soldiers' monument, Castine, Maine.
Soldiers' monument, Machias, Maine.
Governor Bodwell monument, Hallowell, Maine.
Governor Hubbard monument, Hallowell, Maine.
Grant monument, Chicago, Ill.
Pedestal, John A. Logan monument, Washington, D. C.
All the Maine monuments on battlefield of Gettysburg, Pa.
New Masonic temple, Boston, Mass.
Scott mausoleum, Erie, Pa.
Allegheny post office, Allegheny, Pa.
McDonald monument, Cincinnati, Ohio.
Northeastern Mutual Life building, Milwaukee, Wis.

Blocks of granite, weighing more than one hundred tons and containing twelve hundred cubic feet, have been taken from the Hallowell quarries. It is said that in one of the quarries there are twenty-six different sheets that can be worked and these sheets are arranged like strata. They vary from eight inches to four feet in thickness.

Mount Waldo Granite Works, Frankfort.

The town of Frankfort is on the west bank of the Penobscot river and is about eighteen miles south of Bangor. It has several elevations, the most noted of which are Mount Waldo, nearly one thousand feet in height, and Mosquito mountain, nearly six hundred feet in height. These two mountains are composed entirely of granite, lying in sheets of varying thicknesses, constituting two of the most remarkable granite quarries in New England,

if not in the United States. The granite is light gray in color, of great beauty as a building stone, and is said to have withstood the greatest pressure ever applied to any Maine granite as a test.



QUARRY OF MOUNT WALDO GRANITE WORKS, FRANKFORT, MAINE.

A creek, navigable for vessels of 250 tons, makes in to the base of these mountains from the Penobscot river, thus affording excellent transportation facilities. The Mount Waldo quarry is

operated by the Mount Waldo Granite Company. The quarry was first opened in 1851 by George A. Pierce and John P. Rowe. Mr. Pierce died in 1873, and his sons, George Pierce and John Pierce, became partners of Mr. Rowe, the new firm being known by the title of Pierce, Rowe and Company. In 1880 the company was incorporated under the title of Mount Waldo Granite Works.

Although this quarry has been operated for more than a half a century, it looks as though it were even now but fairly opened. Some impression has been made about half way up the mountain, but now the company has commenced operations at the very top, where the granite lies in sheets of different thicknesses, varying from one to ten or twelve feet. A railroad of about a mile in length has been built from the sheds and wharves to the top of the mountain and a double track has been laid for a portion of the way. The empty cars are hauled up most of the way by steam power, but where the double track is laid near the top of the mountain, the loaded car going down hauls up the empty car.

The view from the top of Mount Waldo is beautiful beyond description and came near interfering seriously with the business at hand, which was to observe the quality, quantity and accessibility of this mountain of granite. This mountain alone could furnish the world with granite for the next thousand years. Blocks of any desired size can readily be obtained; and we saw masses of granite over one hundred feet in length, eight or ten feet in thickness, and, perhaps, twelve feet wide, that had been detached from a sheet, possibly an acre in extent, by the force of dynamite and powder, and done so gently that no pieces flew when the charges in the Lewis holes were exploded.

The cutting sheds of the concern are at the base of the mountain, near the inlet that makes up from the Penobscot. The main shed is 205 feet long by seventy feet wide. It is fitted with a powerful travelling crane, capable of picking up the largest block of granite and conveying it to any desired position. There are several other sheds, beside blacksmith shops, store houses for lumber and a freight house.

The wharf is 350 feet in width along the water front, and the company owns a staunch schooner of 200 tons that makes frequent trips to New York and other points, laden with the finished granite from Mount Waldo.

From the long list of public buildings, business blocks, private residences and government works, built wholly or in part of granite from Mount Waldo, we have selected the following as best showing the character of the work done by this great industrial corporation.

United States post office, court house and custom house, Chicago, Ill. This building is now in process of erection.

United States post office, court house and custom house, Milwaukee, Wis.

United States post office, court house and custom house, Indianapolis, Ind.

Navy yard, Pensacola, Florida.

Fort Knox, Penobscot river, Maine.

United States post office, court house and custom house, Bangor, Me.

St. Louis bridge, Saint Louis, Missouri.

East river bridge, New York City.

State, War and Navy building, Washington, D. C.

State capitol, Hartford, Conn.

Equitable building, Boston, Mass.

Tribune building, New York City.

Washington bridge, New York City.

Twelfth regiment armory building, New York City.

Massachusetts state house, Boston, Mass.

Congressional library, Washington, D. C.

Brooklyn navy yard, Brooklyn, N. Y.

Brooklyn water works, Brooklyn, N. Y.

One hundred fifty-fifth street viaduct, New York City.

New government dry dock, New York City.

New York Central railroad building, New York City.

Empire building, New York City.

Puck building, New York City.

Philadelphia mint, Philadelphia, Pa.

City hall, Philadelphia, Pa.

Mausoleum for Robert Goelet, New York City.

Cathedral, Saint John the Divine, New York City.

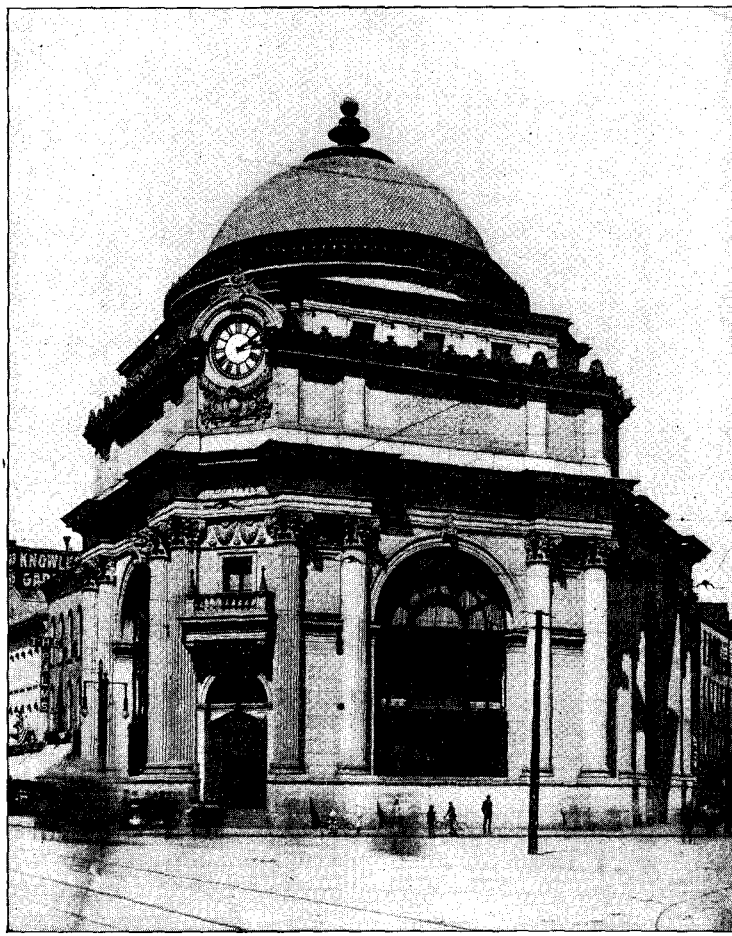
Battery place building, New York City.

Bank of the Metropolis, New York City.

New government dry dock at Kittery navy yard. This last named work is now going on.

Mosquito Mountain, Frankfort.

About half a mile from Mount Waldo is Mosquito mountain, another immense mass of beautiful granite lying in sheets of varying thicknesses. Mr. Hayward Pierce, who is one of the partners in the Mount Waldo Granite Works, is the sole proprietor of Mosquito mountain and the works. The granite is taken from the very top of the mountain, so that in the course of a thousand years or thereabouts, provided the quarry should be



BUFFALO SAVINGS BANK, BUFFALO, N. Y.
From Quarries of Booth Brothers and Hurricane Isle Granite Co., Waldoboro, Maine.

worked continually that length of time, the height of the mountain might be perceptibly decreased. A double track railroad has been built from the sheds and wharf to the top of the mountain, the loaded car going down hauling up the empty car without employing steam power. The sheds for cutting are located near the inlet, along which a capacious wharf has been built.

Mr. Pierce commenced work here in 1889. Since that time much of the granite taken from his quarry has gone into the same structures as that from Mount Waldo. Considering this quarry in connection with that at Mount Waldo, we can truly say that we have never seen two nearby quarries where the supply of granite is more vast, the facilities for quarrying and handling more complete and quick transportation more available. These two companies could take contracts for furnishing the best of granite to any desired amount. Mr. John Pierce, the manager of the New York office, is agent for several large granite companies in Maine, and probably no man more thoroughly understands the fine qualities of Maine granite than he.

Booth Brothers and Hurricane Isle Granite Company.

This granite company was organized in 1889. The principal office is in Rockland, and the principal quarries are at Hurricane Isle, Waldoboro and Long Cove. Hurricane Isle was formerly a part of Vinalhaven, from which it was set off and incorporated as a separate town in 1878. There is one elevation on the island 165 feet in height.

The late General Davis Tillson, who owned the island, commenced quarrying granite here in 1870. Large quantities of granite have been taken from these quarries without materially lessening the supply. The quarries at Waldoboro have previously been mentioned.

Long Cove is in the town of Saint George. The prevailing rock in this town is granite, and the quarrying of it has been one of the leading industries for many years. With all the above mentioned accessible quarries to draw from, this company has at its command any desired quantity of fine and beautiful granite. This is one of the strongest companies in the State, giving employment to a large number of men, and sending Maine granite to all the principal cities east of the Mississippi river for

the erection of public buildings and the most substantial business blocks.

The following list indicates the class of buildings constructed of granite from the works of the Booth Brothers and Hurricane Isle Granite Company.

Buffalo savings bank, Buffalo, N. Y.
Naval academy building, Annapolis, Md.
City building, Philadelphia, Pa.
United States custom house, Saint Louis, Mo.
County court house, Fall River, Mass.
Fidelity Trust Company building, Buffalo, N. Y.

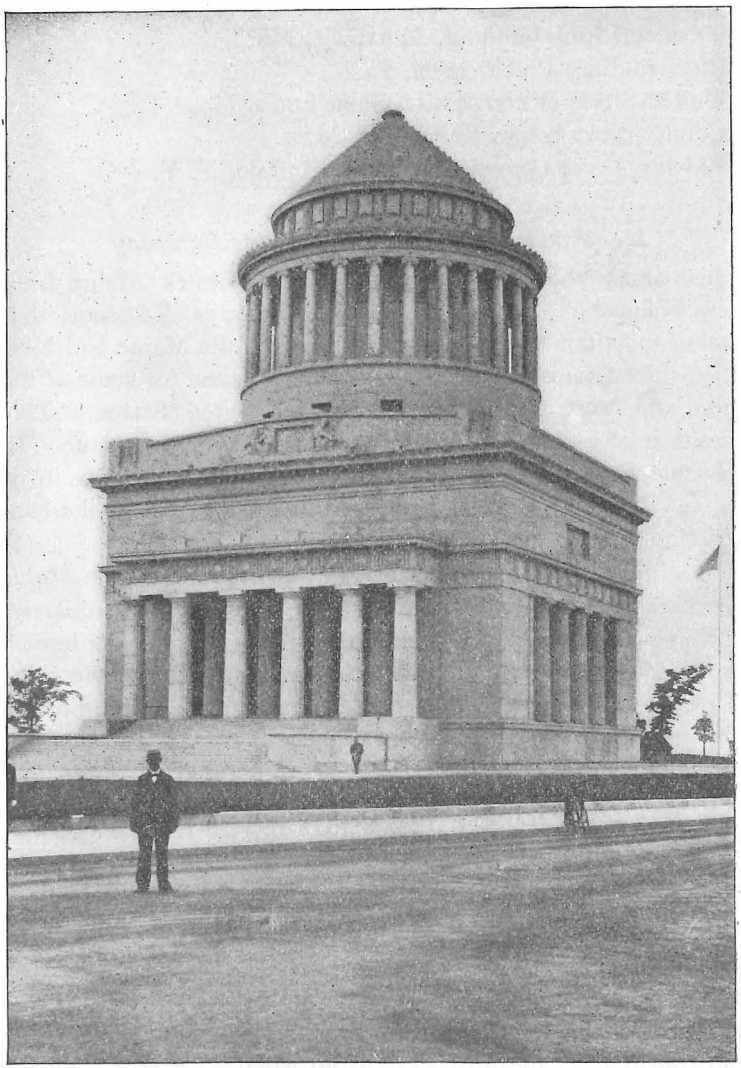
Maine and New Hampshire Granite Company.

Just across the boundary line which separates Maine from New Hampshire, in the town of Conway, is Redstone, that famous mountain of red granite from which the Maine and New Hampshire Granite Company has quarried stone for some of the finest and most costly buildings in the United States. This granite is of a pink shade and is spoken of as pink granite. In the same vicinity this company is working a quarry of granite of a greenish shade which is also used to some extent in the construction of buildings.

In addition to the quarries at Redstone mountain, the Maine and New Hampshire Granite Company has extensive quarries at North Jay, Franklin county, Maine. The Farmington branch of the Maine Central railroad runs along the base of the ridge of granite on which the quarries are located. The granite lies in sheets of various thicknesses, so that different sizes called for are easily obtained. The granite is light gray in color, and entirely free from knots. It has been subjected to the severest mechanical tests made by the United States testing machine at Watertown arsenal, Massachusetts, and has passed through them successfully. The stone cutting sheds are near the line of the railroad and the stone from the quarries is brought down easily on a tramway.

With such a combination of fine granites as that at North Jay and Redstone, with the excellent facilities for quarrying, cutting and transporting the product, it is no wonder that the company has been among the most successful granite companies in the State. The late Payson Tucker was one of the principal share-

holders and officials of this company. The main office is in the Baxter memorial building on Congress street, Portland. Below we give a list of some of the principal buildings, their location and color of stone in each, in which North Jay or Redstone granite has been used. That designated as pink and green came



TOMB OF GEN. U. S. GRANT, RIVERSIDE PARK, NEW YORK.
From Quarry of Maine and New Hampshire Granite Co., North Jay, Maine.

from the quarries in Conway, while the white was quarried at North Jay.

Grant memorial tomb, New York City, white.

R. G. Dunn building, New York City, white.

New York Life Insurance building, Chicago, Ill., white.

Mercantile building, New York City, white and pink.

Chamber of Commerce, Cleveland, Ohio, pink.

Erie public library, Erie, Pa., pink.

New union station, Boston and Maine railroad, Boston, Mass., pink.

Union railway station, Portland, Maine, pink.

Leiter block, Chicago, Ill., pink.

Woman's Christian Temperance Union temple, Chicago, Ill., pink.

High school building, Springfield, Mass., pink.

Fidelity Mutual Life Insurance building, Philadelphia, Pa., pink.

City hall, Lowell, Mass., pink.

State library building, Concord, N. H., pink.

Northwestern Guaranty Loan Company building, Minneapolis, Minn., green.

Wayne county court house, Detroit, Mich., white.

Merchants' national bank, Baltimore, Md., pink.

Memorial building and library, Lowell, Mass., pink.

First national bank, Manistee, Mich., white.

Monongahela national bank, Pittsburg, Pa., white.

Equitable Insurance building, Des Moines, Iowa, pink.

Loan and Trust Company building, Boston, Mass., pink.

William A. Clark mausoleum, New York City, white.

Brooklin railroad exchange, Brooklyn, N. Y., pink.

Third national bank, Allegheny, Pa., pink.

Longfellow monument, Portland, Maine, pink.

The above list could be extended almost indefinitely, but enough has been given to show that the Maine and New Hampshire Granite Company stands in the front rank among those great corporations whose mission is to furnish to the great cities of our country the beautiful granites from the State of Maine, which, wrought into their public buildings and costly business edifices, tend so largely to make those cities substantial and attractive.

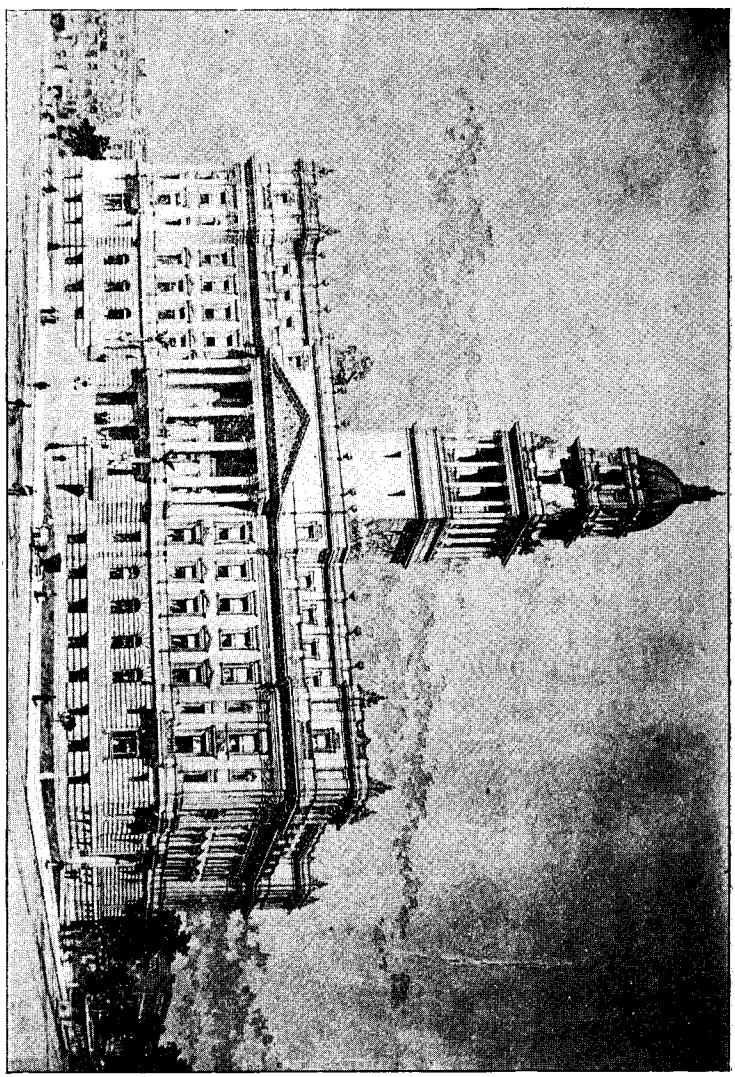
The Bodwell Granite Company.

About fifteen miles east of Rockland, in the mouth of Penobscot bay, is the town of Vinalhaven, formerly known as South Fox island. In this town is one of the principal quarries of the Bodwell Granite Company, also its cutting and polishing sheds. The company owns, in all, fourteen quarries in the vicinity, some on other islands and some on the mainland. The office of the company is in Rockland. The company was organized under its present title in 1871. The late Governor Bodwell was the founder and one of the principal owners in this well known company.

From a long list of buildings, etc., into which granite from the Bodwell Granite Company has entered, we have selected the following:

The new post office building, Washington, D. C.
State, War and Navy building, Washington, D. C.
Masonic temple, Philadelphia, Pa.
Western saving fund building, Philadelphia, Pa.
Record building, Philadelphia, Pa.
Girard building, Philadelphia, Pa.
Pennsylvania railroad passenger station, Philadelphia, Pa.
Philadelphia county jail, Philadelphia, Pa.
Basement of new post office and court house, Erie, Pa.
Carnegie free library building, Allegheny City, Pa.
Frick building, Pittsburg, Pa.
Fidelity, Title and Trust Company building, Newark, N. J.
Savings bank building, Wilmington, Del.
Custom house and post office, Cincinnati, Ohio.
Court house and post office, Atlanta, Ga.
New county and city buildings, Chicago, Ill.
New board of trade building, Chicago, Ill.
Offices for Pullman company, Chicago, Ill.
Counselman building, Chicago, Ill.
Home Insurance Company building, Chicago, Ill.
Peck building, Chicago, Ill.
Auditorium building, Chicago, Ill.
Saint Louis bridge, Saint Louis, Missouri.
Northwestern Insurance Company building, Milwaukee, Wis.
Polished granite for State House, Indianapolis, Ind.
Savings bank building, Buffalo, N. Y.

Custom house and post office, Buffalo, N. Y.
New post office and custom house, Brooklyn, N. Y.
Savings bank, Brooklyn, N. Y.



WAYNE COUNTY COURT HOUSE, DETROIT, MICH.
From Quarry of Maine and New Hampshire Granite Co., North Jay, Maine.

New York and Brooklyn bridge, N. Y.
Harlem river bridge, New York City.
Wells building, New York City.
Mutual Life Insurance Company building, New York City.

Manhattan bank building, New York City.
Kelley building, New York City.
Methodist Book Concern building, New York City.
Havemeyer residence, New York City.
Sun Insurance Company building, New York City.
Mechanics bank building, New York City.
New United States appraisers' warehouse building, New York City.
Broad exchange building, New York City.
Wellington building, Boston, Mass.
Jordan, Marsh and Company building, Boston, Mass.
New custom house and post office, Fall River, Mass.
Peabody town buildings, Peabody, Mass.
General Wool monument, Troy, N. Y.
Pilgrims' monument, Plymouth, Mass.
Smith monument, Philadelphia, Pa.
Mausoleum and monument for Dr. Gibson, Jamestown, Pa.
Ladeu mausoleum, Woodlawn cemetery, New York City.

This company is now furnishing cut granite for the United States custom house and for the Metropolitan Life Insurance Company building, New York city, also for the United States dry dock at Kittery navy yard. It furnished the columns for the Church of Saint John the Divine, New York city. These columns are eight in number, each 54 feet in length and six feet in diameter. They cost about $10,000 each. The Bodwell Granite Company is one of the best known industrial plants in Maine, and the location of its quarries, near the coast and on islands, gives it unequalled facilities for shipping granite.

Pleasant River Granite Company, Addison.

The quarries and works of this company are in the town of Addison, Washington county. In the southern part of the town are unlimited quantities of black granite which takes a beautiful polish and which is in great demand for monumental purposes and for interior finish of building. The quarries of this company are situated near Pleasant bay, where vessels of any size can safely approach the company's wharves. About two miles eastward are the Black Diamond quarries of black granite which have been operated extensively in past years.

The Pleasant River Granite Company was at work several years furnishing granite for base boards for the Philadelphia public buildings. The company furnished granite for interior finish for the house of Professor H. A. Packard of Princeton, New Jersey, for a fine building in Chillicothe, Ohio, for a building in Danforth, Maryland, for one in Morristown, New Jersey, and for many others in all parts of the country.

This granite is used a great deal in combination with gray or red granite for cemetery work. The company has ample polishing works near its quarry and is well equipped for filling large orders promptly. The building of the Washington County railroad, which runs within a few miles of the company's works, has furnished much needed transportation facilities, and an increased output of this beautiful black granite may be confidently expected.

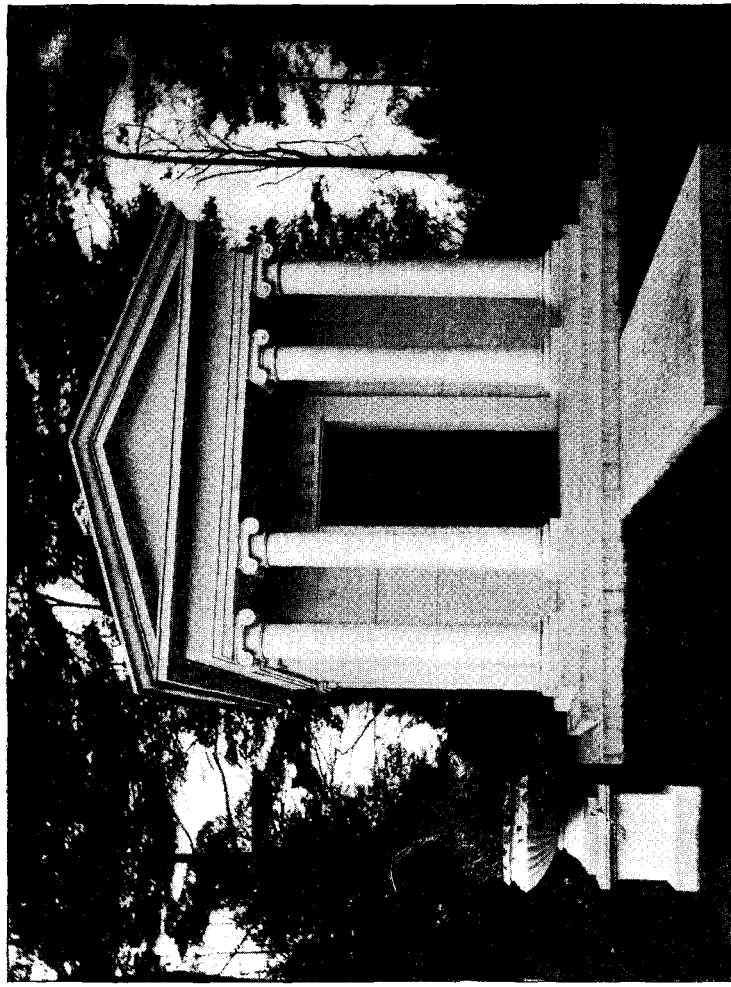
Maine Red Granite Company, Red Beach.

The Maine Red Granite Company is located at Red Beach on the Saint Croix river within the limits of the city of Calais. The granite found here is mainly red in color, but there are other shades, all beautiful and all capable of taking a fine polish. The company was first organized in 1876 and reorganized in 1901. Like nearly all other granite quarries in Maine, this one is practically inexhaustible. The company has one of the best equipped plants in the State for cutting and polishing granite and makes a specialty of this class of work. For trimmings, interior finish, monumental work, etc., there is nothing handsomer in the world than the red granite of this and other quarries in Washington county. We regret that we have not a more extensive list of the different structures into which this beautiful granite has entered, but the few given will indicate the class of buildings and works that are rendered more attractive by its presence.

Museum of natural history, Central park, New York City.
Residence of D. B. Wesson, Springfield, Mass.
Baptist church, Portsmouth, N. H.
Baptist church, Newport News, Va.
Plant cases on terrace around Capitol, Washington, D. C.

C. E. Tayntor and Company, Hallowell.

The above named company is engaged principally on monumental work. Their quarry is near the quarries of the Hallowell Granite Works, and the stone is similar in color and quality.



MAUSOLEUM OF GEN. THOMAS W. HYDE, BATH, MAINE.
Built by C. E. Tayntor & Co., Hallowell, Maine.

The cutting sheds are in the city, near the line of the Maine Central railroad. The company is doing a large and rapidly increasing business and has erected some of the finest and most costly mausoleums, vaults and monuments in this country.

From the long list furnished us, we select a few as specimens of the class of work done.

William H. Webb mausoleum, New York City.
W. F. Proctor mausoleum, New York City.
James J. Faye mausoleum, New York City.
George N. Curtis mausoleum, New York City.
W. J. Demorest mausoleum, New York City.
Charles T. Yerkes mausoleum, Chicago, Ill.
J. Pierpont Morgan monument, New York City.
General Benjamin F. Tracy monument, New York City.
Henry Ward Beecher monument, New York City.
S. S. Cox monument, New York City.
Levi P. Morton monument, New York City.
S. S. Sprague monument, Providence, R. I.
General J. M. Schofield monument.
Soldiers' monument, Newton, N. J.

The above were selected from a list of 130 mausoleums and monuments which this enterprising company has built.

The American Stone Company, North Jay.

This company was organized two or three years ago for the purpose of furnishing Maine granite for the $3,000,000 residence which Senator Clark of Montana is now building in New York city. A quarry was purchased in North Jay, near the quarry of the Maine and New Hampshire Granite Company. The stone is transported to Portland, where, at 442 to 452 Commercial street, a well equipped granite cutting plant has been established. At this point the dressed stone can be loaded directly upon vessels for transportation to New York. There are employed at this plant as many granite cutters as at any plant in the State. So it can readily be seen that an immense quantity of granite is going from Maine into one of the most costly private residences in the country. We understand that the company is to continue work in Maine after its present contract is completed.

Alfred Goodwin, Biddeford.

The quarry of Alfred Goodwin was opened in 1861. From this quarry came a large portion of the granite used in the construction of the forts in Portland harbor. Granite was also furnished from this quarry for the construction of an arch bridge

in Lowell, Massachusetts; for a bridge for the Boston and Maine railroad in Haverhill, Massachusetts; for a draw bridge in Portland; for the City hall, the Masonic building, the Spring street schoolhouse, the Park schoolhouse, and the Dyer library, Biddeford; and for the Thornton academy building, Saco. Mr. Goodwin also does more or less work for the cotton mills in Saco and Biddeford, the Cocheco mills, Dover, New Hampshire, and the mills in Newmarket, New Hampshire. Although this quarry has been worked more than forty years, such is its extent that it has the appearance of just having been opened.

The Tidewater Stone Company.

The above heading is the title of a company organized last spring under the laws of the state of New York, with a capital of $500,000, to quarry and manufacture granite. The quarries belonging to this company are at Pleasant island, South Thomaston and Yarmouth. The officers of the company are Merrick D. Lawrence, president; Walter J. Roberts, vice-president, treasurer and general manager; Charles P. Sumner, secretary.

This company purchased the property once owned by the Standard Quarrying and Construction Company, together with the Casco Bay quarries at Yarmouth, and are getting ready to operate. The stone in the various quarries owned by the company is all of excellent quality, texture and color, and doubtless this strong company will do a large business in the near future.

The Chase Granite Company, Bluehill.

This company was organized in 1894, and its product is fine building stone principally. Its quarries are inexhaustible, and its granite has gone into some noted structures as the following partial list will show.

General Thomas monument, Washington, D. C.
Post office, Harrisburg, Pa.
Gillenden building, New York City.
Bohies hospital, New York City.
Martinique hotel, New York City.
Emigrant station, Ellis island, New York harbor.
Grand Central hotel annex, New York City.
Martinique hotel annex, New York City.

Bureau of engraving and printing, Washington, D. C.
Navy yard buildings, Washington, D. C.

Bluehill granite has entered into the construction of many other United States government buildings in all parts of the country as well as many public and private buildings in the large cities.

OTHER GRANITE OPERATORS.

In the following list of granite producers we present the names of those whose operations during the past year have not been so extensive as those whose quarries and plants have been described in the preceding pages. The quarries owned by these producers are in every instance considered inexhaustible, and their plants are well equipped with modern appliances for handling, cutting and polishing granite.

Hooper, Havey and Company, and Crabtree and Havey, North Sullivan.

Both of the above named companies did an extensive business in curbing, random stone and paving blocks. The Sullivan granite is gray in color, of fine texture, takes a beautiful polish, and is suitable for any work into which granite enters.

Oak Hill Granite Company, Swanville.

This company did some business, but owing to the death of one of the principal owners and managers, and to the fact that the quarry is now owned principally by widows, the business has been for the past few years somewhat inactive. The quarry is a good one and has furnished much stone in the past for cemetery work in the rough and for paving blocks. Its success under the management of energetic business men would be certain, as it is well equipped and in a good location.

Peter Swensen, Round Pond.

Round Pond is in the town of Bristol, which town has several good granite quarries. Mr. Swensen furnishes considerable granite for monumental work and he reports the demand for it increasing.

Grand Trunk Railway Quarry, Bryant's Pond.

The Grand Trunk railway has a granite quarry at Bryant's Pond in the town of Woodstock from which granite for bridge work is taken. The operations in this quarry are governed by the company's needs.

Billings and Watts, Houlton.

This firm furnishes granite for all the bridges on the Bangor and Aroostook railroad. Their quarries, which are situated in the town of Smyrna, are inexhaustible and their business is increasing.

Charles Bennett, Alfred.

The granite for the Alfred public library was furnished by Mr. Bennett, who has an excellent quarry and an increasing business.

Alonzo Abbott, North Sullivan.

Mr. Abbott does a good business in furnishing curbing, random stone and paving blocks. His market is Washington, Baltimore, Philadelphia, New York and Boston.

James S. Condon, South Brooksville.

Brooksville is in Hancock county and has several quarries of fine granite. Granite for the Saint Louis bridge, Saint Louis, Missouri, was taken from Mr. Condon's quarry. His product at the present time is mainly curbing, crossing, walk and paving stone.

Elie Roy, Oxford.

Mr. Roy has a quarry of excellent granite for building or monumental purposes. Several large buildings have been wholly or partly erected with granite from this quarry; notably, a large church at Berlin Falls, New Hampshire; the Central Maine general hospital, the B. Peck block and the McGillicuddy block, Lewiston.

Allen Granite Company, Mount Desert.

This company is located in a section that abounds in granite suitable for building or paving. The transportation facilities

are excellent, as the quarries are all near deep water in Somes sound.

William J. Bovard Granite Works, Machias.

This company is producing red granite of excellent quality, for which it finds a ready market in all parts of the country. The company was organized in 1899 and has already furnished granite for some noted buildings, among them the public library at Wayland, Massachusetts.

M. D. Chatto, South Brooksville.

Mr. Chatto is producing at the present time dimension and paving stone, but his granite is suitable for building or any purpose for which granite is used. He commenced operations in 1894.

A. M. Webster Company, Pleasant River, Vinalhaven.

This company has quarries of gray, black and red granites, the market for the same being Boston, New York and Philadelphia. The company was organized in 1900 and the business has increased from the start.

Joseph S. Black. Pleasant River, Vinalhaven.

This quarry was opened about five years ago. The granite is a good building stone. At the present time Mr. Black is furnishing granite for the government dry dock at Kittery navy yard.

V. E. Libby, E. A. Hurd, and Walter H. Wells, Lincoln.

The above named parties are each working separate quarries in the town of Lincoln. The quarries are located along an immense ridge of granite not far from the Maine Central railroad, from which a spur track was laid several years ago to the old Jewell quarry which is now owned and operated by Mr. Libby. Mr. Libby has furnished from his quarry considerable monumental stone for Mount Hope cemetery at Bangor, also for the William Pinkham monument at Lincoln. The Lincoln granite is very similar to the gray granite of Vinalhaven and Hurricane Isle.

H. F. Hanson, Bangor.

Dr. H. F. Hanson owns a quarry of rare stone, about four miles out of Bangor in the town of Hermon, which merits some description. The stone is a hornblende syenite or green stone, and experts say there is no other stone like it in the United States. The feldspar has a distinct greenish tinge and this with the black hornblende makes a pleasing combination of color. It has been tested and will withstand both heat and pressure better than the usual granite. It is well adapted for interior finish, polished columns, tablets, window sills and trimmings generally for buildings. It has already been used considerably for monumental work.

Charles Sylvester, Augusta.

Mr. Sylvester's quarry is on the east side of the Kennebec river on the South Belfast road about a mile from the Kennebec bridge. The granite is very similar to that at the Hallowell quarries. His work is mostly local, furnishing a large amount of rough stone for foundations, cellars, etc., as well as some dressed stone.

SOME RECENT CHANGES AND TRANSFERS.

We note a few changes in ownership of quarries, also some leases and changes in the titles of companies, as indicated by returns.

Allen and Company, Mount Desert, are succeeded by the Allen Granite Company.

Green and Company, Stonington, sold their plant to the Chase Granite Company of Bluehill, about a year ago.

C. M. Jewett, Bangor, sold his quarry a few years ago to Joseph H. Baker of Hartland. The quarry is located in Hartland.

The quarry at Canaan owned by the late S. L. Fowler, will be managed hereafter by Elwin H. Brawn.

Orris S. Vose, Machias, has leased his quarry at Jonesboro, the agent being Frank Wallace, 81 Nassau street, New York city.

A granite quarry was opened for the first time recently near Pittsfield village.

SUMMARY OF ESSENTIAL FACTS.

From the returns made to the bureau from practically all the quarries operated during the year 1901, the following summary of the more important facts is obtained:

Capital invested in the industry	$2,915,000
Value of production in the year 1901	$2,689,300
Whole number of workmen employed	3,500
Total number of quarrymen	814
Total number of granite cutters	1,242
Total number of blacksmiths	151
Total number of paving cutters	784
Total number of common laborers	350
Other workmen, engineers, carpenters, polishers, etc.,	161

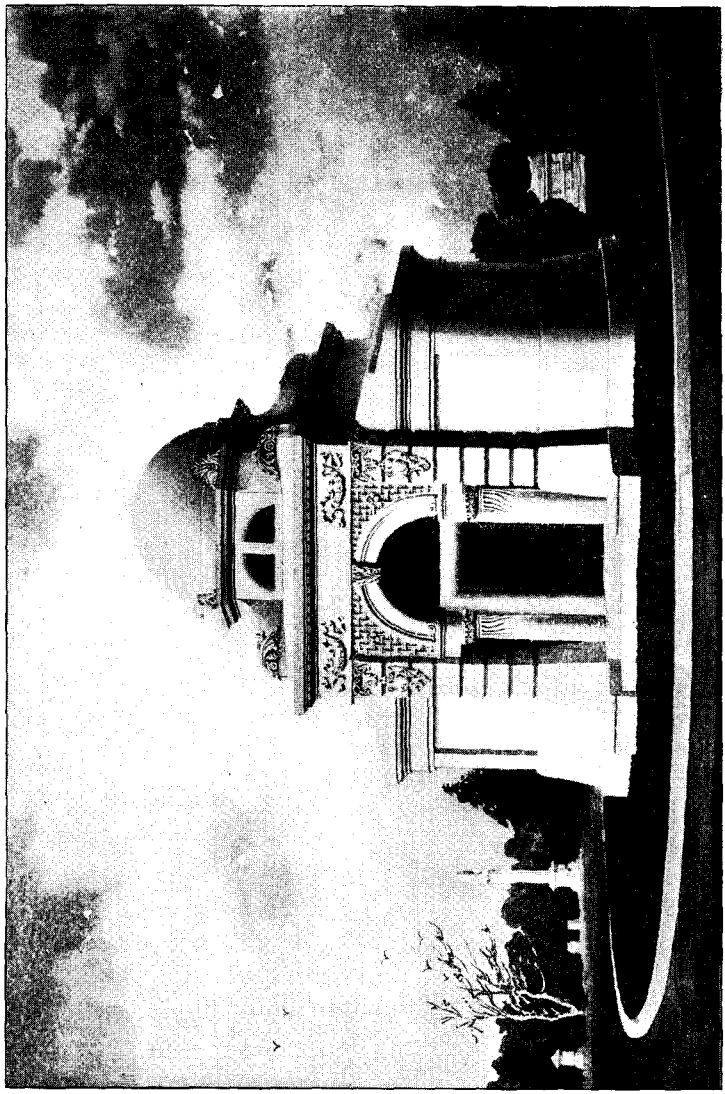
The total amount paid out for labor was a little over $2,000,000. The rates of wages of the different classes of workmen were as follows: granite cutters, from $2.80 to $3.20 per day; quarrymen, from $1.75 to $2.00 per day; blacksmiths, $2.80 per day; common laborers, from $1.50 to $1.75 per day; other laborers, including polishers, engineers, carpenters, etc., from $1.75 to $2.50 per day. Paving cutters work by the piece, receiving a fixed sum for 1,000 blocks. They generally make from $2.25 to $2.50 per day.

All granite cutters work eight hours per day. In some large plants the quarrymen now work only eight hours but in most plants they work nine hours per day. In many plants the blacksmiths work but eight hours, while in the majority of cases they work nine hours. In several plants all classes of laborers work only eight hours per day, but aside from granite cutters the majority of laborers work nine hours.

Nearly all the granite cutters in the State belong to the Granite Cutters' Union, while most of the blacksmiths belong to the same union. A large proportion of the quarrymen belong to the Quarrymen's Union and many of the engineers belong to the same union.

The answers on the blanks to the eleventh question, "What is the market for your production?" were in many cases, "The United States east of the Mississippi river." On two or three of the blanks the answer was, "The United States east of the

Rocky mountains." On several blanks the answer was, "Maine and New England."



THE ARNHEIM MAUSOLEUM, NEW YORK.
Built by C. E. Taynton & Co., Hallowell, Maine.

