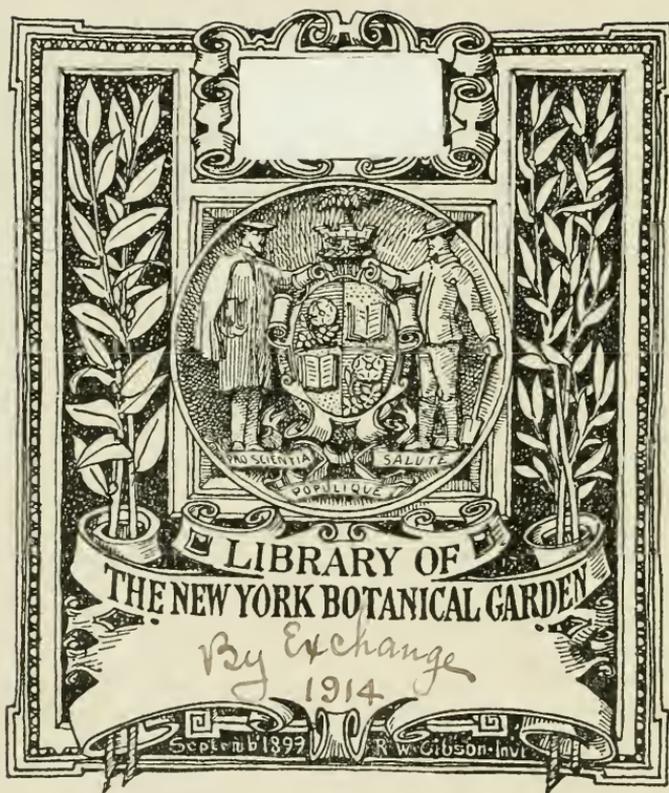


REPORT  
OF  
FOREST COMMISSIONER, MAINE 1912  
WITH A  
REPORT ON THE WOOD USING INDUSTRIES OF MAINE  
BY  
J. C. NELLIS  
UNITED STATES FOREST SERVICE



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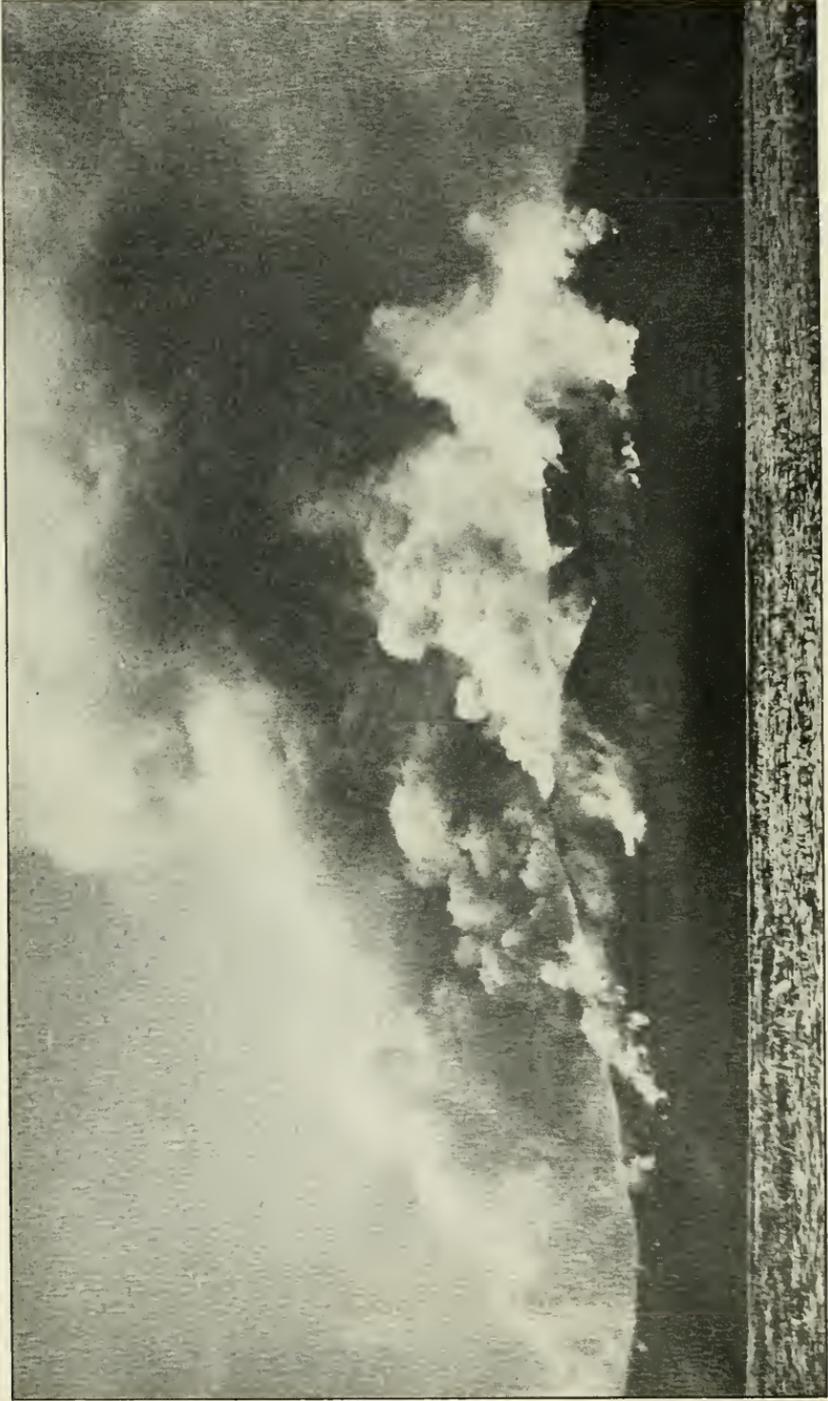












Fire on Lobster Mountain Summer of 1911

Compliments of

FRANK E. MACE.



# State of Maine

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Frank E. Mace, Forest Commissioner

In Cooperation With the Forest Service

U. S. Department of Agriculture

Henry S. Graves, Forester.

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## WOOD-USING INDUSTRIES OF MAINE

By J. C. NELLIS, Forest Assistant

1912



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1912

STATE OF MAINE.

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*To His Excellency, Frederick W. Plaisted, Governor of Maine:*

I herewith submit my first report as Forest Commissioner for the years 1911 and 1912.

FRANK E. MACE

*Forest Commissioner.*

FORESTRY DEPARTMENT.

---

*Forest Commissioner*, FRANK E. MACE, Great Pond.

*Deputy Forest Commissioner*, CHARLES W. CURTIS, Brewer.

*Clerk*, GLADYS D. MATHES, Augusta.

25  
MAY  
1911

## REPORT OF THE FOREST COMMISSIONER.

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In presenting this the ninth report of the Forest Commissioner of Maine, I do so realizing the importance of the office to the forestry interests of the state and that much of the future prosperity is bound up in the richly wooded areas of the several counties.

Accepting the office of Forest Commissioner in the spring of 1911 I took up the work and have endeavored to carry it on in a manner to uplift and forward the greatest of Maine's resources.

Coupled with the duties of Forest Commissioner is that of Land Agent of the state, having the custody of the only remaining township in the state's name, Indian Township in Washington County, together with upwards of 90,000 acres of public or school lands held in trust by the state for such townships as have plantation organizations, or have at some time been organized and later given up their organization for some reason or other.

I have given considerable time to the subject of permitting these lands and in all cases endeavored to place the permits in the hands of men whom I trusted would cut the lands to the best advantage, taking into consideration the future growth. Some twenty permits were given for the lumbering season of 1911-12, from which was realized about \$23,000. Not as many permits have been given for the coming season, but there will be some cutting on state lots.

As a result of a study into the state's right in the timber and grass in certain school or reserved lands I have found some 3000 acres in which the state has a claim. In the old deeds of the timber and grass there is a provision that the right to cut and carry away said timber and grass shall continue until the said township or tract shall be incorporated, or organized for plantation purposes, and no longer. In some instances I found that where the townships were organized and after a short period had given up their organization, assuming again the status of an unorganized township, that the land of the reserved lots had not been taken over by the state.

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One of the townships A. Range 1, Oxford County, was organized as Riley Plantation in 1879, but there is no record to show that the land agent at that time assumed control of the public lots and the township lost the benefit of the growth on 960 acres of reserved land.