The answer to the twelfth question, "Do you consider your quarry practically inexhaustible?" was invariably, "Yes," thus showing that, in the opinion of those most competent to judge, there is an unlimited store of granite in the good State of Maine.

In answer to the fourteenth question, "Are your employes union or non-union," nearly all responded, "Both," explaining that the granite cutters, blacksmiths, quarrymen, etc., are generally union, while other laborers are not.

In response to the fifteenth question, "What effect on the amount of production does the reduction in the number of working hours have?" the answers were various. In many cases the answer was, "A decrease in the amount of production," although some answered, "Increased cost of production," while one or two answered, "An increase in the number of employes." One answer was, "Good men can do as much in nine hours as in ten hours." The general trend of the answers to the above question was that the amount of production was decreased in proportion to the reduction in the number of working hours.

In a great majority of cases the answers to the sixteenth question, "Is the granite industry, as far as your plant is concerned, in as prosperous a condition now as in former years?" were "Yes." From these answers and from the facts given in the next paragraph we are justified in coming to the conclusion that the granite industry in the State of Maine is on a substantial and satisfactory basis.

The value of granite produced in Maine in 1897 was $1,115,327; in 1898, $1,032,621; in 1899, $1,321,082; in 1900, $1,568,573; and in 1901, $2,689,300.

There was an increase in the amount of production from $1,568,573 in 1900 to $2,689,300 in 1901, thus raising Maine from the second place in the rank of granite producing states in 1900 to first place in 1901. It is the first time that the granite production of Maine has exceeded that of Massachusetts. The greatest increase was in the value of dressed building stone, which increased from $887,786 in 1900 to $1,501,797 in 1901. The value of crushed stone increased from $5,012 in 1900 to $90,499 in 1901. Paving block value increased from $145,966 in 1900 to $401,189 in 1901, thus proving that the paving block industry has not yet passed away. The increase in the value of rough stock was from $286,781 in 1900 to $459,340 in 1901. There was a slight decrease in the value of granite reported as dressed for monumental work in 1901 as compared with 1900, but the prospects are that there will be an increase in 1902.

The four states producing the most granite in 1901, in the order of the amount produced, are as follows: Maine, $2,689,300; Massachusetts, $2,216,258; Vermont, $1,245,828; California, $1,134,675. The two states approaching the above in the amount of granite production are South Carolina, $996,084, and New Hampshire, $935,494.

CONCLUSION.

In 1838 Dr. Charles T. Jackson completed the first geological survey of the State. While this survey was of great value, it was by no means full and complete. In fact the whole of the great granite industry of the State has sprung into existence since the reports of that survey were published, and the greater part of it has been commenced since the Civil War.

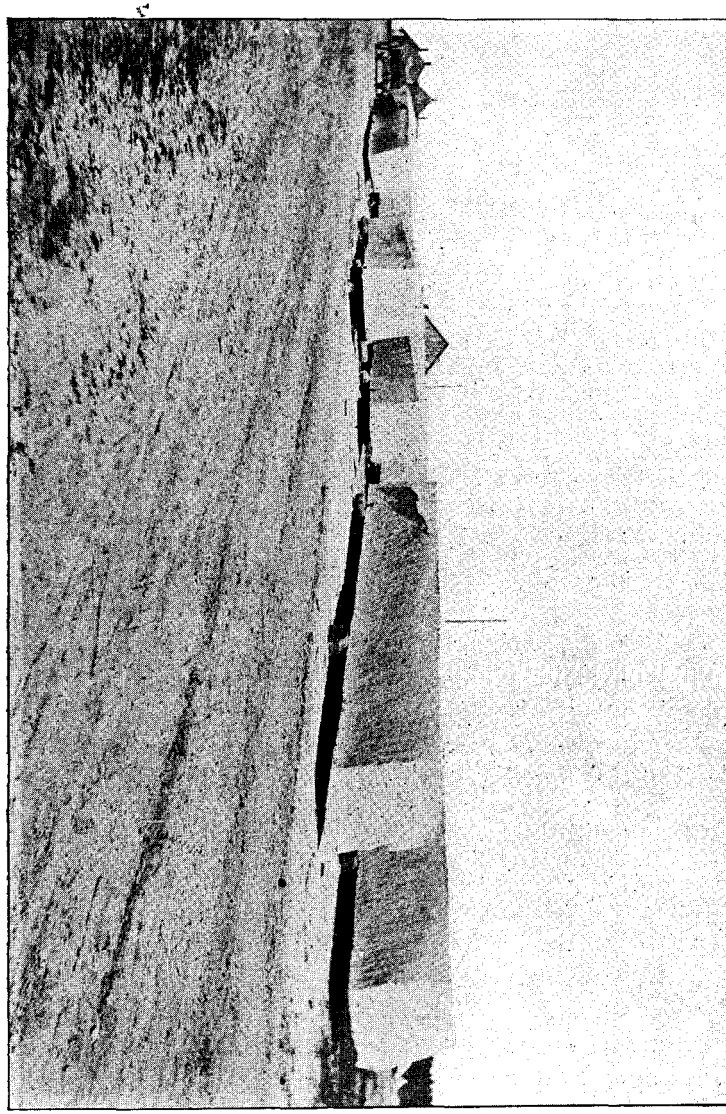
In 1861 a scientific survey of the State was begun and continued for two years. This survey was intended to make a full and exhaustive investigation of the geology and natural history of the State, and if it had been fully carried out, the reports would have been of inestimable value. As it is, the reports of that survey for the years 1861 and 1862 are full of valuable information and give accurate knowledge, as far as they go, concerning the great resources of the State.

A topographical survey of the State was commenced nearly four years ago, and is now going forward. The United States government coöperates with the State government in this survey, each expending an equal amount. If this survey should be carried on to completion, we should have at hand accurate descriptions of every locality, the height above sea level, the kind of soil, the various kinds of rocks, the varieties of trees, etc.

While it is not likely that Maine will ever become famous for the production of valuable ores, she has already become famous for her granite, and it is very probable that all her granite has not yet been discovered.

Maine's forests of valuable timber will disappear, unless more economy is used and more conservative methods practised in cutting in the years to come than in years past, but Maine's quarries of granite are inexhaustible. There is not the slightest danger of producing a scarcity of granite. If all the quarrymen and granite cutters in the United States should come to Maine and their numbers be kept up for the next fifty years,

producing to the extent of their ability during that time, their work would hardly show, so vast are the supplies of granite in this State. In color, texture, resistance to heat, firmness, and



BLOCKS OF GRANITE FROM QUARRY OF HALLOWELL GRANITE WORKS, HALLOWELL, MAINE.

in every quality that makes granite desirable as a building stone, or for monumental or ornamental purposes, the granite of Maine

will compare favorably with that obtained in any part of the world, and in many respects it is not equalled anywhere.

The greater portion of our granite quarries are located so near tidewater that the product can be easily transported in vessels to all the large cities along the Atlantic coast. Notwithstanding this fact, it is also true that the large interior cities, like Chicago, Milwaukee, St. Louis, Cincinnati, Pittsburg, Buffalo, Albany and many others, have drawn largely on Maine for the granite which has entered into the construction of their more costly and beautiful public buildings and fine business blocks. The omnibus bill passed last winter by Congress, authorizing the erection of a hundred or more government buildings in cities of a certain size throughout the country, will have a beneficial effect on the granite business generally, for a portion of these buildings will be of granite, and the contracts for part of the material will presumably come to Maine.

The demand for granite for state buildings, bank, insurance and trust buildings, costly private residences, etc., is likely to be greater in the future than in the past, especially if the present era of prosperity continues. The outlook for the continued prosperity of our great granite industry is extremely favorable.

Granite working requires skilled labor. To become an expert granite cutter, requires a taste for mechanics, and then years of experience. Hence we find these men intelligent, sober, industrious and skillful. They command good wages because of their determination to maintain a high standard. Their union is thoroughly organized, but no one can become a member of the granite cutters union, until he is really a granite cutter of skill and ability. This fact is in favor of both operator and employee, hence operators as a rule make no objection to employing union labor in their granite sheds or their quarries. The whole tendency of quarrying, cutting and carving the beautiful Maine granites, which go into some of the handsomest and most costly structures in the land, is to educate and elevate the workmen. It is perfectly safe to say that in no vocation can there be found better men in every sense of the word than compose the army of granite workers in the State of Maine.

In our pleasant interviews with granite producers, we found them invariably men of broad and liberal views. Their business

is one that reaches out into the world and brings them into contact with hustling, progressive men. They become accustomed to figure on a large scale and to make great contracts. The whole tendency of the great and growing granite industry is to expand and elevate all connected with it. The State should give this industry every encouragement in its power. It has none more valuable in the way of making good citizens. Our granite resources are inexhaustible, and will remain a source of perpetual revenue. We have now reached the period when granite producers can point to our state seal, with its magic word "Dirigo," when asked where we stand among the states in this great industry. Let us hope and strive to maintain our proud position.

ARTIFICIAL STONE.

Artificial stone, concrete or granolithic, as the substance is variously called, is now being used so much for pavements, sidewalks, floors and foundations, that a brief description of its composition, the manner of laying it, and the extent of its use in Maine, will doubtless be interesting.

Artificial stone or concrete is made by mixing gravel or ground stone with cement. Formerly nearly all the cement used in this country came from England and Germany, but now more is made in the United States than is imported. Cement is made by burning certain kinds of limestone with clay and then regrinding it. There are two kinds of cement, known respectively as Portland cement and Rosendale, hydraulic or natural cement. In 1890 there were in this country sixteen factories, producing 335,000 barrels of Portland cement; in 1897 there were thirty factories, producing 2,304,000 barrels; in 1900 there were fifty factories, producing 8,482,020 barrels; and in 1901 there was manufactured in this country the enormous amount of 12,711,225 barrels of Portland cement. These figures show the tremendous growth of this industry. They also show the increase in the use of artificial stone or concrete, for most of the cement manufactured goes into the composition of that material.

Concrete will never take the place of our beautiful granites in the erection of handsome and costly public buildings, fine business blocks or private residences, but in the construction of sewers, subways, tunnels, aqueducts, reservoirs, pavements, floors, foundations, tanks, etc., it is superior to anything yet discovered, and for all these and many other purposes it is more and more in demand daily.

In the great development of the pulp and paper industry in Maine, involving the expenditure of millions of dollars in the erection of mills, concrete or artificial stone has been used largely in the laying of the foundations, also in constructing the huge tanks which hold the various acids necessary in the process of converting wood into pulp.

To show in some degree how largely artificial stone is now used in laying foundations, we will mention a recent instance. In 1900-1901 the Grand Trunk Railway Company built a grain elevator at Portland, with a capacity of 1,500,000 bushels, being the largest elevator on the Atlantic coast. Excavations were made for the foundations, and then 4,000 piles were driven. These piles were driven in clusters of eight or ten close together. The tops were then sawn off to make a level surface, and on these surfaces the artificial stone foundations were laid. For this one structure 5,500 barrels of cement were used, together with 3,500 cubic yards of crushed stone and 2,000 cubic yards of sand.

The great advantage of using artificial stone in laying foundations is that it can be manufactured on the spot, thus saving valuable time, also, that it can be cast into any form and made to correspond to any desired shape. It has the strength of natural stone, when properly made, and will outlast it, as moisture, climate, acids or anything that sometimes disintegrates natural stone seem to have no effect on concrete.

About five years ago Mr. George H. Smardon started in a small way to lay walks, sidewalks and floors with artificial stone in the city of Portland and vicinity. He did not do much the first year, only enough here and there to furnish samples of the beauty and desirability of this material over the old-fashioned brick walk. Year by year the business has grown, and now the city has long strips of beautiful artificial stone sidewalks. It is only a question of time when on all the principal streets artificial stone will replace brick in the matter of sidewalks. It is safe to say that during the last five years $30,000 has been expended in the city of Portland in artificial stone walks and sidewalks.

Other cities are adopting artificial stone walks to some extent, there having been some sidewalks and some private walks laid in Augusta and in Waterville with this material. One of the best examples of this kind of work can be seen in front of the State House in Augusta, where Mr. Smardon has just completed

laying the landings or terraces with artificial stone. Here the superiority of this material over anything else in this class of work is plainly apparent.

The use of artificial stone in the West for walks and sidewalks is almost universal. Chicago has hundreds of miles of artificial stone sidewalks, and very handsome and neat they look as they stretch away as far as the eye can follow them on some of the long, straight and level streets. They are easy to sweep and every rain washes them thoroughly. If laid properly the frost does not affect them and they will remain intact for years.

At the present time Mr. J. W. Burrowes of Portland is supervising the erection of a hundred or more brick houses for workmen at Strathglass park, Rumford Falls. Concrete or artificial stone enters largely into the construction of these houses. The cellar floors are of concrete, the floors of the wide verandas are also of concrete, and the balustrades and rails of these verandas are of concrete. In some of the houses the cornices also are of concrete, while the sidewalks throughout the park will be of the same material.

The Hartford street bridge over the wide canal of the International Paper Company at Rumford Falls furnishes a good example of what can be done with artificial stone. This is an arch bridge, and the two arches, instead of being made of granite blocks, as is usually the case in such bridges, are composed of concrete laid over a steel frame. The bridge is very wide with a sidewalk six feet in width on either side. An immense amount of heavy traffic passes over it as it is on the highway from the business section of the town to the Portland and Rumford Falls Railroad station. The bridge cost $17,000, and as far as we are aware is the first bridge in Maine with concrete arches.

At present we know of but three firms in the State engaged in manufacturing artificial stone and laying artificial stone sidewalks, namely: George H. Smardon and Company, 22 Exchange street, Portland; Portland Sewer Pipe and Artificial Stone Company, 83 Preble street, Portland; and the Maine Artificial Stone Company, 19 Preble street, Portland.

We shall see this clean, handsome and durable substance increase in favor for private walks and public sidewalks in our cities and larger towns in the years to come.

BRICK MAKING BY MACHINERY.

Ever since the more pretentious homes of the early settlers were made complete with brick chimneys, Maine has made brick. In many parts of the State there are located brickyards of varying sizes which are doing a conservative and a profitable business. Nearly all these yards are worked only through the summer months and in a majority of them the work is done wholly by hand. For the most part, these yards supply a somewhat local demand, but little brick being shipped from the State, except in the extreme southwestern portion, where improved machinery is used and some of the output goes to the Boston market. The larger of these yards turn out from 20,000 to 40,000 brick per working day during the summer months, and the Maine brick makers have found the business profitable.

It has remained, however, for a man in Knox county to give the brick business in Maine a start which is one of the most interesting features in the industrial year. This man is E. D. Carleton, a resident of Thomaston and a student of mineralogy. While quietly conducting investigations near his home, he made discoveries which will prove of great commercial value to his native town. As a result of his discoveries, a very fancy price has been paid for some land on the shore of Mill creek in the town of Thomaston, just where that little stream empties into the Georges river. This land was never regarded as of any particular value and in no wise better or worse than any amount of land in nearby pastures. For ordinary farming purposes, the land is no better, but in its sloping hillsides Nature stored away a peculiar and superior quality of clay. And now that Nature's secret has been discovered by Mr. Carleton, half a hundred men will find lucrative employment the year around, and Thomaston brick may become as much sought in the market as Knox county lime.

Mr. Carleton dug into the banks and submitted to various tests the clay which he found. Then he went to certain capitalists and told them what there was in Thomaston. They heard him through and said they would investigate. They sent down their most experienced man, Mr. Frank E. Smith of Medford, Massachusetts. His report coincided with Mr. Carleton's statement. That was encouraging, but the capitalists did not wish to be lured into something which might give out, so they sent a number of experts in brick clay to make further investigations. These men were sent at different times and conducted their investigations on wholly independent lines. In due time they made their reports and each one declared that Mr. Carleton had made no error in his first statements. The clay was tried by every test known to the brick makers, and every trial served to make evident its superiority. Mr. Smith, who has had fifteen years' experience in brick making in the New England states, in New Jersey and in Illinois, says the Thomaston clay is the finest article he has ever seen. It contains a larger percentage of pyrites of iron than ordinary brick clays, and is almost absolutely free from stone, sand and lime. For this reason it is adapted to the finest grades of work in pressed and ornamental brick.

Acting on the reports of the experts, the Massachusetts capitalists who had been approached formed a corporation under the laws of Maine and negotiated the purchase of the property. The corporation is known as The Thomaston Face and Ornamental Brick Company. John H. Norton is president; Benj. F. Peach, treasurer, and A. B. Call, secretary. The land, consisting of thirty acres, was purchased last April and the plant will be completed and in operation early in 1903. Ground was broken for the mill in August and a large construction crew has been constantly employed ever since. Part of the land lies on one side of Mill creek and the remainder on the other, the company being thus afforded unlimited wharfage facilities.

The experts have gone very carefully into the matter of supply, for the capitalists did not wish to establish a costly plant until thoroughly assured that there was clay enough to last for a number of years. The experts agree that the mill may turn out fifty thousand brick on every working day for the next twenty-seven years and yet not exhaust the supply of clay. It is a recognized rule in brick making that an acre of clay one foot deep will pro-

duce one million brick. Now the Thomaston clay banks show a depth of not less than ten feet at any point, and in many places the tests have been carried to a depth of eighteen feet without reaching the bottom of the clay deposit. Taking the minimum depth of ten feet and applying the rule just quoted would give three hundred million brick for the thirty acres. Superintendent Smith, however, is not taking the full benefit of the million-per-acre rule. In the process which he will install no sand will be used in making the brick, as in the old-fashioned way, thus requiring more clay. He allows a wide margin for this and bases his estimates of twenty-seven years' supply on a basis of only nine hundred thousand finished brick per acre.

The company will be able to ship its product by rail or water, for it will have its own wharves and a twelve-hundred-foot siding from the Maine Central railroad will run to the kilns. The river gives a depth at the company's wharfage of eleven feet on the extreme low tide, so that there will be no difficulty in regard to vessels taking their cargo.

The buildings of the company will cost in the neighborhood of $15,000 and their interior equipment will add $20,000; wharfage, another $2,000; several thousand more for tracks and cars; and six kilns at a cost of $5,000 each. When everything is completed the establishment will be by all odds the most complete and thoroughly modern brick making plant in New England, and the equal of any plant in the world.

The equipment of the plant is as different from the ordinary brickyard as the hand loom is different from the modern cotton mill. The contrast between the latter is no greater than the contrast between the new brick making and the old.

The boiler room of the new factory is equipped with two 100-horse-power boilers, and in the engine room adjoining is a 150-horse-power engine. These two rooms, together with the large clay room, make up one section of the building and have a floor space of 30 by 100 feet. The main mill is 50 by 100 feet in size and in addition to this is the drying tunnel, 122 feet long, constructed of brick.

The clay will be dug from the banks by hand and shoveled into specially constructed bank cars. These cars are two in number and will run by gravity, the full car going down the incline to the clay room hauling up the empty car on the other track.

Five men will be employed in mining the clay and loading it into the bank cars.

In the clay room the central piece of machinery is the disintegrator. This piece of machinery in a way corresponds to the digester in a pulp mill, though its functions are more in the nature, perhaps, of a grinder. Into it the clay is dumped as it comes from the bank. The machine grinds the clay to a uniform fineness and passes it out on an endless feed belt. The clay passes rapidly through the disintegrator and the machine could pass along three hundred tons per day if called upon for such a spurt. But, since the disintegrator is called upon for no more ground clay than the rest of the plant can use, it is not worked to its fullest capacity and two men can easily keep it fed for the daily output of fifty thousand brick.

Leaving the clay room on an endless belt, the ground clay passes into the main machine room. The belt carries its load into what is called the pulp mill. The pulp mill is a half-round steel tank, shaped very much like an elongated bath tub. It is fourteen feet in length and through it, revolving in a lateral horizontal plane, is a shaft which is armed with propeller-like blades. These blades cut the clay again and again, reducing it to a uniform consistency. It is here that water is added, if the clay is too dry, for when the clay leaves this tank it must be all ready for the molds.

The pulp mill rests on a framework which brings it seven feet from the floor and directly over the upper end of the auger machine. As the clay leaves the mill it drops into the mouth of the waiting auger machine below. The head of the auger machine resembles a huge locomotive cylinder, narrowing to a rectangular mouthed cone at the lower end. Inside this cylinder moves a heavy shaft with spiral blades. These blades take the plastic clay and push it with increasing force into the cone toward the rectangular opening. That opening is the mold which shapes the clay. For ordinary brick it is the width of a brick's length and the height of a brick's width, so that the clay issues in a ribbon which is as wide as a brick is long and as thick as a brick is wide. The head of the auger machine is at all times kept warm by means of steam pipes, the temperature being maintained at 100 degrees Fahrenheit. By simply changing the mold the

machine will turn out other shapes of brick or will make hollow ware for fireproofing.

As the ribbon of clay comes out of the auger machine it passes over a short metal table and onto a wide endless belt. This belt moves over twenty-one feed rolls which give it support to bear its burden without the slightest sagging. The ribbon of clay is hurried along to a metal table which is cut transversely by twelve narrow openings. Through these openings pass the wire cutters. These wires are part of a huge steel skeleton drum, revolving in a lateral horizontal plane. The twelve wires are stretched taut from diameter to diameter of the drum, and are just the thickness of a brick apart. As the ribbon of clay passes onto the cutting table, the steel drum revolves and down go the twelve wires, through the clay, leaving twelve individual brick. The ribbon pushes them rapidly along and as the last one is out of the way the twelve wires on the opposite side of the steel drum come down and individualize another dozen of brick.

From the cutting table the brick pass almost immediately onto another endless belt. This belt moves at a greater speed than the preceding part of the machinery, so that as it picks up a brick it carries it some little way before another comes along. This carries the brick along with several inches of space between them and makes it easy for the workmen to get hold of them.

On either side of the belt, which now has the brick, run the tracks of the railway to the drier tunnel. The brick are now handled for the first time, as the workmen take them from the endless belt and stack them on the drier cars. It is here that the selection is made for re-pressed brick. Experienced workmen select a certain percentage of the brick and lay them aside. These brick are taken in charge by another crew and subjected to a heavy pressure in a hydraulic machine, after which they go along on the drier cars with the ordinary brick. There are 150 of these drier cars and 3,000 feet of track, two feet two inches in gauge.

The drier tunnel is a brick drying room, 122 feet in length, and is divided into ten parallel tunnels. It is heated from a coal furnace by radiation and the temperature is maintained at 300 degrees Fahrenheit. The ten tunnels have a combined capacity of 75,000 brick. The brick stay in here for twenty-four hours

and when they emerge at the other end of the tunnel are thoroughly dry.

Still on the drier cars, the brick go to the kiln. Here they are handled for the second time. The brick, now hard and dry, but still the color of clay, are stacked in the kilns, each of the great brick-made kilns taking 150,000 brick at a baking. When the kiln is filled the fire is started and for the next five days the baking process goes on. It takes five days, when coal is used, but with wood it takes seven days. The use of coal permits a dampered fire so that more uniformity of temperature can be maintained. It is impossible to burn a kiln so that all the brick will be of a uniform color, since there must be an up-draft or a down-draft fire and those brick which are nearest the fire will be the darkest. Yet coal gives much greater uniformity in color than wood. When the plant is running at full capacity it will require seventy-five tons of coal per week. For the first six or eight months the company will burn wood in three temporary kilns while burning brick with which to construct the six modern coal kilns.

The brick are taken from the kilns and loaded onto the railway cars for shipment. This is the third and last handling of the brick if they are to be shipped by rail. If they go by water they have to be handled once more at the wharf.

The plant will employ fifty hands when it is running at full capacity. The daily pay will run from $1.50 to $3.00, according to the work and the responsibility. Five of the fifty employes will work in the bank, mining the clay; two will work on the disintegrator; one will tend the engine; one will look after the pulp mill; one will tend the auger machine; five will take the brick from the belt and place them on the drier cars; two will take the cars away; one will tend the switch that distributes the cars to the different tracks in the tunnel and sends the empties back to the belt; one will tend the dryhouse; one will tend the furnace in the dryhouse; six will set brick in the kilns; four to six will take brick from the kilns; two will distribute fuel; eight will ship the brick; and in addition there will be two roustabouts, one carpenter, one machinist, one foreman, one superintendent and one man and a team to plow up the clay in the bank.

On account of the heavy machinery, the foundations of the mill have been laid with special care to solidity. The mill struc-

ture rests on thirty-one stone piers set on bed clay. The machinery is set on a brick superstructure, resting on a broad base of Portland cement, which in turn rests on the clay itself.

The machinery of the plant has a guaranteed capacity of 75,000 brick per ten-hour day, but the manufacturers claim that the machinery will turn out 100,000 brick if the clay can be fed to it fast enough. To make 100,000 brick, however, would require the handling of three hundred tons of clay, which is no small amount. Unless forced by rush orders, the company does not expect to turn out more than 50,000 brick per day, an amount which will not overwork either the crew or the machinery.

The company will bore for an artesian water supply in order to get a water that will not discolor the brick nor injure the boiler tubes. Good water is essential to the manufacture of good brick.

As to the profit of the enterprise, that is something which time alone will settle, but the company expects that it can turn out a superior brick at a reduced price. Brick made in the old-fashioned way become expensive by reason of being handled so many times, but under the new process they are handled only three times from the point at which they become brick until they are on the cars, speeding toward the market.

Modern buildings have done away with many things that used to be essential but brick and fireproofing are still favored with an increasing demand, so Thomaston views the future cheerfully.

NEW FEATURES IN MAINE LIME INDUSTRY.

While the blue-crystaled ice of Maine has suffered by the introduction of machine-made ice, or "artificial ice" as it is called, science and machinery have not yet succeeded in making anything which can displace the lime that comes from the rocky reserves laid away so many ages ago by thoughtful Nature.

And just so long as the world needs lime, Knox county, Maine, stands ready to supply all that is demanded. Locality will ever be a factor in the marketing of lime, for it cannot be carried beyond a certain distance with profit. But within the limit of profitable transportation, the Maine product fears no competition. In the markets of New York and Boston, Knox county lime has a name which places it at the head of the list, for the Maine brand is a guarantee of excellence which other states may equal but never surpass. For more than a hundred years has Maine been building up this reputation, and during that time there has been many a change in the marketable product. The changes in the methods of construction have called for a variation here and there in the way of making lime. Some of these variations have been slight and others have been almost revolutionary, but it is a matter of pride to those who have a watchful eye on the industrial progress of Maine that never has the Pine Tree State operator failed to be in the van to meet each new demand of the building trade. If it has been necessary to change machinery, it has been Maine operators who have hurried the new product into the market and been the first to supply the demand. If a new field has been opened up to lime, the Maine operators have been the first to conduct experiments and develop the most feasible process for producing what is wanted. In no line of industrial development to-day is there a more progressive, ever-watchful class of business men than the Maine lime producers. They are abreast the times in every branch of their business and ever have an eye out to note the coming change and be ready for it when it shall arrive.

For over a hundred years the Maine lime business has been growing, small at first and worked in the simplest manner. Yet

from the first it has been profitable, and has given employment to an ever increasing number of men. Like other lines of industry, the men directly employed in the mining and burning of lime are not the only classes that are supported by the business. There are divers ways in which the lime business makes other business good and gives employment to large numbers of people who hardly realize that it is, after all, the lime industry's success which means good times or bad for them. Lime production has a direct and fully comprehended effect on shipping. The lime that Knox county furnishes the rest of the State is a mere bagatelle. The great bulk of the product goes to Boston and New York, and even as far as Galveston, Texas, and goes by water. It takes a sizeable fleet of vessels to carry all this lime and to bring the coal and wood that is used in the burning. When the lime business is good, coastwise shipping from the Knox county district is profitable and all along the rocky bays of Maine is the touch of prosperity felt. This is one of the allied industries. Back in the country districts, we find another. This is where they are making the barrels in which the lime is shipped to market. Farmers take to cooperage naturally in the territory surrounding the lime kilns. They make these casks in the dull hours of the farm and their sale nets them a clean and handsome profit for the season, if business be good and barrels scarce. Even beyond the cooperage region, still further inland, we come to the hoop-pole belt, where one of the important occupations is the cutting and splitting of young growth, to make the hoops that bind together the staves of the lime cask. The latter district is often far removed from the lime kilns, and yet the prosperity of the lime business means prosperity to those that make hoop-poles. There are other trades which are interdependent on lime production, but the instances cited serve to show that it is one of the most far-reaching industries in Maine to-day.

The lime industry has several times in the past been the subject of more or less extended articles in the reports of this department, but so interesting and important have been the developments in lime manufacture, that it ever furnishes fresh material for the industrial writer.

There is little of intricate machinery in the production of lime, yet the quarrying, the burning and the shipment of lime has

undergone great changes since the first shipments were made from the Waldo quarries in the town of Thomaston, more than a century ago. A steadily increasing demand, with a competition that has increased in like ratio, has made it necessary to clip the cost of production at every possible point. In the old days the stone was quarried in a leisurely manner, was transported to the kilns in no more of a hurry, and burned and barreled in the way that came easiest. But such methods will not suffice in these days when a quarter-second saved means success and a half-minute lost means financial disaster. The oxen gave way to horses and the horses gave way to steam and electricity in the transportation of the lime rock from the quarry to the kilns. The hand drill has given way to the power drill of the latest pattern, even as blasting powder has been found too slow and been thrown aside to make way for the higher explosives. The old kiln that served our fathers well is too slow for these busy days and there are patent kilns of many makes, some using wood, some coal, and still others turning the quarried rock into marketable lime with the aid of gas. In this way has time been saved, and there are few cases where time has a higher monetary value than in the making of lime for the market of the present day.

The report of the United States Geological Survey for 1900 contains figures which show the magnitude of the lime business of the nation and the relative importance of the Maine business. The following table shows the value of all limerock quarried in the United States for the ten years covered by that report, together with the value of all quarried in Maine for those years and the percentage of the Maine output to the national output:

Year.	Value of United States product.	Value of Maine product.	Per cent of Maine to United States.
1890	$19,095,179	$1,523,499	7.9
1891	15,792,000	1,200,000	7.6
1892	18,342,000	1,600,000	8.7
1893	13,947,223	1,175,000	8.4
1894	16,190,118	810,089	5.0
1895	15,308,755	700,000	4.6
1896	13,022,637	608,077	4.7
1897	14,804,933	742,877	5.0
1898	16,039,056	1,283,468	8.0
1899	18,757,963	1,028,375	5.5

The above figures show that the average value of the product in the United States for the ten years cited was $16,129,996, while the average value of the Maine product for the same years was $1,067,138, the average percentage of the latter to the former being 6.6 per cent.

The Geological report further shows that the limerock produced in Maine for the year 1899 was divided, by uses, as follows: Made into lime, $1,001,368; stone sold to lime burners, $16,396; flux, $2,543; other purposes, $8,068; making a total of $1,028,375, as given in the tabular statement above.

Figures showing the production of lime by the various companies for the last few years would be of little avail at the present time, for the consolidation of so many of the large lime burning concerns, which took place in 1900, has greatly changed the commercial aspect of the Maine field. Conditions are now shaping themselves in permanent form, but it is too early yet to deal with new conditions which have arisen as a result of this combination of the larger interests. This combination is incorporated under the laws of Maine as The Rockland-Rockport Lime Company, and produces the larger part of all the lime that is shipped from Knox county. It has plants in four towns and by its large available capital is able to meet the most advanced demands of the New York building trades. Many of the individual firms, prior to the consolidation, saw the need of greater capital in order to keep abreast the times, and in a combination which would interest large financial interests they saw the solution of the problem. It was thus that the new company came into existence, merging many of the leading firms. In Rockland, Rockport, Thomaston and Warren there are large plants which are operated independently and with gratifying financial results to the men that are behind them. New firms have been coming into existence from time to time and some of the old firms have been retiring from the field, so that for two years past the business has been in a very unsettled condition, and it will be several years before these conditions will be likely to adapt themselves to a permanent basis. Not until then will it be possible to get reliable figures that will show how large a percentage of the total business is to be done by the Rockland-Rockport Lime Company. In the production of hydrated lime,

this company has no competitor in Maine and is not likely to have, for the installation of this plant has cost many thousands of dollars. The company now has a finishing plant in New York, on its own wharves, and will shortly make a like entry into the Boston market. When all the changes now in contemplation by this concern have been made, its managers expect that their output will be double what it is to-day.

Perhaps in no better way can the magnitude of the lime interests of Knox county be brought out than by the statement that there is a standard-gauge railroad eleven and one-third miles in length, located in the city of Rockland, which does nothing but carry the limerock from the quarries to the kilns, and carry back such coal as is needed at the quarries. This road is owned and managed by the Rockland-Rockport Lime Company, and is the only railroad in the State which does a wholly freight business. It carries no passengers, and yet makes a good financial showing every year. According to its last report it hauled during the year 113,209 tons of rock. Its gross transportation earnings were $62,026.86, its operating expenses were $25,631.24, leaving an income from operation of $36,395.62. Added to this was a miscellaneous income of $1,000.11, making a total income for the year of $37,995.73. On June 30, 1902, the road had a surplus of $30,334.69. The cost of the road was $396,395.49, the cost of its equipment, $112,136.22, and its total assets amount to $552,840.23. A business which uses half a million dollars' worth of railway, just for performing a part of its work, must of necessity be an industry of great magnitude and of vast importance to the State as a whole.

The railway has been in successful operation for some years, but it is only within a year that another important feature of transportation has been developed. This is the matter of transporting the finished product to the market. Formerly, all Knox county lime went out in sailing vessels, but the Rockland-Rockport Lime Company has set a new pace in this respect, by the introduction of the steel barge. This company has a fleet of six ocean-going steel barges with a capacity of 15,000 barrels each. To accompany these the company has an ocean-going tug to tow them back and forth from New York. The barges carry lime on their outward passage and coal for the kilns on their return trip. These barges make possible the shipping of lime

in bulk, if it becomes advisable. In the old wooden vessels this was impossible, for water and lime make a disastrous mixture in the wash of a wooden bottom, but in the steel barge, with its watertight compartments, its rubber gaskets well locked home, the loose lime can be carried through the roughest seas without the slightest danger. At present, the lime is still being shipped in casks for the building trades prefer it in that form, as being easier to get to the building site, but if the demand should shift, the Maine company would be ready to meet the demand.

The cooperage shops are another novelty of but few years' standing. In these shops lime casks are turned out with a celerity that makes hand work seem slow indeed, machinery being made to do almost everything but the book-keeping. These machine cooperage shops are capable of turning out a thousand barrels per day and keep a large number of men employed at profitable wages. But though these shops produce a large number of casks, there is always a brisk demand for the casks that come in from the farms in the surrounding towns. In cases of great demand, when farm work presses and few casks come in from outside, the machines can be relied upon to keep enough casks ahead so that no shipments will be lost for lack of casks to hold the lime.

The introduction of soft coal as fuel for burning lime has raised a general protest against the smoke nuisance, and the lime burners are now devoting a large amount of time and money to the solution of the smoke problem. It is thought by some that the installation of gas producers will give a fuel which will not only eliminate the troublesome smoke but produce a finer quality of lime than is burned to-day. The prosecution of this experimentation will be watched with close interest by all who are interested in lime burning. While a majority of the kilns in use in Knox county to-day are coal-burners, wood is still preferred by some operators and used exclusively in their kilns.

The Rockland-Rockport Lime Company is reaching out for a new line of trade with a product which is its exclusive property, made by a process which is protected by patent rights.

This product is a pure prepared white lime and to produce it the company has expended thousands of dollars in fitting up a

mill at Rockland and another in New York, to give it final preparation for the market. The lime is taken directly from the kiln to the mill where it is hydrated by the patent process. It comes out of the mill in the form of a dry, white powder, which is put into bags and sent to the market in that form. There is little new in the hydration of lime for it is a principle that has been recognized for centuries, but the introduction of the process at this time is another evidence of how every nerve is strained to save time in these days. Ordinary lime mortar requires long exposure to the air in order that it may absorb the carbonic acid gas thrown off in the kiln, before it becomes fitted for use. Furthermore, it takes time to dry, and modern buildings in New York can wait for neither of these delays. Fireproof construction has done away with a great deal of the old lath and plaster work. In its place have come the quick-drying cements and mortars, and it is this demand that the Maine lime burners are reaching out to meet. Ordinary lime cannot be hurried in any of its processes but the new product is expedition itself and permits many combinations to meet different needs. The Rockland mill prepares the lime and at New York the company has machinery to compound it with any given materials for different classes of work. Thus, it will matter not what the builders may demand in the way of modern mortar, the Maine concern can provide it at short notice.

While steel construction has greatly decreased the use of lime in the business sections of New York, the Maine product has found a field that goes far to fill its place, and that is the field of suburban construction. This is known in New York as speculative building. The real estate men make up their mind which way the city will take its next growth and there they erect a cluster of modern houses. As the city expands, these houses are sold and the real estate men move along to new fields. The movement in all cities for more breathing room has been a great aid to the lime-burners of Maine, for every new suburb that is opened means so much more lime consumed. This movement for fresh air is still growing, and will continue to grow for years to come, so there is no fear that the modern sky-scraper built of steel will do away with the necessity for the sort of lime which has made Knox county famous.

Knox county lime burners have not only reached out for the business that modern construction furnishes, but they have met the demands of the paper and pulp mills which are using a great deal of lime in the manufacture of paper. This branch of the trade calls for a rock in which there is a large percentage of magnesia, and the McLoon and Stover Lime Company in Warren have been very successful in furnishing the grade of lime which the paper makers desire. The expansion of Maine's pulp and paper interests has served to make business better in the lime quarries of Knox, and thus has the State been brought into closer industrial touch.

The manufacture of lime pencils is another novelty that has become an important factor in the Maine field. A. J. Bird & Co. of Rockland have made a specialty of this line. Singularly enough, the successful production of this new article requires a reversion to the old style of burning lime. The modern kiln breaks the pieces of lime as the kiln in drawn, little by little, from the bottom, and this leaves the pieces too small to be sawn into pencils. The old kiln, however, in which the rock is not disturbed from the time it is put in till the whole kiln is ready to be drawn, leaves the pieces of rock of the proper size for making pencils. The lime is first sawed into strips of the required size and then rounded by machinery. The pencils are used for calcium lights.

In all branches of the lime industry to-day there is great activity and new features are constantly developing. Nearly all states produce lime and the fact that Knox county has been able to hold its own in far-off competition is due to the recognized and indisputable superiority of its lime—and the enterprise and far-sightedness of the men who are putting that lime on the market.

SLATE.

For convenience of reference the following table, compiled from reports of the United States Geological Survey, is here inserted. It gives the number of squares of roofing slate manufactured in Maine and its value, the value of the Maine output for other than roofing slate, and the total value of all Maine slate produced, for each year from 1890 to 1900 inclusive. It also gives for each of the years named the annual average value per square of Maine slate compared with the same average for all the slate produced in the United States. The price per square of Maine slate for the eleven years will average $4.94, while for the entire country for the same time the average is but $3.30, which makes Maine slate fifty per cent higher than the average for the country. From these figures the superiority of Maine slate is very manifest.

Year.	Squares roofing slate.	Annual average price per square.		Value of roofing slate.	Value other than roofing slate.	Total value.
		For Maine.	For United States.			
1890	41,000	$4 91	$3 34	$201,500	$18,000	$219,500
1891	50,000	5 00	3 49	250,000	- -	250,000
1892	50,000	5 00	3 56	250,000	- -	250,000
1893	18,184	6 83	3 55	124,200	15,000	139,200
1894	24,690	5 02	3 11	123,937	22,901	146,838
1895	23,774	5 00	3 23	118,791	21,363	140,154
1896	23,078	4 32	3 36	99,831	24,255	124,086
1897	38,367	4 20	3 09	161,262	39,855	201,117
1898	29,834	4 42	3 42	131,752	67,485	199,237
1899	24,676	4 93	3 14	121,640	60,126	181,766
1900	21,771	4 77	3 01	103,949	73,393	177,342

TRADE UNIONS.

DEFINITIONS AND OBJECTS.

Among the various definitions of trade unions found in dictionaries and other authorities, we have chosen the following as best expressing the correct idea of the term.

"A trade union is an organized combination among workmen for the purpose of maintaining their rights, privileges and interests with respect to wages, hours of labor, customs, etc."

"A trade union is a continuous association of wage earners for the purpose of maintaining or improving the conditions of their employment."

"Trade unions are combinations for regulating the relations between workmen and masters, workmen and workmen, or masters and masters, or for imposing restrictive conditions on the conduct of any industry or business."

The objects of trade unions are twofold; first, such as may be accomplished by a friendly or benefit society, and, secondly, such as may be accomplished by a trade society or guild. In the former capacity they afford relief to their members when they are out of work for any cause, including sickness or accident; they occasionally provide them with superannuation allowances, and they almost always make burial allowances on account of deceased members and their wives. In the latter capacity it is their special business to promote what they conceive to be the interests of the trade with which they are connected. The leading aims of all trade unions are to increase wages and to diminish the labor which is needful to earn them, and further to secure a more equal distribution of work among the workmen in any given trade than would be the case under a regime of unrestricted competition. Hence their rules prescribe a minimum amount of wages to be accepted and a maximum amount of work to be done by their members, and prohibit piece work or working overtime.

The methods by which the unionists endeavor to accomplish their end, which in a sense is the monopoly of the labor market, are either direct or indirect. The direct method is a strike or simultaneous cessation of labor on the part of the workmen. The indirect methods are limiting the number of workmen to be employed in any trade and repressing or discountenancing competition among those who are actually employed in it. Most of them forbid the admission of more than a stipulated proportion of apprentices, and nearly all of them resist the common employment of unionists and non-unionists, and do their best to exclude non-unionists from employment altogether.

The employer seeks to secure labor for the least possible outlay, while the laborer endeavors to obtain as high a compensation as possible. From these antagonistic principles between the buyer and seller of labor springs the idea of a combination among workmen for their mutual advancement and protection.

TRADE UNIONS IN ENGLAND.

Trade unions have existed in England for centuries. At first they were regarded by the common law as illegal and the operation of the common law was enforced and enlarged by between thirty and forty acts of Parliament, all designed to prohibit and prevent what we have learned to describe and recognize as the organization of labor.

In the year 1824 these laws were repealed and an act passed giving masters and workmen perfect liberty to make such agreements in regard to wages and hours of labor as they mutually thought proper. This law was afterwards repealed, and so the struggle went on till about the year 1875, when the law relating to combinations, whether of workmen or masters, assumed the shape in which it exists at the present time. In connection with trade disputes no person can now be prosecuted for conspiracy to commit an act which would not be criminal if committed by himself singly.

ORGANIZATION OF TRADE UNIONS IN AMERICA.

The ship carpenters and calkers of Boston and New York were the first in this country to organize, and the first authenticated strike occurred in New York city in 1803. In 1806 the

ship carpenters and calkers of New York city asked a reduction of the hours of labor from fourteen to ten per day, and the chief struggle in this country on the part of organized labor, until the close of the civil war, was to reduce the hours of labor to ten per day.

The Cotton Mill Spinners' Association was instituted at Fall River, Massachusetts, in 1858.

The Iron Moulders' Union of America was organized June 5, 1859.

The Cigarmakers' International Union of America was founded June 21, 1864.

The Brotherhood of Railway Engineers was instituted August 17, 1863.

The Bricklayers and Masons' International Union of America was established February 1, 1865.

The Order of Railway Conductors was organized in 1868.

The International Union of Furniture Workers of America was instituted July 7, 1873.

The Brotherhood of Locomotive Firemen was established December 1, 1873.

The Journeymen Horseshoers' National Union was organized April 20, 1874.

The National Amalgamated Association of Steel and Iron Workers was founded August 4, 1876.

The Granite Cutters' National Union was established March 10, 1877.

The New England Boot and Shoe Lasters' Protective Union was formed in 1879.

The International Brotherhood of Boilermakers and Iron Shipbuilders and Helpers was formed at Chicago in 1880.

The Brotherhood of Carpenters and Joiners of America was formed at Chicago in 1881.

The Metal Workers' Union of North America was founded in 1882.

The Journeymen Tailors' National Union was formed at Philadelphia in 1883.

The Brotherhood of Railroad Brakemen was instituted in 1883.

The National Federation of Miners and Mine Laborers was founded in 1885.

The Railroad Switchmen's Association of North America was instituted at Chicago in 1886.

The Brotherhood of Decorators and Painters of America was founded in 1887.

The Paving Cutters' National Union was organized at Baltimore, June 1, 1887.

The Journeymen Barbers' National Union came into existence September 5, 1887.

The Building Laborers' National Union started at Worcester, Massachusetts, September 30, 1887.

Some of the above unions have changed their titles since they were first organized and many other unions have been added to the list, so that now the different kinds of unions number more than one hundred.

These organizations are sustained by amounts received from initiation fees, monthly dues and other sources of revenue. Most of them have sick, disability, funeral and insurance benefits.

One of the largest and most powerful labor organizations of modern times, the Knights of Labor, was founded at Philadelphia in December, 1869, the Garment Cutters' Assembly being the first local organization of that body, and Uriah H. Stephens was the first master workman elected. From this humble beginning sprang that organization, which at one time numbered about 750,000 members.

The tendency in recent years has been for different classes of laborers to have distinct organizations with a national or international head and branches or local unions at convenient points. In this way trade unionism has been placed on a more permanent and sensible basis and its aims and purposes can be more effectively carried out.

The growth of trade unionism during the last decade has been phenomenal, and there are now but few trades or callings the members of which are not, especially in the cities and larger towns, organized into unions.

INVESTIGATION OF TRADE UNIONS IN MAINE.

To facilitate the gathering of data in regard to labor organizations in Maine, the following questions were generally addressed to the secretary of each local union:

1. Name of town or city.
2. Name of union.
3. Date of organization.
4. Number of members.
5. Qualifications for membership.
6. Initiation fee.
7. Monthly dues.
8. Times of meeting.
9. Benefits, insurance, etc.
10. Number of hours of labor daily.
11. Minimum daily wages.
12. What have you been able to accomplish for labor by organization?

This investigation was commenced on the part of the bureau with only the general knowledge that many labor unions existed in the State, so the work was necessarily slow in getting at the facts required. In visiting the larger cities and towns, inquiries were made of workmen at different trades in regard to the existence of unions in their locality, and in this way the names of the officers were ascertained. Through the officers of unions in one place, the fact of the existence of unions in other places was learned, many of which, however, had to be reached by mail. So far as we were able to obtain the locations of unions, the list of questions was placed in the hands of the secretary of each, either personally or by mail, and in many cases the questions were fully answered. A few failed to make the necessary returns and in many cases the questions were not all answered. The result as a whole, however, is quite satisfactory.

It is not our province either to advocate or discourage the organization of labor, but to deal with facts and results. We present as complete a list of labor organizations in the State as was possible to make with the time and means at our disposal.

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

Auburn.

Boot and Shoemakers' Union. Number of members, 50; initiation fee, $1.00; sick benefits, $5.00 per week for 13 weeks; death benefits, $50.00 and $100.00 according to time of membership; hours of labor, 10.

Augusta.

Augusta Typographical Union, No. 380. Organized October 5, 1902; number of members, 60; qualifications for membership, must be a printer or pressman; initiation fee, $2.00; monthly dues, 50 cents; meetings, first Sunday in each month; funeral benefits, $65.00; hours of labor and minimum wages, now pending.

Bricklayers, Plasterers and Masons' Union, No. 9. Organized in September, 1898; number of members, 44; initiation fee, $10.00; monthly dues, 25 cents; meetings, twice a month; death benefits, an assessment of $1.00 on each member; hours of labor, 9; minimum wages, 33⅓ cents per hour; have obtained 9 hours instead of 10 by organization.

Carders' Union. Number of members, 50.

Carpenters and Joiners' Union, No. 914. Organized in October, 1901; number of members, 96, taking in Hallowell and Togus; initiation fee, $5.00; monthly dues, 50 cents; meetings, twice a month; death benefits, assessment of $1.00 on each member; hours of labor, 9; minimum daily wages, $2.00; average daily wages, $2.50.

Loom Fixers' Union. Number of members, 20.

Mason Tenders' Union, No. 9,286. Organized August 1, 1901; number of members, 30; initiation fee, $5.00; monthly dues, 25 cents; meetings, first and third Thursdays in each month; benefits, none; hours of labor, 9; minimum daily wages, $1.75; maximum daily wages, $2.00; have reduced number of hours of labor and increased wages.

Painters, Paper Hangers and Decorators' Union, No. 554. Organized in February, 1902; number of members, 36; initiation fee, $5.00; monthly dues, 35 cents; meetings, 1st and 3rd Tues-

days of each month; death benefits, $50.00; hours of labor, 9; minimum daily wages, $2.50; have reduced hours of labor and increased wages.

Quarrymen's Protective Union. No return.

Weavers' Union. Number of members, 100.

Bangor.

Amalgamated Association of Sheet Metal Workers, No. 34. Organized in September, 1901; number of members, 18; initiation fee, $5.00; monthly dues, 50 cents; benefits, local; hours of labor, 9; minimum daily wages, $1.75; maximum daily wages, $2.25; have secured a reduction in number of working hours.

Atlantic Coast Seamen's Union, Bangor Branch. Initiation fee, $5.00; monthly dues, 70 cents; death benefits, $50.00; shipwreck benefits, $25.00; wages per month, small craft, $25.00; wages per month in vessels of over 1,500 tons, $35.00.

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

Bangor Typographical Union, No. 446. Number of members, 30; meetings, first Saturday in each month.

Barbers' Union, No. 211. Organized January 1, 1902; number of members, 45; initiation fee, $2.00; sick benefits, $5.00 per week for 16 weeks; death benefits, $60.00; hours of labor, close Friday evening at 5.30 P. M., Saturday at 11 P. M., other evenings at 8 o'clock; minimum daily wages, $2.00; have secured shorter hours and increased wages.

Bricklayers, Plasterers and Masons' Union, No. 7. Organized April 1, 1899; initiation fee, $10.00; monthly dues, 25 cents; meetings, every Friday evening; benefits, none; hours of labor, 9; daily wages, $3.00, with 50 per cent added for overtime, and double time for Sundays; have reduced hours of labor from 10 to 9 and increased wages 10 per cent.

Brotherhood of Locomotive Engineers, No. 503. Number of members, 100; qualifications for membership, one year's work;

initiation fee, $10.00; insurance, $750.00, $1,500.00, $3,000.00 and $4,500.00, with dues according to amount of insurance taken; daily wages, $3.50.

Brotherhood of Locomotive Firemen, No. 514. Number of members, 75; initiation fee, $2.00; benefits, insurance, death and sick benefits, but amounts not stated; hours of labor, overtime after 11½ hours; daily wages, firemen, $2.00; shifters and round house men, $1.50.

Brotherhood of Railroad Trainmen, No. 443. Number of members, 80; hours of labor, 10 in yard and 11 on train; daily wages, brakemen, $2.00 in yard and $2.10 on train; switchmen, foremen, $2.00, helpers, $1.95, with increased pay for night work.

Building Laborers' Protective Union, No. 1. Organized August 20, 1901; number of members, 77; initiation fee, $5.00; monthly dues, 50 cents; meetings, every Saturday night; benefits, local; hours of labor, 9; daily wages, $1.75 and $2.00; have reduced hours of labor from 10 to 9 without reduction of wages.

Building Trades Council, made up of delegates from the different building trades' unions, meets 2d and 4th Monday in each month.

Carpenters and Joiners' Union, No. 621. Organized June 11, 1900; number of members, 256; initiation fee, $5.00; monthly dues, 50 cents and 30 cents; benefits, wife's funeral benefit, $50.00 on one year's membership; member's funeral benefit, $200.00 on one year's membership; disability benefits, $100.00 on one year's, $200.00 on two years', $300.00 on three years' and $400.00 on five years' membership; sick benefits, regulated by local union; hours of labor, 9, with 50 per cent added for overtime and double time Sundays; minimum daily wages, $1.75; maximum daily wages, $2.50; have reduced the number of working hours, raised the trade to a legitimate place in the labor world and made the season longer.

Cigarmakers' Union, No. 179, including the cigarmakers in Houlton and Presque Isle. Organized October 13, 1884; number of members, 40; initiation fee, $3.00; monthly dues, $1.20; meetings, first Monday in each month; benefits, out of work, traveling and sick benefits, but the amounts are not stated; hours

of labor, 8; have reduced the hours of labor, secured better sanitary conditions and increased wages.

Federal Labor Union, No. 9,646. Organized April 1, 1902; number of members, 127; initiation fee, $2.00; meetings, every Thursday night; benefits, only strike benefits; hours of labor, 9; daily wages, $1.75 and $2.00; have reduced hours of labor and increased wages.

Foundry Workers' Union. No return.

Granite Cutters' National Union. No local organization but 17 members of the union hold meetings the 20th of each month; hours of labor, 8; daily wages, $2.80 and $3.25.

Horse Shoers' Union. Organized April 2, 1902; number of members, 17; meetings, every Friday night.

Iron Moulders' Union, No. 101. Organized in 1859; number of members, 37; initiation fee, $5.00; monthly dues, 25 cents; meetings, 1st and 3d Wednesdays of each month; sick benefits, amount not stated; hours of labor, 9; daily wages, $3.00; have reduced hours of labor.

Journeymen Plumbers, Gas Fitters and Steam Fitters' Union, No. 209. Organized July 14, 1900; number of members, 30; initiation fee, $15.00; monthly dues, 80 cents; meetings, every Monday night; benefits, none; hours of labor, 9; daily wages, $3.00; have reduced hours of labor and increased wages.

Journeymen Tailors' Union of America, No. 336. Number of members, 20.

Local Union of Shoemakers, No. 304. Organized April 8, 1902; number of members, 50; initiation fee, $1.00; monthly dues, $1.00; sick benefits, $5.00 per week for 13 weeks; death benefits, $50.00 and $100.00 according to time of membership; hours of labor, 10.

Machinists' Union, No. 494. Organized in June, 1902; number of members, 10; initiation fee, $5.00; monthly dues, 50 cents; benefits, only strike benefits; hours of labor, 10; minimum daily wages, $2.00; maximum daily wages, $2.50; have increased wages.

Order of Railroad Telegraphers, No. 11. Organized in June, 1899; embraces about 250 members in the State; initiation fee, $3.50; death benefits, $300.00, $500.00 and $1,000.00, with dues

in proportion; hours of labor, dispatchers and operators at principal stations, 8; daily wages, station men and operators, $1.53.

Painters, Decorators and Paper Hangers' Union, No. 262. Organized January 5, 1900; number of members, 123; initiation fee, $10.00; monthly dues, 35 cents; benefits, $100.00 and $150.00 on death of a member, and $50.00 on death of wife; hours of labor, 9; minimum daily wages, $2.00; maximum daily wages, $2.25; have reduced hours of labor and increased wages.

Sawmill Employes' Union, No. 10,039. Organized June 15, 1902; number of members, 300; initiation fee, $1.00; monthly dues, 50 cents; benefits, local; hours of labor, 10; minimum daily wages, $1.50; maximum daily wages, $7.00; have reduced working hours from 11½ to 10.

Slate, Gravel and Metal Roofers' Union, No. 10,229. Organized August 25, 1902; number of members, 12; initiation fee, $5.00; monthly dues, 50 cents; benefits, none except strike; hours of labor, 9; minimum daily wages, $2.00; maximum daily wages, $2.50; have secured shorter hours.

Stove Moulders' Union, No. 50. Organized May 8, 1902; number of members, 20; initiation fee, $3.00; monthly dues, 55 cents; meetings, 1st and 3rd Tuesdays in each month; death benefits, $100.00; hours of labor, 9; daily wages, $1.75 and $2.25; have reduced hours of labor from 10 to 9.

Team Drivers' Union, No. 365. Organized March 20, 1902; number of members, 104; initiation fee, $2.00; monthly dues, 50 cents; meetings, every Friday night; benefits, none except strike; hours of labor, 9; daily wages, $1.75 and $2.25; have reduced hours of labor and increased wages.

Bath.

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

Bricklayers, Stone Masons and Plasterers' Union. Organized in 1899; number of members, 30; meetings, weekly; hours of labor, 9; daily wages, $3.25.

Iron Moulders' Union. Number of members, 30; initiation fee, $5.00; death benefits, $100.00 and $200.00 according to time of membership; hours of labor, 9; daily wages, $2.50 and $2.75.

Machinists' Union, No. 466. Number of members, 100; initiation fee, $3.00; meetings, 2nd and 4th Fridays in each month; hours of labor, 10; daily wages, $2.00 to $2.50.

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

Sailmakers' Union, No. 8,232. Number of members, 20; initiation fee, $3.00 for residents of city and $5.00 for others; monthly dues, 35 cents; meetings, every Wednesday; death benefits, $20.00.

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

Biddeford.

Biddeford Typographical Union. Number of members, 15.

Bricklayers, Masons and Plasterers' Union. Number of members, 15; hours of labor, 9; daily wages, $3.00 and $3.50.

Carpenters and Joiners' Union. Hours of labor, 9; daily wages, $2.00.

Central Labor Union, composed of delegates from local unions. Considers questions of interest to all union workmen.

Cigarmakers' Union. Number of members, 25; hours of labor, 8; daily wages, $2.50.

Granite Cutters, affiliated with union at Portland. Number of members, 24; hours of labor, 8; daily wages, $3.00 and $3.50.

Iron Moulders' Union. Number of members, 75; hours of labor, 9; daily wages, $2.25 and $3.00.

Loom Fixers' Union. Hours of labor, 10; daily wages, $1.50 and $1.70.

Painters, Decorators and Paper Hangers' Union. Number of members, 43; hours of labor, 9; daily wages, $2.00 and $2.25.

Plumbers' Union. Number of members, 18; hours of labor, 9; daily wages, $3.00.

Slasher Tenders' Union. Number of members, 23; hours of labor, 10; daily wages, $2.00.

Bluehill.

Granite Cutters' Union. Organized in 1889; number of members, 25; monthly dues, 70 cents; meetings, monthly; death benefits, $125.00; hours of labor, 8; minimum daily wages, $2.80 with 50 per cent added for overtime; have secured reduction of hours and increased wages.

Bluehill (East).

Quarrymen's Union, No. 9,671. Number of members, 32.

Brewer (South).

Foundry Workers' Union. Organized June 7, 1902; number of members, 9; initiation fee, $2.00; monthly dues, 10 cents; meetings, 2nd and 4th Tuesdays of each month; hours of labor, 9; minimum daily wages, $1.33; maximum daily wages, $2.00; have reduced working hours and increased wages.

Brownville (Henderson).

Brotherhood of Locomotive Engineers, No. 440. Number of members, 40.

Brotherhood of Locomotive Firemen, Katahdin Lodge, No. 469. Number of members, 32; the same initiation fee, dues and benefits as in other like lodges.

Brotherhood of Railroad Trainmen, No. 366. Number of members, 42; initiation fee, dues, benefits, etc., the same as in other like lodges.

Calais (Red Beach).

Granite Cutters' Union, Calais Branch. Organized in November, 1893; number of members, 42; initiation fee, $2.00; monthly dues, 70 cents; meetings, once a month; death benefits, $125.00; hours of labor, 8; minimum daily wages, $2.80; maximum daily wages, $3.00; have reduced working hours and increased wages.

East Livermore (Livermore Falls).

Paper Makers' Union, No. 11. Organized May 28, 1899; number of members, 67; initiation fee, $1.00 and $2.00; meetings, 1st and 3d Sundays in each month; benefits, none; hours of labor, 11 and 13 alternately; minimum daily wages, $2.29.

Eden (Bar Harbor).

Bricklayers, Masons and Plasterers' Union, No. 4. Organized in December, 1901; number of members, 50; initiation fee, $10.00; monthly dues, 25 cents; death benefits, assessment of $1.00 on each member; hours of labor, 9; minimum daily wages, $3.00.

Carpenters and Joiners' Union, No. 459. Organized February 2, 1900; number of members, 224; qualifications for membership, must be a journeyman carpenter; initiation fee, $5.00; monthly dues, journeymen, 50 cents, apprentices, 30 cents; funeral benefits, $200.00 on death of a member and $50.00 on death of a wife; total disability benefits, $400.00; hours of labor, 9; minimum daily wages, $2.50; have shortened working day 1 hour and increased wages 25 cents.

Painters and Decorators' Union, No. 142. Organized June 9, 1900; number of members, 87; initiation fee, $5.00; monthly dues, 50 cents; death benefits, assessment of $1.00 on each member; total disability benefits, same as death benefits; sick benefits, according to need; hours of labor, 9; minimum daily wages, $2.50.

Foxcroft.

Federal Labor Union, No. 9,717. Organized April 4, 1902; number of members, 11; monthly dues, 30 cents; meetings, 2d and 4th Mondays in each month; hours of labor, 9; have reduced hours and advanced wages.

Frankfort.

Mount Waldo Branch, Granite Cutters' Union. Organized in 1878; number of members, 150; qualifications for membership, must be a practical stone cutter; initiation fee, $1.00; monthly dues, 70 cents; death benefits, $125.00; hours of labor, 8; minimum daily wages, $2.80; maximum daily wages, $3.00; have reduced working hours and increased wages; have regular pay day the 15th of each month.

Hallowell.

Bodwell Quarrymen's Union, No. 9,748. Number of members, 80; initiation fee, $1.00; monthly dues, 30 cents; benefits,

local; hours of labor, 8; minimum daily wages, $1.67; maximum daily wages, $1.85; have reduced number of working hours and increased wages.

Granite Cutters' Union. Organized March 10, 1877; number of members, 250; initiation fee, $1.00; monthly dues, 70 cents; death benefits, $125.00; hours of labor, 8; minimum daily wages, $2.80; maximum daily wages, $3.60; have secured all improvements by organization.

Houlton.

Aroostook Lodge, No. 393, Railroad Trainmen. Number of members, 57; fees, dues and benefits, the same as in other lodges of the order.

Brotherhood of Locomotive Firemen, No. 587. Organized June 22, 1901; number of members, 62; qualifications for membership, must have served 9 months as fireman; initiation fee, $5.00; insurance benefits, $500.00, $1,000.00, $1,500.00, $2,000.00 or $3,000.00; sick benefits, local; minimum daily wages, $1.85.

Division No. 588, Brotherhood of Locomotive Engineers. Number of members, 34; initiation fees, monthly dues, wages, benefits and insurance, the same as in other divisions of the order.

Hurricane Isle.

Granite Cutters' Union. Number of members, 111; dues, benefits, wages, etc., the same as in all granite cutters' unions.

Jay (Chisholm).

Laborers' Protective Union, No. 9,555. Organized December 15, 1901; number of members, 350; qualifications for membership, must be wage earners of good moral character; initiation fee, $1.00; meetings every Sunday afternoon; benefits, none except in case of strike or lockout; hours of labor, 11 and 13 alternately; minimum daily wages, $1.65; have increased wages.

Jay (North).

Granite Cutters' Union, North Jay Branch. Organized in August, 1891; number of members, 81; initiation fee, from $1.00 to $25.00; monthly dues, 70 cents; meetings, once a month; death benefits, $125.00; hours of labor, 8; minimum daily wages,

$2.80; maximum daily wages, $3.20; have secured all that was asked for in reduction of hours and increased pay.

Quarrymen's Union, No. 9,789. Organized April 24, 1902; number of members, 101; monthly dues, 50 cents; meetings, 1st Wednesday in each month; benefits, local; hours of labor, 8; minimum daily wages, $1.75; maximum daily wages, $2.25 with 50 per cent added for overtime and double pay for Sundays and holidays; have secured reduction in number of working hours and increased wages.

Lewiston.

Boot and Shoemakers' Union. No return.

Bricklayers and Plasterers' Union. Organized in 1885; number of members, 80; qualifications for membership, practical workmen; initiation fee, $10.00; meetings, every Monday; death benefits, assessment of $1.00 on each member on death of a member, and 50 cents on death of wife; hours of labor, 9; minimum daily wages, $3.25; have secured reduction in working hours and increased wages.

Carders' Union. No return.

Carpenters and Joiners' Union. Number of members, 20; hours of labor, 9; daily wages, from $2.00 to $2.25.

Cigarmakers' Union. Organized in 1886; number of members, 52; death benefits, $50.00 on 2 years', $200.00 on 5 years', $350.00 on 10 years' and $550.00 on 15 years' membership; sick benefits, $5.00 per week; also out of work and strike benefits; hours of labor, 8; average weekly wages, $15.00.

Granite Cutters' Union. Organized April 10, 1890; number of members, 27; initiation fee, $1.00; monthly dues, 70 cents; meetings, once a month; death benefits, $150.00; hours of labor, 8; daily wages, $2.80 and $3.00; have secured reduction in hours of labor and increased wages.

Iron Moulders' Union. No return.

Loom Fixers' Union. No return.

Mule Spinners' Union. No return.

Weavers' Union. No return.

Madison.

Brotherhood of Stationary Firemen, No. 12. Organized June 21, 1902; number of members, 47; initiation fee, $2.00; meetings, every Saturday; benefits, local; hours of labor, 12; minimum daily wages, $1.50; maximum daily wages, $2.25.

Carpenters and Joiners' Union, No. 1,031. Organized March 16, 1902; number of members, 56; qualifications for membership, must be a journeyman carpenter; initiation fee, $5.00; meetings, 1st and 3d Mondays in each month; benefits, local; hours of labor, 9; daily wages, $2.00; have secured a nine hour day by organization.

Millinocket.

Papermakers' Millinocket Union, No. 27. Organized in March, 1901; number of members, 75; initiation fee, $2.00 and $1.00 according to wages; monthly dues, 50 cents; benefits, local; hours of labor, 8; minimum daily wages, $1.75; maximum daily wages, $4.50; machine tenders, $3.50; back tenders, $2.50.

Norridgewock (South).

Granite Cutters' Union, South Norridgewock Branch. Organized in May, 1891; number of members, 20; initiation fee, $2.00; monthly dues, 70 cents; meetings, once a month; death benefits, $125.00; hours of labor, 8; minimum daily wages, $2.80; maximum daily wages, $4.00; have reduced hours of labor and increased wages.

Portland.

Atlantic Coast Seamen's Union, Portland Branch. Qualifications for membership, must be a practical seaman and an American citizen, or declare intention of becoming such; monthly dues, 70 cents; death benefits, $50.00; total disability benefits, $200.00; monthly wages, on vessels of less than 500 tons, $25.00, over 500 and less than 1,500 tons, $30.00, over 1,500 tons, $35.00.

Barbers' Union, No. 210. Number of members, 20; monthly dues, 60 cents; meetings, 1st and 3d Thursdays in each month; death benefits, $60.00; sick benefits, $5.00 per week; hours of labor, 69 per week; close Friday night at 6 o'clock, other nights at 8 except Saturday; minimum weekly wages, $10.00.

Bricklayers, Masons and Plasterers' Union, No. 2. Organized February 6, 1890; number of members, 105; initiation fee, $11.25; monthly dues, 50 cents; meetings, every Sunday evening; death benefits, $100.00; other benefits, local; hours of labor, 9; daily wages, $3.50 with double time for Sundays and holidays; have secured reduction in number of working hours and a great increase in wages.

Brotherhood of Locomotive Engineers, No. 40. Number of members, 145; qualifications for membership, 1 year's experience as engineer; initiation fee, $10.00; meetings, 2d and 4th Sundays in each month; insurance benefits, $750.00, $1,500.00, $3,000.00 and $4,500.00; dues of 50 cents for $1,500 and proportionately for other amounts; minimum daily wages, $3.50.

Brotherhood of Locomotive Firemen, No. 4. Number of members, 100; initiation fee, $5.00; meetings, 1st and 3d Sundays in each month; insurance benefits, $500.00, $1,000.00 and $1,500.00 with dues proportionately; daily wages, shifters, $1.80, others, $2.00, $2.15 and $2.25 according to work.

Brotherhood of Railroad Trainmen, No. 82. Organized April 23, 1896; number of members, 300; initiation fee, $3.00 and upward according to insurance; medical examination fee, $1.00; insurance benefits, $400.00, $800.00 and $1,200.00 with corresponding dues; also total disability and sick benefits; hours of labor, 10 in yard and 11 on road; daily wages, foremen in yard, $2.25, helpers, $1.85, night men, $2.35 and $1.95.

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

Carpenters and Joiners' Union. Organized March 19, 1900; number of members, 100: qualifications for membership, must be a journeyman carpenter or woodworker of ability and of good character; initiation fee, $5.00; monthly dues, 50 cents; meetings, 2d and 4th Fridays in each month; death benefits, $100.00 and $200.00 according to time of membership; disability benefits, $100.00, $200.00, $300.00 and $400.00 according to time of membership; hours of labor, 9; minimum daily wages, $2.25; have

secured reduction in number of hours of labor and increased wages.

Central Labor Union, made up of delegates from other unions. Meetings, 1st and 3d Tuesdays in each month.

Cigarmakers' Union, No. 470. Number of members, 20; meetings, 1st Friday in each month; hours of labor, 8; average weekly wages, $15.00.

International Association of Machinists. Number of members, 20; monthly dues, 70 cents; meetings, 2d and 4th Tuesdays in each month; death benefits, $200.00; hours of labor, 10; minimum daily wages, $2.50.

Iron Moulders' Union, No. 248. Organized in August, 1896; number of members, 45; qualifications for membership, must have served apprenticeship of four years; initiation fee, $5.00; sick, death and disability benefits, amounts not stated; hours of labor, 10; minimum daily wages, $2.50 with 50 per cent added for overtime and double time for Sundays and holidays; have secured regular hours and increased wages.

Lasters, Boot and Shoe Workers of America. Meetings, every Thursday evening.

Marine Engineers' Union. No return.

Painters, Decorators and Paper Hangers' Union, No. 237. Number of members, 30; meetings, every other Thursday; hours of labor, 9; daily wages, $2.00 to $2.50.

Pine Tree Division, No. 66, Order of Railway Conductors. Organized March 16, 1890; number of members, 125; initiation fee, $5.00; grand dues, $2.00; local dues, regulated by lodge; insurance benefits, $1,000.00, $2,000.00 and $3,000.00 with dues according to insurance taken; other benefits, regulated by lodge; wages governed by number of hours run.

Plumbers and Steam Fitters' Union. Meetings, 1st and 3d Wednesdays in each month.

Portland Bakers' Union. Recently organized; number of members, 25.

Portland Branch Granite Cutters. Number of members, 250; initiation fee, $1.00; meetings, 3d Friday in each month; death benefits, $125.00; sick and local benefits, amounts not given; hours of labor, 8; minimum daily wages, $2.80.

Portland Bricklayers' Tenders' Union, No. 9,231. Organized May 12, 1901; number of members, 125; initiation fee, $5.00; benefits, none; hours of labor, 9; minimum daily wages, $2.00; maximum daily wages, $2.25; have secured an advance of 25 cents a day for brick carriers, and 50 cents a day for mortar carriers.

Portland Longshoremen's Benevolent Society. Number of members, 400; qualifications for membership, must have been a resident of Portland six months and be of good character; meetings, every Tuesday evening; sick and death benefits, amounts not given; wages by the hour, day work 30 cents, night work 40 cents, trimming grain 60 cents.

Portland Printing Pressmen and Assistants' Union, No. 22. Number of members, 26; monthly dues, pressmen 40 cents, feeders 30 cents; death benefits, $150.00.

Portland Typographical Union, No. 66. Organized in 1878; number of members, 70; hours of labor, 9; weekly wages, job compositors $14.00 minimum; newspaper compositors, day work $14.00, night work $16.00; typesetting machine operators, day work $14.00, night work $20.00; all overtime work, 40 cents an hour.

Railway Freight Handlers' Union. Number of members, 50; meetings, 1st and 3d Sundays in each month.

Team Drivers' Local Union, No. 282. Meetings, 1st and 3rd Thursdays in each month.

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

United Brotherhood of Laborers. Meetings, 1st and 3d Wednesdays in each month.

Wood, Wire and Metal Lathers' Union. No return.

Rumford (Falls).

Bricklayers, Masons and Plasterers' Union. Number of members, 50; meetings, twice a month; hours of labor, 9; daily wages, masons $3.00, bricklayers $3.50.

Laborers' Protective Union, No. 9,545. Organized December 5, 1901; number of members, 730; qualifications for membership,

must be a worker for wages, of good moral character and physically able to earn a living; initiation fee, $2.00; benefits, local; hours of labor, day men 10 with 9 on Saturday, others 11 by day and 13 by night alternately; minimum hourly wages, 15 cents; have secured a uniform scale of wages by the hour instead of so much by the day, irrespective of hours, as formerly.

Stationary Firemen's Union, No. 38. This union embraces firemen, engineers, oilers, coalmen, electrical engineers, etc. Number of members, 83; initiation fee, $2.00; meetings, every Monday; sick and injury benefits, amount not stated; hours of labor, 11 by day and 13 by night alternately; hourly wages, 16½ cents; have secured recognition and respect.

Steam and Hot Water Fitters and Helpers' Union. Organized May 20, 1902; number of members, 21; qualifications for membership, must have worked three years at the business and be a citizen of the United States or declare intention of becoming such; initiation fee, fitters $10.00, helpers $3.00; hours of labor, 10 with 9 on Saturday; daily wages, fitters $2.20, helpers $1.50.

United Brotherhood of Carpenters and Joiners, No. 1,189. Organized July 7, 1902; number of members, 125; qualifications for membership, 3 years work at the trade with 50 years as the age limit; initiation fee, $5.00; meetings, every Tuesday evening; benefits, not yet determined; hours of labor, 10; minimum daily wages, $2.25.

Saint George (Clark Island).

Granite Cutters' Union. Organized March 10, 1877; number of members, 46; monthly dues, 70 cents; meetings, 20th of each month; hours of labor, 8; minimum daily wages, $2.80.

Sanford (Springvale).

Boot and Shoe Workers' Union. No return.

Skowhegan.

Bricklayers and Masons' Union. Organized in July, 1901; number of members, 21; initiation fee, $10.00; monthly dues, 25 cents; meetings, 1st and 3d Mondays of each month; benefits, all granted by the order; hours of labor, 9; minimum daily wages, $3.00; have secured a reduction of working hours with same wages.

Carpenters and Joiners' Union. Organized April 6, 1901; number of members, 58; qualifications for membership, must be a practical carpenter or woodworker and an American citizen; initiation fee, $5.00; monthly dues, 50 cents; meetings, 2d and 4th Saturdays in each month; funeral benefits, $200.00 on death of member and $50.00 on death of wife; disability benefits, $100.00, $200.00, $300.00 and $400.00 according to time of membership; sick benefits, regulated by the union; hours of labor, 9; minimum daily wages, $2.25; have reduced working hours and increased wages and united workmen in a common cause.

Cigarmakers' Union. No return.

Laborers' Protective Union. Organized August 22, 1902; number of members, 140; initiation fee, $1.00; meetings, 2d and 4th Fridays in each month; hours of labor, 10; minimum daily wages, $1.50; have secured a 9 hour day in some kinds of work.

Painters and Decorators' Union. Organized April 28, 1902; number of members, 34; initiation fee, $5.00; meetings, 1st and 3d Wednesdays in each month; benefits, same as in other like unions; hours of labor, 9; minimum daily wages, $2.50; have secured reduction in number of working hours and increased wages.

South Thomaston (Spruce Head).

Granite Cutters' Union. Organized March 10, 1877; number of members, 56; initiation fee, $1.00; monthly dues, 70 cents; death benefits, $125.00; other benefits, $1.00 per day when out of work; hours of labor, 8; minimum daily wages, $2.80; maximum daily wages, $3.20; have secured fewer hours of labor and increased pay.

Stonington.

Granite Cutters' Union. Number of members, 45; hours of labor, 8; minimum daily wages, $2.80.

Quarrymen's Protective Union, No. 9,778. Organized April 16, 1902; number of members, 165; monthly dues, 25 cents; meetings, 1st and 17th of each month; benefits, local; hours of labor, 9; minimum daily wages, $1.75.

Thomaston.

Sailmakers' Protective Union. No return.

Vinalhaven.

Granite Cutters' Union. Number of members, 135; dues and benefits, same as in other like unions; hours of labor, 8; minimum daily wages, $2.80; maximum daily wages, $3.20.

Waldoboro.

Granite Cutters' Union. Number of members, 95; dues, benefits, wages and hours of labor, same as in other like unions.

Waldoboro (Winslow's Mills).

Quarrymen's Protective Union. No return.

Waterville.

Bricklayers and Masons' Union. No return.

Brotherhood of Railroad Trainmen, No. 343. Organized in 1897; number of members, 70; initiation fee, $3.00; meetings, 2nd and 4th Sundays in each month; insurance benefits, $400.00 to $1,200.00 with dues regulated by the amount of insurance; hours of labor, 10 in yard and 11 on train; daily wages, brakemen, $2.00 in yard and $2.10 on train, switchmen, foremen $2.10, helpers $1.95, with increased pay for night work.

Carpenters and Joiners' Union. No return.

Cigarmakers' Union. Branch of Lewiston union. No return.

Stone Cutters' Union. Branch of Hallowell union. No return.

Westbrook.

International Brotherhood of Papermakers. No return.

RESULTS OF ORGANIZATION.

The twelfth question on the blank sent out was "What have you been able to accomplish for labor by organization," and almost invariably the answer was, in substance, a reduction in the number of hours of labor and an increase in wages. Some indicated a better understanding between employer and employe and

the doing away with jealousies, while others claimed an increased respect for workmen and that, through the unions, employers of labor secured a better class of help. As a general thing the operators do not oppose the unions and in many cases they favor them for the reason that they bring them a better class of workmen.

MEMBERSHIP AND LOCATION OF UNIONS.

The number of members belonging to each union must be understood as a variable quantity, for union men are prone to go from one town to another in search of employment. Especially is this true of granite cutters and quarrymen, who naturally seek the locality where large contracts have been made. If they take with them a clearance card showing all dues paid and that they are in good standing, they have no difficulty in obtaining work.

According to our returns there are about 150 labor organizations in the State with a membership between 10,000 and 12,000. Many unions have recently been organized, and the number at the present time is undoubtedly larger than when the returns were sent in.

Within the United States there are more than 25,000 local labor unions with a membership of over 2,000,000.

The Atlantic coast seamen have organizations in Bangor and Portland.

The boot and shoe workers have organizations in Auburn, Bangor, Portland and Springvale.

The bricklayers, masons and plasterers have organizations in Augusta, Bangor, Bar Harbor, Bath, Biddeford, Lewiston, Portland, Rumford Falls, Skowhegan and Waterville, with a membership of about 500.

The carpenters and joiners have organizations in Augusta, Bangor, Bar Harbor, Lewiston, Madison, Portland, Rumford Falls, Skowhegan and Waterville, with a total membership of 985.

The cigarmakers have organizations in Bangor, Biddeford, Lewiston, Portland and Rockland, with a membership of 137. They are well organized and nearly all in the State belong to the cigarmakers' union.

The granite cutters have organizations in Biddeford, Bluehill, Clark Island, Frankfort, Hallowell, Hurricane Isle, Lewiston,

Norridgewock, North Jay, Portland, Red Beach, Spruce Head, Stonington, Vinalhaven and Waldoboro, with a total membership of 1,374. They are thoroughly organized and practically all granite cutters in the State belong to the order.

The iron moulders have organizations in Bangor, Bath, Biddeford, Lewiston and Portland, with a total membership of 237.

There are laborers' protective unions located at North Jay, Rumford Falls and Skowhegan, with a total membership of 1,220. The union at Rumford Falls has a membership of 730, the largest union in the State.

The locomotive engineers have organizations in Bangor, Henderson, Houlton and Portland, with a total membership of 319.

The locomotive firemen have organizations in Bangor, Henderson, Houlton and Portland, with a total membership of 269.

The painters and decorators have organizations in Augusta, Bangor, Bar Harbor, Biddeford, Portland, Skowhegan and Waterville, with a membership of about 375.