The situation in what is known as Jerusalem in Franklin County is similar, that township having been organized into a plantation in 1881 and the state should have had the benefit of the 960 acres of reserved land from that date until the present.

In township No. 5 Range 20, Somerset County, the timber and grass rights in the reserved lands of 1000 acres were never sold and consequently the state has an interest in that township in the proportion of 1,000-20,960 of all stumpage cut.

One township, No. 3 Range 1, North of Bingham's Kennebec Purchase in Somerset County was organized in 1912 as Long Pond Plantation and the state thus came into control of 950 acres of reserved lands in that township. The land has, however, been hard cut and it will be some years before there will be any income from stumpage.

Under acts of incorporation by the Legislature of 1911, three plantations, Eagle Lake, Merrill and Stockholm, all in Aroostook County, became towns on the first day of July 1911 and the public lots in the three plantations became the absolute property of the said new towns. All money in the state treasury to the credit of the above towns, which had been collected from stumpage in years back is available to be paid over to the town treasurer and become a permanent school fund.

Cases of trespass during the two years were few, but those reported were looked into and the parties committing the trespass made to settle. There are still upon some of the public lots in plantations, squatters who have been on the same for years, having cleared farms and erected buildings. While these cannot obtain a "squatters claim" against the state, it has been the policy of the state not to work any great hardship upon these people and nearly every legislature has provided by special resolves some way by which such residents could obtain absolute control of these lands by the payment of a reasonable sum per acre for the land. Money thus received has been placed to the credit of the school fund of the plantation in which such cases existed.

Maine has benefited under the provisions of the Weeks' law passed by congress in March 1911. As soon as the bill was passed steps were immediately taken looking towards this state getting its share of the fund to be expended by coöperation between the Federal and state governments. The conditions under which any state could get a portion of the \$200,000, made available by the passage of the act, was that there should be a well organized forestry system for the protection of fires, with a specific appropriation therefor.

Maine already had the organization and there was no delay in that line. The maximum amount fixed by the Federal government that any state could get was \$10,000 for each fiscal year, and that on condition that a like sum was expended by the state applying for coöperation. With the tax of the Maine Forestry District amounting to nearly \$68,000 there was no barrier for Maine and the full allotment of \$10,000 for each of the years 1911-12 was made for the state. Practically all of the allotment was spent in 1911, but owing to a decision of the Federal department against allowing for as much patrolling as was asked for, there was a substantial balance of the 1912 allotment. More about this service will be found in another chapter.

As the \$200,000 fund is being diminished and no more for the same purpose was appropriated by congress during the past session, it is very doubtful if any state gets more than \$7,500 in 1913. The Federal government also proposes to limit its expenditure wholly to the lookout stations and none for patrolling. It is suggested that more lookout stations be established in Maine.

Another proposition in the way of coöperation by the Federal government was submitted to Maine in 1911, that of making a study of the wood using industries of the state. An agreement was finally entered into, providing that upon the payment of the sum of \$350 by the state, the Federal government would perform the work and pay all expense above the \$350. A study with the object of getting data upon the following subjects was decided upon: Products manufactured; properties of wood desired for use employed; efforts to utilize waste material; kinds of wood desired at factory; form and dimensions in which purchased; specific uses of each kind; quantity used annually; prices delivered at factory; and sources of each kind. The result of the study is given on other pages of this report.

## LAW CREATING MAINE FORESTRY DISTRICT.

The following law creating the Maine Forestry District was passed by the Legislature of 1909:

Section 1. An administrative district shall be and is hereby established and incorporated, to be known as the Maine Forestry District, and to include the following territory:

Township A, R. 2, W. E. L. S.; Hammond Plantation; C. R. 2, W. E. L. S.; D, R. 2, W. E. L. S.; E. Plantation; 3, R. 2, W. E. L. S.; Cox Patent; Glenwood Plantation; 3, R. 3, W. E. L. S.; 4, R. 3, W. E. L. S.; 7, R. 3, W. E. L. S.; 8, R. 3, W. E. L. S.; 9, R. 3, W. E. L. S.; 10, R. 3, W. E. L. S.; Stockholm Plantation; 17, R. 3, W. E. L. S.; 1, R. 4, W. E. L. S.; 2, R. 4, W. E. L. S.; 3, R. 4, W. E. L. S.; 7, R. 4, W. E. L. S.; 8, R. 4, W. E. L. S.; 9, R. 4, W. E. L. S.; 10, R. 4, W. E. L. S.; 11, R. 4, W. E. L. S.; Westmanland Plantation; 16, R. 4, W. E. L. S.; 17, R. 4, W. E. L. S.; A, R. 5, W. E. L. S.; 1, R. 5, W. E. L. S.; 7, R. 5, W. E. L. S.; 8, R. 5, W. E. L. S.; 9, R. 5, W. E. L. S.; 13, R. 5, W. E. L. S.; 14, R. 5, W. E. L. S.; 15, R. 5, W. E. L. S.; 16, R. 5, W. E. L. S.; 17, R. 5, W. E. L. S.; Oxbow Plantation; 10, R. 6, W. E. L. S.; Garfield Plantation; Nashville Plantation; 14, R. 6, W. E. L. S.; 15, R. 6, W. E. L. S.; 16, R. 6, W. E. L. S.; 9, R. 7, W. E. L. S.; 10, R. 7, W. E. L. S.; 11, R. 7, W. E. L. S.; 12, R. 7, W. E. L. S.; 13, R. 7, W. E. L. S.; 14, R. 7, W. E. L. S.; Winterville Plantation; 9, R. 8, W. E. L. S.; 10, R. 8, W. E. L. S.; 11, R. 8, W. E. L. S.; 12, R. 8, W. E. L. S.; 13, R. 8, W. E. L. S.; 14, R. 8, W. E. L. S.; 15, R. 8, W. E. L. S.; 16, R. 8, W. E. L. S.; 11, R. 9, W. E. L. S.; 12, R. 9, W. E. L. S.; 13, R. 9, W. E. L. S.; 14, R. 9, W. E. L. S.; 15, R. 9, W. E. L. S.; 16, R. 9, W. E. L. S.; 11, R. 10, W. E. L. S.; 12, R. 10, W. E. L. S.; 13, R. 10, W. E. L. S.; 14, R. 10, W. E. L. S.; 15, R. 10, W. E. L. S.; Allagash Plantation; 18, R. 10, W. E. L. S.; 11, R. 11, W. E. L. S.; 12, R. 11, W. E. L. S.; 13, R. 11, W. E. L. S.; 14, R. 11, W. E. L. S.; 15, R. 11, W. E. L. S.; 18, R. 11, W. E. L. S.; 19, R. 11, W. E. L. S.; 11, R. 12, W. E. L. S.; 12, R. 12, W. E. L. S.; 13, R. 12, W. E. L. S.; 14, R. 12, W. E. L. S.; 15, R. 12, W. E. L. S.; 16, R. 12, W. E. L. S.; 17, R. 12, W. E. L. S.; 18, R. 12, W. E. L. S.; 19, R. 12, W. E. L. S.; 20, R. 11 & 12, W. E. L. S.; 11, R. 13, W. E. L. S.; 12, R. 13, W. E. L. S.; 13, R. 13, W. E. L. S.; 14, R. 13, W. E. L. S.; 15, R. 13, W. E. L. S.; 16, R. 13, W. E. L. S.; 17, R. 13, W. E. L. S.; 18, R. 13, W. E. L. S.; 11, R. 14, W. E. L. S.; 12, R. 14, W. E. L. S.; 13, R. 14, W. E. L. S.; 14, R. 14, W. E. L. S.; 15, R. 14, W. E. L. S.; 16, R. 14, W. E. L. S.; 17, R. 14,

W. E. L. S.; 11, R. 15, W. E. L. S.; 12, R. 15, W. E. L. S.; 13, R. 15, W. E. L. S.; 14, R. 15, W. E. L. S.; 15, R. 15, W. E. L. S.; 11, R. 16, W. E. L. S.; 12, R. 16, W. E. L. S.; 13, R. 16, W. E. L. S.; 14, R. 16, W. E. L. S.; 11, R. 17, W. E. L. S.; 12, R. 17, W. E. L. S.; in Aroostook County.