The plumbers and steam fitters have organizations in most of the cities and larger towns.

The railroad trainmen have organizations in Bangor, Henderson, Houlton, Portland and Waterville, with a total membership of 549.

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

There are typographical organizations in Augusta, Bangor, Biddeford and Portland, with a membership of about 200.

HOURS OF LABOR AND DAILY WAGES.

The number of hours of labor per day is given with the essential facts connected with each union, but in summarizing these we will again present the hours of labor of the principal trades, also their minimum and maximum wages where they have a maximum rate.

Barbers work generally about 65 hours per week, with a minimum wage of $2.00 per day.

Bricklayers, plasterers and masons work 9 hours daily. Their minimum wage is generally $3.00 and the maximum $3.50 per day.

Carpenters and joiners work 9 hours daily and the minimum wage is generally $2.00 per day, with a maximum of $2.50.

Cigarmakers work 8 hours per day with a wage that averages $2.50.

Granite cutters work 8 hours per day with a minimum wage of $2.80 and a maximum of $3.20.

Iron moulders work 9 hours daily with a minimum wage of $2.25 and a maximum of $3.00.

Longshoremen receive 30 cents an hour for ordinary day work and 40 cents an hour for night work, with a special rate of 60 cents an hour for trimming grain.

Loom fixers work 10 hours daily with a minimum wage of $1.50 and a maximum of $1.75.

Machinists generally work 10 hours daily. Their minimum wage is $2.00 and maximum $2.50.

Mason tenders work 9 hours daily with a minimum wage of $1.75 and a maximum of $2.00.

Painters, paper hangers and decorators work 9 hours daily. In some localities the minimum wage is $2.50 and in others $2.00. Our returns show that $2.50 per day is generally the wage.

Plumbers, gas fitters and steam fitters work 9 hours daily with a minimum wage of $3.00 generally.

The wages of pulp and paper mill workers vary according to the class of work performed. The hours of labor also vary in different mills. Some mills run on two shifts where the hours are 11 and 13 alternately, while others run on three shifts thus making an 8 hour day.

Quarrymen work 9 hours a day in some localities, but in many places during the past season the number of hours has been reduced to 8. In Hallowell this was done voluntarily by the operators. The minimum wage of quarrymen is generally $1.75 and the maximum $2.25.

The number of hours per day of railroad men cannot very well be regulated but their wages are well defined. Conductors' wages are governed by the number of hours of work. Locomotive engineers receive $3.50 per day, being the best paid operatives in the State. Locomotive firemen receive generally $2.00 per day and trainmen receive from $1.95 to $2.25 per day.

Sawmill employes formerly worked 11½ hours per day, but they now work 10 hours with a minimum wage of $1.50.

Sheet metal workers make 9 hours their day's labor with a minimum wage of $1.75 and a maximum of $2.25.

Slasher tenders work 10 hours per day with wages at $2.00.

Slate, gravel and metal roofers work 9 hours a day with a minimum wage of $2.00 and a maximum of $2.50.

Stove mounters work 9 hours daily with a minimum wage of $1.75 and a maximum of $2.25.

Team drivers work 9 hours daily with a minimum wage of $1.75 and a maximum of $2.25.

ATLANTIC COAST SEAMEN'S UNION.

The headquarters of this union are in Boston, and as has already been stated, there are two branches in Maine, one in Bangor and one in Portland. Outside of Maine there are branches at New Bedford, Providence, New York, Philadelphia, Baltimore and Norfolk, the total membership being about 3,500.

The preamble to their constitution sets forth the purposes of the organization as follows:

"In order to improve the environments and better the conditions of the seamen of the Atlantic coast, we, the said seamen, have organized this union, setting forth for our guidance the fundamental principles of right and justice. We believe that through organization we can obtain some of the prosperity that, as distributors of wealth, we ought to be entitled to, gain some respect for our chosen calling, and force our employers to recognize that, as men, we are entitled to the same consideration as our fellow workmen ashore. It is our object to use our influence individually and collectively for the purpose of effecting a change in the marine laws of the United States, so as to render them more equitable and to make them an aid instead of a hindrance to the development of a merchant marine and a body of American seamen."

They have already secured the amendment of marine laws relative to seamen, providing for larger living quarters, better food scale, abolition of imprisonment for breaking civil contracts, abolition of advances in coastwise trade, and raised wages in coastwise trade from 40 to 60 per cent.

The two organizations in Maine are a great aid to seamen, as their rooms are headquarters for those belonging to the order when in port, and there are many ways in which aid or comfort can be extended to a class whose vocation is not any too full of ease or pleasure.

UNITED BROTHERHOOD OF CARPENTERS AND JOINERS.

The United Brotherhood of Carpenters and Joiners was first established in 1881 and it is a well organized and numerous body. Its local organizations are scattered throughout the United States and Canada.

The objects of the brotherhood are:

"To discourage piece work, to encourage an apprentice system and a higher standard of skill, to cultivate feelings of friendship among the craft, to assist each other to secure employment, to reduce the hours of daily labor, to secure adequate pay for work, to furnish aid in cases of death or permanent disability, and by legal and proper means to elevate the moral, intellectual and social condition of all our members, and to improve the trade."

Among the principles of the order we find the following:

"Resolved, That we hold it as a sacred principle that trade union men, above all others, should set a good example as good and faithful workmen, performing their duties to their employers with honor to themselves and to their organization."

In the adjustment of trade difficulties in this order provision is made for settlement by arbitration.

UNIONS OF RAILROAD EMPLOYES.

The several classes of railroad employes are finely organized, their unions are strong and are well managed. The qualifications for membership in the different railroad orders secure men of skill, intelligence, and of good moral character. As a general thing the railroad companies throughout the country recognize the unions and deal with them in settling disputes and labor difficulties.

With these organizations the strike is the weapon of last resort, and every other means of adjusting disagreements must first be exhausted. There are local boards of adjustment, and these local boards must settle difficulties between operatives and employers if possible. If unable to do so, the local board reports the case to a general committee of adjustment which must be maintained on each system of railway where there are any divisions of the order. The general committee will use every endeavor to adjust the difficulty, but if unable to do so, will report the case to the chief of the brotherhood who in turn will endeavor to settle the trouble. So fortified are the various

orders in regard to differences that more than nine-tenths of all disagreements between employers and employes are adjusted either by the local board or the general committee of adjustment and do not reach the chief at all.

Many of the labor organizations beside those connected with railroads have similar methods of adjusting differences, and among the best organized, strikes are becoming less frequent.

IMPROVED CONDITIONS IN PULP AND PAPER MILLS.

In pulp and paper mills where there is a continuous running of machinery, the custom has been to work the crew in two shifts, the day crew working eleven hours and the night crew thirteen hours, the crews shifting from night to day work and vice versa each week; but recently in some of the larger mills there has been a change to three shifts, thus making an eight-hour day, the custom of changing from night to day work being kept up. This way of working was first adopted in the S. D. Warren plant at Cumberland Mills and it proved eminently satisfactory to both operators and employes. The Hollingsworth and Whitney Company have adopted the same method in their great plant at Winslow, and the Great Northern Paper Company at Millinocket is now operating in three shifts of eight hours each.

The S. D. Warren Company at Cumberland Mills has always been very considerate and liberal towards its employes. It maintains a fine library especially for their benefit, and is at the present time devising plans for some kind of a workmen's house with parlors, smoking room, etc. The tenements owned by this company are kept in good repair and are let to employes at a very reasonable rate.

The Hollingsworth and Whitney Company at Winslow have recently built and are maintaining a club house for workmen, which is furnished with a piano, papers and magazines, has a smoking room, hall, a wide veranda and extensive grounds. This club house with its fine appointments is highly appreciated by the operatives and their families.

TRADE UNION PERIODICALS.

Nearly all the great labor organizations have their periodical or official organ. Many of these in literary ability, attractiveness in the way of illustrations, quality of paper and general make-up, will compare favorably with other magazines in the country. This is especially true of some of the railway union organs. The Railroad Trainmen's Journal is a handsome monthly filled with good reading, not only for trainmen but for the public generally. The same is true of the Brotherhood of Locomotive Engineers' Journal and of the Locomotive Firemen's Magazine. The Granite Cutters' Journal is a monthly publication devoted mainly to the interests of that order but containing much general information. The Iron Moulders' Journal is published monthly and is a very bright periodical. The carpenters have a very fine paper, and so do many other trades.

GENERAL REMARKS.

That labor organizations have done much to advance the interests of laboring people there can be no doubt. They have been earnest advocates of education and have established newspapers and periodicals devoted to the promotion of their interests. They have increased wages where inadequate and have secured reasonable hours of service. They have abolished or modified conditions in the sweat shops of the great cities. They have stood against the abuses of child labor and are a unit at the present time in opposing the abuses of child labor in the cotton mills of the South, many of which mills are owned by Northern capital.

The collisions between labor and capital have been many, and they have been destructive. During the last twenty years the strikes and lockouts have involved a loss to employes of over $300,000,000, and to employers more than $140,000,000. If we add to these figures the losses to employers and employes caused by the great anthracite coal strike of 1902 both sums would be increased by one-third or more. Many millions more were lost to those who were not immediately involved in the strike, but were dependent upon the continuance of production which was suspended.

It is certainly desirable that some rational and effective method should be devised for avoiding or settling contests productive of such tremendous and calamitous results. The problem has been recognized as a grave and difficult one and a satisfactory solution has been earnestly desired. Arbitration has been much discussed and sometimes invoked by mutual consent, but the difficulty of establishing a tribunal in which both interests would have absolute confidence has been generally recognized. Compulsory arbitration has been suggested but it has found few advocates.

In closing we give the ideas of a prominent American statesman in regard to labor organizations and their conduct, as follows:

"The evolution in our industrial conditions, which is the marvel and admiration of the world, has rendered it necessary that labor should organize. Labor organizations have their origin in the instinct of self-preservation, of mutual advancement, of common good, and are as natural and legitimate as the organization of capital. In fact the organization of labor and capital naturally go hand in hand. The one is essentially the complement of the other.

"Those who represent the various labor organizations are charged with important and delicate responsibilities, and it is essential that they should be men of good judgment, of forceful character and worthy of confidence. They should be men knowing the rights of labor and willing and able to assert and maintain them. They should likewise know the rights of capital and be willing and able to respect them. Let the laborers and the leaders of labor organizations be broad minded and liberal, obedient to the laws of the land, refraining always from violence towards individuals or the destruction of property, just, generous and patriotic, mindful of the golden rule, willing to live and let live, and they will strengthen their cause by disarming criticism, and by gaining the respect of all the people."

FACTORIES, MILLS AND SHOPS BUILT DURING 1902.

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 1902?" "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-four cities, towns and plantations report building in this line as follows:

ANDROSCOGGIN COUNTY.

Towns.	Buildings.	What done.	Cost.	Help.
East Livermore	Sawmill	Built new	$3,000	-
Lisbon	Cotton mill	Enlarged	5,000	-
Turner	Corn canning shop	Built new	10,000	-

AROOSTOOK COUNTY.

Caribou	Two starch factories	Built new	12,000	30
Caribou	Lumber mill	Built new		
Cary Pl.	Lumber mill	Built new	3,000	15
Connor Pl.	Shingle mill	Built new	15,000	25
Eagle Lake Pl.	Lumber mill	Built new	30,000	50
Grand Isle	Two grist mills	Built new	1,500	10
Mars Hill	Roller grist mill	Built new	3,000	2
Merrill Pl.	Saw mill	Built new	800	12
New Limerick	Tannery	Rebuilt	70,000	50
Perham	Shingle mill	Built new	600	3
Presque Isle	Two starch factories	Built new	7,000	30
Reed Pl.	Lumber mill	Built new	5,000	40
Reed Pl.	Lumber mill	Built new	4,000	35
Reed Pl.	Lumber mill	Built new	1,000	8
Stockholm Pl.	Hard wood mill	Built new	2,000	50
Van Buren	Lumber mill	Built new	300,000	300
Woodland	Starch factory	Built new	3,000	10

CUMBERLAND COUNTY.

Brunswick	Box factory	Improved	15,000	40
Brunswick	Saw mill	Built new		
Casco	Cooper shop	Built new	600	10
Casco	Corn canning shop	Enlarged		
Otisfield	Saw mill	Rebuilt	1,500	5
Portland	R. R. repair shop	Enlarged	12,000	-
Westbrook	Machine shop	Enlarged		
Westbrook	Dry house	Built new		
Westbrook	Cotton mill	Enlarged	40,000	-
Westbrook	Paper mill	Enlarged		

FRANKLIN COUNTY.

Towns.	Buildings.	What done.	Cost.	Help.
Rangeley Pl.	Birch mill	Built new	$5,000	-
Wilton	Woolen mill	Enlarged	20,000	30

HANCOCK COUNTY.

Aurora	Saw mill	Built new	300	2
Castine	Line and twine mill	Built new	1,200	20
Ellsworth	Saw mill	Built new	2,500	15
Franklin	Stave mill	Built new	3,000	12
Gouldsboro	Lumber mill	Enlarged	1,500	10
Long Island Pl.	Saw mill	Built new	1,000	4
Tremont	Sardine factory, storehouse, &c.	Built new	8,000	-

KENNEBEC COUNTY.

Clinton	Spool stock mill	Built new	1,200	
Gardiner	Pulp mill	Commenced	*30,000	
Oakland	Woolen mill	Built new	75,000	100
Rome	Shingle and stave mill	Built new	800	4
Waterville	Worsted mill	Enlarged	20,000	)
Waterville	Woolen mill	Built new	30,000	(130
Waterville	Shirt factory	Enlarged	5,000	)
West Gardiner	Saw mill	Built new	800	4

* Amount expended in 1902.

KNOX COUNTY.

South Thomaston	Stone shed	Built new	700	5
Thomaston	Brick manufacturing plant	Built new	60,000	100
Washington	Blacksmith shop	Built new	300	1

LINCOLN COUNTY.

Jefferson	Lumber mill	Built new	3,000	6
Nobleboro	Lumber mill	Built new	2,000	10

OXFORD COUNTY.

Canton	Tannery store house	Enlarged	2,000	
Newry	Spool stock mill	Built new	800	6
Norway	Saw and shingle mill	Built new	500	4
Paris	Butter factory	Remodeled	2,500	)
Paris	Woodworking plant	Enlarged	5,000	(50
Peru	Saw mill	Built new	500	3
Rumford	Eight manufacturing plants, including pulp mills, paper mills, paper bag mill, chemical plant and others	Enlarged	415,000	500
Stoneham	Lumber mill	Built new	1,000	8
Magalloway Pl	Blacksmith shop	Built new	200	1

PENOBSCOT COUNTY.

Bangor	Iron foundry	Built new	5,000	10
Bangor	Biscuit factory	Built new	2,500	25
Bradley	Lumber mill	Built new	2,000	10
Burlington	Grist and turning mill	Built new	2,500	1
Corinna	Creamery	Built new	800	)
Corinna	Cheese factory	Built new		(4
Garland	Machine shop	Rebuilt	500	1
Greenfield	Lumber mill	Built new	1,000	18
Lincoln	Lumber mill	Built new	50,000	80
Newport	Wool pulling shop	Built new	10,000	30
Veazie	Canoe factory	Enlarged	1,500	25
Winn	Saw mill	Enlarged	700	6
Woodville	Saw mill	Built new	3,000	10

PISCATAQUIS COUNTY.

Towns.	Buildings.	What done.	Cost.	Help.
Blanchard	Slate sheds	Built new	$7,000	20
Greenville	Veneer mill	Enlarged	5,000	50
Guilford	Kindling wood factory	Rebuilt	2,500	30
Milo	Spool factory	Built new	50,000	80
Monson	Saw mill	Built new	1,500	12

SAGADAHOC COUNTY.

West Bath	Saw mill	Built new	500	3

SOMERSET COUNTY.

Detroit	Electric light and power plant	Built new	10,000	2
Embden	Canning factory	Built new	1,000	10
Fairfield	Pulp mill	Enlarged	25,000	50
Fairfield	Furniture factory	Enlarged	15,000	35
Fairfield	Woodworking plant	Enlarged	10,000	30
Harmony	Lumber mill	Built new	2,500	12
Pittsfield	Woolen mill	Enlarged	24,500	50
Pittsfield	Woodworking plant	Enlarged	1,000	10
Pittsfield	Creamery	Enlarged	450	2
Pittsfield	Light and power plant	Enlarged	1,000	10
Pleasant Ridge Pl	Spool bar mill	Built new	5,000	30
Pleasant Ridge Pl	Lumber mill	Built new	1,000	8
Skowhegan	Canning factory	Built new	2,500	15
Skowhegan	Worsted mill	Enlarged	45,000	200
Starks	Saw mill	Enlarged	1,000	6

WALDO COUNTY.

Islesboro	Saw mill	Built new	1,800	8
Palermo	Saw and shingle mill	Built new	800	5
Swanville	Saw mill	Built new	2,000	15
Thorndike	Creamery	Built new	1,000	3

WASHINGTON COUNTY.

Calais	Shoe factory	Built new	2,500	75
Columbia	Blueberry packing shop	Built new	3,000	25
Cooper	Two lumber mills	Built new	1,500	8
East Machias	Lumber mill	Machinery	10,000	-
East Machias	Lumber mill	Enlarged	1,000	-
East Machias	Novelty mill	Enlarged	1,000	-
Lubec	Electric plant	Built new	10,000	7
Lubec	Bottling plant	Built new	500	
Machias	Electric plant	Built new	15,000	3
Machias	Lumber mill	Built new	25,000	50
Princeton	Excelsior mill	Added	1,000	8
Talmadge	Lath mill	Built new	80	5
Vanceboro	Stave and shingle mill	Built new	4,000	15

YORK COUNTY.

Hollis	Pulp mill	Commenced	300,000	50
Saco	Cotton mill	Enlarged	800,000	1,800
Saco	Picker and harness factory	Enlarged		
Saco	Box factory	Enlarged		
Saco	Wood pump factory	Enlarged		
Sanford	Plush mill	Additions	62,000	300

RECAPITULATION.

Counties.	Number of towns.	Number of buildings.	Total cost.	Hands employed.
Androscoggin	3	3	$18,000	-
Aroostook	14	20	457,900	670
Cumberland	5	10	69,100	55
Franklin	2	2	25,000	30
Hancock	7	7	17,500	63
Kennebec	6	8	162,800	243
Knox	3	3	61,000	106
Lincoln	2	2	5,000	16
Oxford	8	16	427,500	572
Penobscot	11	13	79,500	220
Piscataquis	5	5	66,000	192
Sagadahoc	1	1	500	3
Somerset	8	15	144,950	470
Waldo	4	4	5,600	31
Washington	9	14	74,580	196
York	3	6	1,162,000	2,150
Total	91	129	$2,776,930	5,017

TOTALS FOR TWELVE 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	827,800	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

THE COTTON INDUSTRY.

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

COTTON GOODS.

Consecutive number.	Capital invested.	Cost of material used.	Value of product.	Number weeks in operation.	Average Number Hands Employed.				Average Weekly Wages Paid.			Total wages paid.
					Total.	Men.	Women.	Children under 16 years.	Men.	Women.	Children under 16 years.	
1	$900,000	$799,124	$1,536,820	52	1,625	1,040	550	35	$6 95	$5 41	$3 86	$518,294
2	140,000	80,000	200,000	52	100	25	75	–	8 00	6 00	–	35,000
3	5,123,222	2,747,475	3,976,287	52	3,437	1,365	1,879	193	7 40	5 88	3 09	1,142,363
4	1,000,000	743,350	1,286,410	47	1,243	551	628	64	8 25	5 71	2 34	387,953
5	500,000	130,100	227,610	52	273	146	106	21	7 98	5 72	2 40	94,068
6	1,500,000	363,063	845,040	52	933	324	570	39	8 22	5 73	4 16	349,729
7	798,500	363,192	737,795	50	723	319	311	93	9 00	6 25	2 80	252,645
8	130,000	271,081	477,813	52	302	158	144	–	7 45	5 25	–	92,480
9	1,200,000	788,476	1,553,828	52	1,772	725	1,043	4	8 69	6 67	3 30	660,977
10	1,100,000	514,720	1,009,152	49	1,025	455	500	70	8 25	4 95	3 30	321,699
11	1,000,000	292,804	532,286	52	638	215	418	5	7 28	5 60	2 50	201,903
	$13,391,722	$7,093,385	$12,383,041	51	12,071	5,323	6,224	524	$7 81	$5 85	$3 07	$4,057,111

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

Capital invested	$13,391,722
Cost of material used	$7,093,385
Total wages paid	$4,057,111
Value of product	$12,383,041
Average time run in weeks	51
Total number of hands employed	12,071

Total men	5,323
Women	6,224
Children under 16 years	524
Average weekly wages of men	$7 81
women	$5 85
children	$3 07

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

ITEMS.	1880.	1890.	1897.	1898.	1899.	1900.	1901.	1902.
Raw material	55.0	55.2	57.9	52.4	51.8	53.9	57.1	57.3
Wages	22.0	28.5	33.1	34.8	36.6	35.0	33.5	32.8
Margin	23.0	16.3	9.0	12.8	11.6	11.1	9.4	9.9
Totals	100	100	100	100	100	100	100	100

Referring to the above table, it will be seen that the percentage of raw material entering into a given product, which reached its lowest point, 51.8, in 1899, has increased to 57.3. The percentage of wages, which had shown a constant increase and reached its highest point, 36.6, in 1899, has fallen off to 32.8, although the average rate has increased somewhat. The percentage of margin, which reached its lowest point, 9.0, is 1897, and has shown some fluctuation since, has increased .5 of one per cent since last year.

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

PER EMPLOYE.	1880.	1890.	1897.	1898.	1899.	1900.	1901.	1902.
Annual product	$1,132 70	$1,094 61	$873 89	$777 98	$818 34	$914 57	$959 69	$1,025 85
Annual earnings	249 73	312 50	289 50	270 91	300 00	319 62	321 11	336 10

The average annual product per employe shows a constant decrease between 1880 and 1898, the fall off amounting to $354.72 during the eighteen years, but the past four years show an increase of $247.87.

In average annual earnings per employe there was an increase from 1880 to 1890 of $62.77, from 1890 to 1898 a decrease of $41.59, and during the past four years an increase of $65.19, a net increase since 1880 of $86.37.

Ten of the eleven returns received this year are from the same mills from which certain ten returns were received in 1901, and fair comparisons can be made between the results of the tabulations of these two sets of returns for 1901 and 1902 as follows:

Capital invested, 1901	$13,075,219
Capital invested, 1902	13,251,722
Increase	$176,503
Cost of material used, 1901	$6,434,148
Cost of material used, 1902	7,013,385
Increase	$579,237
Total wages paid, 1901	$3,787,797
Total wages paid, 1902	4,022,111
Increase	$234,314
Value of product, 1901	$11,289,049
Value of product, 1902	12,183,041
Increase	$893,992
Average weekly wages of men, 1901	$7 75
Average weekly wages of men, 1902	7 81
Increase	$ 06
Average weekly wages of women, 1901	$5 88
Average weekly wages of women, 1902	5 85
Decrease	$ 03
Average weekly wages of children, 1901	$3 15
Average weekly wages of children, 1902	3 07
Decrease	$ 08

Average number of men employed, 1901	5,221
Average number of men employed, 1902	5,298
Increase	77
Average number of women employed, 1901	6,015
Average number of women employed, 1902	6,149
Increase	134
Average number of children employed, 1901	518
Average number of children employed, 1902	524
Increase	6
Average total number of employes, 1901	11,754
Average total number of employes, 1902	11,971
Increase	217
Average number of weeks in operation, 1901	50.6
Average number of weeks in operation, 1902	51.0
Increase	.4

THE WOOLEN INDUSTRY.

In 1901, returns from twenty-four woolen mills were tabulated, while this year but twenty-two complete returns have been received. The following table will show the condition of the industry in these twenty-two mills for the year ending June 30, 1902, and furnish a basis from which comparisons are made with former years:

WOOLEN GOODS.

Consecutive number.	Capital invested.	Cost of material used.	Value of product.	Number weeks in operation.	Average Number Hands Employed.				Average Weekly Wages Paid.			Total wages paid.
					Total.	Men.	Women.	Children under 16 years.	Men.	Women.	Children under 16 years.	
1	$144,000	$87,493	$151,265	52	90	65	25	-	$8 80	$6 50	-	$38,158
2	100,000	137,395	239,660	52	130	94	36	-	9 00	6 00	-	54,889
3	150,000	192,000	263,400	52	150	85	65	-	8 50	7 00	-	57,140
4	113,000	130,000	200,000	50	114	70	42	2	9 00	8 35	$4 50	43,000
5	109,500	102,056	181,442	51	97	67	30	-	9 55	7 00	-	43,313
6	125,000	142,000	325,000	52	140	100	40	-	10 00	7 00	-	70,594
7	50,000	50,000	80,000	52	62	50	12	-	9 00	7 00	-	25,000
8	200,000	232,462	336,632	52	200	130	62	8	9 75	7 00	3 50	90,069
9	75,000	138,170	209,475	52	100	75	25	-	7 50	6 00	-	41,043
10	300,000	299,915	528,363	52	192	131	61	-	11 43	8 18	-	93,873
11	160,000	118,475	198,123	52	136	84	52	-	8 65	5 90	-	54,734
12	22,500	92,373	167,585	52	80	60	14	6	8 25	6 00	4 00	32,000
13	80,000	126,334	176,000	52	87	54	33	-	8 11	5 47	-	32,168
14	146,000	137,000	251,000	52	115	65	50	-	11 20	6 60	-	54,731
15	100,000	98,873	155,293	50	83	53	30	-	8 10	7 20	-	32,381
16	75,000	120,000	158,000	52	70	35	35	-	9 00	6 90	-	25,000
17	250,000	290,417	449,629	52	240	160	80	-	9 90	7 00	-	114,905
18	160,000	231,600	311,600	52	194	140	50	4	7 00	5 40	3 00	65,700
19	9,000	50,528	87,500	52	60	40	20	-	9 00	6 00	-	22,719
20	100,000	181,968	267,997	52	150	100	50	-	9 00	7 00	-	65,012
21	324,500	327,078	531,392	52	250	160	90	-	9 00	7 50	-	101,790
22	796,064	352,868	606,560	52	332	260	53	19	9 76	7 20	4 25	155,969
	$3,589,564	$3,639,005	$5,875,916	51¾	3,072	2,078	955	39	$9 20	$6 87	$3 94	$1,314,188

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

Capital invested	$3,589,564
Cost of material used	$3,639,005
Total wages paid	$1,314,188
Value of product	$5,875,916
Average time run in weeks	51¾
Total number of hands employed	3,072
Men	2,078
Women	955
Children under 16 years	39
Average weekly wages of men	$9 20
women	$6 87
children	$3 94

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

ITEMS.	1880.	1890.	1897.	1898.	1899.	1900.	1901.	1902.
Raw material	64.2	65.9	65.4	60.1	65.5	55.9	60 0	61.9
Wages	15.6	21.7	25.1	23.4	21.7	21.9	22.6	22.4
Margin	20.2	12.4	9.5	16.5	12.8	22.2	17.4	15.7
Totals	100	100	100	100	100	100	100	100

As compared with 1901, the percentage of raw material entering into the total product has increased 1.9 per cent in 1902. The percentage of wages which decreased 3.4 per cent from 1897 to 1899 and increased .9 of one per cent from 1899 to 1901, has again decreased .2 of one per cent in 1902. The percentage of margin has decreased 6.5 per cent from 1900 to 1902.

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

PER EMPLOYE.	1880.	1890.	1897.	1898.	1899.	1900.	1901.
Annual product	$2,160 28	$1,739 84	$1,389 86	$1,602 67	$1,635 40	$1,900 24	$1,719 81
Annual earnings	337 51	377 03	348 79	375 20	354 71	416 10	388 77

For 1902, the average annual product per employe is $1,912.73; the average earnings per employe are $427.80.

The average annual product per employe, which fell off $770.42 between 1880 and 1897 and showed an increase of

$510.38 in the next three years, has increased $12.49 since 1900, although there was a fall off of $180.43 from 1900 to 1901; while the average annual earnings per employe, including men, women and children, show an increase from last year of $39.03, and a net increase since 1880 of $90.29.

Eighteen of the returns from woolen mills tabulated this year are from mills from which returns were received in 1901, while the other four are from mills from which no returns were received for that year, or if received, were too defective for use. The following comparisons are made between the business of the above mentioned eighteen mills for 1901 and 1902:

Capital invested, 1901	$3,296,027
Capital invested, 1902	3,187,064
Decrease	$108,963
Cost of material used, 1901	$2,534,386
Cost of material used, 1902	3,098,647
Increase	$564,261
Total wages paid, 1901	$985,629
Total wages paid, 1902	1,130,695
Increase	$145,066
Value of products, 1901	$4,284,884
Value of products, 1902	5,050,477
Increase	$765,593
Average weekly wages of men, 1901	$8 99
Average weekly wages of men, 1902	9 24
Increase	$ 25
Average weekly wages of women, 1901	$6 59
Average weekly wages of women, 1902	6 83
Increase	$ 24
Average weekly wages of children, 1901	$3 74
Average weekly wages of children, 1902	3 91
Increase	$ 17

Average number of men employed, 1901.....	1,736
Average number of men employed, 1902.....	1,787
Increase	51
Average number of women employed, 1901.....	759
Average number of women employed, 1902.....	800
Increase	41
Average number of children employed, 1901.....	36
Average number of children employed, 1902.....	37
Increase	1
Average total number of employes, 1901.....	2,531
Average total number of employes, 1902.....	2,624
Increase	93
Average number of weeks in operation, 1901.....	50.8
Average number of weeks in operation, 1902.....	51.9
Increase	1.1

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.

Name of Road.	Number of employes, 1901.	Number of employes, 1902.	Total wages paid, 1901.	Total wages paid, 1902.	Average daily compensation, 1901.	Average daily compensation, 1902.
Bangor and Aroostook Railroad. ...	1,045	1,183	$492,178 84	$569,095 65	$1 84	$1 89
Boston and Maine Railroad	1,461	865	881,777 11	517,122 95	1 91	1 94
Bridgton and Saco River Railroad *..	43	41	18,823 62	19,470 57	1 48	1 50
Canadian Pacific Railway	315	411	201,201 28	226,768 46	1 98	2 02
Franklin and Megantic Railway *....	53	51	17,819 30	20,278 63	1 35	1 39
Georges Valley Railroad..... ...	13	12	5,702 46	5,699 46	1 59	1 59
Grand Trunk Railway.	715	610	410,085 61	351,533 64	1 80	1 82
Kennebec Central Railroad*..... ..	15	15	6,928 47	6,968 14	1 58	1 59
Lime Rock Railroad.....	44	33	16,865 67	18,456 41	1 72	1 87
Maine Central Railroad.	2,913	3,274	1,624,008 00	1,814,429 26	1 77	1 81
Monson Railroad *.....	12	12	4,284 17	5,026 79	1 47	1 45
Phillips and Rangeley Railroad *....	77	81	18,064 44	19,943 08	1 44	1 38
Portland and Rumford Falls Railway	274	296	127,152 15	147,155 17	1 74	1 74
Rumford Falls&Rangeley Lakes R. R.	104	94	33,238 80	36,615 17	1 52	1 56
Sandy River Railroad *.....	48	45	17,962 51	17,852 29	1 47	1 50
Sebasticook and Moosehead Railroad	28	31	5,838 46	7,970 69	1 19	1 46
Somerset Railway.....	72	77	36,220 99	38,503 77	1 63	1 62
Washington County Railroad	255	242	126,649 20	117,032 11	1 71	1 80
Wiscasset, Waterville & Farmington Railroad.....	50	68	17,870 02	18,154 68	1 20	1 16
York Harbor and Beach Railroad....	36	36	7,947 46	9,198 21	1 72	1 73
	7,573	7,477	$4,070,617 96	$3,967,274 53		

*Narrow (two feet) gauge.

Availing ourselves of the courtesy of the railroad commissioners in furnishing advance sheets of their report, we are able to give interesting information regarding the employment of persons and the compensation received by them, as well as other statistical matter, upon the steam and electric railroads in Maine.

RAILROAD EMPLOYES AND WAGES.

The total number of employes upon the steam railroads in Maine on June 30, 1902, was 7,477, and upon the street railways, 1,002, making the number of persons employed in railroad work, 8,479. The amount paid in wages by the steam railroads was $3,967,274.53 and that paid by the street railways was $491,-108.67, making a total in wages paid of $4,458,383.20. The average daily wages upon the steam railroads, including general officers, increased from $1.79 in 1901 to $1.81 in 1902; and not including general officers, from $1.69 in 1901 to $1.76 in 1902. The average daily wages on street railways was $1.65. The total number of days worked in 1902 upon steam railroads was 2,186,019, and the number of days worked upon street railways was 297,641. It is estimated that there were dependent upon the railroad employes in the State from 30,000 to 35,000 persons.

GROSS EARNINGS AND TRAFFIC IN MAINE.

As shown by the report of the railroad commissioners for the year ending June 30, 1902, the gross earnings of the railroads in Maine operated by steam were $11,763,068.86, against $10,930,-002.86 in 1901, a gain of $833,066. The gain in number of passengers carried was 362,646. The number of tons of freight hauled for the year ending June 30, 1902, was 8,868,303, against 8,387,688 tons hauled in 1901, a gain of 480,615 tons. This increase in tonnage of freight hauled shows unmistakably the commercial and industrial growth of our State.

MILEAGE OF STEAM RAILROADS IN MAINE.

The total mileage of steam railroads in Maine on June 30, 1902, was 1,933.35. against 1,918.98 in 1901, a gain of 14.37 miles, which came from the construction of the extension of the Wiscasset, Waterville and Farmington railroad from Week's Mills to Winslow, and the slight addition of .03 of a mile to the

Bangor and Aroostook railroad and .34 of a mile to the branch track of the York Harbor and Beach railroad.

Since the return of the companies of June 30, 1902, there has been put in operation 2 miles by the Bangor and Aroostook railroad, 52.50 miles by the Fish River railroad, and 12.66 miles by the Rumford Falls and Rangeley Lakes railroad, making in all, on December 31, 1902, 2,000.51 miles of steam railroad in the State. The Fish River railroad, from Ashland to Fort Kent, runs through a wilderness section, abundant in valuable timber and prolific in game and fish, a section which will invite not only the lumberman and manufacturer but the tourist and sportsman as never before. The Bangor and Aroostook extension is from Van Buren 2 miles up the Saint John river, thus giving additional facilities for lumber operations in that section. The extension of the Rumford Falls and Rangeley Lakes railroad is from Bemis up the east side of Mooselucmaguntic lake to Oquossoc at the foot of Rangeley lake, 9 miles, and 3.66 miles further north, making an addition of 12.66 miles into the lumber section. The survey of this road has been made still further north and the company anticipates reaching Little Kennebago lake in the near future and finally making a connection with the Quebec Central railroad extending into Canada.

STREET RAILWAYS.

On June 30, 1902, there were in operation in the State 300.35 miles of street railway, against 286.01 in 1901, a gain of 14.34 miles. Since that date there has been constructed 14.15 miles by the Augusta, Winthrop and Gardiner railway from Augusta to Winthrop; 4.50 miles by the Portland railroad from Dunstan's corner to a connection with the Biddeford and Saco railway; 15.30 miles by the Portland and Brunswick railway from Brunswick to a connection with the Portland railroad at Yarmouth; 4.43 miles by the Rockland, Thomaston and Camden street railway from Thomaston to Warren; 3.50 miles by the Kittery and Eliot street railway from Kittery to Greenacre; an extension of the Lewiston, Brunswick and Bath street railway in Auburn of 3.02 miles; and slight additions to the Bangor street railway and the Bangor, Orono and Old Town railway, making, on December 31, 1902, 345.68 miles, 341.18 miles being in operation.

THE DEVELOPMENT OF RUMFORD FALLS.

The Rumford Falls of to-day well illustrates to what extent industrial development may be effected in a few years when far-seeing sagacity seizes the resources nature has lavishly bestowed and proceeds to utilize them. Ten years ago last April the first building was erected in what is now the great and flourishing village of Rumford Falls. In no other place and at no other time has ten years produced such a transformation within the State of Maine. At the close of its first decade it is well to review briefly some of the steps in this great industrial development and derive such lessons therefrom as will incite to similar endeavors in other localities.

In 1881 Hon. Waldo Pettengill, who saw the industrial possibilities of this spot, began to purchase land in order to secure control of the immense water power and the territory required for its development. In 1882 Hugh J. Chisholm became interested in the utilization of this vast power, then running to waste, and from that time to the present these two men have been the main promoters of the grand enterprise. They have lived to see the realization of their fondest hopes, and the actual results must have surpassed what they would have dared to predict twenty years ago.

THE WATER POWER.

The Androscoggin river is the outlet of the Umbagog-Rangeley chain of lakes near the border line between Maine and New Hampshire. The entire fall of the Androscoggin from the level of Rangeley lake to tide water at Brunswick amounts to 1,511 feet. At Rumford the river falls about 182 feet in the distance of one mile, thus affording the greatest water power in New England. The river descends in three successive pitches, the upper one being nearly one hundred feet in height. The minimum at this point is 54,000 horse power. If all this power

should be utilized, it would be sufficient to run one-fifth of the machinery used in all the manufactories in the State of Maine whether run by water, steam or electric power, and is equal to about one-third of the water power utilized in the State for manufacturing purposes at the present time.

The natural conformation of the ground on the right bank of the river, where the industries have been placed, is in every way adapted to the building of canals and the planting of manufactories. In developing the power, plans were made for constructing three canals, to be called, respectively, the upper level canal, the middle level canal and the lower level canal. Two of these canals have already been constructed, namely, the middle level and lower level canals. The 30,000 horse power, now latent but at any time available, from the upper dam, will be utilized when the demand comes for more power than is now furnished by the two canals already built. The head of water from the upper dam will be nearly one hundred feet, the middle level canal furnishes a head of fifty feet, and the lower level canal furnishes a head of about thirty feet. The water can be used three times in producing power, as one canal empties into another, the water from the lower canal flowing into the river. It is very seldom that on the same falls water can be used three times in turning wheels of industry.

The Androscoggin is one of the best controlled rivers in the country. There are eighty-seven lakes connected with its sources, aggregating about 230 square miles of surface, and many of these lakes are capable of being utilized for storage purposes by means of dams. The Rangeley lakes are now controlled by a series of magnificent stone dams. The lakes can be drawn down thirteen feet if necessary.

THE RUMFORD FALLS POWER COMPANY.

In 1890 the Rumford Falls Power Company was incorporated with a capital of $500,000. The officers were as follows:

President, George N. Fletcher, Detroit, Mich.

Treasurer and manager, Hugh J. Chisholm, Portland, Me.

Resident agent, Waldo Pettingill, Rumford Falls, Me.

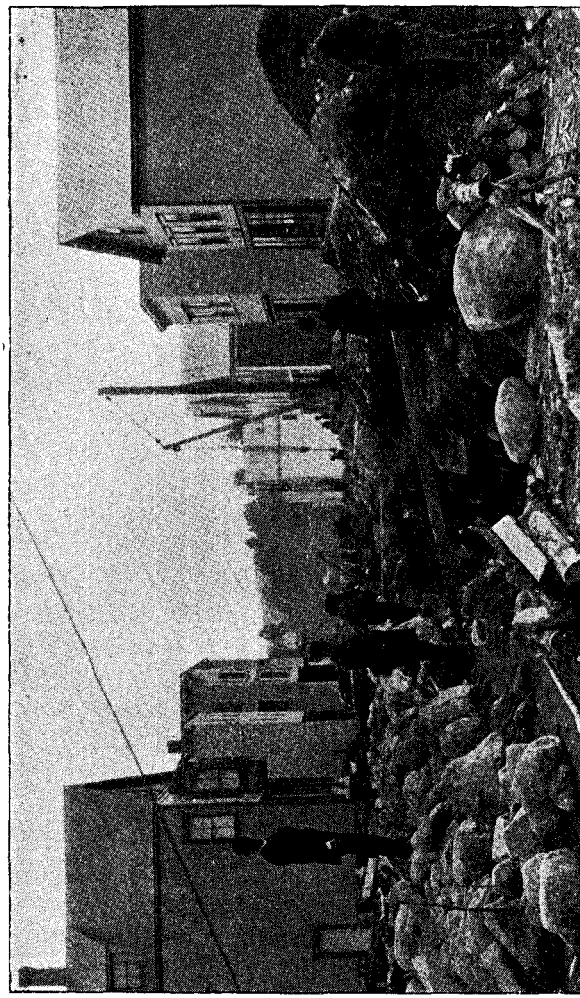
Directors, W. S. Eaton, Portland, Me.; George N. Fletcher, Detroit, Mich.; Don M. Dickinson, Detroit, Mich.; Hugh J.

Chisholm, Portland, Me.; Charles D. Brown, Boston, Mass.; Daniel F. Emery, Jr., Portland, Me.

Attorneys, Symonds, Snow and Cook, Portland, Me.

Consulting engineer, J. Herbert Shedd, Providence, R. I.

Resident engineer, Charles A. Mixer, Rumford Falls, Me.



CONGRESS STREET LOOKING SOUTH, 1892. (Laying Water Pipes).

This company has cleared the forests from the hillsides and done much other preliminary work. It has built the dams and dug the canals in order to make the water power available. It

CONGRESS STREET LOOKING SOUTH, 1898.

has advertised the advantages of the place as a site for manufacturing industries and interested capitalists to invest their money here. It has sold mill sites, and, in connection with each, given a perpetual lease of a certain amount of water for power purposes. It has built a large number of houses, mostly of brick, which it rents to workmen in the different mills, and this work of house building is to be continued on a still larger scale. In short the Rumford Falls Power Company has been and still is the motive power, so to speak, in the development of Rumford Falls.

THE FIRST WORK.

In 1890 work was begun in the now business section in clearing off the forest, the first blow being struck on August 25th. The same month a saw mill was hauled here on skids. Work was commenced on the middle level dam in 1890 and it was completed in 1891.

It should be remembered that at that time woods covered the whole section where the business and residential areas of Rumford Falls now are; also that Hon. Waldo Pettingill had bought for the company 1,200 acres of land, and for himself 550 acres, these tracts lying on both sides of the river and including the whole series of falls.

The writer of this article visited Rumford Falls in 1891, driving in an open wagon from Canton, which was at that time the terminus of the Portland and Rumford Falls railway. There was at that time no building near the falls, the boarding house for the workmen being a shanty made of rough boards and standing near the site of the present railroad round house. Many of the Italian laborers, who were employed in the work of digging, etc., were living in huts constructed mainly of sods. At that time the whole region in the vicinity of the falls presented an exceedingly rough and forbidding appearance.

In her distribution of rocks, Nature was very lavish in her favors around these cascades, and she filled the earth with granite boulders, besides scattering them helter skelter on the top of the ground, probably realizing that all these stones would sometime be required for foundations, walls and embankments. Much of the stone used in the building operations at Rumford Falls has been obtained on the ground or in the vicinity, but the removal of these stones, when excavating for foundations or building

sewers and laying water pipes, has been arduous work, which only rough, hardy men could endure. Where the business portion of the village stands to-day there were countless boulders. and the purchaser of a building site was literally obliged to remove the rocks in order to discover his lot.

The first building in what is now Rumford Falls village was begun on April 11, 1892. That year was a busy one in the prospective new town. The extension of the Portland and Rumford Falls railway from Canton to the falls had been begun the year before and was completed in 1892, the first passenger train arriving in August. The foundations for the first paper mill, that of the Rumford Falls Paper Company, were begun in May, 1892; and the upper dam, located at the head of the falls, was built the same year, the flowage caused by the dam increasing considerably the fall of water on the upper pitch. The erection of buildings for business purposes went on rapidly all the season, and during the latter part of the year the place could boast of several well filled stores, a post-office, a printing press, and, in December, a hotel.

The middle level canal, which was the first one built, was completed in 1892. J. S. Smith and Company of New York were the contractors, and hundreds of men were employed on the canal and other great works during that year. The middle level dam, which was completed in 1891, is 380 feet long. Just above this dam are the middle canal head gates which control the flow of water from the river into the canal. About 4,000 cubic yards of stone and earth work were used in their construction. The canal is 2,400 feet long, from 90 to 200 feet wide and twenty feet deep. The cost was about $85,000. Besides serving to supply power, the canal is also used to float logs to the pulp mills.

The Rumford Falls Paper Company was organized February 10, 1892, with a capital stock of $400,000, which was afterwards increased to $500,000. The officers of the company were as follows:

President, Daniel F. Emery, Jr.

Manager, Garrett Schenck.

Directors, Daniel F. Emery, Jr., George F. Perkins, Hugh J. Chisholm, Edward H. Haskell, C. H. Haywood, Garrett Schenck and Edward L. Stanwood.

Superintendent, John A. Decker.

Treasurer, Edward H. Haskell.

Assistant manager, John T. Eustis.

Clerk, Benjamin Thompson.

The pulp and paper plant of this company was practically completed in 1892. Greenleaf and Foster of Auburn were the contractors. The total floor space of this mill was about two acres. There were about 8,000 cubic yards of masonry in the foundations, and 2,250,000 brick were used in the construction of the walls. The chimney connected with the boiler house is 165 feet in height and is made of iron plates. The capacity of this mill when it started up was about 60 tons of news paper a day.

PROGRESS IN 1893.

The new town, less than a year old, had begun to assume definite form and some measure of comeliness. The year 1893, like its predecessor, was a very busy one; and the work carried on, while not any greater, was more apparent to the eye, as it consisted more in the erection of buildings than in building dams and canals. Work on the lower level canal was being pushed forward as fast as possible at this time, the contractors being Emerson and Liddle of Providence, Rhode Island.

On October 24, 1892, the Rumford Falls Sulphite Company was organized with a capital stock of $200,000. The officers were as follows:

President, Allan M. Fletcher.

Treasurer, Hugh J. Chisholm.

Directors, Allan M. Fletcher, George N. Fletcher, Daniel F. Emery, Jr., and Hugh J. Chisholm.

Preparation was at once made for the building of a sulphite pulp mill, which was completed in 1893, thus adding a much desired factor in the process of producing paper. The plant was located on the middle level canal near the ground wood pulp and paper mill plant of the Rumford Falls Paper Company. Both these plants were later sold to the International Paper Company.

At the plant of the Rumford Falls Paper Company the manufacture of pulp was commenced early in the year, water being turned on January 5th, and the first paper was manufactured on July 12th following. From that date Rumford Falls fast became one of the most important paper manufacturing places in the United States. This plant has been so enlarged and improved

LOADING LOG TRAIN, RUMFORD FALLS AND RANGELEY LAKES RAILROAD.

that any description of it when first erected would not be applicable to it to-day.

A chemical mill for manufacturing bleaching powder and caustic soda from common salt was completed and put in operation that year, the product being about three tons daily at first. The process consisted in causing a powerful electric current to pass through brine made from common salt. This current resolved the salt into its elements, namely, chlorine and sodium. From the chlorine bleaching powder was made, and from the sodium, caustic soda.

Early in the year, H. C. Foster of Gray and J. M. Dolley of Portland erected a woodworking plant, which was a great convenience to builders in the way of planing and finishing lumber.

On March 2, 1893, the town bridge across the Androscoggin near the middle level dam was completed. This bridge is 180 feet long, 31 feet high, and, including sidewalks, 28 feet wide. The abutments were built by Contractor Maxwell at a cost of $9,000. The structure was contracted to Dean and Westbrook, bridge builders, of New York, and sub-let to the R. F. Hawkins Iron Company of Springfield, Massachusetts. It is a fine bridge and one of which any town might be proud.

The new passenger station of the Portland and Rumford Falls railway at this point was first used on May 26, 1893.

The Rumford Falls Light and Water Company was organized in 1892, with a capital stock of $100,000. Its officers were as follows:

President, George D. Bisbee, Buckfield.

Treasurer, Waldo Pettingill, Rumford Falls.

Directors, Hugh J. Chisholm, Portland; Daniel F. Emery, Jr., Portland; Fred E. Richards, Portland; George D. Bisbee, Buckfield; and Waldo Pettingill, Rumford Falls.

The purposes of the company were to furnish electric light and power, and water for domestic and municipal purposes. The town was first lighted by electricity June 19, 1893.

As the company get their water at the upper dam they secure a head of ninety feet to the street level in the business section, and a much greater head in the lower parts of the town. C. W. Talcott of Woonsocket, Rhode Island, was the contractor for laying the water pipes, and Fred Carroll was overseer of the work, which was completed in the summer of 1893.

The electrical plant is on the left bank of the river below the upper dam, and includes the old flume which was constructed by the early settlers of the town. There is a fifty-five feet head at this point and the company can use all the water they require. All the work in connection with the supply of water and the furnishing of electricity was done in the most thorough manner.

One of the finest houses erected that year in the residential section was that of Garrett Schenck, although there were a goodly number of other very handsome dwellings built.

The scarcity of tenements for the working people during that year may be judged by the fact that a building erected by a Berlin Falls man at a cost of between $7,000 and $8,000, was rented for $145 per month; in other words the man was making twenty-one per cent on his investment. Another man had a little building on Congress street that cost about $1,000, and it was renting for $47 per month. This scarcity of tenements has continued to the present time. The erection of dwelling houses has never kept pace with the industrial development.

The Rumford Falls Loan and Building Association, with authority to accumulate not exceeding $1,000,000, was formed in 1893, the principal officers being Waldo Pettingill, president, and Stanley Bisbee, secretary and treasurer. This association did business but a short time, returning all moneys to the shareholders.

The religious and educational needs of the people then began to be looked after. The first Catholic services were held in the new paper mill on January 15, 1893, by Rev. Father Horan. As far as we are informed this was the first religious service held in Rumford Falls. The Methodists, however, were not far behind, as their first service was held in the street on May 18 of that year, being conducted by Presiding Elder Corey, and a church was organized on July 30 following. The first Universalist service was held on July 2 of the same year, conducted by Rev. Anson Titus.

The first school was opened on September 18, 1893, and from that day to the present time the new town has had hard work to provide school accommodations fast enough to meet the needs of the community.

The Rumford Falls Times, E. N. Carver, editor and manager, which up to that time had been printed in Canton, was for the first time printed at Rumford Falls on October 27, 1893.

The Penacook Lodge, Independent Order of Odd Fellows, was instituted October 10 of that year, this being the pioneer among the secret fraternal orders in the new town.

The closing events for the year 1893 were the opening of the Mexico toll bridge, which spans the Androscoggin and connects Rumford Falls village with Ridlonville, on December 24, and the occupying of the Methodist Episcopal church for the first time on December 25. The village, not then two years old, had electric lights, water works, a large hotel, a newspaper, two churches, a dozen stores, and industries that were employing hundreds of men and paying out thousands of dollars in wages every month.

PROGRESS IN 1894.

The year 1894 was one of great growth in the way of erecting dwelling houses, school houses and churches. No additional industrial plants were installed during the year, but much was done in the way of solidifying and perfecting those already established. Dwelling houses began to appear across the river at Ridlonville in the town of Mexico, and that town felt the influence of the great enterprises being carried to completion at Rumford Falls.

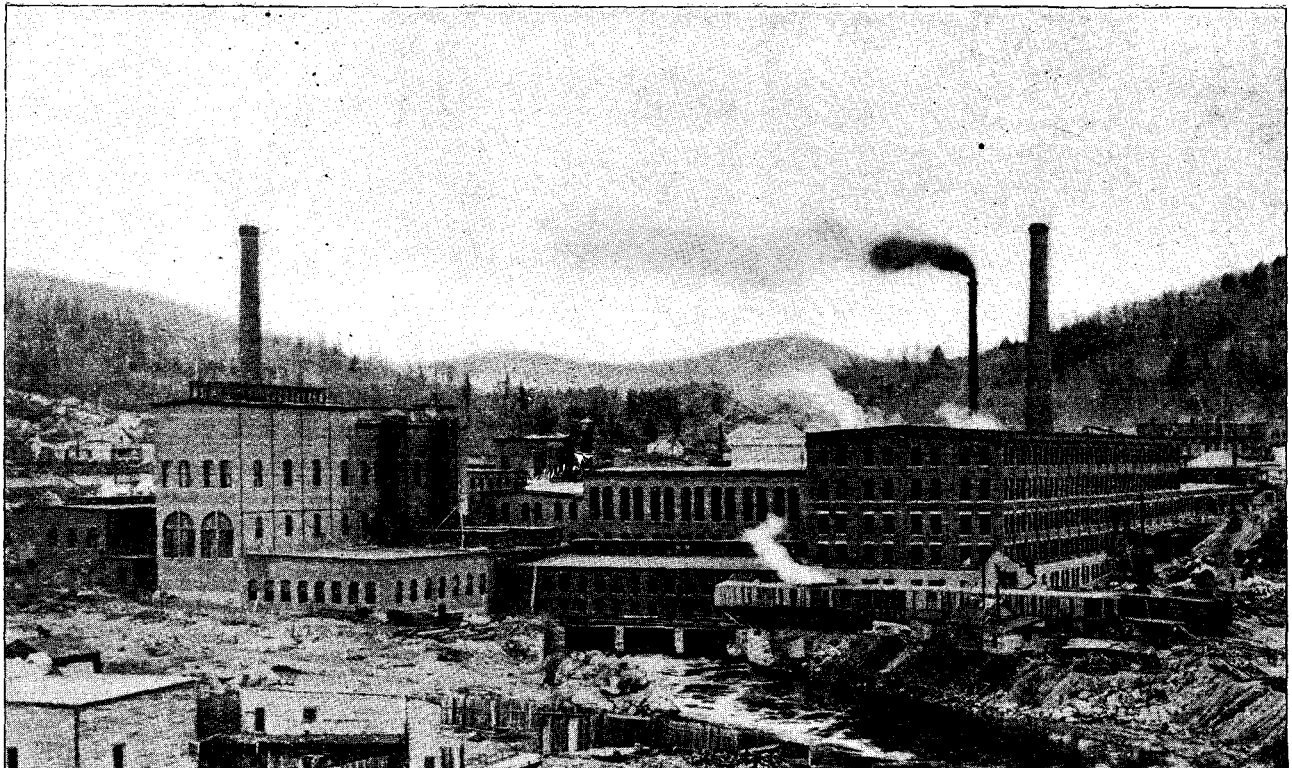
The first public hall in Rumford Falls was opened on the first of January of that year and known as the Wigwam. The Universalist parish was organized April 30, and their church was first occupied on December 16. On September 27 the Rumford Falls high school building was dedicated. The year had been one of substantial growth and general business prosperity.

PROGRESS IN 1895.

The year 1895 was one of continued prosperity, building operations being carried on extensively, especially in the way of business blocks and dwelling houses, besides several school houses. The population increased, the industries added to their output and many changes and improvements were made in their plants.

The Rumford Falls and Rangeley Lakes railroad was opened September 2 of that year.

The Knapp falls suspension bridge was opened on the 20th of November. This is a foot bridge, extending from the busi-



THE INTERNATIONAL PAPER COMPANY'S MILLS.

ness to the residential section and passing almost directly over the beautiful lower falls. A steel bridge for general traffic will be built next year just below the present suspension bridge, which will be one of the handsomest on the Androscoggin river.

To afford the banking facilities which had long been needed, the Rumford Falls Trust Company began business February 1 and occupied their new bank building for the first time on the 11th of November. The bank quarters are fitted up with every modern improvement for the rapid and convenient dispatch of business.

A village corporation charter was adopted November 2, and by this means desired improvements are much facilitated.

The Rumford Falls board of trade was organized March 2, thus furnishing proof of the energy and broad mindedness of the business men of the place.

The Odd Fellows' hall was dedicated March 28 and was considered at that time a commodious and handsome hall.

The Universalist church was dedicated May 30. It was then, and is now, a credit to the town both in its outward appearance and in its interior arrangement and finish.

The Methodist Episcopal church was dedicated September 6 and the bell was first used December 21. The building is a handsome structure and adds much to the appearance of the residential section.

The Baptist church was organized a little later, in the month of February, 1896. The parsonage was built in 1897 and the new church building erected in 1902.

Without proceeding further with the growth of the place year by year, we will now give a more particular description of the plants and business of the leading enterprises where so many of our wage workers find employment.

THE INTERNATIONAL PAPER COMPANY.

The formation of the great International Paper Company and the merging into it of the mills at Rumford Falls, Chisholm, North Jay and several other places was an event with far reaching results. The officers of this company are as follows:

President, Hugh J. Chisholm.

First vice-president and treasurer, A. N. Burbank.

Second vice president and manager of sales, W. B. Dillon.

Directors, Hugh J. Chisholm, A. N. Burbank, W. B. Dillon, F. H. Parks, Warren Curtis, A. Pagenstacker, William A. Russell, D. O. Mills, and T. S. Coolidge.

Division superintendent, Edwin Riley.

Local superintendent, J. H. Hassett.

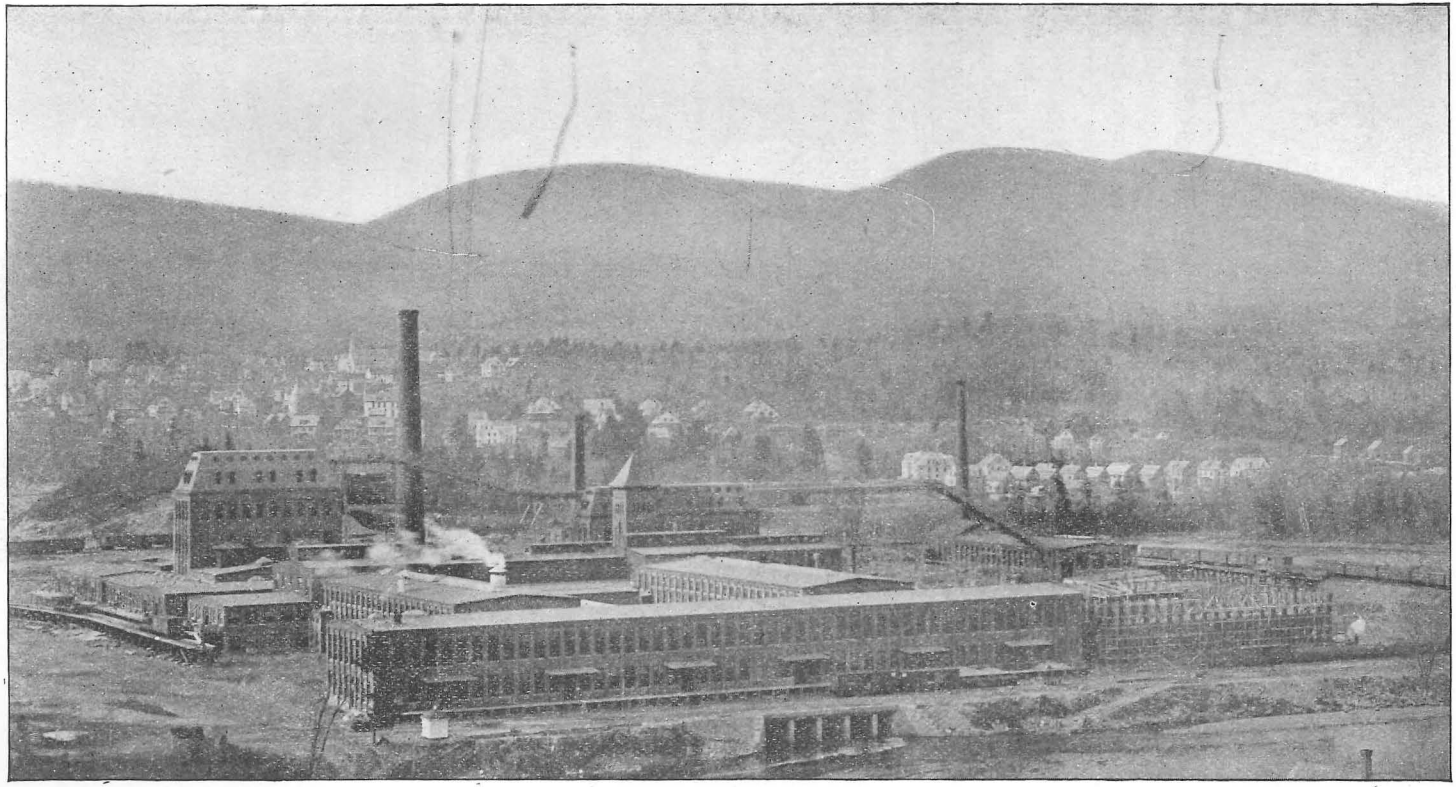
This company secured the mills of the Rumford Falls Paper Company about 1897, and at once commenced to remodel, enlarge and improve the same. They also built, and have since enlarged, the buildings for the Continental Paper Bag Company. In 1897 the paper mill was enlarged at a cost of $40,000. About this time it secured possession of the mill of the Rumford Falls Sulphite Company. In 1898 plans were made which have resulted in the most wonderful development ever made in any town in Maine.

Some of the results of the enlargement are here given. Four new paper machines have been put in, making nine machines altogether, producing 200 tons of paper daily. The sizes of the new machines are 96, 108, 112 and 120 inches respectively. The old stock chests in the basement have been removed and a court way ten feet wide has been constructed between the old beater room and the new store house, which gives better light to the beater room and also entrance to the grinder room.

The old digester room has been torn down and in its place has been constructed a storehouse, 150 feet long, 80 feet wide at one end and 30 feet wide at the other, and seven stories in height. The Schenck digesters have been moved from the old digester room to the sulphite mill, a distance of 500 feet, where they have been placed on foundations beside the two new ones which have been erected. These new digesters are forty-two feet in length by fifteen in diameter. In all there are eight digesters in the new digester room.

A new wood room has been built, which contains twenty barkers and has a capacity of about 400 cords per day. The screen room has been enlarged to double its former capacity. Fire doors have been placed over the entire mill, and concrete floors have been made throughout the establishment, except in the finishing room. With these improvements the mill is entirely up to date and one of the best paper mills in the country.

The International Paper Company is now using at Rumford Falls over 40,000,000 feet of logs annually, and it furnishes



THE OXFORD PAPER COMPANY'S MILLS, DURING CONSTRUCTION, 1900.

employment to 850 operatives. It has a daily output of 200 tons of manila and news paper. One of its paper machines is the largest and widest in the world. It furnishes the Continental Paper Bag Company with all the manila paper used in that plant in the manufacture of paper bags, and, as it is the policy of this company to have its product, so far as possible, still further worked into other products before being shipped away, it is altogether probable that, at no distant day, its entire output of paper will be manufactured at Rumford Falls into some of the almost innumerable articles into which paper now so largely enters.

THE CONTINENTAL PAPER BAG COMPANY.

The Continental Paper Bag Company was incorporated under the general laws of Maine, May 27, 1899, with a capital of $5,000,000. The officers are as follows:

President and general manager, Herman Elsas.

Vice president, Warren Curtis.

Treasurer, E. W. Hyde.

Assistant treasurer, Owen Shepherd.

Secretary, I. Kuhe.

General superintendent, Theodore Hawley.

The original building of this plant was 306 feet in length, 82 feet wide and four stories in height besides a basement. It required 1,250,000 brick and 5,000 cubic yards of masonry to erect this structure. The mill is equipped with over 200 bag machines which turn out about 10,000,000 paper bags of all sizes and kinds daily.

The making of paper bags is a novel and interesting process. At one end of the machine a roll of paper is placed on an axle which unrolls as fast as wanted; and from this paper there comes out at the other end of the machine perfect paper bags, dropping into a box faster than any one could count. The tender, usually a young woman, arranges the bags in bundles and ties them up.

The paper is furnished by the International Paper Company. They have four paper machines running entirely on manila paper. This is taken to the finishing room where it is weighed, and then it is taken up into the bag mill by elevators, where it is made into bags.

A complete printing outfit has lately been added and such bags as are to be printed on are transferred to the printing room. We saw here bags for parties in Fittsburg, Pennsylvania; Cincinnati, Ohio; Saint Louis, Missouri; and even for far away Seattle. The printing plant requires about 75 employes.

The processes of the conversion of the log into ground wood and sulphite pulp, the conversion of this pulp into manila paper, the conversion of this paper into paper bags of any desired size, and the printing of these bags for any customer, can all be seen at these mills by just passing from one room or one building to another.

Another great improvement is the building of a walk from the street into the bag mill, thus enabling the operatives to go direct into the bag mill instead of through the paper mill as heretofore.

There are at present about 500 operatives in this mill, half of whom are girls. A storehouse, 460 by 96 feet, has recently been built, and a large addition to the mill is now in process of construction, which, when completed, will increase its capacity fully one-third.

THE OXFORD PAPER COMPANY.

At the annual meeting of the Oxford Paper Company held in Portland in December, 1901, the following officers were elected:

President, Waldo Pettengill, Rumford Falls.

Vice president, Henry P. Cox, Portland.

Treasurer, Fred M. Harmon, Portland.

General manager, Charles W. Gardner, Rumford Falls.

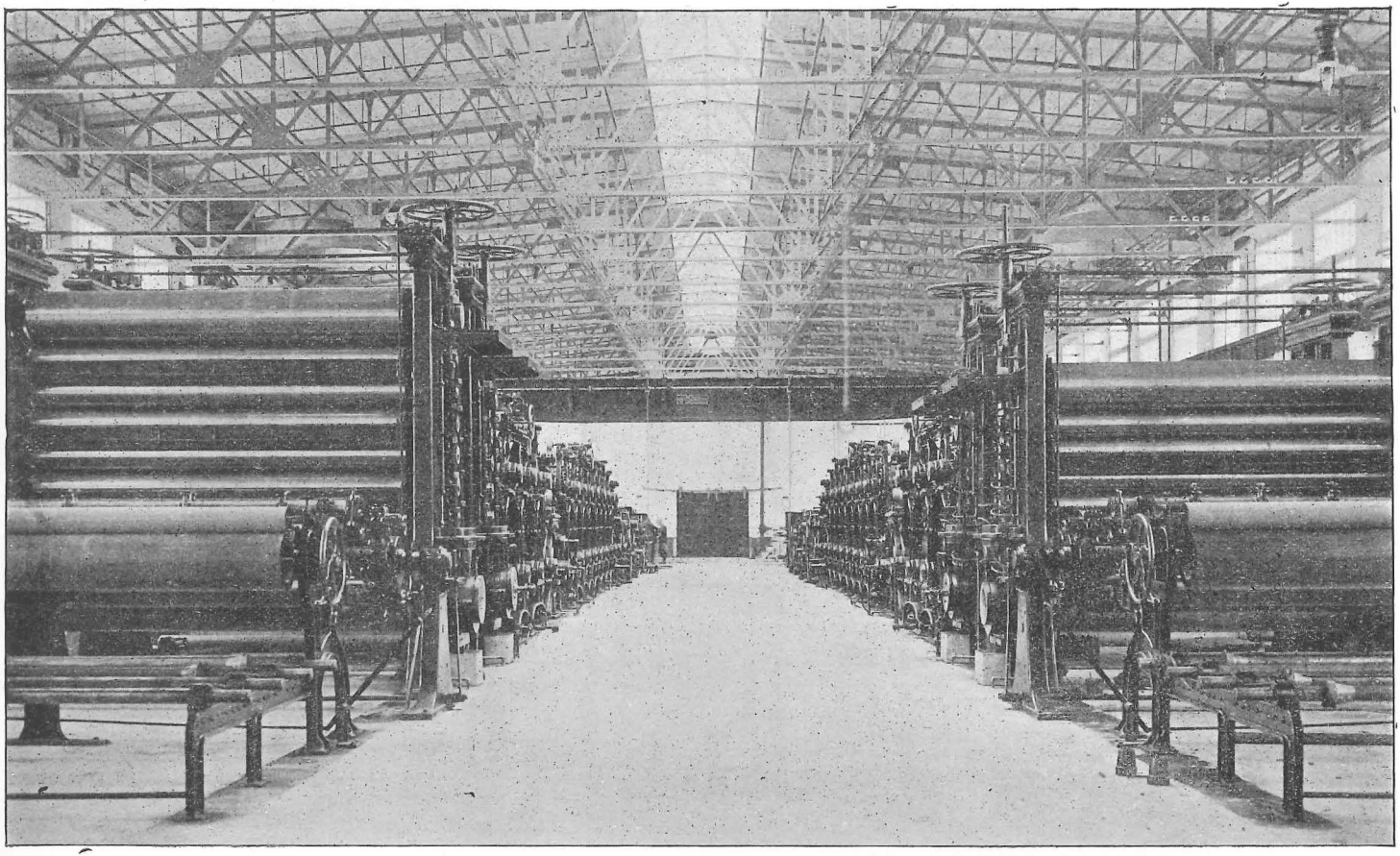
Clerk, Seth L. Larrabee, Portland.

Directors, Waldo Pettengill, Henry P. Cox, Fred E. Richards, Ammi Whitney, A. N. Burbank, Hugh J. Chisholm, Jonathan Bulkley, John E. Burnham, and Charles W. Gardner.

Superintendent, Frank H. Cloudman.

United States inspector, postal card department, Maj. E. S. Shook.

This company was organized December 11, 1899, and work on their immense plant at Rumford Falls was commenced in April, 1900. It is located on the lower level canal, which was extended in order to furnish for it the necessary water power.



MACHINE ROOM, OXFORD MILLS.

The plant is unique in that it contains both the soda fiber and the sulphite fiber processes, with a paper mill on the same site. The soda mill is designed for a daily output of from 70 to 80 tons, the sulphite mill for from 140 to 150 tons of pulp, while the present paper mill will have a daily capacity of 90 tons of finished paper.

The soda mill contains six distinct buildings. The reclaiming room, which is 98 by 66 feet, contains four incinerators or rotary furnaces and four 200 horse power Stirling boilers. The boilers are supplied with a square brick chimney 123 feet in height. The evaporator room, which is 66 by 58 feet, is equipped with Newhall quadruple effect evaporators. The object of the incinerators and evaporators is to reclaim from the liquors after they have been used in the digesters the greatest per cent possible of soda for use again, which otherwise would go to waste thus entailing great loss.

The leaching and causticizing room, which is 100 by 80 feet, is next in order. Adjoining this is the soda digester house, 130 by 32 feet, containing seven digesters 43 feet high and 9 feet in diameter. Beyond these is the blow tank room, 130 by 40 feet, and the screening and bleaching room, 214 by 66 feet. In the latter are the pulp condensers and screens, 72 in number, the screening occupying the main floor and the bleaching the basement or ground floor.

In the sulphite group comes first the acid department, 130 by 99 feet, including the sulphur storing, sulphite burning, acid making and acid storage rooms. The sulphite digester house, 99 by 40 feet, contains three steel digesters 60 feet high and 16 feet in diameter, built by the Portland Company, Portland, Maine, and among the largest in the world. The blow pit building is 99 by 52 feet, the chemical storage building 97 by 50 feet and the bleach liquor room 131 by 50 feet. The wet machine room contains five wet machines and a pulp dryer machine located on the main floor. The surplus sulphite fiber is loaded from this room directly upon the cars from the shipping platform on the main floor level.

The paper mill buildings include the beating engine room 342 by 75 feet, two machine rooms each 216 by 70 feet, and the finishing building 402 by 70 feet. In the beater room basement are the drainers and stock reservoirs and the water power plant.

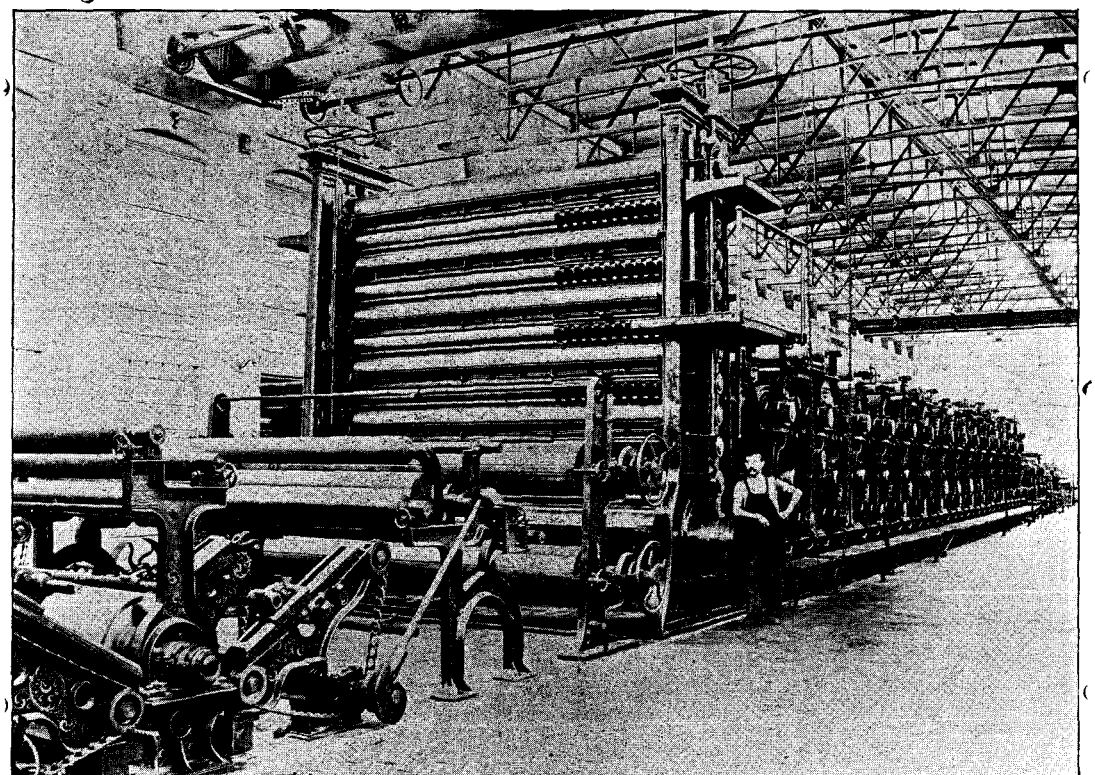
The latter consists of five pairs of Hercules wheels for driving, and one single Hercules wheel for electric lighting, the total development being 3,500 horse power. The wheels are so arranged that different parts of the mill can be run independently. On the main floor of the beater room are the beating engines, the sizing, mixing and storage tanks and pulp condensers.

The machine rooms each contain two Fourdrinier machines, each driven by a Watertown engine equipped with the Tower and Wallace patent machine drive. One room contains a 128-inch and a 146-inch machine, and the other room a 118-inch and a 138-inch machine. The finishing room proper occupies the main floor of the finishing building, the basement being given up to the storage and shipping departments and machine shop. There are ten supercalenders capable of calendering to a width of 72 inches, also Morse and White cutters, the widest of which is 136 inches.

The boiler house is 200 feet long by 51 feet wide and is located between the soda and sulphite mills. It contains eight Stirling boilers generating 4,000 horse power. The chimney is 206 feet high above the 26 feet square base, with a flue 10 feet in diameter, and contains 700,000 brick. All the coal and ashes are handled by conveyors, and the boilers are equipped with American mechanical stokers.

The wood preparing room is located so as to accommodate future extensions. It is 154 by 80 feet, not including the engine room and boiler house. A Harris-Corliss engine furnishes motive power and all waste is utilized by the furnaces. The chimney for the wood room is 152 feet in height. Conveyors from the chippers supply both digester houses.

Fifteen hundred tons of structural steel and 700,000 feet of hard pine lumber were used in the construction of the plant. The total floor space is about 410,000 square feet, 189,000 square feet of which are of concrete and expanded metal. Nearly two miles of track are used, with about 10,000 square feet of shipping and unloading platform, the whole site being about 17 acres in extent. Over 25,000,000 feet of logs are now annually used in the manufacture of pulp, and it gives employment in all its departments to 650 operatives, but the plant was so built that by making the requisite additions its product could be



THE 162-INCH PAPER MACHINE, INTERNATIONAL MILLS.

doubled, and plans to bring this about have already been adopted. It is now manufacturing 90 tons of book paper daily, and is also shipping large quantities of sulphite and soda pulp to other plants.

THE POSTAL CARD CONTRACT.

On December 1, 1901, the Oxford Paper Company entered into a contract with Albert L. Daggett of Piedmont, West Virginia, for making postal cards, Mr. Daggett having been awarded the contract for furnishing the United States government with postal cards for four years. The contract calls for 3,000,000,000 large size single cards, 3¼ by 5½ inches, weighing 6 pounds 3 ounces per 1,000 cards, of which about 5,000,000 are to be of the International kind; 70,000,000 double reply cards, 5½ by 6½ inches, weighing 12 pounds 6 ounces per 1,000 cards, and 5,000,000 small sized single cards, 2 15-16 by 4 15-16 inches, weighing 5 pounds per 1,000 cards. The paper must be made of 69 per cent sulphite bleached spruce fiber, 22 per cent soda chemical fiber and 9 per cent agalite or its equivalent. It must be clean and free from all imperfections, run and calendered to a uniform thickness and weight, finished on both sides suitable for writing with ink or pencil, and the same in color, quality, sizing and finish as the standard.

This contract will amount to $700,000, and the daily output must be from 2,000,000 to 3,000,000 cards. These are shipped by registered mail and the shipments run from two to six carloads daily. In order to carry out the above contract a brick building, exactly like the finishing room of the paper mill, was erected at a cost of $25,000, and this was connected with the finishing room by a passage way. The contract for erecting the building was awarded to S. W. Foster of Gray, Maine.

The specifications of the government were ironclad. The building must be strictly first-class and fire proof. It must give security against theft, and there must be no other work done in the building. There must be a burglar proof vault capable of containing 60,000,000 finished cards. The safe keeping on the premises of the cards while in course of preparation is subject to the regulations prescribed by the postmaster general or his agents. A resident agent and inspector of the department has supervision of the manufacture, storage and issue of the cards. Office rooms for the inspector and his clerks must be provided

by the contractor without cost to the government. The right of inspection at all times and the necessity of obeying all regulations made by the department are two additional features of the contract.

The company has now been engaged about a year on this contract, which has four years in all to run. The process of printing the cards is exceedingly interesting. They are printed in large sheets containing several hundred cards. These sheets then go to the cutting machine, which works so accurately that the cards do not differ from each other in size by a hair's breadth. They are then bunched and tied up in packages of 250 or 300 cards. The postal card building requires about 75 operatives, a part of whom are girls.

THE DUNTON LUMBER COMPANY.

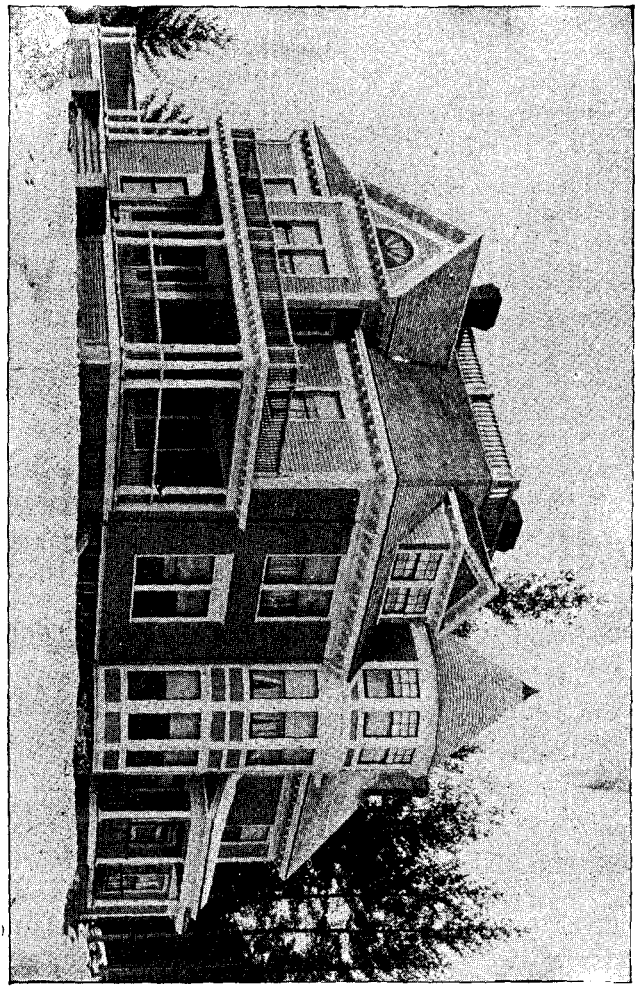
The Dunton Lumber Company was incorporated October 18, 1898, with Waldo Pettengill as president and H. C. Dunton as treasurer and manager. The plant of this company is located above the upper dam near the great steel bridge over the Androscoggin river at this point. The pond made in the river by the building of the upper dam extends several miles, and here millions of logs can float in safety.