Township No. 4, Washington Plantation; Sandy River Plantation; Rangeley Plantation; 4, R. 1, B. K. P., W. K. R.; 4, R. 2, B. K. P., W. K. R.; 4, R. 3, B. K. P., W. K. R.; D, R. 1; 1, R. 2, W. B. K. P.; Dallas Plantation; Coplin Plantation; Lang Plantation; 3, R. 3, W. B. K. P.; 3, R. 2, B. K. F., W. K. R.; 2, R. 4, W. B. K. P.; 3, R. 4, W. B. K. P.; 1, R. 5, W. B. K. P.; 2, R. 5, W. B. K. P.; 3, R. 5, W. B. K. P.; 1, R. 6, W. B. K. P.; 2, R. 6, W. B. K. P.; 3, R. 6, W. B. K. P.; 1, R. 7, W. B. K. P.; 2, R. 7, W. B. K. P.; 1, R. 8, W. B. K. P.; 2, R. 8, W. B. K. P.; Gore North of T. No. 2 and 3, R. 6, W. B. K. P.; No. 6 North of Weld; Gore North of T. 1, R. 8, W. B. K. P.; Township E; Perkins; in Franklin County.

Township No. 3, North Division; No. 4, North Division; Two Mile Strip North of No. 3, North Division; Strip North of No. 4, North Division; No. 7, South Division; No. 8 Plantation; No. 9, South Division; No. 10, South Division; No. 16, Middle Division; No. 21 Plantation; No. 22, Middle Division; No. 28, Middle Division; No. 32, Middle Division; No. 33 Plantation; No. 34, Middle Division; No. 35, Middle Division; No. 39, Middle Division; No. 40, Middle Division; No. 41, Middle Division; Butter Island; Eagle Island; Spruce Head Island; Bear Island; Beach Island; Hog Island; Bradbury's Island; Pond Island; Western Island; Little Spruce Island; Marshall's Island; Pickering's Island; in Hancock County.

Fryeburg Academy Grant; T. A. No. 1; Andover North Surplus; Andover West Surplus; T. C.; C Surplus; 4, R. 1, W. B. K. P.; Magalloway Plantation; 4, R. 2, W. B. K. P.; Lincoln Plantation; 4, R. 3, W. B. K. P.; 5, R. 3, W. B. K. P.; 4, R. 4, W. B. K. P.; 5, R. 4, W. B. K. P.; 4, R. 5, W. B. K. P.; 4, R. 6, W. B. K. P.; 5, R. 5, W. B. K. P.; Batchelder's Grant; in Oxford County.

Township 3, R. 1, N. B. P. P.; Lakeville Plantation; 5, R. 1, N. B. P. P.; Webster Plantation; Drew Plantation; 1, R. 7, N. W. P.; 2, R. 8, N. W. P.; Seboeis Plantation; 2, R. 9, N. W. P.; 3, R. 9, N. W. P.; 1, R. 6, W. E. L. S.; 2, R. 6, W. E. L. S.; Stacyville Plantation; 6, R. 6, W. E. L. S.; 7, R. 6, W. E. L. S.; 8, R. 6, W. E. L. S.; A. R. 7, W. E. L. S.; 1, R. 7, W. E. L. S.; 2, R. 7, W. E. L. S.; 3, R. 7, W. E. L. S.; 4, R. 7, W. E. L. S.; 5, R. 7, W. E. L. S.; 6, R. 7, W. E. L. S.; 7, R. 7, W. E. L. S.; 8, R. 7, W. E. L. S.; Hopkins Academy Grant; 8, R. 8, W. E. L. S.; A. R. 8 & 9, W. E. L. S.; Veazie Core; No. 3, Indian Purchase; No. 4, Indian Purchase; 1, R. 8, W. E. L. S.; 2, R. 8, W. E. L. S.; 3, R. 8, W. E. L. S.; 4, R. 8, W. E. L. S.; 5, R. 8, W. E. L. S.; 6, R. 8, W. E. L. S.; 7, R. 8, W. E. L. S.; No. 1, North Division; Grand Falls Plantation; in Penobscot County.

Lakeview Plantation; Barnard Plantation; 4, R. 9, N. W. P.; 5, R. 9, N. W. P.; 6, R. 9, N. W. P.; 7, R. 9, N. W. P.; Elliottsville Plantation; 3, R. 5, B. K. P., E. K. R.; 2, R. 6, B. K. P., E. K. R.; 1, R. 9, W. E. L. S.; 2, R. 9, W. E. L. S.; 3, R. 9, W. E. L. S.; 4, R. 9, W. E. L. S.; 5, R. 9, W. E. L. S.; 6, R. 9, W. E. L. S.; 7, R. 9, W. E. L. S.; 8, R. 9, W. E. L. S.; 9, R. 9, W. E. L. S.; 10, R. 9, W. E. L. S.; A, R. 10, W. E. L. S.; B, R. 10, W. E. L. S.; 1, R. 10, W. E. L. S.; 2, R. 10, W. E. L. S.; 3, R. 10, W. E. L. S.; 4, R. 10, W. E. L. S.; 5, R. 10, W. E. L. S.; 6, R. 10, W. E. L. S.; 7, R. 10, W. E. L. S.; 8, R. 10, W. E. L. S.; 9, R. 10, W. E. L. S.; 10, R. 10, W. E. L. S.; A, R. 11, W. E. L. S.; B, R. 11, W. E. L. S.; 1, R. 11, W. E. L. S.; 2, R. 11, W. E. L. S.; 3, R. 11, W. E. L. S.; 4, R. 11, W. E. L. S.; 5, R. 11, W. E. L. S.; 6, R. 11, W. E. L. S.; 7, R. 11, W. E. L. S.; 8, R. 11, W. E. L. S.; 9, R. 11, W. E. L. S.; 10, R. 11, W. E. L. S.; 7, R. 10, N. W. P.; 8, R. 10, N. W. P.; A, R. 12, W. E. L. S.; 1, R. 12, W. E. L. S.; 2, R. 12, W. E. L. S.; 3, R. 12, W. E. L. S.; 4, R. 12, W. E. L. S.; 5, R. 12, W. E. L. S.; 6, R. 12, W. E. L. S.; 7, R. 12, W. E. L. S.; 8, R. 12, W. E. L. S.; 9, R. 12, W. E. L. S.; 10, R. 12, W. E. L. S.; A, R. 13, W. E. L. S.; A, 2, R. 13 & 14, W. E. L. S.; 1, R. 13, W. E. L. S.; 2, R. 13, W. E. L. S.; 3, R. 13, W. E. L. S.; 4, R. 13, W. E. L. S.; 5, R. 13, W. E. L. S.; 6, R. 13, W. E. L. S.; 7, R. 13, W. E. L. S.; 8, R. 13, W. E. L. S.; 9, R. 13, W. E. L. S.; 10, R. 13, W. E. L. S.; A, R. 14, W. E. L. S.; X, R. 14, W. E. L. S.; 3, R. 14 & 15, W. E. L. S.; 4, R. 14, W. E. L. S.; 5, R. 14, W. E. L. S.; 6, R. 14, W. E. L. S.; 7, R. 14, W. E. L. S.; 8, R. 14, W. E. L. S.; 9, R. 14, W. E. L. S.; 10, R. 14, W. E. L. S.; Sugar Island; Deer Island; Middlesex Canal; Day's Academy; 4, R. 15, W. E. L. S.; 5, R. 15, W. E. L. S.; 6, R. 15, W. E. L. S.; 7, R. 15, W. E. L. S.; 8, R. 15, W. E. L. S.; 9, R. 15, W. E. L. S.; 10, R. 15, W. E. L. S.; Moose Island; Kineo; Farm Island; Kingsbury Plantation; in Piscataquis County.