Their mill is a modern steam mill, fitted up with every appliance for the rapid and economical manufacture of lumber, and last year its product was 10,000,000 feet. Mr. Dunton is an experienced lumber manufacturer, and the plant has been a success from the beginning. A great portion of the product is required in carrying on the building operations in Rumford Falls, and, in fact, the whole output of the mill is generally in demand in the new town and vicinity. The plant employs about 54 hands, and is one of the important industries in this industrial center.

FORT HILL CHEMICAL COMPANY.

This plant, which is managed by Stone and Webster of Boston, with Karl Burroughs local superintendent, employs about thirty operatives. This is the same plant that was established in 1893 for the manufacture of bleaching powder and caustic soda, but it has been entirely remodeled and enlarged, and its product changed. Two buildings have been added, one

75 by 45 feet and four stories high, the other 45 by 45 feet and three stories high. New dynamos have been put in, much smaller but more powerful than the original ones, and other changes have been made.



RESIDENCE OF J. E. STEPHENS.

The product of the plant is chlorate of potash, manufactured from muriate of potash, which is imported from Germany. The process of manufacture is somewhat intricate but consists first in passing a powerful current of electricity through the muriate

of potash. The product is used mainly in dye works and the larger portion of it finds a market in Massachusetts.

THE RUMFORD FALLS MACHINE SHOP AND FOUNDRY.

Mr. Philo B. Clark, the proprietor of the above named plant, commenced work in 1896, in a small building near the round house, employing only one man beside himself. He now has three buildings and employs fifteen men, doing a profitable and increasing business. One of the buildings, 60 by 25 feet and two stories high, is fitted as a machine shop with all the latest improvements, well equipped with lathes, planers, shapers, etc. Another, a blacksmith shop, is 25 by 15 feet and two stories high; the third, a foundry, is 60 by 36 feet and has a cupola furnace with a capacity of three tons a day. There is also a brass furnace to meet the demand for brass work. The motive power of the plant is electricity.

J. B. REDMOND, CARRIAGE MAKER.

The shop of J. B. Redmond is located near the round house. It includes two departments, carriage building and repairing, and carriage and car painting. Beside building carriages, sleighs, sleds, farm wagons, dump carts, etc., Mr. Redmond has a contract with the Portland and Rumford Falls railway and the Rumford Falls and Rangeley Lakes railroad for the painting of their rolling stock, including passenger coaches, freight cars, locomotives, etc.

METEVIER AND FISHER, STONE WORKERS.

The Metevier and Fisher Company was organized in 1896 for the purpose of conducting a stone work business. They have a quarry on the Rumford Falls and Rangeley Lakes railroad, and employ fifty men on the average, with a monthly pay roll of $2,000. They do all the stone work for the Portland and Rumford Falls railway, besides furnishing stone for much of the building in the village.

JAMES H. KERR, CONTRACTOR.

James H. Kerr began business here in 1893. He is a contractor on foundation and mason work and has laid the foundations for many of the finest structures in Rumford Falls. Among his recent works are the foundations for the new Baptist

church and the Hall and Smith block, the abutments for the Hartford street bridge, and the foundations for many of the Strathglass park houses.

OTHER MANUFACTORIES.

Among other manufacturing industries may be mentioned the following:

H. C. Foster and Son, house finish and planing mill.

V. A. Linnell, house finish and planing mill.

James S. Morse, grist mill.

A. S. Burgess, grist mill.

THE HARTFORD STREET BRIDGE.

In 1901 a substantial stone arch bridge was built across the canal on Hartford street to replace the temporary wooden trestle bridge that had served its purpose since the early days of Rumford Falls. This is the only bridge of its kind in this section and perhaps in the State. The bridge consists of two arches, each eighty feet span, supporting a macadam roadway twenty-four feet wide, granite curbs and two granolithic walks, each six feet wide with railings. The arches are of the modern concrete-steel construction, according to the Melan system. This system was invented by Joseph Melan of Austria and patented in the United States.

A large excavation was made back of each abutment and an immense mass of concrete built there, weighing over 800 tons, to receive the thrust of the arches. Then there were placed for each arch twelve curved steel ribs, each made of four angle irons latticed together. Beneath these steel arches was placed false work on which the concrete was to rest until it became hardened, the frame work of steel was filled in with concrete and side walls of the same material were built up. When the false work was removed the arches had the appearance of solid masonry, the steel being entirely hidden by the concrete. Over the tops of the arches filling was put into the street grade, curbing set and sidewalks made as though it were a street.

The strength of the bridge is sufficient to carry safely a double track freight train. Excepting only the small amount of steel in the ribs and the cement, the bridge was manufactured on the site, being made of sand and crushed rock. There are no

MODEL HOMES FOR WORKMEN, STRATHGLASS PARK.

wooden floors to relay, no vibration and no noise. The cost of the bridge was $17,000. The cost of a steel bridge would have been $15,000. The saving from plank floors and repainting will be more than the interest on twice the difference in cost.

STEEL BRIDGES.

The building of the toll bridge in 1893, connecting Rumford Falls with Mexico, and of the town bridge across the Androscoggin near the middle level dam, connecting the business part of Rumford Falls with its residential section, built the same year, have both previously been mentioned. More recently two other very important bridges have been constructed. One, crossing the Androscoggin at the head of the falls, was built in 1898 at a cost of $14,000 and is 200 feet in length; the other crosses Swift river near its junction with the Androscoggin and was completed December 24, 1902, and opened for travel on Christmas. It connects Rumford with Mexico, Swift river at this point being the town line. These bridges are all of steel.

STRATHGLASS PARK.

Strathglass park is the name given to a section of the residential area of Rumford Falls, which has been reserved for the erection of beautiful, commodious and convenient houses for working men, and is a product of the fertile brain of Hugh J. Chisholm. The term "Strathglass" was chosen by Mr. Chisholm for the reason that Strathglass in Scotland is the name of the place where his ancestors dwelt. He is of Scotch descent, although he was not born in Scotland, but in Toronto, Canada.

It is the intention of Mr. Chisholm to make this one of the handsomest residential parks in the country, and to this end a New York architect was engaged to design the plans for the park and the buildings. The streets will be 75 feet wide, and a parking strip 25 feet in width will run through the middle, while the traveled portions of the streets will all be macadamized. The grounds will all be completely graded, and the houses placed twelve feet back from the streets according to the conditions provided for all houses erected on the company's land at Rumford Falls. An artificial stone sidewalk will run through the middle of the twelve feet space, and there will be a strip of lawn on either side of the walk.

In 1901 fifty houses were begun in the park, and in 1902 fifty-four more. Their erection is under the superintendence of that veteran contractor and builder, J. W. Burrowes of Portland. All the houses are built of brick, with hollow walls, thus insuring dryness and warmth, and the roofs are of slate. The cellars extend under the entire house and are cemented throughout, and each contains a hot air furnace and laundry tubs. Every outside door will be entered through a vestibule, keeping out the cold winds in winter. On the first floor are a large living room, closets, kitchen, dining room and pantry. Some of the houses have a separate dining room, and some have the bath room on this floor, while others have it on the second floor. On the second floor some of the houses have three large sleeping rooms and others have four, while all of them have large, light attics, where two or more rooms can be finished if needed. All have the entire first story finished with hard wood floors for using rugs instead of carpets, and all are lighted by electricity. One purpose has been to have a few large rooms instead of many small ones, and in many of these houses the living room is eighteen feet square, less furniture being required in furnishing such houses. The plumbing is complete throughout the house with both cold and hot water. In every kitchen there is a cooking range and a hot water tank.

Workmen in the mills, recommended by their foremen, will have first choice of these houses. The rental will be fixed, not on a basis of profitable investment, but they are built to require a minimum of repairs and are to be let for a sum that will barely cover maintenance.

As has been stated, the houses are all of brick and all have a wide veranda in front. The floors, balustrades and rails of the veranda are of concrete, or artificial stone, and in many of the houses the cornices are of the same material.

THE RAILROADS.

The railroads have been no small factor in the industrial development of this place, indeed without their aid Rumford Falls could never have reached its present importance, for the immense freights, both incoming and outgoing, could not be hauled by horses at a profit over these rough and steep Oxford hills.

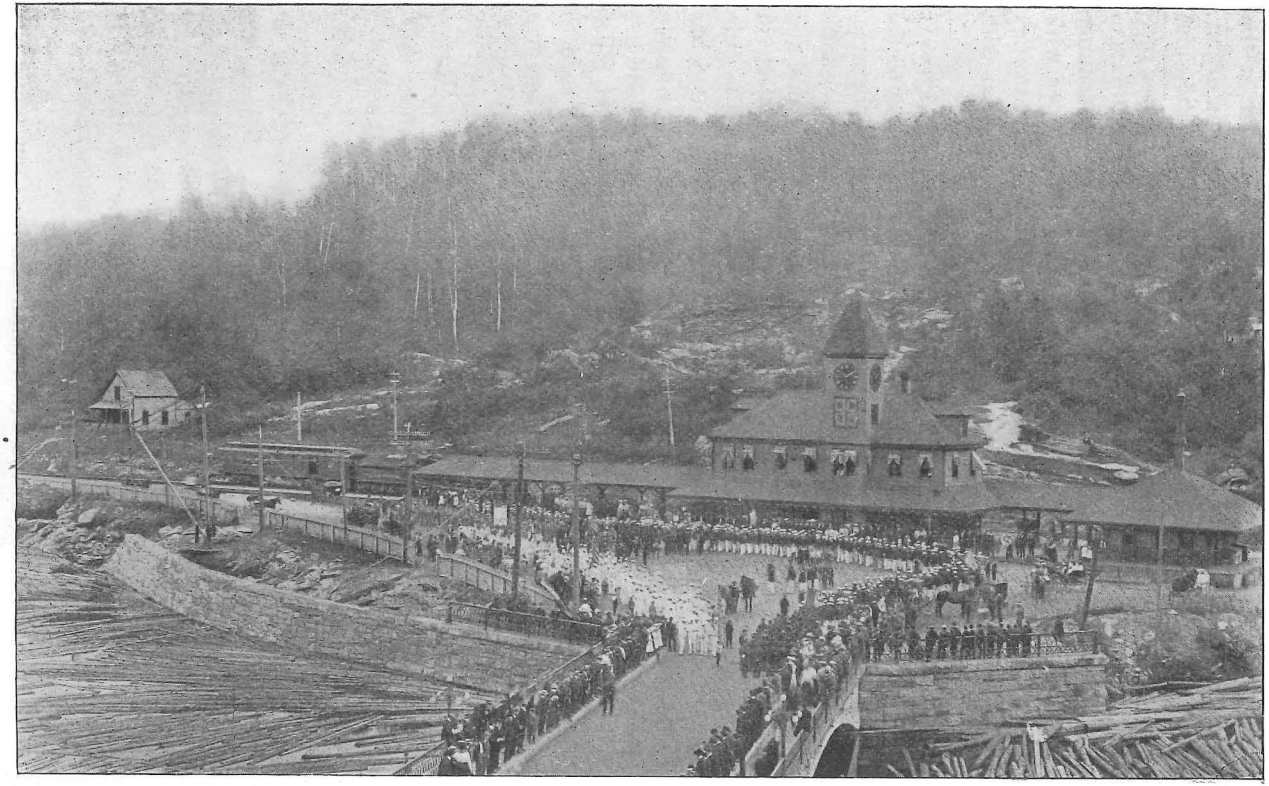
Seeing the absolute necessity of railroad connections at the beginning, the Portland and Rumord Falls railway was organized November 8, 1890. It leased for a term of one thousand years the Rumford Falls and Buckfield railroad and at once proceeded to extend it from Gilbertville, in the town of Canton, to Rumford Falls, which extension was completed in the summer of 1892. Hon. George D. Bisbee, who had been connected with the old road under its various names as director and attorney since 1868, was retained by and still holds his connection with the new road.

The Rumford Falls and Rangeley Lakes railroad which was opened in 1895, is a very important road, and its value to the place will increase as it works its way further into the wilderness. It extends from Rumford Falls to Bemis on Mooselucmaguntic lake, passing through some of the wildest scenery in Maine and having some of the steepest grades. The primary object in building this road was the hauling of logs to supply the pulp mills at Rumford Falls, Riley and Chisholm, but the road has proved to be the favorite route to the Rangeleys. It is now a part of the Portland and Rumford Falls railway system, and has been extended during the past season to Oquossoc, ten miles beyond Bemis. It is in contemplation to extend the road to Megantic to connect with the Quebec Central and Canadian Pacific railways, and the work of construction is now going on. It is a novel sight to see a log train coming down from the Rangeley region over this road. Cars specially constructed for the purpose are used, so that the curves are taken without difficulty. The road has done an immense business from the start.

HOTELS.

Hotel Rumford was the first hotel built at Rumford Falls, in fact it was one of the first buildings to be erected. It was built by M. G. Shaw of Bath, who is still the owner. Work was commenced upon it in the spring of 1892 and it was opened to the public December 23rd of that year. It contained at that time thirty rooms and was three stories high. In the fall of 1893 an addition four stories high was built, containing twenty-two rooms, making fifty-two rooms in all.

With the building of the Oxford mill and the Continental bag mill, and the enlargement of the International Paper Company's



RAILROAD STATION, LABOR DAY, 1902.

plant, it was found that additional hotel accommodations were required, and a still greater addition to Hotel Rumford was decided upon. This new addition is of brick, is four stories in height, and contains twenty-nine rooms besides a dining room, parlor and bath rooms. All the rooms are heated by steam and lighted by electricity. The hotel is now modern in every particular and the service is as perfect as in any city hotel. J. W. Withee was the first proprietor and he remained in charge until January 1, 1902. He was succeeded by Albert M. Miller who remained but eleven months, H. S. Jordan, the present proprietor, taking charge December 1, 1902.

The Windsor House, Alfred Roberge, proprietor, and the Androscoggin House, B. Meritt, proprietor, are both good houses of their class.

THE CHENEY OPERA HOUSE.

Rumford Falls has now as good an opera house as any place of its size in Maine. It has recently undergone extensive repairs. The seats have all been placed on movable bases so that they can be taken up when the hall is needed for dancing or other purposes. The ceilings and walls have all been painted and decorated, the scenery thoroughly renovated and the whole interior made very attractive.

THE RUMFORD FALLS TRUST COMPANY.

The Rumford Falls Trust Company was organized February 1, 1895, with the following officers:

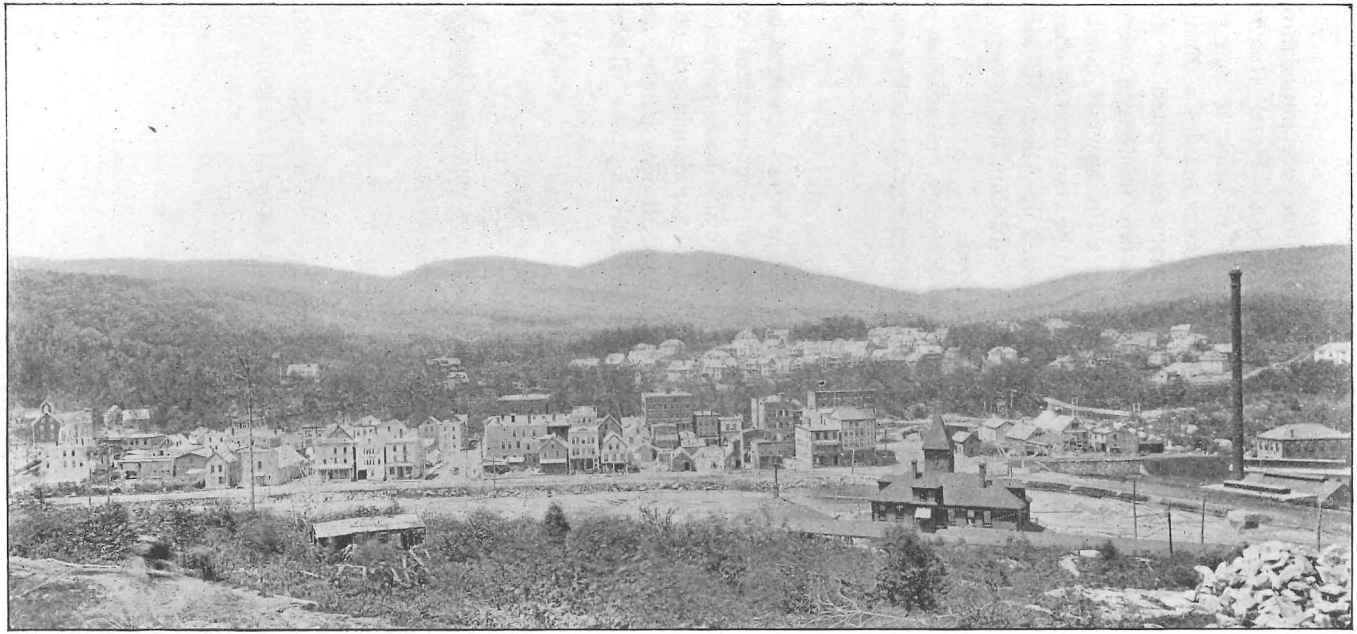
President, George D. Bisbee.

Vice-president, Waldo Pettengill.

Treasurer, Elisha Pratt.

On October 20, 1902, its total resources were $802,881.19. The following comparative statement of deposits is significant.

Deposits October 20, 1895	$83,113 62
Deposits October 20, 1896	133,067 62
Deposits October 20, 1897	189,960 80
Deposits October 20, 1898	230,163 23
Deposits October 20, 1899	240,760 17
Deposits October 20, 1900	383,471 48
Deposits October 20, 1901	578,290 10
Deposits October 20, 1902	696,637 70



BUSINESS AND RESIDENCE SECTIONS OF RUMFORD FALLS, 1898.

THE RUMFORD NATIONAL BANK.

The Rumford National bank was organized April 28, 1902, with a capital of $75,000. The officers are as follows:

President, A. E. Stearns.

Vice-president, Gershon P. Bickford.

Cashier, Leland B. Lane.

The bank commenced to do business July 21, 1902, and on September 15th following its resources amounted to $99,566.11. Although it has been doing business but a short time its deposits are increasing daily and its showing in every way is satisfactory. The banking facilities at Rumford Falls are now ample for the needs of the place.

THE RUMFORD FALLS TIMES.

The above named paper was first established at Canton, Maine, in 1883, by Edgar N. Carver, its present proprietor, as the Canton Telephone, a small four-page paper. Mr. Carver has given this enterprise an uninterrupted service of nearly twenty years as owner, editor and manager, and its publication has had a powerful influence on the development of Rumford Falls. He was one of the pioneers of this place, early anticipating its future possibilities, and in 1892 he organized the Rumford Falls Publishing Company, and brought the first printing press into the town, setting up a job printing plant here that year. The next year, 1893, a publishing house was opened in the building now occupied by the Times, and the newspaper was brought from Canton and its name changed to the Rumford Falls Times. Since coming here the paper has had continuous growth and prosperity, has been many times enlarged and improved, and is now the leading paper in Oxford county, having the largest circulation, largest plant and largest volume of annual business. It is now a large eight page sheet, well edited and printed, showing push and enterprise in its presentation of local news and illustrated features. Its holiday, annual and special illustrated editions have been frequent and have elicited favorable comment from the press of the State.

The Rumford Falls Publishing Company owns and occupies a three story block on Canal street, in which is located its newspaper and job printing plants, consisting mainly of three cylinder

presses, three job presses, cutter, folder and type setting machine. The plant is run by electric power.

RUMFORD FALLS EVENING HERALD.

On October 20, 1902, the Evening Herald made its first appearance, issued by the Rumford Falls Publishing Company. It started in a modest form but has developed so rapidly and so fills the need of this progressive town, that public appreciation is evident on every page and its success is assured.

The staff of both the Times and the Herald is as follows: Edgar N. Carver, general manager; Israel A. Herrick, editor; Martin C. Day and Miss Edith Vandenburgh, reporters; and A. W. Davenport, staff correspondent.

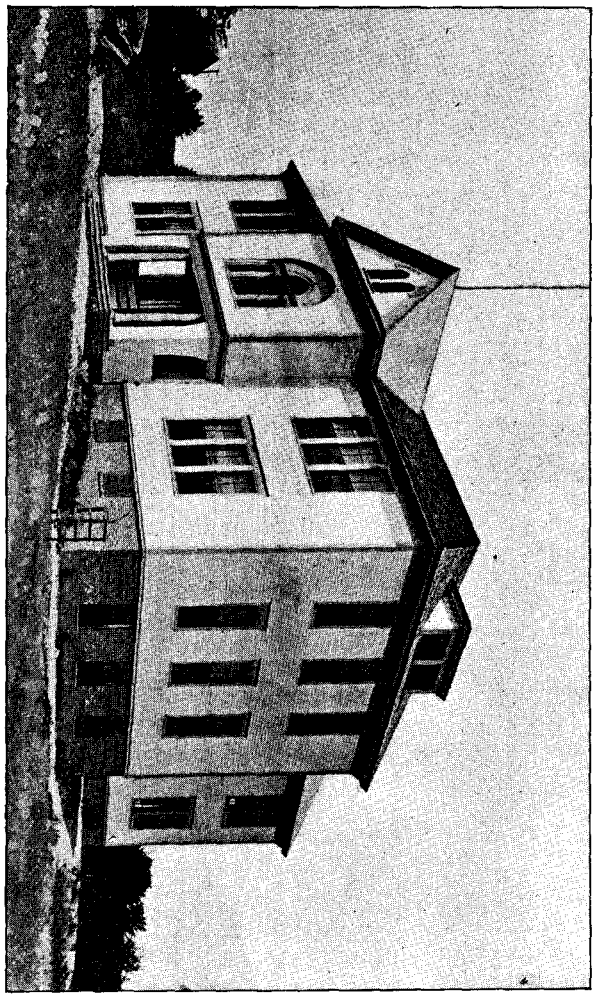
FRATERNAL SOCIETIES.

The fraternal societies are well represented at Rumford Falls. Blazing Star Lodge, Free and Accepted Masons, organized in the town of Rumford in 1819, has been removed to Rumford Falls, where it has one of the finest halls in the State. Its membership is now 228. Penacook Lodge, Independent Order of Odd Fellows, instituted at Rumford Falls October 10, 1893, now numbers 176 members. Its hall, which had undergone thorough repairs, was rededicated March 18, 1902. Purity Rebekah Lodge of Odd Fellows and Metallue Lodge, Knights of Pythias, also occupy Odd Fellows' hall. Some of the other fraternal societies are Royal Arch Chapter, Masons, Independent Order of Foresters, Grand Army of the Republic, Good Templars, Independent Order of Red Men, Knights of Columbus, Woman's Christian Temperance Union, and Order of the Lone Star.

ITEMS—WAGES, POPULATION, SCHOOLS, ETC.

The combined industries of Rumford Falls give employment to about 2,100 operatives, and the amount paid out in wages each month considerably exceeds $100,000. Wages are paid entirely in cash, as the different companies run no stores. The completion of the enlargements of industrial plants begun the present year will add another 500 workmen to this industrial army.

The population of the village at the present time, according to the assessors' returns, exceeds 6,000, but if we should add the number who have made homes in Ridlonville and other parts of the town of Mexico, whose coming here to find employment was owing to the establishment of the industries at this point, the



CHISHOLM SCHOOL HOUSE.

total would be in excess of 7,000 according to the opinion of those best informed. The population of the town of Rumford in 1890 was 898, and as late as 1891 there were no inhabitants at the falls except the workmen employed in building the first dam.

In 1891 the number of polls in the town of Rumford was 231, while at the present time, according to the assessors' books, they number 2,076. In 1891 the valuation of the town was $302,439, while at the present time it is $2,534,575, an increase of over eight fold, and an increase of $604,935 over the valuation of one year ago. The rate of taxation is less now than it was before the development at the falls began. The town never has and never intends to exempt from taxation any manufacturing concern desiring to locate there, although it will cordially extend any and every legitimate encouragement.

In all improvements, such as the building of new roads and bridges, schoolhouses, etc., there has never been a division of sentiment or any organized opposition. The farmers and others residing in parts of the town aside from the falls seem to have caught the spirit of enterprise, and to have realized that in supporting every reasonable demand for improvements they were helping build up a large and prosperous community where labor and their products would be in greater demand, where their own advantages would be enhanced, and where the reflex influence from this industrial center would increase the value of their suburban property.

The number of scholars in the town of Rumford is about 1,500. At Rumford Falls there is a fine system of graded schools, taught by a corps of well fitted and trained teachers and under the supervision of a town superintendent of schools. Its high school is well advanced, and it also supports an evening school during the winter and many young men gladly avail themselves of its advantages. In 1902 the town appropriated the sum of $9,850 for the support of its schools.

While ten years ago there was no post office at Rumford Falls, it now supports an office with a postmaster at a salary of $2,000 per year. The first assistant receives $1,000 and the head clerk $500. There are seven lawyers and the same number of physicians located here. The Catholics, Methodists, Universalists, Congregationalists and Baptists all have convenient church buildings. Here are also nearly one hundred stores of all kinds, and this is becoming the great trading center of Oxford county.

Rumford Falls has never had much difficulty with violators of the prohibitory liquor law, for the reason that the deed from the power company, when they sold a lot or lots for building pur-

poses, contained the proviso that the purchaser, his heirs and assigns, shall never use the premises or any part thereof for the manufacture or sale of intoxicating liquors, on penalty of forfeiting the estate.

CONCLUSION.

Briefly in the foregoing pages we have attempted to sketch the development of a unique and intensely interesting industrial center. Ten years ago the place where is now the busy village of Rumford Falls was not only a wilderness, but a wilderness presenting almost insuperable difficulties in the way of development. Ten years ago the waters of the Androscoggin were tumbling over the falls, just as they had been for untold ages, wild and beautiful in their freedom but producing nothing for the benefit of man.

To-day these waters are harnessed by man's ingenuity and are compelled to turn the wheels of industry as they move along on their journey to the sea, great mills line the banks of the river, and beautiful residences, business blocks, churches and schoolhouses have taken the place of the trees of the forest and the granite boulders.

Over 2,000 workmen now go to daily labor here and the product of their handiwork is a benefit to all humanity. Their wages amount to over $100,000 a month, and a community numbering more than 6,000 people are enabled thereby to enjoy all the comforts of civilization and progress. The new town has banks and hotels, water works, electric lights, sewers, fine streets and sidewalks, large parks, and a class of residences for workingmen that are the wonder and admiration of all who see them.

Rumford Falls has been developed on a solid and enduring basis. The new town is not only a prosperous industrial community, but in the intelligence and morality of its people it stands equal to any place of its size in New England. Not only were the plans for its material development designed correctly, but the plans for the moral, intellectual and spiritual welfare of those who should come here and make homes were drawn with equal care and foresight.

Of the 54,000 horse power available at Rumford Falls, 24,000 horse power have been developed and 19,000 horse power are in use, while the 30,000 horse power, available at any time, can be drawn upon when needed. It would hardly be safe to make

predictions in regard to Rumford Falls, but considering what has been done in the decade just past and remembering that there remains more available water power at this point than has already been developed, we can safely let the imagination run forward ten years and behold around New England's greatest water power a city renowned the world over for its enormous productions of paper and paper products, chemical products, and other goods which can be manufactured more cheaply by water than by steam power.

Rumford Falls presents an example of what Maine might become, were its water powers properly developed, namely, one of the most extensive and prosperous manufacturing states in the Union.

AGRICULTURAL STATISTICS OF MAINE.

The following facts are compiled from bulletins of the twelfth census of the United States:

A "farm," as defined by the twelfth census, includes all the land, under one management, used for raising crops and pasturing live stock, with the wood lots, swamps, meadows, etc., connected therewith. It also includes the house in which the farmer resides, and all other buildings used by him in connection with his farming operations.

The farms of Maine, June 1, 1900, numbered 59,299, and had a value of $96,502,150. Of this amount, $47,142,700, or 48.9 per cent, represents the value of buildings, and $49,359,450, or 51.1 per cent, the value of land and improvements other than buildings. On the same date the value of farm implements and machinery was $8,802,720, and of live stock, $17,106,034. These values, added to that of farms, give the "total value of farm property," $122,410,904.

The products derived from domestic animals, poultry, and bees, including animals sold or slaughtered on farms, are referred to in this bulletin as "animal products." The total value of all such products, together with the value of all crops, is termed "total value of farm products." This value for 1899 was $37,113,469, of which amount, $15,159,415, or 40.8 per cent, represents the value of animal products, and $21,954,054, or 59.2 per cent, the value of crops, including forest products. The total value for 1899 exceeds that reported for 1889 by $15,064,249, or 68.3 per cent. A large part of this apparent increase is doubtless due to a more detailed enumeration in 1900 than in 1890. Of the actual increase, the greater part has been in the products of market gardens, dairies, and poultry farms.

The value of "net farm products," or the "gross farm income," is obtained by deducting from the "total value of farm products" the value of the products fed to live stock on the farms of the

producers. In 1899 the reported value of products fed was $9,847,860, leaving $27,265,609 as the gross farm income. The percentage which this amount is of the "total value of farm property" is referred to in the text of the bulletin as the "percentage of gross income upon investment." For Maine in 1899 it was 22.3 per cent.

As no reports of expenditures for taxes, interest, insurance, feed for stock, and similar items have been obtained by any census, no statement of net farm income can be given.

Maine has a total land area of 29,895 square miles, of which 9,844 square miles, or 32.9 per cent, are included in farms. The surface consists of two great slopes, the northern and the southern. The northern slope, comprising about one-third of the total area, is drained by the St. John river and its tributaries, and the southern slope by numerous streams which flow into the Atlantic. The broad, flat divide which separates the two slopes serves as a natural reservoir, most of the rivers of the State having their sources in the large lakes of this region.

The surface of a large part of the State is rugged and broken. The soil of the river valleys is very productive, but in the mountainous regions and along the seacoast it is for the most part sterile. The Aroostook valley, which comprises the largest area of fertile farming land in New England, has a deep, porous, yellow loam, especially adapted to the growing of fruits and vegetables. The remarkable development of this part of the State in the past ten years is an important feature revealed by the statistics presented in this bulletin.

NUMBER AND SIZE OF FARMS.

The following table gives, by decades since 1850, the number of farms, the total and average acreage, and the per cent of farm land improved.

TABLE 1.--FARMS AND FARM ACREAGE: 1850 to 1890.

Year.	Number of farms.	Number of Acres In Farms.				Per cent of farm land improved.
		Total.	Improved.	Unimproved.	Average.	
1850	46,760	4,555,393	2,039,596	2,515,797	97.4	44.8
1860	55,698	5,727,671	2,704,133	3,023,538	102.8	47.2
1870	59,804	5,838,058	2,917,793	2,920,265	97.6	50.0
1880	64,309	6,552,578	3,484,908	3,067,670	101.9	53.2
1890	62,013	6,179,925	3,044,666	3,135,259	99.7	49.3
1900	59,299	6,299,946	2,386,889	3,913,057	106.2	37.9

The number of farms in 1900 was 12,539 greater than in 1850, a gain of 26.8 per cent. Since 1880, however, the number has been decreasing, the loss for the past decade having been 2,714 farms, or 4.4 per cent.

Except in the decade 1880-1890, the total farm acreage has increased steadily since 1850. An increase since 1890 of 120,021 acres, accompanying the decrease in the number of farms, resulted in a gain of 6.5 acres in the average size of farms, which was larger in 1900 than at any previous time.

The acreage of improved land increased steadily until 1880, when a marked decline began, and in 1900 the percentage of farm land improved was smaller than ever before reported. This change, although less marked than in other New England States, is doubtless due to the same general causes, namely, the demands of a growing city population for the products of special branches of agriculture, notably dairying and market gardening, and the competition of western land in cereal production. The lands which are most fertile and most easily tilled have been retained under cultivation and made increasingly productive. As a result, the aggregate income derived from meadow, orchard, and plow lands is now greater than it was in 1860, although the acreage under cultivation is considerably less. The less fertile lands have been found to afford greater incomes as permanent pastures than as meadow or plow lands, and each decade since 1870 has shown an increasing acreage of such land reported as unimproved.

FARM PROPERTY AND PRODUCTS.

Table 2 presents a summary of the principal statistics relating to farm property and products for each census year, beginning with 1850.

TABLE 2.—VALUES OF SPECIFIED CLASSES OF FARM PROPERTY AND OF FARM PRODUCTS: 1850 TO 1900.

Year.	Total value of farm property.	Land, improvements, and buildings.	Implements and machinery.	Live stock.	Farm products.*
1850	$66,852,031	$54,861,748	$2,284,557	$9,705,726	
1860	97,424,385	78,688,525	3,298,327	15,437,533	
1870†	131,128,193	102,961,951	4,809,113	23,357,129	‡$33,470,044
1880	123,805,039	102,357,615	4,948,048	16,499,376	21,945,489
1890	122,347,283	98,567,730	5,499,413	18,280,140	22,049,220
1900	122,410,904	96,502,150	8,802,720	17,106,034	37,113,469

* For year preceding that designated.

† Values for 1870 were reported in depreciated currency. To reduce to specie basis of other figures they must be diminished one-fifth.

‡ Includes betterments and additions to live stock.

The value of farm property in 1900 was nearly twice as great as in 1850 although the gain in the decade 1890-1900, was less than one-tenth of 1 per cent. In this decade there was a slight decrease in the value of land, improvements, and buildings, and also in that of live stock, but in the value of implements and machinery there was a gain of 60.1 per cent. A portion of this increase, however, is doubtless the result of a more detailed enumeration in 1900 than heretofore.

COUNTY STATISTICS.

Table 3 gives an exhibit of general agricultural statistics by counties.

TABLE 3.—NUMBER AND ACREAGE OF FARMS, AND VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, JUNE 1, 1900, WITH VALUE OF PRODUCTS OF 1899 NOT FED TO LIVE STOCK, AND EXPENDITURES IN 1899 FOR LABOR AND FERTILIZERS, BY COUNTIES.

Counties.	Number of Farms.		Acres in Farms.		Values of Farm Property.				Value of products not fed to live stock.	Expenditures.	
	Total.	With buildings.	Total.	Improved.	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		Labor.	Fertilizers.
Androscoggin	2,924	2,900	257,400	125,701	$2,897,270	$3,045,050	$470,650	$906,907	$1,574,083	$170,710	$46,840
Aroostook	6,938	6,761	793,205	389,232	6,863,290	4,274,020	1,325,440	2,220,671	4,553,169	473,010	268,700
Cumberland	5,101	5,030	408,946	148,436	5,371,850	5,067,720	775,840	1,303,913	2,509,406	274,100	67,480
Franklin	2,526	2,462	393,870	158,051	1,774,550	1,713,290	316,300	874,136	1,038,436	98,290	22,790
Hancock	2,784	2,747	274,390	51,353	1,783,450	1,895,510	316,530	571,943	912,518	91,200	16,940
Kennebec	5,523	5,249	479,749	180,994	4,650,350	4,846,950	776,510	1,564,277	2,258,618	236,250	56,270
Knox	2,115	2,091	156,480	47,091	1,507,890	1,682,720	249,970	477,548	767,607	72,320	10,860
Lincoln	2,808	2,779	223,069	58,430	1,649,490	1,851,050	324,540	582,060	884,035	59,296	14,340
Oxford	4,420	4,320	620,704	198,474	3,604,620	3,478,880	576,650	1,443,731	2,000,323	181,690	45,390
Penobscot	6,076	6,007	663,671	293,240	4,496,330	4,845,340	999,020	2,011,128	2,787,258	263,690	68,700
Piscataquis	1,935	1,888	265,180	104,223	1,325,180	1,382,870	310,730	632,232	858,652	85,520	24,270
Sagadahoc	1,238	1,221	115,043	39,279	973,950	1,052,990	174,840	299,840	555,006	61,830	19,200
Somerset	4,122	4,068	579,301	240,474	3,093,060	3,199,150	601,210	1,435,540	1,868,907	186,060	52,160
Waldo	3,674	3,637	381,531	155,789	2,326,690	2,535,680	526,710	974,963	1,544,808	123,840	29,530
Washington	2,051	2,022	248,782	54,919	1,232,670	1,225,490	278,896	479,714	753,171	64,370	14,070
York	5,064	4,954	438,625	141,203	5,808,810	5,045,990	778,890	1,327,431	2,399,612	225,090	62,140
The State	59,299	58,136	6,299,946	2,386,889	$49,359,450	$47,142,700	$8,802,720	$17,106,034	$27,265,609	$2,667,260	$819,680

For the 7 counties which reported more farms in 1900 than in 1890, the percentages of increase are as follows: Aroostook, 12.3; Kennebec, 5.6; Androscoggin, 2.2; Sagadahoc, 1.4; Franklin, Knox, and Oxford each less than 1 per cent. The counties reporting the largest relative decreases were Hancock, Washington, Waldo, and Penobscot, the percentages being 28.4, 16.9, 10.7, and 9.2, respectively.

The portion of the total land surface included in farms varied from 11.4 per cent in Piscataquis county to 85.2 per cent in Kennebec county, and the average size of farms, from 74 acres in Knox county to 156 acres in Franklin county.

The total acreage in farms increased in the last decade in every county except Hancock, Washington, Piscataquis, and Somerset, which reported decreases of 10.6 per cent, 8.9 per cent, 4.0 per cent, and 0.5 per cent, respectively. The greatest relative increase, 9.7 per cent, occurred in Aroostook county, which was the only county that reported a larger acreage of improved land in 1900 than in 1890. In 1900 the per cent of improved farm land varied from 18.7 in Hancock county to 49.1 in Aroostook county.

All counties except Androscoggin, Aroostook, and Oxford show decreases since 1890 in the value of farms. With the exception of the increase of 48.1 per cent in Aroostook county, and the decreases of 21.7 per cent and 20.2 per cent in Hancock and Waldo counties, respectively, the changes were slight. The average value of farms varied from $1,199 in Washington county to $2,144 in York county. In the south-central part of the State the value of the farm buildings exceeds that of the land. Elsewhere the reverse is true, especially in Aroostook county and in the extreme southeastern part of the State.

The value of implements and machinery increased greatly in every county. In Aroostook county it was more than three times as large in 1900 as in 1890. The average value per farm ranged from $114 in Hancock county to $191 in Aroostook county.

The only counties in which the value of live stock increased are Aroostook and Sagadahoc, where gains of 18.5 per cent and 1.2 per cent, respectively, were reported. The most marked decrease occurred in Washington county, and amounted to 21.7 per cent.

The average value per farm of the products of 1899 not fed to live stock ranged from $315 in Lincoln county to $656 in Aroostook county. The average value per acre was greatest in Cumberland, where it was $6.14, and least in Franklin, where it was $2.64.

The average expenditure per farm for labor, including value of board furnished, varied from $21 in Lincoln county to $68 in Aroostook county. Waldo and Washington counties each reported a smaller expenditure for fertilizers than in 1890. All other counties show increases, the amounts reported by Hancock and Aroostook counties in 1900 being three and five times, respectively, as great as the amounts reported in 1890. The average expenditures per farm varied from $5 in Lincoln and Knox counties to $39 in Aroostook county. The general use of commercial fertilizers in recent years in the growing of potatoes accounts for the relatively large expenditure in the latter county.