Lexington Plantation; Pleasant Ridge Plantation; Highland Plantation; 1, R. 3, B. K. P., W. K. R.; 2, R. 3, B. K. P., W. K. R.; Dead River Plantation; Bigelow Plantation; 1, R. 4, B. K. P., W. K. R.; 2, R. 4, B. K. P., W. K. R.; 3, R. 4, B. K. P., W. K. R.; Flagstaff Plantation; West Forks Plantation; 2, R. 5, B. K. P., W. K. R.; 3, R. 5, B. K. P., W. K. R.; 4, R. 5, B. K. P., W. K. R.; 1, R. 6, B. K. P., W. K. R.; 2, R. 6, B. K. P., W. K. R.; 3, R. 6, B. K. P., W. K. R.; 4, R. 6, B. K. P., W. K. R.; 5, R. 6, B. K. P., W. K. R.; 1, R. 7, B. K. P., W. K. R.; 2, R. 7, B. K. P., W. K. R.; 3, R. 7, B. K. P., W. K. R.; 4, R. 7, B. K. P., W. K. R.; 5, R. 7, B. K. P., W. K. R.; 6, R. 7, B. K. P., W. K. R.; Gore North of Nos. 1, 2 & 3, R. 7, B. K. P., W. K. R.; Mayfield Plantation; 2, R. 3, B. K. P., E. K. R.; The Forks Plantation; 2, R. 4, B. K. P., E. K. R.; 1, R. 5, B. K. P., E. K. R.; 2, R. 5, B. K. P., E. K. R.; 1, R. 6, B. K. P., E. K. R.; 1, R. 1, N. B. K. P.; 2, R. 1, N. B. K. P.; 3, R. 1, N. B. K. P.; Jackman Plantation; 5, R. 1, N. B. K. P.; 6, R. 1, N. B. K. P.; 1, R. 2, N. B. K. P.; 2, R. 2, N. B. K. P.; 3, R. 2, N. B. K. P.; Moose

River Plantation; Dennistown Plantation; 6, R. 2, N. B. K. P.; Big W, N. B. K. P.; Little W, N. B. K. P.; 1, R. 3, N. B. K. P.; 2, R. 3, N. B. K. P.; 3, R. 3, N. B. K. P.; 4, R. 3, N. B. K. P.; 5, R. 3, N. B. K. P.; Seboomook; 1, R. 4, N. B. K. P.; 2, R. 4, N. B. K. P.; 3, R. 4, N. B. K. P.; 4, R. 4, N. B. K. P.; 5, R. 4, N. B. K. P.; 3, R. 5, N. B. K. P.; 4, R. 5, N. B. K. P.; 4, R. 16, W. E. L. S.; 5, R. 16, W. E. L. S.; 6, R. 16, W. E. L. S.; 7, R. 16, W. E. L. S.; 8, R. 16, W. E. L. S.; 9, R. 16, W. E. L. S.; 10, R. 16, W. E. L. S.; 4, R. 17, W. E. L. S.; 5, R. 17, W. E. L. S.; 6, R. 17, W. E. L. S.; 7, R. 17, W. E. L. S.; 8, R. 17, W. E. L. S.; 9, R. 17, W. E. L. S.; 10, R. 17, W. E. L. S.; 4, R. 18, W. E. L. S.; 5, R. 18, W. E. L. S.; 6, R. 18, W. E. L. S.; 7, R. 18, W. E. L. S.; 8, R. 18, W. E. L. S.; 9, R. 18, W. E. L. S.; 5, R. 19, W. E. L. S.; 6, R. 19, W. E. L. S.; 7, R. 19, W. E. L. S.; 8, R. 19, W. E. L. S.; 5, R. 20, W. E. L. S.; in Somerset County.

Township No. 18, East Division; No. 19, East Division; No. 26, East Division; No. 27, East Division; No. 18, Middle Division; No. 19, Middle Division; No. 24, Middle Division; No. 25, Middle Division; No. 29, Middle Division; No. 30, Middle Division; No. 31, Middle Division; No. 36, Middle Division; No. 37, Middle Division; No. 42 Middle Division; No. 43, Middle Division; No. 5, North Division; Strip North of No. 5, North Division; No. 6, North Division; Strip North of No. 6, North Division; No. 1, R. 1, Titcomb's Survey; Grand Lake Stream Plantation; 1, R. 2, Titcomb's Survey; 1, R. 3, Titcomb's Survey; 6, R. 1, N. B. P. P.; 7, R. 2, N. B. P. P.; 8, R. 3, N. B. P. P.; 10, R. 3, N. B. P. P.; 11, R. 3, N. B. P. P.; 8, R. 4, N. B. P. P.; Indian Township; Codyville Plantation; No. 14 Plantation; No. 21 Plantation; in Washington County.

Sect. 2. An annual tax is hereby assessed upon all the property in said district, including rights in public lots, to be used for the protection thereof. Said tax shall be due and payable at the date of the assessment of the State tax, in the years when the legislature is in session, and for other years it shall be due and payable in one year after the date of such assessment.

The rate of such tax is hereby fixed at one and one-half mills on the dollar. The valuation as determined by the board of State assessors, and set forth in the statement filed by them as provided by the Revised Statutes, chapter eight, section eleven, as amended, shall be the basis for the computation and apportionment of the tax hereby assessed until the next biennial equalization.

The tax hereby assessed shall be valid, and all remedies herein provided shall be in full force if said property is described with reasonable accuracy, whether the ownership thereof is correctly stated or not.

Sect. 3. The board of State assessors shall within thirty days after such tax is due, prepare and file with the treasurer of the State, a certificate setting forth the description of each lot, parcel or right subject to the tax hereby assessed, together with the tax computed at the rate hereby established.

Sect. 4. The treasurer of the State shall cause lists of the assessments made hereby to be advertised for three weeks successively in the State paper, and in some newspapers, if any, in the county where the land lies, within three months after such tax is due. Such advertisement may be consolidated with the advertisement required by Revised Statutes Chapter 9, Section 42, as amended.

The said land shall be held to the State for the payment of the tax hereby assessed, with interest at twenty per cent. per annum, to commence six months after such tax is due as herein provided.

Sect. 5. Owners of lands so assessed and advertised may redeem them by paying to the treasurer of the State the tax with interest thereon, within one year from the time when such interest commences. Each owner may pay for his interest in any tract, whether in common or not, and upon filing with the State treasurer a certificate showing the number of acres, and describing the property on which he desires to pay the tax, and where the same is located, and paying the amount due, shall receive a certificate from the treasurer of the State, discharging the tax on the number of acres or interest upon which such payment is made.

Each part or interest of every such township or tract upon which the tax hereby imposed so advertised is not paid, with interest, within the time limited in this section for such redemption, shall be wholly forfeited to the State and vest therein free of any claim by any former owner.

Sect. 6. The tax assessed by authority of this act shall be held by the State treasurer as a fund to be used to protect from fire the forests situated upon and within the district hereby created, and to pay expenses incidental thereto and for no other purpose.

The State treasurer shall from such fund pay bills for this purpose and also expenses incurred in assessing, advertising and collecting said tax. Such payment shall be made immediately upon approval by the State forest commissioner and auditing by the State auditor.

Sect. 7. The forest commissioner shall take measures for the prevention, control and extinguishing of forest fires in said forestry districts, and to this end he shall establish such sub-forestry districts as he may deem necessary for effective protection against loss or damage by fire. He shall have authority to establish lookout stations connected by telephone, and to equip and maintain depots for necessary tools for the extinguishment of forest fires.

Sect. 8. The said commissioner shall appoint in and for each of said districts so established, a chief forest fire warden, and he shall also appoint within such districts such number of deputy forest fire wardens as in his judgment may be required to carry out the provisions of this act, assigning to each of the latter the territory over and within which he shall have jurisdiction. All chief and deputy forest fire wardens, so appointed, shall hold the office during the pleasure of said commissioner, be sworn to the faithful discharge of their duties by any officer authorized to administer oaths, and a certificate thereof shall be returned to the office of such commissioner.

Sect. 9. The said chief forest fire wardens, under the direction of said commissioner, shall have general supervision of their respective districts and of the deputy forest fire wardens therein. Each chief forest fire warden, when directed by the said commissioner, shall patrol the forests of his district for the purpose of searching out, extinguishing and guarding against forest fires. He shall investigate and gather evidence regarding the causes of forest fires, enforce all laws relating to forests and forest preservation, arrest all violators thereof, prosecute all offenses against the same, and in this connection shall have the same power to serve criminal processes against such offenders and shall be allowed the same fees as a sheriff, or his deputy, for like services, and shall have and enjoy the same right as a sheriff to require aid in executing the duties of his office. Said chief forest fire wardens shall perform such other duties, at such times, and under such rules and regulations, as the said commissioner may prescribe, and each shall receive as compensation three dollars for each and every day of actual service, with an allowance for expenses of travel and subsistence not to exceed two dollars daily for such period. The said commissioner may authorize the employment of suitable persons to assist said chief forest fire wardens in patrolling their respective districts and every person so employed shall be paid twenty cents for each hour of service so rendered by him and be provided with subsistence during such period. Deputy forest fire wardens shall perform such duties, at such times and under such rules and regulations, as the said commissioner, or the chief fire warden of the district, with the approval of said commissioner, may prescribe, and they shall receive as compensation two dollars and subsistence for each and every day of actual service.

Sect. 10. Whenever a fire occurs on, or is likely to do damage to forest lands within the district of any chief forest fire warden, he shall take immediate action to control and extinguish the same. If such fire occurs upon or is likely to do damage to forest lands within the territory of a deputy forest fire warden and the chief fire warden of the district is not present, then and in such case the deputy forest fire warden having jurisdiction of the territory shall forthwith proceed to control and extinguish the same, and he shall meanwhile, with all consistent dispatch, cause the said chief fire warden of the district to be notified of the occurrence of such fire. Until the arrival of the chief warden at the place of fire the deputy warden shall be in charge of the control and extinguishment of the same. For the purpose of controlling and extinguishing fires as aforesaid chief forest fire wardens, and deputy forest fire wardens when in charge of the control and extinguishment of forest fire or when so directed by the chief warden, may summon to their assistance citizens of any county, and each person so summoned and assisting shall be paid fifteen cents for each hour of service rendered by him and be provided with subsistence during such service. Immediately after the extinguishment of a fire the deputy forest fire warden who for any time may have

been in charge of the same shall make return to the chief warden of the district of the expense thereof during the period of his being in charge including the names of the persons so summoned and assisting, with their postoffice addresses and the hours of labor actually performed by each under his direction. The return shall be made upon oath and the said chief warden is hereby authorized and empowered to administer such oath. Upon receipt of such return the said chief fire warden shall carefully examine and audit the same and he may direct the deputy to amend and correct any return found to be incomplete, incorrect or insufficient in form. If upon examination and auditing of said return, and investigation of the subject matter thereof said chief fire warden believes said return to be just and correct, he shall endorse his written approval thereon and forward the same so approved to said forest commissioner. The chief fire warden of every district burned by a forest fire shall, upon the extinguishment of such fire, promptly forward an extract and detailed statement of the expense, if any, which said chief fire warden may have incurred in connection with the extinguishment of such fire, to the said forest commissioner, who may confirm, reject or recommit either or both said approved return of said deputy or said detailed statement of said chief fire warden if justice so requires.

Sect. 11. All expenses incurred under the provisions of this act shall be paid from the funds raised and created by the tax hereby assessed.

Sect. 12. For the purpose of the better carrying out of the provisions of this act it is hereby provided that the chief clerk to the land agent shall be a deputy forest commissioner. The said deputy shall hold office during the pleasure of the forest commissioner and perform such duties as the latter may prescribe. For such services the said deputy forest commissioner shall receive annually the sum of five hundred dollars, to be paid from the funds provided under this act, in addition to the salary now provided for the clerk to the land agent. It is also hereby further provided that the forest commissioner shall receive from the funds provided under this act, the sum of five hundred dollars, in addition to the salary as now provided by law.

Sect. 13. So much of the funds raised by the tax hereby imposed and paid into the treasury as may be necessary to pay the claims, accounts and demands arising under the provisions of this act is hereby appropriated to pay the same, and the governor and council are hereby authorized to draw their warrants therefor at any time. Any balance remaining unpaid shall continue from year to year as a fund available for the purpose of this act.

Sect. 14. All acts and parts of acts which are inconsistent with this act are hereby repealed.

Sect. 15. This act shall take effect when approved.

## FOREST DISTRICT ACT IS CONSTITUTIONAL.

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### *Law Court so Decides.*

In November 1912 the Law Court handed down a rescript overruling defendants' exceptions in the Franklin county tax case of Inhabitants of Sandy River Plantation vs. Weston Lewis and Josiah S. Maxcy, both of Gardiner, and owners of property in Sandy River Plantation. The constitutionality of the forestry district tax and the authority of the plantation assessors to assess or collect any part of the forestry district tax, are among the questions involved in the exceptions.

The rescript, which was drawn by Associate Justice George F. Haley of Biddeford, is as follows:

This is an action of debt, to recover taxes assessed against the property of the defendants in the year 1910 by the assessors of Sandy River Plantation, in which assessment is included the forestry district tax for that year. At the close of the testimony the presiding justice directed a verdict for the plaintiff, for the amount of the tax sued for, and interest thereon from the date of demand, May 30, 1910.

In considering the exceptions it should be remembered that this is an action at law to recover the tax, and not a proceeding seeking to enforce a forfeiture for its non-payment, and that an action for the recovery of a tax assessed will not be defeated by any irregularity, but only by such omission or defects as go to the jurisdiction of the assessors, or deprive the defendant of some substantial right, or by some omission of an essential pre-requisite to the bringing of the action.

1. It is objected that there is no evidence of the legal election or qualification of the assessors of said plantation for the year 1910, because the book of record, which purported to show their election, had been mutilated and pages, upon which the record of the annual meeting for 1910 had been attempted to be made, had been cut out and the record introduced as the record of that meeting was made in February, 1911.

There is no evidence that the pages cut from the record book was the record of the annual meeting. The legitimate inference is that the writing upon the leaves cut from the book was done by a daughter of the clerk, in an attempt to make the record for the clerk to sign, but he never signed or attested it as the record. It was found to be contrary to the facts, or wrong in some particulars and then the record that was introduced in evidence was made as the record of the annual meeting of 1910, and the clerk testified at the trial that it was the record of

that meeting, made according to the facts, and it was properly attested by him. The fact that it was not made until February, 1911, did not affect its validity. The clerk could make the record of the meeting at any time during the year following his election.

2. It is objected that the records of the plantation do not show before whom the alleged assessors qualified, as required by Chapter 4, Section 27, Revised Statutes. It was held in *Hale et al vs. Cushing*, 2 Maine, 218, that the statute requiring such a certificate to be returned and filed, was directory, and that case has been cited with approval, although the same point was not directly involved, in *Purrington vs. Dunning*, 11 Maine, 176; *Chapman vs. Inhabitants of Limerick*, 56 Maine, 390, and *Farnsworth Co. vs. Rand*, 65 Maine, 19, and is decisive of that objection.

3. It is objected that the record fails to show a legal qualification of the assessors. The record states that J. L. Clark was chosen first assessor by ballot, and duly qualified. The record states the same as to the other two assessors, except it states that S. H. Learned was chosen second assessor and C. S. Marden third assessor. The only act that either of them could do, and should do, to qualify them as assessors was to take the oath of office, and the record says they duly qualified.

We think the words of the record, showing that they each, naming them, duly qualified is at least prima facie evidence that they were sworn as required by law, and nothing appearing in the case to overcome that presumption, that they were authorized to perform the duties of assessors.

4. It is objected that the assessors had no authority to commit the taxes prior to June 1, 1910, and the evidence shows that they were committed, April 21, 1910. Section 90, Chapter 86, Public Laws of 1905, reads: "In July of each year said assessors shall commit the same with a warrant in the usual form to the collector of taxes." The law contemplates that when the taxes are committed, all things have been done by the assessors to complete the assessment, and the date of the commitment to the collector has nothing to do with the validity of the assessment, and to rule that, by committing the taxes to the collector before the date named in the statute, rendered the assessment void, would be to hold that an act of the assessors that had nothing to do with the assessment, that was after the assessment had been completed, would render the assessment void. The assessment was made as of April 1, 1910, and whether the assessors completed their duties in April or July would not affect the validity of the assessment, and the direction in the statute to commit the tax to the collector in July of each year was directory.