FARM TENURE.

Table 4 gives a comparative exhibit of farm tenure for 1880, 1890, and 1900. In Table 5 the tenure of farms for 1900 is given by race of farmer, and "farms operated by owners" are subdivided into groups designated as "owners," "part owners," "owners and tenants," and "managers." These terms denote, respectively: (1) Farms operated by individuals who own all the land they cultivate; (2) farms operated by individuals who own a part of the land and rent the remainder from others; (3) farms operated under the joint direction and by the united labor of two or more individuals, one owning the farm or a part of it, and the other, or others, owning no part, but receiving for supervision or labor a share of the products; and (4) farms operated by individuals who receive for their supervision and other services a fixed salary from the owners.

TABLE 4.—NUMBER AND PER CENT OF FARMS OF SPECIFIED TENURES: 1880 TO 1900.

Year.	Total number of farms.	Number of Farms Operated by—			Per Cent of Farms Operated by—		
		Owners.*	Cash tenants.	Share tenants.	Owners.*	Cash tenants.	Share tenants.
1880	64,309	61,528	1,628	1,153	95.7	2.5	1.8
1890	62,113	58,643	1,976	1,394	94.6	3.2	2.2
1900	59,299	56,524	2,030	745	95.3	3.4	1.3

* Including "part owners," "owners and tenants," and "managers."

TABLE 5.—FARMS OF SPECIFIED TENURES, JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER.

Race.	Total number of farms.	Owners.	Part owners.	Owners and tenants.	Managers.	Cash tenants.	Share tenants.
White	59,270	54,237	774	569	916	2,029	745
Colored *	29	26	1	-	1	1	-
The State	59,299	54,263	775	569	917	2,030	745

* Including 5 Indians.

The number of farms operated by owners has decreased 5,004 since 1880, but, as the total number of farms has also decreased, the percentage of farms operated by owners has not materially changed. The total number of tenant-operated farms, June 1, 1900, varied but 6 from the number reported twenty years before. Within the class, however, there has been a significant change in the intervening years, the number of share tenants having decreased 35.4 per cent, while the number of cash tenants increased in a corresponding degree. In 1880, 41.5 per cent of all tenants were share tenants, while in 1900 only 26.8 per cent were of this class. The change in the relative number of cash and share tenants is the result of a growing sentiment on the part of both landlord and tenant in favor of the cash-payment system, and indicates greater independence and financial responsibility on the part of the tenant class as a whole. Considered as evidence of agricultural progress, the significance of this

change is enhanced by the fact that the greatest relative numbers of share tenants are found in the most recently developed and least improved sections of the State. In Aroostook county 42.9 per cent of all tenants are share tenants, while in Cumberland county the corresponding per cent is but 19.7.

No previous census has reported the number of farms operated by "part owners," "owners and tenants," or "managers," but it is believed that the number conducted by the last-named class is constantly increasing.

OWNERSHIP OF RENTED FARMS.

The ownership of 2,633 of the 2,775 rented farms in Maine was ascertained by the enumerators; that of 142 was unreported. The titles to the 2,633 farms are vested in 2,563 owners, an average of about 103 farms to every 100 owners. Of the 2,563 owners, 2,510 possess 1 farm each; 45, 2 each; 6, 3 each; and the remaining 2 own 4 and 11 farms, respectively.

Of the 2,563 owners, 2,165, possessing 2,235 farms, reside in Maine. The owners of 1,868 of these farms live in the counties in which their farms are located. Of the non-resident owners, 336 live in the North Atlantic states; 5, in the South Atlantic states; 14, in the North Central states; 32, in the Western states; 1, in a South Central state; and 10, in foreign countries. None of them possess more than one farm. The total value of the 398 farms owned by these non-residents was $719,675, an average of $1,808. This amount is so small as to make it apparent that few, if any, of the non-resident owners derive their support from farms in Maine.

Of the 2,775 rented farms, only 5 are worth $25,000 or over. These 5 farms have an aggregate value of $157,800, an average of $31,560. Eighteen rented farms are worth between $10,000 and $25,000 each, their aggregate value being $229,200, and their average value $12,733. The remaining 2,752 rented farms have a total value of $3,576,160. As the average value of these farms is but $1,299, it is evident that the number of landlords in Maine who are supported by the incomes from their rented farms is very small.

FARMS CLASSIFIED BY RACE OF FARMER AND BY TENURE.

Tables 6 and 7 present the principal statistics for farms classified by race of farmer and by tenure.

TABLE 6.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER AND BY TENURE, WITH PERCENTAGES.

Race of Farmer, and Tenure.	Number of farms.	Number of Acres in Farms.			Value of Farm Property.	
		Average.	Total.	Per cent.	Total.	Per cent.
White farmers	59,270	106.3	6,298,591	100.0	$122,383,844	100.0
Colored farmers*	29	46.7	1,355	†	27,060	†
The State	59,299	106.2	6,299,946	100.0	$122,410,904	100.0
Owners	54,263	105.3	5,712,308	90.7	$109,959,024	89.8
Part owners	775	168.7	130,704	2.1	2,334,770	1.9
Owners and tenants	569	133.4	75,910	1.2	1,614,390	1.3
Managers	917	138.0	126,537	2.0	3,668,370	3.0
Cash tenants	2,030	86.9	176,491	2.8	3,536,510	2.9
Share tenants	745	104.7	77,996	1.2	1,297,840	1.1

*Including 5 Indians. † Less than one-tenth of 1 per cent.

TABLE 7.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFED BY RACE OF FARMER AND BY TENURE.

Race of Farmer and Tenure.	Average Values per Farm of—					
	Farm property, June 1, 1900.					
	Land and improvements (except buildings.)	Buildings.	Implements and machinery.	Live stock.	Gross income (products of 1899 not fed to live stock.)	Per cent of gross income on total investment in farm property.
White farmers	$833	$795	$148	$289	$460	22.3
Colored farmers*	440	333	52	108	265	28.4
The State	$832	$795	$148	$289	$460	22.3
Owners	808	785	147	286	457	22.5
Part owners	1,344	1,024	231	414	743	24.7
Owners and tenants	1,080	1,062	218	477	729	25.7
Managers	1,835	1,509	228	428	591	14.8
Cash tenants	802	636	97	207	331	19.0
Share tenants	756	646	119	221	376	21.6

*Including five Indians.

The value of the farm property of the 24 negroes who operate farms in Maine is $24,915, and that of the 5 Indian farmers, all of whom are owners, is $2,145.

Farms operated by "part owners" have the largest average area, 168.7 acres, and those operated by "cash tenants" the smallest, 86.9 acres. Of the 114 farms containing 1,000 acres each or over, 99 are operated by "owners;" 6, by "managers;" 5, by "part owners;" 3, by "share tenants;" and 1, by an "owner and tenant."

Many of the farms operated by managers are adjuncts of public institutions. Such farms, as a rule, are favorably located and highly improved, and the average values of the several classes of farm property are generally larger for this than for any other group of farms classified by tenure. The ratio which the gross income of these farms bears to the total value of their farm property is, however, smaller than for the other groups. This is due to the high average valuation of land and buildings, and to the fact that many of these farms are not cultivated primarily for profit.

FARMS CLASSIFIED BY AREA.

Tables 8 and 9, for farms classified by area, present facts corresponding to those given in Tables 6 and 7 for farms classified by race of farmer and by tenure.

TABLE 8.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY AREA, WITH PERCENTAGES.

Area.	Number of farms.	Number of Acres in Farms.			Value of Farm Property.	
		Average.	Total.	Per cent.	Total.	Per cent.
Under 3 acres	375	2.8	1,034	*	$441,290	0.4
3 to 9 acres	2,042	7.3	14,933	0.2	2,484,250	2.0
10 to 19 acres	2,890	14.1	40,690	0.7	3,752,260	3.1
20 to 49 acres	9,267	34.3	317,627	5.0	13,131,150	10.7
50 to 99 acres	18,644	69.6	1,297,754	20.6	31,386,890	25.7
100 to 174 acres	17,191	123.8	2,127,393	33.8	39,178,374	32.0
175 to 259 acres	5,662	207.0	1,171,767	18.6	17,399,050	14.2
260 to 499 acres	2,598	322.5	837,867	13.3	10,301,900	8.4
500 to 999 acres	516	594.4	306,709	4.9	2,954,890	2.4
1,000 acres and over	114	1,615.5	184,172	2.9	1,380,850	1.1
The State	59,299	106.2	6,299,946	100.0	$122,410,904	100.0

* Less than one-tenth of 1 per cent.

TABLE 9.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY AREA.

Area.	Average Values Per Farm of—					
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	Per cent of gross income on total investment in farm property.
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
Under 3 acres	$360	$706	$46	$65	$300	25.5
3 to 9 acres	391	674	60	92	175	14.4
10 to 19 acres	457	651	76	114	185	14.2
20 to 49 acres	542	625	95	155	268	18.9
50 to 99 acres	661	667	128	227	372	22.1
100 to 174 acres	922	840	170	347	548	24.0
175 to 259 acres	1,268	1,100	219	486	736	24.0
260 to 499 acres	1,714	1,337	290	624	935	23.6
500 to 999 acres	2,773	1,825	344	785	1,194	20.8
1,000 acres and over	7,370	2,733	755	1,255	1,970	16.3
The State	$832	$795	$148	$289	$460	22.3

The group of medium-sized farms, containing from 100 to 174 acres each, comprises a larger percentage of the total farm area and of the value of farm property than does any other group. With the exception of slight variations in the average values of buildings on small farms, the average values of the several forms of farm property advance as the farms increase in size. For farms of less than 100 acres each, the value of the buildings exceeds that of the land and improvements other than buildings, but for larger farms the land is more valuable than the buildings. For the group of farms containing less than 3 acres each, the average values of farm property per acre are relatively high, as this class includes most of the florists' establishments and many city dairies.

The average gross incomes per acre for the various groups are as follows: Farms under 3 acres, $108.82; 3 to 9 acres, $23.94; 10 to 19 acres, $13.10; 20 to 49 acres, $7.82; 50 to 99 acres, $5.34; 100 to 174 acres, $4.42; 175 to 259 acres, $3.56; 260 to 499 acres, $2.90; 500 to 999 acres, $2.01; and 1,000 acres and over, $1.22. In considering the high gross income per acre for farms of less than 3 acres, it should be borne in mind that

the incomes of the florists' establishments, nurseries, and city dairies, of which this group is largely composed, are determined not so much by the acreage of land used, as by the amount of capital invested in buildings, implements, and live stock, and the amounts expended for labor and fertilizers.

FARMS CLASSIFIED BY PRINCIPAL SOURCE OF INCOME.

Tables 10 and 11 present the leading features of the statistics relating to farms classified by principal source of income.

If for any farm, 40 per cent of the products not fed to live stock consists of hay and grain, the farm is designated a "hay and grain" farm. Should 40 per cent of the products consist of vegetables, the farm is designated a "vegetable" farm. The farms of the other groups are classified in the same manner. A "miscellaneous" farm is one whose operator does not derive his principal income from any single class of farm products. Farms which yielded no income in 1899 are classified according to the agricultural operations upon other farms in the same locality.

TABLE 10.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME, WITH PERCENTAGES.

Principal Source of Income.	Number of farms.	Number of Acres in Farms.			Value of Farm Property.	
		Average.	Total.	Per cent.	Total.	Per cent.
Hay and grain	7,453	97.5	726,661	11.5	$13,601,110	11.1
Vegetables	5,263	101.8	535,611	8.5	12,409,818	10.1
Fruit	551	64.2	35,404	0.6	1,075,509	0.9
Live stock	15,048	102.1	1,537,083	24.4	28,978,948	23.7
Dairy produce	17,740	100.6	1,785,286	28.4	38,751,782	31.7
Flowers and plants	65	9.6	625	*	293,255	0.2
Nursery products	16	78.4	1,254	*	84,940	0.1
Miscellaneous	13,163	127.5	1,678,022	26.6	27,215,542	22.2
The State	59,299	106.2	6,299,946	100.0	$122,410,904	100.0

* Less than one-tenth of 1 per cent.

TABLE 11.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER, CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME.

Principal Source of Income.	Average Values per Farm of—					
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock.)	Per cent of gross income on total investment in farm property.
	Land and improvements (except buildings.)	Buildings.	Implements and machinery.	Live stock.		
Hay and grain	$891	$735	$86	$113	$254	13.9
Vegetables	1,087	747	205	319	731	31.0
Fruit	810	874	113	155	351	18.0
Live stock	710	760	144	312	427	22.2
Dairy produce	825	859	157	343	475	21.7
Flowers and plants	1,898	2,338	209	67	2,181	48.3
Nursery products	3,425	1,475	359	50	2,988	56.3
Miscellaneous	840	790	156	282	478	23.1
The State	$832	$795	$148	$289	$460	22.3

Only about one-half of the 7,453 "hay and grain" farms report any domestic animals, and many report no crops except small quantities of hay or grain. These facts explain the relatively small percentage of gross income shown in Table 11 for farms of this group.

For the several classes of farms the average values per acre of products not fed to live stock are: Flowers and plants, $226.84; nursery products, $38.13; vegetables, $7.18; fruit, $5.45; dairy produce, $4.72; live stock, $4.18; miscellaneous, $3.75; hay and grain, $2.60.

The wide variations in the averages and percentages of gross income are largely due to the fact that in computing gross income no deductions are made for expenses involved in operation. For florists' establishments, nurseries, and market gardens the average expenditure for such items as labor and fertilizers represents a far larger percentage of the gross income than in the case of "hay and grain," "live stock," or "miscellaneous" farms. If it were possible to present the average net incomes, the variations shown would be comparatively slight.

FARMS CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK.

Tables 12 and 13 present data relating to farms classified by the reported value of products not fed to live stock.

TABLE 12.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK, WITH PERCENTAGES.

Value of Products not Fed to Live Stock.	Number of farms.	Number of Acres in Farms.			Value of Farm Property.	
		Average.	Total.	Per cent.	Total.	Per cent.
$0	266	34.6	9,194	0.2	$205,370	0.2
$1 to $49	1,842	39.1	71,962	1.1	1,636,920	1.3
$50 to $99	3,886	48.8	189,466	3.0	3,787,910	3.1
$100 to $249	16,215	69.0	1,118,265	17.8	21,035,890	17.2
$250 to $499	19,414	103.0	1,999,205	31.7	36,313,420	29.6
$500 to $999	12,732	143.8	1,831,449	29.1	35,356,810	28.9
$1,000 to $2,499	4,436	207.5	920,587	14.6	19,809,790	16.2
$2,500 and over	508	314.6	159,818	2.5	4,264,794	3.5
The State	59,299	106.2	6,299,946	100.0	$122,410,904	100.0

TABLE 13.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK.

Value of Products not Fed to Live Stock.	Average Values per Farm of—					Per cent of gross income on total investment in farm property.
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock.)	
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
$0	$307	$334	$37	$94	-	-
$1 to $49	363	435	37	54	$32	3.7
$50 to $99	401	455	44	75	75	7.7
$100 to $249	527	549	80	141	178	13.7
$250 to $499	724	742	137	267	365	19.5
$500 to $999	1,105	1,020	215	437	694	25.0
$1,000 to $2,499	1,881	1,549	347	689	1,422	31.8
2,500 and over	4,011	2,597	613	1,174	3,550	42.3
The State	$832	$795	$148	$289	$460	22.3

The absence of income in the first group is due in part to the inability of the enumerators to secure complete reports for certain farms where changes in proprietorship had occurred shortly prior to the date of enumeration. Frequently the persons in charge of such farms, June 1, 1900, could not give definite information concerning the products of the preceding year. The same statement is also true of some of the farms with reported incomes of less than $100. To this extent the reports fall short of giving a complete exhibit of farm income in 1899. Some of the farms reporting little or no income are doubtless summer homes or country estates held for pleasure and not for profit.

LIVE STOCK.

At the request of the various live-stock associations of the country, a new classification of domestic animals was adopted for the census of 1900. The age grouping for neat cattle was determined by their present and prospective relations to the dairy industry and the supply of meat products. Horses and mules are classified by age, and neat cattle and sheep by age and sex. The new classification permits a very close comparison with the figures published in previous census reports.

Table 14 presents a summary of live-stock statistics.

TABLE 14.—NUMBER OF DOMESTIC ANIMALS, FOWLS, AND BEES, ON FARMS, JUNE 1, 1900, WITH TOTAL AND AVERAGE VALUES, AND NUMBER OF DOMESTIC ANIMALS NOT ON FARMS.

Live Stock.	Age in years.	On Farms.			Not on Farms.
		Number.	Value.	Average Value.	Number.
Calves	Under 1	61,794	$411,104	$ 6 65	1,522
Steers	1 and under 2	15,508	218,758	14 11	396
Steers	2 and under 3	11,156	266,452	23 88	174
Steers	3 and over	11,442	582,828	50 94	168
Bulls	1 and over	6,995	152,984	21 87	82
Heifers	1 and under 2	45,877	621,354	13 54	1,179
Cows kept for milk	2 and over	173,592	5,060,048	29 15	11,956
Cows and heifers not kept for milk	2 and over	12,483	272,017	21 79	146
Colts	Under 1	2,834	78,537	27 71	156
Horses	1 and under 2	3,955	201,548	50 96	165
Horses	2 and over	99,510	6,778,904	68 12	33,690
Mule colts	Under 1	92	2,675	29 08	8
Mules	1 and under 2	21	970	46 19	1
Mules	2 and over	240	15,885	66 19	41
Asses and burros	All ages	48	769	16 02	18
Lambs	Under 1	167,903	364,706	2 17	2,045
Sheep (ewes)	1 and over	240,717	709,720	2 95	4,820
Sheep (rams and wethers)	1 and over	11,496	42,057	3 66	228
Swine	All ages	79,018	516,015	6 53	9,545
Goats	All ages	279	1,091	3 91	36
Fowls:*					
Chickens†		1,564,853			
Turkeys		6,437			
Geese		4,566	756,153		
Ducks		9,708			
Bees (swarms of)		10,857	51,459	4 74	
Value of all live stock			$17,106,034		

*The number reported is of fowls over three months old. The value is for all, old and young.

†Including Guinea fowls.

The total value of all live stock on farms was $17,106,034. Of this amount 41.3 per cent represents the value of horses; 29.6 per cent, that of dairy cows; 14.8 per cent, that of other neat cattle; 6.5 per cent, that of sheep; 4.4 per cent, that of poultry; 3.0 per cent, that of swine; and 0.4 per cent, that of all other live stock.

As in the other New England states, the value of steers 3 years old and over is comparatively high, this class including the valuable working oxen still used in some parts of the State. The number of these animals is rapidly decreasing. In 1850, 83,893 working oxen were reported; in 1860, 79,792; in 1870, 60,530; in 1880, 43,049; in 1890, 33,105. In 1900 the total number of steers over 2 years old was only 22,598, and it is probable that many of these were not working oxen.

No reports were received concerning the value of live stock not on farms, but it is probable that such animals have higher average values than those on farms. Allowing the same averages, however, the total value of all live stock in the State, exclusive of the poultry and bees not on farms, is approximately $19,897,000.

CHANGES IN LIVE STOCK ON FARMS.

The following table shows the changes since 1850 in the number of the most important domestic animals.

TABLE 15.—NUMBER OF SPECIFIED DOMESTIC ANIMALS ON FARMS: 1850 TO 1900.

Year.	Dairy cows.	Other neat cattle.	Horses.	Mules and asses.	Sheep.*	Swine.
1850	133,556	209,783	41,721	55	451,577	54,598
1860	147,314	229,619	60,637	104	452,472	54,783
1870	139,259	203,802	71,514	336	434,666	45,760
1880	150,845	183,576	87,848	298	565,918	74,369
1890	157,278	141,832	109,156	278	370,484	91,297
1900	173,592	165,255	106,299	401	252,213	79,018

* Lambs not included.

With the exception of the decade 1860-1870 the number of dairy cows has increased steadily for fifty years, the gain in the last decade having been 16,314, or 10.4 per cent. The number of "other neat cattle" given for 1900 includes 61,794 calves. It is uncertain whether calves were included with "neat cattle" in census reports prior to 1900. If not, their number in that year should be deducted when making comparisons with reports for previous years, in which case a decrease would be shown for the last decade in the number of "other neat cattle" corresponding with that shown for each succeeding decade since 1860.

The number of horses more than doubled from 1850 to 1890, but in the last decade there was a small decrease. The number of sheep remained nearly constant until 1880, since which date there has been a rapid decrease, amounting in the last ten years to 31.9 per cent. Between 1850 and 1890 the number of swine fluctuated slightly with a general upward tendency, but in the last decade there was a decrease of 13.4 per cent.

In comparing the poultry report for 1900 (see Table 14) with that for 1890, it should be borne in mind that in 1900 the

enumerators were instructed not to report fowls less than 3 months old, while in 1890 no such limitation was made. This fact explains, in part, the decrease shown in the number of all kinds of fowls except chickens, and the smallness of the increase shown for these fowls. Compared with the figures for 1890, the present census shows decreases in the number of fowls as follows: Ducks, 64.0 per cent; turkeys, 57.8 per cent; and geese, 37.2 per cent. The number of chickens increased 10.9 per cent.

ANIMAL PRODUCTS.

Table 16 is a summarized exhibit of the animal products of agriculture.

TABLE 16.—QUANTITIES AND VALUES OF SPECIFIED ANIMAL PRODUCTS AND VALUES OF POULTRY RAISED, ANIMALS SOLD, AND ANIMALS SLAUGHTERED ON FARMS IN 1899.

Products.	Unit of measure.	Quantity.	Value.
Wool	Pounds	1,478,018	$318,585
Mohair and goat hair	Pounds	105	21
Milk	Gallons	*99,586,188	
Butter	Pounds	16,174,173	8,182,344
Cheese	Pounds	425,102	
Eggs	Dozens	13,304,151	2,038,225
Poultry			955,468
Honey	Pounds	200,080	
Wax	Pounds	6,570	34,461
Animals sold			2,371,717
Animals slaughtered			1,258,594
Total			$15,159,415

*Includes all milk produced.

The animal products of the State in 1899 were valued at $15,159,415, or 40.8 per cent of the value of all farm products and 55.6 per cent of the gross farm income. Of the above amount, 54.0 per cent represents the value of dairy products; 23.9 per cent, that of animals sold and of animals slaughtered on farms; 19.8 per cent, that of poultry and eggs; and 2.3 per cent, that of wool, mohair, honey and wax.

DAIRY PRODUCE.

The steady growth of population in Maine and the increasing popularity of its summer resorts have largely increased the demand for dairy produce in this State. The present importance of this industry is shown by the fact that in 1899 the proprietors

of 17,740 farms, or 29.9 per cent of the farms of the State, derived their principal income from dairy produce. The production of milk in 1899 was 41,616,397 gallons greater than in 1889, a gain of 71.8 per cent. The census of 1890 secured no report of the quantity of milk sold, but since 1880 there has been a gain of 329.5 per cent. In every county except Androscoggin, the quantity of milk sold in 1899 was more than three times as great as that sold in 1879.

Of the $8,182,344 given in Table 16 as the value of all dairy products in 1899, $2,561,239, or 31.3 per cent, represents the value of such products consumed on the farms of the producers, and $5,621,105, or 68.7 per cent, the amount realized from sales. Of the latter sum, $2,278,122 was derived from the sale of 15,979,003 gallons of milk; $2,272,437, from 11,030,091 pounds of butter; $1,028,752, from 2,810,733 gallons of cream; and $41,794, from 365,936 pounds of cheese.

While the quantity of butter made on farms has increased since 1890, that of cheese has rapidly decreased, the production of 1899 being little more than one-half that of 1889 and less than one-fifth that of 1849. The transfer of cheese making from the farm to the factory explains the decrease.

POULTRY AND EGGS.

Of the $2,993,693 given as the total value of the products of the poultry industry in 1899, 68.1 per cent represents the value of eggs, and 31.9 per cent that of poultry raised. The number of dozens of eggs increased 41.8 per cent in the last decade.

WOOL.

The northern counties report a larger total production of wool than the southern counties, but show a much smaller number of fleeces per square mile. The production of wool increased steadily from 1850 until 1880, in which year 2,776,407 pounds were reported. Since that date there has been a steady decrease, amounting in the last decade to 20.7 per cent. The average weight of fleeces was 5.3 pounds in 1890 and 5.7 pounds in 1900.

HORSES AND DAIRY COWS ON SPECIFIED CLASSES OF FARMS.

Table 17 presents, for the leading groups of farms, the number of farms reporting horses and dairy cows, the total number of these animals, and the average number per farm. In computing the averages presented, only those farms which report the kind of stock under consideration are included.

TABLE 17.— HORSES AND DAIRY COWS ON SPECIFIED CLASSES OF FARMS, JUNE 1, 1900.

Classes.	Horses.			Dairy Cows.		
	Farms reporting.	Number.	Average per farm.	Farms reporting.	Number.	Average per farm.
Total	49,576	106,299	2.1	49,161	173,592	3.5
White farmers	49,554	106,267	2.1	49,148	173,563	3.5
Colored farmers	22	32	1.5	13	29	2.2
Owners*	46,996	100,274	2.1	46,689	164,753	3.5
Managers	578	2,007	3.5	554	3,020	5.5
Cash tenants	1,457	2,884	2.0	1,361	4,083	3.0
Share tenants	545	1,134	2.1	557	1,736	3.1
Under 20 acres	3,262	4,537	1.4	2,921	4,520	1.5
20 to 99 acres	22,217	38,939	1.8	22,584	59,365	2.6
100 to 174 acres	15,723	36,076	2.3	15,459	62,529	4.0
175 to 259 acres	5,367	15,209	2.8	5,250	28,386	5.4
260 acres and over	3,007	11,538	3.8	2,947	18,792	6.4
Hay and grain	3,272	7,142	2.2	2,246	4,761	2.1
Vegetables	4,809	13,091	2.7	4,108	11,463	2.8
Fruit	370	650	1.8	242	648	2.7
Live stock	13,352	27,098	2.0	13,100	39,671	3.0
Dairy	15,982	33,199	2.1	17,740	83,293	4.7
Miscellaneous†	11,791	25,119	2.1	11,725	33,756	2.9

* Including "part owners" and "owners and tenants."

† Including florists' establishments and nurseries, and one tobacco farm.

CROPS.

The following table gives the statistics of the principal crops grown in 1899.

TABLE 18.—ACREAGES, QUANTITIES, AND VALUES OF THE PRINCIPAL FARM CROPS IN 1899.

Crops.	Acres.	Unit of measure.	Quantity.	Value.
Corn	16,856	Bushels.	645,040	$326,824
Wheat	6,667	Bushels.	116,720	107,396
Oats	108,661	Bushels.	3,799,435	1,374,573
Barley	8,809	Bushels.	252,850	137,448
Rye	611	Bushels.	9,290	6,126
Buckwheat	25,292	Bushels.	468,320	185,836
Flaxseed	2	Bushels.	16	22
Clover seed	–	Bushels.	519	2,956
Grass seed	–	Bushels.	417	854
Hay and forage	1,270,254	Tons	1,136,774	10,641,546
Tobacco	*	Pounds..	150	14
Hops	*	Pounds..	60	6
Peanuts	1	Bushels.	22	46
Dry beans	10,252	Bushels.	137,290	290,885
Dry peas	2,300	Bushels.	35,991	44,618
Potatoes	71,765	Bushels.	9,813,748	3,711,999
Onions	168	Bushels.	44,489	38,160
Chicory	29	Pounds..	64,820	217
Miscellaneous vegetables	19,844	–	–	1,207,075
Maple sugar	–	Pounds..	5,500	643
Maple syrup	–	Gallons..	16,024	15,280
Small fruits	1,036	–	–	157,679
Grapes	†51	Centals..	2,758	‡7,584
Orchard fruits	†17,322	Bushels.	1,438,919	§833,634
Nuts	–	–	–	593
Forest products	–	–	–	2,652,249
Flowers and plants	71	–	–	155,131
Seeds	6	–	–	3,082
Nursery products	106	–	–	46,207
Miscellaneous	–	–	–	5,371
Total	1,660,103	–	–	$21,954,054

* Less than 1 acre.

† Estimated from number of vines or trees.

‡ Including value of raisins, wine, etc.

§ Including value of cider, vinegar, etc.

Of the total value of crops, hay and forage contributed 48.5 per cent; vegetables, including potatoes and onions, 22.6 per cent; forest products, 12.1 per cent; cereals, 9.7 per cent; fruits and nuts, 4.5 per cent; and all other products, 2.6 per cent.

Owing to a more favorable season, the yield per acre of most crops in 1899 was greater than in 1889. The season of 1899 was especially favorable to the growing of potatoes, the yield per acre having been 136.7 bushels while in 1889 it was but 105.8 bushels. The average yield per acre of hay and forage was 0.9 ton, and the average values, $9.36 per ton and $8.38 per

acre. The acreage devoted to hay and forage was 76.5 per cent of the total area in crops, but yielded only 48.5 per cent of the total receipts. The average values per acre of other crops were as follows: Flowers and plants, $2,185; nursery products, $436; onions, $227; small fruits, $152; grapes, $149; miscellaneous vegetables, $61; potatoes, $52; cereals, $13; and orchard fruits, $7. The crops yielding the highest returns per acre were grown upon very highly improved land. Their production required a relatively great amount of labor and large expenditures for fertilizers.

CEREALS.

Table 19 is an exhibit of the changes in cereal production since 1849.

TABLE 19.—ACREAGE AND PRODUCTION OF CEREALS: 1849 TO 1899.

PART 1—ACREAGE.

Year.*	Barley.	Buckwheat.	Corn.	Oats.	Rye.	Wheat.
1879.....	11,106	20,135	30,997	78,785	2,161	43,829
1889.....	11,972	22,395	10,891	121,612	791	4,116
1899	8,809	25,292	16,856	108,661	611	6,667

PART 2—BUSHELS PRODUCED.

1849.....	151,731	104,523	1,750,056	2,181,037	102,916	296,259
1859.....	802,108	239,519	1,546,071	2,988,939	123,287	233,876
1869...	658,816	466,635	1,089,888	2,351,354	34,115	278,793
1879.....	242,185	382,701	960,633	2,265,575	26,398	665,714
1889.....	286,262	466,411	380,662	3,668,909	6,664	79,826
1899.....	252,850	468,320	645,040	3,799,435	9,290	116,720

*No statistics of acreage were secured prior to 1879.

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 and rapidly increasing for several

decades. This is especially true in 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 1880 Aroostook county reported 24.0 per cent of the total acreage in cereals; in 1890, 33.5 per cent; and in 1900, 49.2 per cent, or approximately one-half.

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; 4.0 per cent, to wheat; and 0.4 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. The northern counties of Aroostook, Penobscot, and Piscataquis show a gain of 48.7 per cent, while all others show decreases.

In 1900, 83.7 per cent of the total area devoted to buckwheat was in Aroostook county, and 12.7 per cent in the other 3 northern counties. The gain of 12.9 per cent in the last ten years in the acreage of this grain has resulted entirely from the increases in these 4 counties.

The northern counties report very little corn, Aroostook county only 27 acres, but in all others there were substantial increases in the last decade, amounting to 54.8 per cent for the State.

Aroostook county reports 48.4 per cent of the total acreage in oats, and Penobscot and Somerset counties, 22.7 per cent. For the last decade Aroostook shows a gain of 16,885 acres, or 47.3 per cent, but all other counties show decreases, resulting in a net loss for the State of 10.6 per cent.

Very little attention is given to rye. Aroostook county reports 58.6 per cent of the product and shows a gain in the last decade of 102.3 per cent. Oxford county, which reported 54.9 per cent of the total acreage in 1890, reports but 5.4 per cent in 1900.

The area in wheat in Aroostook county increased from 1,910 acres in 1889 to 5,759 acres in 1899. For the balance of the State there was a decrease from 2,206 to 908 acres. In 1889 Aroostook county had 46.4 per cent of the acreage devoted to this grain, and in 1899, 86.4 per cent. The gain for the State was 62.0 per cent.

The acreage given for cereals does not include 14,212 acres of grain cut green for hay, nor 12,494 acres devoted to corn, non-saccharine sorghum, and similar crops, grown for forage or ensilage.

ORCHARD FRUITS.

The changes in orchard fruits since 1890 are shown in the following table:

TABLE 20.—ORCHARD TREES AND FRUITS: 1890 AND 1900.

Fruits.	Number of Trees.		Bushels of Fruit.	
	1900.	1890.	1899.	1889.
Apples	4,184,781	3,003,109	1,421,773	3,071,471
Apricots	84	186	-	3
Cherries	11,597	10,686	1,550	864
Peaches	9,592	1,607	1,895	217
Pears	39,902	34,331	11,200	13,141
Plums and prunes	29,001	14,394	2,282	1,291

The value of the orchard products of 1899 was $833,634. The counties whose orchard products were valued at over $50,000 were: York, $150,297; Cumberland, $94,087; Kennebec, $80,991; Penobscot, $70,486; Androscoggin, $66,183; Oxford, $65,925; and Waldo, $63,826.

In 1890, 98.0 per cent, and in 1900, 97.9 per cent of all fruit trees in the State were apple trees. All counties report increases since 1890 in the number of trees, the rate of gain for the State being 39.3 per cent. The greatest relative gain was in Aroostook county. In 1899 there were manufactured on farms 11,906 barrels of cider, 2,161 barrels of vinegar, and 26,170 pounds of dried fruit.

Very little attention is given to apricots. The number of cherry trees has increased slightly, but many counties show decreases. Peach and nectarine trees are few in number, though a large percentage of gain is reported in all parts of the State. A large percentage of the pear trees reported are in the southwestern counties. The gain of 16.2 per cent for the State is, however, quite generally distributed, the only marked decreases being in Cumberland and Franklin counties. Plum and prune trees have more than doubled in number, the only counties reporting losses being Androscoggin, Franklin, and Oxford. In addition to the trees given in Table 20, unclassified fruit trees

to the number of 3,244 are reported, with a yield of 219 bushels of fruit.

The quantity of fruit produced in any year is determined largely by the nature of the season. Consequently, comparisons between the crop of 1889 and that of 1899 have little significance, as in the latter year there was only about one-third of a crop of the most important fruits.

SMALL FRUITS.

The total area used in the cultivation of small fruits in 1899 was 1,036 acres, distributed among 4,577 farms. The value of the fruits grown was $157,679, an average of $34.45 per farm. Of the total area, 512 acres, or 49.4 per cent, were devoted to strawberries, the total production of which was 1,066,860 quarts, grown principally in the southern counties. The acreage and production of other berries were as follows: Blackberries and dewberries, 151 acres and 164,300 quarts; cranberries, 90 acres and 1,554 bushels; currants, 32 acres and 37,080 quarts; gooseberries, 30 acres and 41,230 quarts; raspberries and Logan berries, 131 acres and 214,700 quarts; and other berries, 90 acres and 102,040 quarts.

VEGETABLES.

The value of all vegetables grown in the State in 1899, including potatoes and onions, was $4,957,234. Of this amount, 74.9 per cent represents the value of potatoes. This important crop was reported by 49,548 farmers, or 83.6 per cent of the total number in the State. It is relatively of greatest importance in Aroostook county, where the natural fertility of the soil and the presence of a number of starch factories render the crop an especially profitable one. In 1890 this county reported 33.5 per cent of the total acreage, and in 1900, 58.5 per cent. The average area per farm devoted to potatoes in 1899 was 6.6 acres for Aroostook county, and but 0.7 acre for the remainder of the State. The acreage of potatoes in Aroostook county in 1899 constituted 10.8 per cent of the total improved land; the average yield per acre was 154.1 bushels, while for the rest of the State it was but 112.3 bushels. Aside from the land devoted to potatoes and onions, 19,844 acres were used in the growing of mis-

cellaneous vegetables. Of this area the products of 9,541 acres were not reported in detail. Of the remaining 10,303 acres, concerning which detailed reports were received, 8,252 acres were devoted to sweet corn; 594, to cabbages; 405, to turnips; 223, to cucumbers; 165, to green peas; 162, to tomatoes; and 502 to other vegetables.

FLORICULTURE.

The proprietors of 65 of the 93 establishments where flowers are grown for the market make commercial floriculture their principal business. They have invested a capital of $293,255, of which $123,375 represents the value of land; $151,940, that of buildings; $13,610, that of implements; and $4,330, that of live stock. In 1899 they raised flowers and plants valued at $134,232 and other products valued at $8,910, making a total product of $143,142 or $229.03 for each of the 625 acres used. During the same year they expended $2,830 for fertilizers and $39,515 for labor.

These 65 florists' establishments have 653,861 square feet of glass surface, equivalent to 490,396 square feet of land under glass. In addition, 131 farms have 693,714 square feet of land under glass, making the total for the State, 1,184,110 square feet.

LABOR AND FERTILIZERS.

The total expenditure for labor on farms in 1899, including the value of board furnished, was $2,667,260, an average of $45 per farm. The average was highest on the most intensively cultivated farms, being $789 for nurseries, $608 for florists' establishments, $83 for market gardens, $47 for dairy farms, $45 for fruit farms, $35 for live stock farms, and $31 for hay and grain farms. Managers expended, on an average, $166; owners, $43; share tenants, $35; and cash tenants, $34 per farm. White farmers expended $45 per farm, and colored farmers $13.

Fertilizers purchased in 1899 cost $819,680, an average of $14 per farm, and an increase since 1890 of 79.6 per cent. The average expenditure was greatest for nurseries and least for hay and grain farms, the amounts being $152 and $6, respectively. For vegetable farms the average was $52; for florists' establishments, $44; for fruit farms, $10; for dairy farms, $11; and for live stock farms, $9.

FACTS RELATING TO THE POPULATION OF MAINE.

The following facts and figures, relating to the population of Maine, are compiled from a compendium of the twelfth census of the United States. They contain the birthplace of the native born residents of Maine, the birthplace of the foreign born residents of Maine, the number of Maine born people residing in each state and territory, and the population of Maine by counties for the decades 1790 to 1900 inclusive, with the numerical increase and the percentage of increase in the State for each decade since 1790.

BIRTHPLACE OF NATIVE BORN RESIDENTS OF MAINE.

Of the 694,466 residents of Maine in 1900, 560,506 or 80.7 per cent were born in Maine, 40,630 or 5.8 per cent were native born outside of Maine, and 93,330 or 13.5 per cent were foreign born. The following table shows the birthplace of the native born residents of Maine at that date:

Maine	560,506
New Hampshire	8,902
Vermont	1,969
Massachusetts	15,145
Rhode Island	883
Connecticut	806
New York	3,170
New Jersey	505
Pennsylvania	955
Total in North Atlantic Division	592,841
Delaware	41
Maryland	234
District of Columbia	110
Virginia	259

West Virginia	33
North Carolina	77
South Carolina	70
Georgia	74
Florida	70
Total in South Atlantic Division	968
Ohio	358
Indiana	128
Illinois	435
Michigan	480
Wisconsin	371
Minnesota	414
Iowa	187
Missouri	98
North Dakota	41
South Dakota	40
Nebraska	79
Kansas	80
Total in North Central Division	2,711
Kentucky	80
Tennessee	52
Alabama	35
Mississippi	21
Louisiana	78
Texas	35
Oklahoma	1
Indian Territory	2
Arkansas	14
Total in South Central Division	318
Montana	49
Wyoming	5
Colorado	73
New Mexico	11
Arizona	8
Utah	14
Nevada	30

Idaho	9
Washington	73
Oregon	55
California	429
Alaska	4
Hawaii	2
Total in Western Division	762
In United States, state not specified	1,117
At sea under United States flag	90
In Philippine Islands	9
In Porto Rico	1
American citizens born abroad	2,319
Total not included in states and territories	3,536
Total American born	601,136

BIRTH PLACE OF FOREIGN BORN RESIDENTS OF MAINE.