The next objection is that the Forestry district tax is unconstitutional, because it places a burden on all real property within the limits of the district, in addition to all other property taxes assessed throughout the state, and the case of *Dyer vs. Farmington Village Corporation*, 70 Maine, 515, is cited as sustaining that position. In that case the legislature authorized the Farmington Village Corporation, by a two-thirds

vote of the voters of said corporation, to raise, by loan or taxation, \$35,000 to aid in building a railroad, and the act was held unconstitutional to impose local taxes for public purposes. The doctrine of that case cannot be questioned, but it recognized the doctrine contended for by the plaintiff in this case, that taxation for local purposes by assessments upon property benefited, and in proportion to the benefits conferred upon it, are valid. The forestry tax was not a tax for public purposes, but for the special benefit of the forest lands within the district. Section 6, Chapter 193, of the Laws of 1910, provide that, "the taxes assessed by authority of this act shall be held by the state treasurer as a fund to be used to protect from fire the forests situated upon and within the district hereby created, and to pay expenses incidental thereto, and for no other purpose." "The forests," as said in the preamble to the act, "are one of the chief sources of wealth of the state, and the protection of such forests from destruction by fire is of the greatest importance; to this end it is the paramount duty of the legislature to have funds provided without delay for such protection." With that end in mind the legislature created the Forestry district, and authorized this tax, provided for fire wardens, deputy fire wardens, and watches to be kept of the forests, and authorized the summoning and paying of help for the extinguishment of fires in the district, and provided that the tax should be used for that purpose, and for no other purpose. It was a tax for a local purpose, and, as far as the case shows, was assessed according to the maxim that, "He who receives the advantage ought to sustain the burden." Land within this district had special benefits that no other forest land in the state had, and it ought to bear the burdens caused by the receipt of those special benefits.

It is objected that the assessors had no authority to assess or collect any part of the Forestry District tax, because, by the act creating the district, it is made the duty of the state assessors to assess the tax and the state treasurer to collect it. By Chapter 193 of the Laws of 1905, an administrative district was established and incorporated, known as the Maine Forestry district, its purpose and object being the protection from fire of the forests within that district. The act creating the district specified the lots and plantations included in the district, and fixed the rate of taxation for all land in the district, which was to be in addition to the general tax upon all property within the state and it is admitted that the property upon which the Forestry tax was assessed was within that district and owned by the defendants, and no question is raised but that the state assessors performed their duty in assessing the property, as required by law. But it is urged that the only proceedings by which the tax property assessed could be collected was by a forfeiture of the land taxed, as provided by Section 5, Section 4 of said act provides that the treasurer shall cause lists of the assessments of said lands to be advertised for three weeks in papers specified and Section 5 provides that if the tax is not paid within the time limited, the land shall be held forfeited to the state, and vested therein free of any claim by any former owner, and defendants claim that the tax can be collected in

no way except that provided by Section 5. But Section 65, Chapter 10, R. S., provides: "In addition to other provisions for the collection of taxes legally assessed, the mayor and treasurer of any city, the selectmen of any town, and the assessors of any plantation, to which a tax is due, may, in writing, direct an action to be commenced in the name of such city or the inhabitants of such town or plantation, against the party liable." This section was construed by the court in *Rockland vs. Ulmer*, 84 Maine, 503, in which it was held the state and county tax which, at the time of the assessment, the collector was bound to pay when collected, direct to the county and state, was due the municipality within the meaning of that statute.

If the general state and county tax, which do not belong to the municipality, are due the municipality, within the meaning of the statute, why are not the taxes of the fire district due? It was held in the above case that, "The municipality was the agency through which said state and county taxes were assessed and collected. Viewing the municipality in the light of an agent or trustee of the public, all the taxes to be assessed and collected through its agency, may be said to be due to it as such agent or trustees. The right of action against the delinquent inhabitant, or property owner, was given to the municipality to enable it to perform its duties as such agents or trustees. We think the state and county taxes assessed upon the municipality, are within the purview of the statute granting this relief.

If the municipality could act as the agent of the state in collecting the state tax, why could it not act as the agent of the state in collecting the fire district tax? The last named tax was included in the treasurer's warrant to the assessors of the plaintiff town, and thereby the tax, by the doctrine of *Rockland vs. Ulmer*, supra, was committed to the plantation to collect for the benefit of the fire district, to be paid direct to the state.

The objections above considered are all that are urged in behalf of the exceptions. We do not consider them of sufficient weight to sustain the exceptions, and the mandate should be.

Exceptions overruled.

## REVISED FIRE LAWS FOR TOWNS.

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Following are sections of the new law as amended in 1909:

'SEC. 52. The selectmen of towns shall be forest fire wardens therein, and the services of such selectmen acting as said fire wardens, shall be paid for at the same rate as is paid for their other official services. It shall be the duty of the fire wardens when a fire is discovered to take such measures as may be necessary for its control and extinguishment. For this purpose they shall have authority to call upon any person in the town for assistance, and such persons shall receive such compensation, not exceeding twenty cents per hour, as said selectmen may determine, the same to be paid by the town. But no town shall be holden to pay for extinguishing forest fires in any year an amount greater than two per cent upon its valuation for purposes of taxation. If any person so ordered to assist and not excused from said service by said forest fire wardens on account of sickness, disability, or some important business or engagement, shall neglect to comply with any such order he shall forfeit the sum of ten dollars, to be recovered in action of debt in the name and to the use of the town, by the treasurer thereof. If any person shall suffer damage from fire in consequence of the negligence or neglect of the selectmen of any town to perform the duties required by this act, such person shall have an action on the case to recover from the town where the fire occurs to the amount of his damages so sustained not to exceed two per cent of the valuation of said town. This act shall also apply to cities. The chief engineer of the fire department of cities shall be forest fire wardens and shall have the same powers and duties in carrying out the provisions of this act as selectmen of towns.'

SEC. 55. Whoever by himself, or by his servant, agent or guide, or as the servant, agent or guide of any other person, shall build a camp, cooking or other fire, or use an abandoned camp, in or adjacent to any woods in this state, shall, before leaving such fire, totally extinguish the same, and upon failure to do so such person shall be punished by a fine of fifty dollars, provided that such fires built upon the sea beach in such situation that they cannot spread into forest wood or cultivated lands or meadows, shall not be construed as prohibited by this section. One half of any fine imposed and collected under this section shall be paid to the complainant.

SEC. 56. Selectmen shall erect in a conspicuous place at the side of every highway, as they may deem proper, and suitable distances along-

side the rivers and lakes of the state frequented by camping parties, tourists, hunters and fishermen, in their respective towns, notices in large letters to be furnished by the forest commissioner, substantially in the following form: "Camp fires must be totally extinguished before breaking camp, under penalty of not to exceed one month's imprisonment or one hundred dollars fine, or both as provided by law, ..... Forest Commissioner." The forest commissioner shall furnish owners of wood lands situated within this state, when called upon to do so, notices of similar tenor, to be posted at the expense of said owners upon their respective lands.

'SEC. 58. Municipal officers in towns shall proceed immediately to a strict inquiry into the cause and origin of fires within wood lands, and in all cases where such fires are found to have originated from the unlawful act of any person, to cause the offender to be prosecuted without delay.'

'SEC. 59. The selectmen of towns in which a forest fire of more than one acre in extent has occurred, within a month shall report to the forest commissioner the extent of area burned over, to the best of their information, together with the probable amount of property destroyed, specifying the value of timber as near as may be, and the amount of cord wood, logs, bark or other forest products, fencing, bridges and buildings that have been burned. They shall also report the cause of these fires if they can be ascertained, and the measures employed and found effective in checking their progress. Blanks for the reports required in this act shall be furnished by said forest commissioner at the expense of the state.'

## ACT PROHIBITING THE USE OF FIREARMS IN DRY TIMES.

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The following act authorizing the governor to issue a proclamation to prevent the use of firearms in the forests during a dangerously dry time, was passed by the Legislature in 1909:

Section 1. Whenever, during an open season for the hunting of any kind of game or game birds in this state, it shall appear to the governor that by reason of drought having in possession firearms in the forests is liable to cause forest fires, he may, by proclamation suspend the open season and make it a close season for such time as he may designate.

Section 2. During the time which shall by such proclamation be made a close season, all provisions of law covering and relating to the close season shall be in force, and a person violating a provision of the same shall be subject to the penalty therein prescribed. In case any person shall enter upon the wild lands of the state carrying or having in their possession any firearms, or any person shall shoot during the close season fixed by proclamation of the governor, as provided in the preceding section, any wild animal or bird for the hunting of which there is no close season otherwise provided by law, he shall be punished by a fine of one hundred dollars and costs.

Section 3. Such proclamation shall be published in such newspapers of the state and posted in such places and in such manner as the governor may order in writing. A copy of such proclamation and order, shall be filed with the secretary of state. A like attested copy shall be furnished to the forest commissioner, who shall attend to the posting and publication of the proclamation. All expense thereof and all the expense of enforcing the provisions of the proclamation shall be paid by said commissioner, after allowance by the state auditor, from any funds in the state treasury not otherwise appropriated.

Section 4. If after the issuing of the proclamation as provided in section one, by reason of rains or otherwise, the governor is satisfied that the occasion has passed for the issuance of the proclamation, he may annul it by another proclamation issued as provided in this act for the issuance of the first proclamation.

*Governor Plaisted's Proclamation.* In May 1911 the conditions were such that upon consultation with, and recommenda-

tions by the forest commissioner, Governor Plaisted issued a proclamation in keeping with the act, it being the first time said act was enforced. Copies of the proclamation were sent broadcast and had the effect of making all more cautious. The proclamation was as follows:

STATE OF MAINE.  
BY THE GOVERNOR.  
A PROCLAMATION.

WHEREAS, the towns, villages and timber lands of this State are in great danger from fire at the present time, owing to the almost unprecedented dry weather at this season of the year, and

WHEREAS, our statutes contain the following provisions, wisely enacted for the protection of the lives and property of our people:

"Whoever by himself, or by his servant, agent or guide, or as the servant, agent or guide of any other person, shall build a camp, cooking or other fire, or use an abandoned camp, cooking or other fire in or adjacent to any woods in this state, shall, before leaving such fire, totally extinguish the same, and upon failure to do so such person shall be punished by a fine of fifty dollars,\*\*\*\*\*."

"Selectmen shall erect in a conspicuous place at the side of every highway as they may deem proper, and at suitable distances alongside the rivers and lakes of the state frequented by camping parties, tourists, hunters and fishermen, in their respective towns, notices in large letters to be furnished by the forest commissioner, substantially in the following form: 'Camp fires must be totally extinguished before breaking camp, under penalty of not to exceed one month's imprisonment or one hundred dollars fine, or both as provided by law. \_\_\_\_\_, Forest Commissioner.' The forest commissioner shall furnish owners of wood lands situated within this state when called upon so to do notices of similar tenor to be posted at the expense of said owners upon their respective lands." Sections 55 and 56, Chapter 7, R. S.

"Whoever kindles a fire on land not his own, without consent of the owner, forfeits ten dollars; if such fire spreads and damages the property of others, he forfeits not less than ten, nor more than five hundred dollars; and in either case, he shall stand committed until fine and costs are paid, or he shall be imprisoned not more than three years."

"Whoever with intent to injure another, causes a fire to be kindled on his own or another's land, whereby the property of any other person is injured or destroyed, shall be fined not less than twenty, nor more than one thousand dollars, or imprisoned not less than three months, nor more than three years."

"Whoever for a lawful purpose kindles a fire on his own land, shall do so at a suitable time and in a careful and prudent manner: and is

liable, in an action on the case, to any person injured by his failure to comply with this provision."—Sections 15, 16 and 17, Chapter 28, R. S.

The State Forest Commissioner is using every possible means for the prevention of fires, and now has an organized force of three hundred men employed as wardens, lookout men and patrolmen, besides a large force of emergency men. In some sections of the state every available man is engaged in connection with this work, and the large fires are under control, but smouldering, and likely to break out anew if vigilance is relaxed. The ponds, river and brooks are extremely low; we have had practically no rain since last October, and none whatever in the greater portion of the state for twenty-eight days. These conditions, with the unusually hot weather, make the danger much greater than many of our people realize.

I THEREFORE earnestly recommend that all persons, river drivers, railroad crews, sportsmen and guides in particular, use the utmost precaution. Farmers and others should not build brush fires, and in no case should fires be built on grass or timber land, or on the shores of lakes or streams, while the present conditions exist. It is of especial importance that municipal officers post notices as required by law, and take such other action as in their judgment will secure the co-operation of the citizens in every way that will tend to minimize the danger.

[L. S.]

Given at the Executive Chamber, at Augusta, this twenty-second day of May, in the year of our Lord one thousand nine hundred and eleven, and of the Independence of the United States of America the one hundred and thirty-fifth.

FREDERICK W. PLAISTED.

By the Governor,

ATTEST:

CYRUS W. DAVIS,  
*Secretary of State.*

## BENJAMIN C. JORDAN FUND.

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At the session of the Legislature of 1909 Benjamin C. Jordan, of Alfred, who for many years has been interested in conserving the timber lands of Maine, presented to the members the unique proposition of giving to the state the sum of \$1,000.00. The conditions of said gift are set forth in the following proposition, signed by Mr. Jordan :

I would like to give to the State of Maine, to be its property forever, one thousand dollars, on condition that in consideration of said gift the state shall, once in 18 years, offer five prizes to be called the Jordan Forestry Prizes, as follows :

\$500.00 1st prize  
\$250.00 2d "  
\$125.00 3d "  
\$100.00 4th "  
\$25.00 5th "

Said prizes to be offered now by the State for the five best lots of young forest growth in the State and awarded by the State Forest Commissioner subject to the approval of the Governor, January 1st, 1927, and once in 18 years afterward forever, after a careful examination of all lots competing in accordance with the following rules :

Rule 1. Each lot shall consist of one parcel of not less than ten acres in somewhat regular shape and shall be accurately surveyed and plotted.

Rule 2. The majority of said trees shall not be less than ten feet nor more than thirty feet high and not less than ten nor more than thirty years old when the prize is awarded.

Rule 3. Said forest may consist of any of the following kinds of trees, but other circumstances and conditions being equal, preference shall be given in the following order : White

Pine, White Oak, Hickory, Chestnut, Hacmatack, White Ash, Yellow Oak, Red Oak, Bass, Hemlock, Spruce, Norway Pine, Pitch Pine, Cedar, Fir, Poplar, Birch, Maple, Beech and Elm.

Rule 4. All competitors for the prizes shall file in the office of the State Forest Commissioner, their intention to compete, together with a correct and definite survey and plan of the lot, ten or more years before each award, and when such notice has been filed, said lot shall be eligible although the ownership may have changed.

Rule 5. Myself and my heirs shall have the same right as others to compete for the prizes.

Rule 6. In awarding prizes, other circumstances being equal, the following conditions shall be considered in the order named:

(a) Right number of trees per acre. (b) Even distribution over whole lot. (c) Health and thriftiness of trees. (d) Adaptation of the varieties of trees to the soil in which they stand. (e) Uniformity of size of trees. (f) Size of trees. (g) Size of the lot.

BENJAMIN C. JORDAN.

Alfred, Maine, January 14, 1909.

In accepting the offer the Legislature passed the following resolve:

Resolved, That the offer of Benjamin C. Jordan, of Alfred, Maine, giving to the State of Maine, one thousand dollars, to be known as the Jordan fund, conditions of which are herewith annexed, be hereby accepted, and the conditions of which shall be carried out by the State Forest Commissioner.

The \$1000.00 was deposited with the state treasurer by Mr. Jordan, as required during the year 1909, but up to this date no applications have been filed with the department by anyone wishing to compete for the prizes offered.

Up to November 1st, 1912 no competitors have filed intentions with the Forest Commissioner. The money is in the State Treasury and it is hoped that before another year passes there will be a number of competitors for this prize.

## FOREST FIRES OF 1911.

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The forest fire season of 1911 was the worst the state has experienced in many years, differing in many respects from the season of 1908, when the fire season extended from April until November, with heavy losses in both the spring and fall months. In 1911 the burden of the work and the larger extent of the damage was crowded into a few weeks principally the month of July, the most disastrous of the forest fires breaking out July 3 and 4.

The spring months passed with a considerable diminishing in the average rain fall, which Maine experienced together with all New England, leaving the slash and litter of the woods to quickly dry. Before the green growth was well started, and that was later than usual, numerous forest fires were reported from various sections of the state. Fortunately the early fires did but little damage to the green and mature timber, the path of the fire in most cases following cut over lands and the smaller growth. It was the later fires that did the damage.

An unusual number of fires in 1911 were caused by lightning, that cause being definitely stated in the reports of some of the forest fires doing the greatest amount of damage. From records of Maine forest fires it appears that 35 were set by lightning during the season. That this is considerably above the average is borne out by the fact that the number of forest fires credited to lightning in 1908, a year of many large fires, was only five. For the years of 1909 and 1910, only one forest fire in each year was caused by lightning. This peculiar feature of the fire season of 1911 coupled with the extreme hot weather created a condition against which it was hard to combat.