Of the 694,466 residents of Maine in 1900, 601,136 or 86.5 per cent were native born, and 93,330 or 13.5 per cent were foreign born. Of the 93,330 foreign born residents of Maine in 1900, 67,077 or 71.9 per cent were born in Canada, including New Foundland, 17,278 or 18.5 per cent in Great Britain, and 8,975 or 9.6 per cent in all other countries. The following table shows the birth place of the foreign born residents of Maine at that date:

Africa	8
Asia, except China, Japan and India	282
Atlantic Islands	27
Australia	14
Austria	165
Belgium	23
Bohemia	16
Canada, including Newfoundland (English)	36,169
Canada, including Newfoundland (French)	30,908
Central America	4
China	102
Cuba	17
Denmark	886
England	4,793
Europe, not otherwise specified	10

Finland	179
France	180
Germany	1,356
Greece	7
Holland	22
Hungary	29
India	19
Ireland	10,159
Italy	1,334
Japan	10
Mexico	3
Norway	509
Pacific Islands, except Philippine Islands	6
Poland (Austrian)	22
Poland (German)	9
Poland (Russian)	337
Poland (unknown)	75
Portugal	53
Russia	1,021
Scotland	2,127
South America	15
Spain	29
Sweden	1,935
Switzerland	45
Turkey	84
Wales	199
West Indies, except Cuba and Porto Rico	62
Other countries	22
Born at sea	58
Total foreign born	93,330
Total American born	601,136
Grand total	694,466

RESIDENCE OF MAINE BORN PEOPLE.

Of the 778,266 Maine born people in the country in 1900, including 783 in the military and naval service stationed abroad, 560,506 or 72 per cent were residing in Maine, and 217,760 or 28 per cent were residing outside of Maine. The following table shows the number of Maine born people residing in each state and territory at that date.

Maine	560,506
New Hampshire	16,650
Vermont	2,164
Massachusetts	98,375
Rhode Island	4,239
Connecticut	3,788
New York	8,936
New Jersey	2,450
Pennsylvania	3,688
Total in North Atlantic Division	700,796
Delaware	93
Maryland	538
District of Columbia	918
Virginia	482
West Virginia	263
North Carolina	202
South Carolina	157
Georgia	364
Florida	752
Total in South Atlantic Division	3,769
Ohio	1,816
Indiana	834
Illinois	6,140
Michigan	3,572
Wisconsin	5,418
Minnesota	10,654
Iowa	3,246
Missouri	1,986
North Dakota	970
South Dakota	1,158
Nebraska	2,005
Kansas	2,127
Total in North Central Division	39,926
Kentucky	178
Tennessee	248
Alabama	214

Mississippi	99
Louisiana	221
Texas	741
Oklahoma	301
Indian Territory	80
Arkansas	196
Total in South Central Division	2,278
Montana	2,048
Wyoming	409
Colorado	2,847
New Mexico	178
Arizona	493
Utah	395
Nevada	460
Idaho	727
Washington	5,821
Oregon	2,178
California	14,732
Alaska	332
Hawaii	94
Total in Western Division	30,714
Total Maine born within United States	777,483
In military and naval service (including civilian employes) stationed abroad	783
Aggregate	778,266
Maine born living in Maine	560,506
Maine born living outside of Maine	217,760

POPULATION OF MAINE BY COUNTIES BY DECADES.

The following table shows the population of the State of Maine by counties for the decades 1790 to 1900 inclusive, also the numerical increase and percentage of increase in the State for each decade since 1790.

Counties.	1790.	1800.	1810.	1820.	1830.	1840.
Androscoggin	–	–	–	–	–	–
Aroostook	–	–	–	–	–	9,413
Cumberland	25,450	38,208	42,831	49,445	60,102	68,658
Franklin	–	–	–	–	–	20,801
Hancock	9,549	16,358	30,031	31,290	24,336	28,605
Kennebec	–	24,571	32,564	42,623	52,485	55,823
Knox	–	–	–	–	–	–
Lincoln	29,962	30,225	42,992	53,189	57,192	63,517
Oxford	–	–	17,630	27,104	35,219	38,351
Penobscot	–	–	–	13,870	31,530	45,705
Piscataquis	–	–	–	–	–	13,138
Sagadahoc	–	–	–	–	–	–
Somerset	–	–	12,910	21,787	35,787	33,912
Waldo	–	–	–	–	29,788	41,509
Washington	2,758	4,461	7,870	12,744	21,294	28,327
York	28,821	37,896	41,877	46,283	51,722	54,034
The State	96,540	151,719	228,705	298,335	399,455	501,793
Increase, number	–	55,179	76,986	69,630	101,120	102,338
per cent	–	57.1	50.7	30.4	33.9	25.6

Counties.	1850.	1860.	1870.	1880.	1890.	1900.
Androscoggin	–	29,726	35,866	45,042	48,968	54,242
Aroostook	12,529	22,479	29,609	41,700	49,589	60,744
Cumberland	79,538	75,591	82,021	86,359	90,949	100,689
Franklin	20,027	20,403	18,807	18,180	17,053	18,444
Hancock	34,372	37,757	36,495	38,129	37,312	37,241
Kennebec	62,521	55,655	53,203	53,058	57,012	59,117
Knox	–	32,716	30,823	32,863	31,473	30,406
Lincoln	74,875	27,860	25,597	24,821	21,996	19,669
Oxford	39,763	36,698	33,488	32,627	30,586	32,238
Penobscot	63,089	72,731	75,150	70,476	72,865	76,246
Piscataquis	14,735	15,032	14,403	14,872	16,134	16,949
Sagadahoc	–	21,790	18,803	19,272	19,452	20,330
Somerset	35,581	36,753	34,611	32,333	32,627	33,849
Waldo	47,230	38,447	34,522	32,463	27,759	24,185
Washington	38,811	42,534	43,343	44,484	44,482	45,232
York	60,098	62,107	60,174	62,257	62,829	64,885
The State	583,169	628,279	626,915	648,936	661,086	694,466
Increase, number	81,376	45,110	*1,364	22,021	12,150	33,380
per cent	16.2	7.7	* 0.2	3.5	1.8	5.0

*Decrease.

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, 1902.

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 sixth annual report.

Very respectfully,

CHARLES E. ATWOOD,
Inspector.

REPORT.

To begin with, I desire to correct some mistaken notions which are being held as to the scope and nature of the duties and responsibilities placed by the statutes upon the inspector of factories, workshops, mines and quarries. Some well meaning people assume to credit me with powers and duties which the legislature never delegated to the State factory inspector; others hold that the breadth of responsibility resting upon me as factory inspector, in the matters of sanitary improvement and child labor especially, is co-extensive with the border lines of the State, with powers well nigh supreme. The following brief paragraphs comprise, in substance, the legal duties of the Maine inspector of factories, workshops, mines and quarries:

First—Chapter 292 of the laws of 1893 requires the inspector, upon complaint, to inquire into and prosecute all violations of the law providing for fortnightly payments of wages by "every manufacturing, mining, quarrying, stone cutting, mercantile, horse 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."

Second—To examine into the sanitary condition of factories, workshops, mines and quarries, and when their condition, in his opinion, is such as to endanger the lives and health of the employes, he shall notify the local board of health, and it shall be the duty of said board to investigate the matter.

Third—Said inspector shall enforce the law which requires swinging doors in all factories and workshops to open outward.

Fourth—The inspector shall inquire into and enforce the penalties of chapter 139 of the Public Laws of 1887, entitled

"An act to regulate the hours of labor, and the employment of women and children in manufacturing and mechanical establishments," for which purposes he may at all reasonable times enter any manufacturing or mechanical establishment in this State.

As an instance of the variety of misinformation and misunderstanding which I encounter as I go over the State, Prof. A, in a town which shall be nameless, complains and earnestly claims that the factory inspector is especially charged with the sanitary conditions of all the school houses in the State, that he should personally "inspect" said houses and their adjuncts and promptly prosecute all offenders. Complaints have actually been made to me along this line by town officials. Of course such a proposition is an absurdity. To visit and examine the five thousand school houses in this State would alone call for a corps of ten State inspectors, at least. The governor has seen fit to appoint but one man to do all the work which he believes to be required under the law. If Prof. A and others of his way of thinking, will devote a short time to a study of the labor laws of Maine, they will there find the duties of factory inspector clearly set forth, and that sanitary inspection of school houses is not anywhere mentioned among them. Our State lawmakers have wisely provided a tribunal to which all complainants of this class may go for relief, namely, the local board of health, which, they declare, "shall be chosen in every city and town in this State," clothed with full power to investigate, correct and prosecute. For the letter of the law in ample form, I beg to refer all interested to the Public Laws of 1887 and 1893.

A CONFLICT OF AUTHORITY.

Another source of misunderstanding as to my official responsibility has arisen within the past two years by reason of an apparent conflict of law. We have on our statute books two codes of laws in relation to children, with two plans or systems, administered by two separate sets of officials, namely, the school truant laws and the labor laws. In them the duties of each set of officers are made clear and emphatic. At certain points they run so nearly in the same groove that the not over careful observer might take them to be identical, when in reality they are in open conflict.

The labor law provides that "No child under fifteen years of age shall be employed in any manufacturing or mechanical establishment in this State unless he has for *at least sixteen weeks* attended some public or private school."

The school truant law provides that "Every child between the ages of seven and fifteen inclusive shall attend some public or day school *during the time such school is in session,*" or in an approved private school *"for the same period of time,"* which in cities and large towns might mean thirty-six weeks yearly, while in sparse settlements it might mean six weeks. Note the indefiniteness and the inequality.

The mischievous effects of this conflict of law are already manifest. Within the past two or three years a new class of complainants against child labor has taken the field, made up chiefly of school committee men and school superintendents. The claim made is that it is one of the duties of the factory inspector to enforce the school truant law, or that portion at least which apparently conflicts with the labor law. Such a claim is absolutely without foundation in law or the simplest brand of common sense, as a careful reading of the truant act itself is sufficient evidence. But, these men say, the truant law repealed all legislation inconsistent therewith. Undoubtedly it did repeal all preceding truant legislation. If the labor law was meant to be included, as these truant law experts claim, then the factory inspector is without an occupation so far as child labor is concerned. But the truant law did no such thing. Their proposition has no legal standing. The only conceivable reason for their assumption is that, lacking the needed ability or the manly pluck to enforce the truant law themselves, these local complainants seek to unload their burden of legal responsibility upon the shoulders of a State officer, without the shadow of an excuse in law or right.

As factory inspector, I have no power to turn any child of the required age from a mill, who possesses the proper proof that he attended school sixteen weeks the year previous. I have no jurisdiction in the domain of the common schools, and am in no manner responsible for the school attendance of children of any age. My duties are corrective, not educational. I have consistently, and as I believe, successfully executed my trust under the law as it now stands as to the employment of child

labor, and no child, not duly certified as within the legal age limit, has been nor now is permitted to work for wages in any Maine factory.

This unfortunate conflict of law should certainly be remedied at the coming session of the legislature. While it works no very serious harm to the children, it is a source of hindrance and more or less annoyance to both school and labor officers in the performance of their respective duties.

While I am in no manner responsible for the enforcement of the school truant law nor any part thereof, I cannot forbear a brief reference to the "child" question, as it presents itself outside my own official domain. We have had a compulsory school law in Maine since 1887, which has been repeatedly strengthened, until today it would be no easy task to formulate a more stringent measure than that now on the statute books. I have been interested to know what results have been achieved by the enforcement of this series of truant laws, especially for the last ten years. There are five hundred truant officers and three times that number of school officers in this State, whose sworn duty it is to wield this legal bludgeon, which, if rightly handled, ought ere this to have reduced our army of unschooled children to the minimum. What is the result? Perhaps a few unvarnished facts may throw a glimmer of light upon the matter. The following statement of comparison between 1891 and 1901 is short but full of meat:

Whole number of children of school age, 1891.....	210,997
Whole number of children of school age, 1901.....	211,864
Increase	867
Whole number of children attending school, 1891....	141,433
Whole number of children attending school, 1901....	132,862
Decrease	8,571
Whole number of children not in school, 1891.....	69,564
Whole number of children not in school, 1901.....	79,002
Increase	9,438

These figures tell their own pathetic story. Ten years ago with a mild compulsory school law we had 69,564 children out

of school; last year, ten years later, with a stringent truant law, we find 79,002 children outside the schoolhouse, a gain of 9,438, while the gain in number of scholars was but 867.

As factory inspector, I beg to report that of these 79,002 children out of school last year, barely 946 were in factories, and all with sworn certificates showing their legal right to be there. Let the truant law experts answer for the other 78,056.

SANITARY IMPROVEMENTS.

The sanitary conditions which obtain in the factories and workshops of this State show a marked improvement over the status of things ten years ago when sanitary inspection was inaugurated. The present is an age of sanitary reform. Methods of living and working which existed without a word of protest back in the sixties, or even in the eighties, would not be tolerated today. It is a gratifying fact that throughout the State, wherever I find a cotton or woolen mill, and there are many such, or other manufactory or workshop of any considerable dimensions, I find, almost without exception, good sanitary conditions existing—modern plumbing, good sewerage, cleanliness and a due regard for the convenience and healthful well-being of employes; especially is this true of all places where female help is employed.

Factory owners and workshop proprietors now take pardonable pride in showing patrons and guests through their buildings and grounds, knowing that they can do their business no injury, but benefit rather, by thus turning the light upon the inner workings and processes by which they turn out vast quantities of finished products for the great markets of the world. Publicity is what the public likes. It inspires confidence and draws men of separate interests into more harmonious and better industrial and business relations.

What is true of mills and workshops in regard to sanitary conditions, extends to the tenement houses and homes of employes, where we find them well housed, well clothed, well fed, and with all the evidences of thrift and comfort. As inspector of factories and workshops, I find very little excuse for the exercise of my official authority on the line of sanitary improvements under the law as it now stands. Right here I

desire to take up two matters which I believe should be added to the sanitary department and placed within the jurisdiction of the factory inspector by specific legal action. I refer to dangerous machinery and dangerous trades.

DANGEROUS MACHINERY AND DANGEROUS TRADES.

While our State laws evidently were not intended especially to cover dangerous machinery and dangerous trades, more particularly the latter, both clearly should be placed in the sanitary column, for both have much to do directly with the lives, health and personal safety of the vast army of men, women and children engaged in the great variety of industrial pursuits in the State. There is certainly a wide margin here for improvement, which can only be successfully accomplished under special laws enacted by the legislature. What I mean is safeguards against dangerous machinery and dangerous trades. With reference to dangerous machinery, I am able to report that much has been done to protect those who handle dangerous machines in mills and workshops, but there is still a wide margin for improvement. In a series of immense mill structures, filled with shafting, pulleys and belts, gear wheels, cogs and cylinders, shuttles, saws, planers, jointers and other machinery, all belted on to the "big wheel" in the basement, absolute safety cannot be assured, but the best possible methods of protection against accidents should be insisted upon.

Now a word about dangerous trades. At the fourteenth annual convention of the International Association of Factory Inspectors of America, held in Indianapolis, Mr. W. E. Walling of Chicago read a paper entitled "The Dangerous Trades," which opens up a hitherto neglected subject of great importance, and one which the legislators of our progressive State will do well to think about and act upon. Addressing the convention, Mr. Walling said in part:

"Our American legislatures seem almost to have ignored a branch of factory legislation considered elsewhere to be of the utmost importance. While most of the countries of Europe, especially England, have considered the special regulations of dangerous trades as a necessity of modern industry, in only one case have the American states enacted special laws on the subject. This is the law with reference to emery wheels, that has been adopted by seven of our states.

"The expression, 'dangerous trades,' is used in a somewhat technical sense. It does not, of course, include all trades that are dangerous, but has been especially applied to those trades in which some form of poison or disease is incidental to the trade itself as at present carried on. It is not generally used with reference to those trades in which sudden injury and death are caused by dangerous machinery or unguarded perils, but rather refers to those slower acting causes which, while not so sensational in their horrors, are even more frightful in their results. On the other hand, the term is not applied to those dangers of poor sanitation and poor ventilation that are incidental to all trades.

"In England, we have had, so far, our greatest industrial competitor, and her methods are most similar to our own. In that country this question of the dangerous trades has for the last ten years claimed a very large share of public attention. It has been foremost in the unions, has filled columns of the press day after day for years, has been the subject of two parliamentary acts and two exhaustive parliamentary reports."

Mr. Walling gave a classified list of over fifty trades considered dangerous by reason of fumes or dust of poison in some form, which, when inhaled, are sure to be followed by fatal results.

Of trades in which lead is a poisonous element, he named the manufacture of white lead, the use of lead in print or dye works, the manufacture of red, orange or yellow lead, enameling and tinning hollow metal ware and cooking utensils; of trades which produce other chemical poisons, the manufacture of paint or color, the manufacture of matches, the manufacture of bronzing powders, and dyeing with certain dyes; of trades in which lockjaw occurs, wool sorting, handling of hides and skins, tanning, and warp dressing; of trades in which there is danger from dust, file cutting, flour milling, and trades where grinders or emery wheels are used. I have here given only those trades which are more or less largely followed in this State.

Mr. Walling gave a list of thirteen occupations, in which there is unmistakable evidence of poisoning by lead. In lead poisoning, direct disease is caused by inhaling particles of lead and is called plumbism. One of its early symptoms is a blue gum, followed by a loosening and dropping out of the teeth. There often follow blindness, paralysis and death in convulsions. Miscarriages become the rule with married women. The rate of mortality among those afflicted with lead poisoning is more than three times as great as among those free from that disease.

The use of nitric acid for cleansing, etc., gives rise to poisonous fumes which may cause instant death. The same thing is true of the manufacture of bleaching powder and numerous other chemical processes. Workers in chemical industries have a rate of mortality fifty per cent greater than those in the other trades.

In paint, dye and wall paper works, wherever arsenic is used, the danger of poisoning is very great.

The symptoms of lockjaw are well known, but it is not so well known that large classes of wools, furs, hides and skins are thoroughly infected with the lockjaw germ. The least scratch then becomes sufficient to cause serious illness and even death.

The inhalation or breathing in of dust is looked upon by many as an insignificant matter. The cleanest dust is not healthy for the throat and lungs, while the dust of some of the trades is loaded with disease germs, too often producing fatal results. Asbestos dust, used for scouring, is one of the most deadly, except that which rises from the emery wheel.

Those processes that require sudden change from very high temperature to a much lower one, like those in the iron and brass foundries, are fruitful sources of many diseases.

Numerous processes in cotton, woolen, flax, silk and warp mills require artificial heat and moisture. This brings about and nourishes a long line of diseases, not very striking at first, but they are perhaps the cause of more human misery than many of the shocking mill accidents of which we occasionally read.

Mr. Walling stated that remedies to cover these dangerous trades have been provided by the English parliament, which in many cases have proved effective. Its rules for the prevention of the rising of fumes or dust are quite elaborate. Cleanliness of person and clothing is deemed most important. Frequent bathing and change of garments are required. In many of the trades children and females are not permitted to labor, and in some of the more dangerous trades no person can be employed more than five hours in any day. The New York law forbidding the employment of women and young persons in work with emery wheels is the only labor law in the United States which follows the English precedent, and as such is a novelty in our factory legislation. It is rather extraordinary that in this regard we should be playing second to England, since we claim to

believe in the education and protection of children more strongly than any other nation in the world.

The point for Maine to consider is that, while in an indirect and pointless way the danger side has been touched upon by our factory laws, dangerous machines and dangerous trades have not been made the subject of the necessary special legislation. While we are clamorous in our denial of child labor of any kind below a certain age, we oppose no barrier to their admission to any of the dangerous callings, where they are absolutely without protection from lurking poison fumes or unhealthy conditions which may wreck their bodily health and send them to premature graves, if only they can produce the certificate that they have passed the legal age limit. Then let us guard against the dangers which beset the wage-earners, young and old, by the enactment of well considered laws for their protection against bodily harm from dangerous machinery and dangerous trades.

FORTNIGHTLY PAYMENTS.

Our Maine legislators never did a wiser or better thing for the benefit of our army of seventy-five thousand wage-earners, as well as for the thrift and stability of our more than eight thousand manufacturing and mechanical industries, than when they placed on the statute books the law requiring the fortnightly payment of wages. Its effects were immediate, continuous and most beneficial. It keeps the laborer supplied with ready money for the purchase of necessary family supplies at lowest market prices, enabling him to buy more economically from a cash pocket book than from a ruinous credit pass book, and gives him a golden opportunity to own the house he lives in, instead of being compelled to cut his wage money in two to satisfy a monthly or quarterly rent bill.

The results of this legislation, more or less direct, are marked and gratifying. The wage-earners of this State are not outranked by those of any other state in the matter of good homes, good morals, habits of industry and a high order of intelligence. A spirit of contentment, the key note of industrial success, is widespread among us, and the strike curse, such as in many states wrecks the homes and business interests of whole communities of people, is practically unknown here.

When we consider the vast number of different corporations and firms employing labor, it is quite remarkable to note the readiness with which the great majority, including most of the larger operators in the State, have fallen in with the two weeks' payment plan without friction. The minority which seems disposed to disregard the law is not large nor very difficult to deal with. During the past year two or three of the operators complained of have threatened defiance of the State law requiring them to pay their help bi-monthly, but after reflection have decided that, discretion being the better part of valor, they would yield gracefully, and have joined the procession of fortnightly paymasters. During my six years incumbency of the office of inspector, only one case has presented itself that called for the aid of the courts. In that the parties prosecuted paid a fine and thereafter paid their help promptly as the law requires.

The following named states have enacted laws for the payment of wages, weekly, fortnightly or monthly:

Weekly—Massachusetts, New Hampshire, New York and Wisconsin.

Fortnightly—Maine, Ohio and West Virginia. Pennsylvania and Indiana pay miners every two weeks.

Monthly—Connecticut and Missouri. Pennsylvania and Indiana pay employes of general corporations every four weeks.

DOORS OF EGRESS.

The question of having all factory and workshop doors open outward practically settled itself long ago, as no mill corporation or workshop builder in Maine is today so thoughtless or unwise as to allow the hanging of an inward swinging door. Indeed, the rule is quite generally observed in the erection of all public buildings throughout the State, including school houses, churches and halls, especially.

FIRE PROTECTION AND FIRE ESCAPES.

The requirements of the law as to the means of escape from factories and workshops in cases of fire are quite generally complied with, and the factory and shop owners of the State go a step further than the law specifies. They provide for the prevention of fires, many of them in a very practical and effective

manner. The operatives in all of the larger and many of the smaller cotton and woolen mills of Maine are organized fire departments within themselves, and the facilities there possessed for flooding a particular room, or the entire mill, with water, and thus absolutely to drown out a fire, is simply marvelous. As a matter of fact it has scarcely been found necessary to use fire escapes on the mills of this State within the recollection of the oldest mill employe. However, the means of escape are none the less in evidence on that account.

It will thus be seen that within my jurisdiction the law is more than well complied with. But what of the thousands of hotels and boarding houses and great department stores outside? So far as fire escapes and protection against fire go, they are, in a large measure, helpless and hopeless, first, because it is made the special business of nobody to enforce the law, and, second, because the law itself is neither explicit nor personal enough to cover the situation in a practical and effective manner. The great hotels at our many summer resorts are rendered especially helpless and dangerous for these reasons. Thus far, fortunately, no great fire has occurred involving the destruction of human life, but this fact does not lessen the danger.

The conditions outlined are not new but have existed for years, and have been repeatedly brought to the attention of our State legislators in my annual reports. Are they waiting for a genuine holocaust, which may mean a whole burnt offering of a hundred human lives, to inspire them to action? Such a calamity might occur when no proper safeguard had been neglected, but if today the flames should burst forth with deadly effect, when some simple device for protection used in the right place at the right time might prevent them or rob them of their horrors, will not responsibility of a weighty brand rest somewhere upon somebody for neglect well nigh criminal? Foresight is better than hindsight.

CHILD LABOR.

This plant is a perennial, not peculiar to Maine alone, but its fame is nation-wide. The satisfactory adjustment of the question of when, where and how children shall become wage-earners is, undoubtedly, the most important and, at the same time, the most perplexing problem raised by our existing State labor laws.

During my incumbency of the office of inspector of factories, I have constantly striven to execute my full duty under this phase of the labor law, as under every other phase, faithfully and without favor, realizing that large interests are involved, in which are included not only the children, but their parents, their employers and the State.

From year to year, as my reports are evidence, full discussion of this matter has been given, with recommendations of such legal enactments as seemed necessary to broaden and strengthen the existing law, with a view to making it a more efficient aid in dealing with, not only the child labor feature, but every other labor feature as well. To date, however, the statutes remain substantially as originally enacted, and until some legislative Moses appears, some labor law reformer, with wisdom and the courage of his convictions, equal to the enlargement, improvement and re-enactment of our present code of crude labor laws, any extended reference to the question of child labor, and the whole line of kindred questions, would seem very much like threshing over old straw. And yet, I do not propose to "cease firing" so long as these enemies are in sight. The weak point in our law regulating child labor, and one which should be remedied, is in the matter of certification, especially as to the child's age. The language used by me touching this matter, in my report made in 1898, so fittingly voices the situation to-day that I cannot do better than to reprint it here:

"While, as a rule, it has been found that mill agents and overseers are disposed, apparently, to respect the law in good faith, when parents present their offspring with duly accredited credentials, they are hired without much discrimination, the officials claiming that the certificates being in due form they cannot 'go behind the returns.' Notwithstanding these facts, the inspector has felt warranted, in several instances where appearances indicated that incorrect certificates of age had been filed, in ignoring the papers and sending such children out of the mills. Right here is seen the need of a more stringent system of certification. When parents, through cupidity or anxiety to secure places for their children, do not hesitate to falsify their records, it clearly becomes the duty of the State to take prompt measures to check a practice so misleading and vicious. If the factory inspector of the future is to worthily magnify his office in this regard he must be given a child labor law which cannot be so easily manipulated by interested parties. Perhaps I cannot more intelligibly present my views touching the present child labor law than by the follow-

ing amendment to 'An act to regulate the hours of labor and the employment of women and children,' which amendment I propose and respectfully recommend.

"That section 8 of said act 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 certified 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. In this matter of certification the child's age is the vital question. 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, the State has no remedy, unless indeed it can succeed in finding a record of the child's birth, when it may prosecute the parent. 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 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 cavillers. Without it, illegally employed child labor will continue, as in the past, to snap its fingers in the face of the factory inspector and the child labor law. If cases occur where no record of the child's birth can be found, an affidavit of two disinterested persons, acquainted with the parties might be accepted."

CHILDREN EMPLOYED.

The following schedule shows the number of children employed in cotton and woolen mills in 1902, compared with the number employed in 1901. A marked decrease will be noted in the number of children under 15 years now at work in our Maine factories.

It must be remembered that the number of children employed in factories varies considerably according to the seasons of year, as during school vacation time, especially the long summer vacation, the number of children at work is very much larger than at other times, so that an average for the year would not fairly show the number employed regularly. The accompanying table shows very nearly the number of children steadily employed, without taking into account the ups and downs caused by temporary help,

which may be employed at different times and only for a few weeks in a year, altogether.

NAME OF CORPORATION.	Location.	CHILDREN EMPLOYED.					
		1901.			1902.		
		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	49	38	11	24	17	7
Bates Manufacturing Company	Lewiston	45	34	11	21	12	9
Continental Mills	Lewiston	37	30	7	17	12	5
Hill Manufacturing Company	Lewiston	23	19	4	20	18	2
Barker Mills	Auburn	6	6	-	5	5	-
Cabot Manufacturing Company	Brunswick	94	77	17	86	68	18
Lockwood Company	Waterville	97	82	15	83	44	39
Edwards Manufacturing Company	Augusta	44	37	7	23	14	9
Farwell Mills	Lisbon	35	26	9	31	21	10
Pepperell Manf. Co., Laconia Division	Biddeford	136	101	35	77	56	21
Pepperell Manf. Co., Pepperell Division	Biddeford	76	69	7	71	57	14
York Manufacturing Company	Saco	47	37	10	43	32	11
Goodall Worsted Company	Sanford	120	86	34	83	62	21
Sanford Mills	Sanford	86	54	32	86	37	49
Maine Alpaca Company	Springvale	37	20	17	42	26	16
Old Town Woolen Company	Old Town	-	-	-	-	-	-
Worumbo Manufacturing Company	Lisbon Falls	14	9	5	7	4	3
Totals		946	725	221	719	485	234

CHILD LABOR IN OTHER STATES.

Massachusetts stands, undoubtedly, at the head of the states in the matter of labor reform legislation, especially as touching the question of child labor. Hon. Rufus S. Wade of that state, president of the International Association of Factory Inspectors, says:

"Perhaps no more important legislation for the protection of children has been made than is contained in the law enacted by the legislature of Massachusetts at its last session. It provides that no child under fourteen years of age shall be employed in any factory, workshop, or mercantile establishment. No such child shall be employed in any work performed for wages or other compensation, to whomsoever payable, during the hours when the public schools of the town or city in which he resides are in session, nor be employed at any work before the hour of six o'clock in the morning, or after the hour of seven o'clock in the evening. No child under sixteen years of age shall be employed in any factory, workshop, or mercantile establishment, unless the person or corporation employing him procures and keeps on file and accessible to the school attendance officers of the

town or city, and to the district police, and inspectors of factories, an age and schooling certificate as hereinafter prescribed, and keeps two complete lists of all such children employed therein, one on file, and one conspicuously posted near the principal entrance of the building in which such children are employed, and also keeps on file a complete list, and sends to the superintendent of schools, or where there is no superintendent, to the school committee, the names of all minors therein who cannot read at sight and write legibly simple sentences in the English language.

"It is said that Cardinal Manning, in an earnest plea for raising the minimum age for employment of children in England, under the new factory act, from ten to twelve years, made this statement: 'That nations take rank in civilization according as they legislate for women and children.' Such legislation is an advance that never will be lost or abandoned. The effect upon coming generations it would be impossible to exaggerate. Consider, you that are familiar with the former conditions of things, what it means to thousands of our children. While it is true that much of the work required of children in our factories and workshops is not of a severely exacting nature, yet it must be maintained that the practice of subjecting young children to a daily round of labor, for which they receive a mere pittance in the form of wages, is a wrong alike to the State, and wholly antagonistic to the enlightened and liberal sentiment of the age."

Chief Inspector D. H. McAbee of Indiana says:

"Child labor in the State of Indiana is a thing of the past so far as factories are concerned. When the law went into effect in May, 1897, there were from eight to twelve hundred boys under fourteen years of age working in the glass factories of our State. On receiving the appointment of inspector, I said to the glass men, 'As you have only two months more of this fire, and as we would be unable to get the boys in school this term, we will not be very strict with you until you start up in September, and then we will expect you to comply with the law.' They accepted this as being just, and in consequence we have very little trouble with them. With the factory law enforced and the compulsory educational law adhered to, the illiteracy existing in our state will only be maintained by the incoming of those who have not been permitted to enjoy the unequaled school privileges which are enjoyed by all the children of Hoosierdom. The scope of our law is rather limited; as it is it only applies to factories where ten or more are employed, leaving out the mercantile establishments where the cash boys or girls are confined from ten to sixteen hours per day, nor does the fire-escape feature apply only to factories. By noticing the accidents reported in the daily press, I am led to believe that there are more accidents in the factories where less than ten people are employed than there are in the

larger factories where many are at work. My observation has been the smaller the shop the greater the negligence, and more risks are taken."

Hon. A. J. Harris, assistant chief of the Illinois labor department, gives the following report of child labor reform in that state:

"It is, indeed, very gratifying to state that 'child labor' under the legal age (14 years) has been stamped out in our State, with an earnest desire and an honest and conscientious enforcement of the law. The inspector of factories and workshops has so applied and enforced the law that when, in 1899, of 15,575 places inspected, with a total number of children under sixteen years of age, 10,819 were employed, only thirty-eight children were found who were employed under fourteen years of age, and they were discharged just as fast as the inspectors located them. A large state like ours, with the immense industries, compels the employer and the manufacturer to employ child labor, such as our big glass factories, our immense stock yards and large department stores, which child labor cannot be dispensed with. It is also very gratifying to say that employers of these large establishments, employing a great amount of child labor, have willingly and earnestly lent and given their assistance to the inspector of factories and workshops in the enforcement and compliance of the law, and under no consideration would they knowingly employ children under the legal age or for longer hours than the law allows, ten hours.

"With their assistance, and with the assistance of an earnest, conscientious staff of deputy inspectors, the inspector of factories and workshops can truthfully say that the employment of child labor under fourteen years of age is done away with in our state."

Hon. G. B. Serenbetz, factory inspector in New York, tells what he finds in that state regarding child labor, as follows:

"First and foremost stands the child labor law, which possesses all the attributes which are essential to making good citizens of our children in the future years. In past years, children without any education whatsoever were employed in our mills and workshops; we know, too, that in many cases children were found doing work for which they were physically unfit, and in this manner our future men and women were stunted not only physically, but mentally and morally.

"It became necessary to check this evil and find a remedy to enact a law which would blot out forever from our factories the physical and mental dwarf. Such a law was enacted, and we know that the child, in order to obtain employment certificates, must have the mental knowledge and physical capabilities provided by our laws. Yet, despite the strongest efforts made by

the department, through its inspectors, to prevent the employment of children under sixteen without the proper certificates, the law is frequently violated. In a number of cases which it has been my lot to come in personal contact with, I find that the greatest care has been taken by the manufacturer, superintendent or foreman, not to violate the law in this respect.

"He employs, let us say for example, fifteen or twenty females; certificates are on file and apparently all those without certificates are over sixteen years of age. The inspector will pause to look at some of those supposed to be over sixteen and finds one who acts nervously as though afraid of something. He asks her age, and she admits she is not sixteen. The manufacturer has been imposed upon; the parents or guardian, as often the case, assured the employer that the child is over sixteen years of age.

"Parents are often so base as to actually perjure themselves by taking an oath, as before a notary, that the child in question is over sixteen years of age. The children are taught and told to tell lies as to their ages. In one case, that of an Italian girl, working in a bagging factory, I found she did not understand English; when asked her name, address, how long she had lived there, and so on, she shrugged her shoulders and shook her head; but, when asked 'How old are you?' she quickly answered 'sixteen.' I found a man who could interpret for me and through him found that the child was fourteen years of age. Yet an affidavit made by the father attesting to the fact that his daughter was over sixteen years of age was on file in the factory office."

Hon. John J. Williams of the Wisconsin labor bureau speaks on the same subject as follows:

"One of the greatest difficulties that the inspectors have to contend with is experienced in the enforcement of the law relating to affidavits. Proprietors willing to hire and parents anxious to obtain work for their children are found, who do not hesitate to try to evade the provisions of the law by false affidavits respecting the age of the child, the parents making the affidavit and the proprietor knowingly and willingly receiving it. Several cases of this kind have been prosecuted and convictions secured. In its work along this line the bureau has been greatly assisted by the different labor organizations throughout the state, which are beginning to realize that this is a vital matter, affecting not only the interests of laboring classes but of the whole state.

"Here is the home of the immigrant. Within our borders flock annually thousands, who, tiring of oppression, leave the fatherland and seek liberty and a home within our great and prosperous state. Coming from lands where little if any encouragement is given to the poor to rise above their lowly condition and life one incessant struggle for existence under oppressive taxation laws, it is natural that their first thought and effort should be given to obtaining work, as the majority of them are very

poor, possessing barely sufficient means to pay their passage here. Thus many families are found in which the entire number are at work in the factory or elsewhere. The parents, not having had, in most instances, the privilege of attending school and obtaining a good education themselves, give little or no thought to the educational welfare and advancement of their children, actuated seemingly by the thought that the child should not be better educated than the parent."

BRIEF SYNOPSIS OF CHILD LABOR LAWS OF OTHER STATES.

California.

Employment of minor children for more than 8 hours a day is absolutely prohibited except in vineyards and household occupations.

Connecticut.

No person under 16 can have the care and operation of any elevator.

Illinois.

Children under 14 cannot be employed in any factory or workshop, and all minors must produce sworn statements as to age.

Indiana.

The employment of persons under 14 for more than 8 hours a day is absolutely prohibited.

Massachusetts.

Children under 14 years of age cannot be employed in any factory, workshop or merchantile establishment, neither can they clean machinery. They cannot be employed at all unless they have attended school 30 weeks the year preceding. No child under 18 shall operate an elevator, and children under 15 are prohibited from appearing in a circus or theatrical show. Minors under 18 and all women are not allowed to work more than 58 hours in a week, nor more than 10 hours in any one day. No minor or woman can be employed in any manufactory between 10 P. M. and 6 A. M. A legal day's work for both sexes, employed by the State, is 9 hours.

Michigan.

Children under 14 cannot be employed in any factory or workshop. Sworn statements as to age must be furnished employers. Female minors, and male minors under 18, must not clean machinery while in motion. Males under 18, and females under 21 cannot work more than 10 hours in any one day, nor more than 60 hours a week.

Minnesota.

The law forbids any parent or guardian to let or hire any minor under 12, nor must any person wilfully permit any child under 14 to work at an employment injurious to health, dangerous to life or limb or likely to deprave its morals. No child is permitted, nor must any woman be compelled to work more than 10 hours a day, or to work earlier than 7 A. M. nor later than 6 P. M.

Missouri.

No minor shall be required to clean machinery while in motion.

New Jersey.

Boys under 12 and girls under 14 are prohibited from working in any manufacturing establishment, and no minor shall clean machinery in motion. Hours of labor for minors of both sexes limited to 55 per week.

New York.

No child under 14 can be employed in any factory or workshop, and children between 14 and 16 are required to be able to read and write in English. No minor under 15 can have charge of an elevator, and none under 18 shall operate an elevator running more than 200 feet a minute, nor allowed to clean machinery while in motion. No minor under 18 nor woman under 21 is allowed to work more than 10 hours in any one day, nor to commence working before 6 A. M., nor be employed after 9 P. M.

Ohio.

Children may be employed in manufacturing establishments at 14, and children more than 12 may be employed at non-dangerous work when not required to be in school. The school law

requires all children under 14 and over 8 to attend school during the whole school term. No minor under 18 shall be employed more than 10 hours a day. Notices containing the law must be posted in every room where minors are employed.

Pennsylvania.

Children under 13 cannot be employed in any manufacturing or mercantile establishment, and a sworn statement is required of the child's age from parents or guardians. No boy under 14 is allowed to run an elevator, and no minor under 16 is allowed to clean machinery in motion. Minors must not be employed more than 12 hours in any one day, nor in any one week more than 60 hours.

Rhode Island.

No child under 12 can be employed in any manufacturing or mercantile establishment. Employers must keep a register of all minors under 16, they not being allowed to clean machinery while in motion. Hours of labor for women and minors are limited to 60 per week.

Wisconsin.

In all manufactories, workshops or other places used for mechanical or manufacturing purposes, the time of labor of children under the age of 18, and of women employed therein, shall not exceed 8 hours in the day.

Province of Ontario.

No child under 14 can be employed in any factory, except in canning fruit and vegetables, and no child under 14, and no girl or woman can be employed more than 10 hours a day, except in canning shops. In these, females under 18 may be employed 36 nights in 12 months until 9 o'clock P. M., and women over 18 may be required to labor "until the work is finished," 20 nights in 12 months.

Province of Quebec.

No boy under 12 and no girl under 14 can be employed in any factory, workshop, work-yard or mill of any kind. In establishments classified as "dangerous, unwholesome or inconvenient,"

boys must not be under 16 and girls not under 18. No boy under 18, and no girl or woman shall be employed more than 10 hours a day, and shall not begin before 6 o'clock in the morning, nor end after 9 at night.

In all of the above mentioned states, with the exception of California, Indiana and Wisconsin, safeguards are required for shafting, belting and all movable machinery, elevator ways, tanks, pans, wheel races, well holes, water channels, bridges, etc., to the satisfaction of the inspector.

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