Many of the fires were stubborn and hard to subdue and not having men enough in the vicinity of the fires crews had to be recruited from long distances. This added to the general expenses and the many fires quickly depleted the funds of the

Maine Forestry District and to pay many of the men the timber land owners advanced the money.

It became evident early in August that the funds were practically exhausted, and if all bills were paid there would be a deficit. To curtail further expense it was necessary to call off the patrols by the middle of August. Quite a number of land owners not wishing the patrolling to stop on their lands clubbed together and agreed to pay for the patrol on their own property as much longer as the dangerous season demanded. Fortunately there were heavy rains and there was no danger from forest fires after the state patrol was discontinued.

The causes of the fires in the reports received from the town officials and forest fire wardens connected with the Maine Forestry District were given as follows: Unknown, 75; lightning, 35; clearing land, 26; locomotives, 23; river drivers, 8; camp fires, 3; grass fires, 2; hunters, 2; incendiary, 1; portable mill, 1; smoking, 1; burning of mill, 1.

The tabulations follow:

## Fires of 1911 on Incorporated Towns.

## AROOSTOOK COUNTY.

TOWNSHIP.	Date.	Acres.	CAUSE.	Damage.
Linneus.....	May 5....	110	Clearing land.....	50

## CUMBERLAND COUNTY.

Standish.....	April 13...	3	Unknown.....	15
North Baldwin.....	June.....	1	Unknown.....	75
Standish.....	May 5.....	20	Unknown.....	250
		24		340

## HANCOCK COUNTY.

Gouldsboro.....	June 23...	300	Clearing land.....	400
Orland.....	May 10....	75	Fire in grass.....	100
Orland.....	April 29...	300	Unknown.....	100
Surry.....	April 30...	300	Unknown.....	200
Winter Harbor.....	May 5.....	6	Unknown.....	25
Brooklin.....	April 28...	100	Clearing land.....	1,000
		1,081		1,825

## FRANKLIN COUNTY.

New Vineyard.....	July 11....	4	Portable mill.....	150
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## KENNEBEC COUNTY.

Belgrade.....	May 23....	20	Smoking.....	100
Pittston.....	April 29...	160	Clearing land.....	900
West Gardiner.....	May 7.....	100	Clearing land.....	200
Chelsea.....	July.....	50	Unknown.....	250
		330		1,450

## KNOX COUNTY.

Warren.....	May 5.....	115	Locomotive.....	200
Warren.....	May 10....	120	Locomotive.....	620
Warren.....	May 1.....	60	Locomotive.....	180
Warren.....	May 1.....	15	Clearing land.....	25
Warren.....	May 5.....	5	Unknown.....	200
		315		1,225

## OXFORD COUNTY.

Brownfield.....	May 4.....	100	Locomotive.....	500
Canton.....	May 17....	150	Unknown.....	600
Hebron.....	May 30....	3	Unknown.....	60

## OXFORD COUNTY—CONCLUDED.

TOWNSHIP.	Date.	Acres.	CAUSE.	Damage.
Oxford	May 8.	14	4 Locomotive	65
Oxford	May 6.	7	Locomotive	25
Hebron	June 30	5	Unknown	100
Oxford	June 4	200	Locomotive	450
Oxford	May 30.	8	Locomotive	25
Paris	May 12.	125	Unknown	300
Roxbury	July 13.	1	Unknown	50
Stoneham	May 12.	4	Unknown	150
Stoneham	April 27.	15	Clearing land	75
Paris	July 9.	4	Lightning	20
		636		2,420

## PISCATAQUIS COUNTY.

Abbott	May 17.	500	Locomotive	2,500
Monson	May 10	30	Clearing land	150
Monson	May 7.	25	Unknown	125
Orneville	May 8.	100	Unknown	200
Orneville	May 8.	50	Burning saw mill	1,300
Wellington	July 10.	5	Lightning	18
Blanchard	July 7.	40	Lightning	100
		750		4,393

## PENOBSCOT COUNTY.

Greenbush	May 13.	30	Unknown	100
Millinocket	May 11.	1,000	Clearing land	1,500
Millinocket	May 13.	10	Unknown	50
Orrington	April 27.	40	Locomotive	50
Passadumkeag	May 15.	50	Unknown	50
Orrington	May 5.	25	Unknown	325
Winn	May 15.	25	Unknown	50
Woodville	May 13.	10	Locomotive	25
		1,190		2,150

## SAGadahoc COUNTY.

Bowdoin	May 6.	500	Unknown	2,000
Georgetown	May 13.	1,000	Unknown	5,000
Phippsburg	May 5.	100	Grass fire	500
Topsham	May 10.	100	Locomotive	500
Topsham	May 10.	50	Locomotive	250
Topsham	April 29.	100	Locomotive	500
Topsham	May 5.	200	Locomotive	1,000
West Bath	May 19.	450	Unknown	600
Woolwich	May 8.	160	Unknown	800
		2,660		11,150

## SOMERSET COUNTY.

Bingham	May 10.	3	Locomotive	50
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WASHINGTON COUNTY.

TOWNSHIP.	Date.	Acres.	CAUSE.	Damage.
Alexander.....	May 13....	25	Camp fire.....	100
Baring.....	May 19....	1,200	Unknown.....	1,000
Charlotte.....	May 15....	160	Clearing land.....	400
Crawford.....	June 20...	1,000	Unknown.....	50
Wesley.....	May 7....	50	Unknown.....	200
		2,435		1,750

WALDO COUNTY.

Burnham.....	May 8....	75	Locomotive.....	500
Liberty.....	May 20....	300	Clearing land.....	150
Palermo.....	May 7....	100	Unknown.....	400
		475		1,050

LINCOLN COUNTY.

Whitefield.....	April 28...	300	Clearing land.....	500
Newcastle.....	May 8....	20	Unknown.....	100
Whitefield.....	May 14....	15	Unknown.....	50
		335		650

YORK COUNTY.

Lyman.....	July 13....	50	Unknown.....	1,000
Lyman.....	July 31....	300	Conflagration.....	2,500
York.....	July 12....	500	Unknown.....	10,000
Waterboro.....	July 12....	100	Conflagration.....	5,000
Acton.....	Aug. 23...	50	Camp fire.....	150
Shapleigh.....	July 28....	75	Lightning.....	1,000
		1,075		19,650

SUMMARY OF 1911 FIRES.

Incorporated Towns.

County.	Acres.	Damage.
Aroostook.....	110.....	\$50
Cumberland.....	24.....	340
Hancock.....	1,081.....	1,825
Franklin.....	4.....	150
Kennebec.....	330.....	1,450
Knox.....	315.....	1,225
Oxford.....	636.....	2,420
Piscataquis.....	750.....	4,393
Penobscot.....	1,190.....	2,150
Sagadahoc.....	2,660.....	11,150
Somerset.....	3.....	50
Washington.....	2,435.....	1,750
Waldo.....	475.....	1,050
Lincoln.....	335.....	650
York.....	1,075.....	19,650
	11,423	\$48,303

Fires in 1911 on Unincorporated Townships.  
AROOSTOOK COUNTY.

TOWNSHIP.	Date.	Acres.	CAUSE.	Damage.
Stockholm	May 8	100	Clearing land	\$100
Maewahoc	May 8	150	Unknown	500
A. R. 5	May 10	40	"	100
Hammond	May 14	1	"	5
Stockholm	May 16	1	Clearing land	5
Stockholm	May 17	50	"	150
17 R. 4	May 15	10	"	50
D. R. 2	May 17	40	"	200
15 R. 7	May 19	500	"	2,500
Merrill	May 19	30	Unknown	90
Wallagrass	May 20	16	Clearing land	80
16 R. 10	May 20	10	"	30
S R. 4	May 20	20	Burning building	200
15 R. 7	May 21	25	Clearing land	10
3 R. 4	May 27	30	Incendiary	150
15 R. 4	May 30	1	Fishermen	10
9 R. 3	June 8	3	Unknown	20
16 R. 4	June 23	1	Campers	5
15 R. 6	June 27	700	Unknown	200
16 R. 7	July 7	18	Lightning	5
11 R. 4	July 8	1	Fishermen	10
9 R. 3	July 8	30	"	100
Hammond	July 9	2	Clearing land	5
10 R. 3	July 15	1	Fishermen	5
9 R. 7	July 15	300	Campers	1,200
20 R. 11 & 12	Aug. 12	10	Unknown	20
		2,090		\$5,750

FRANKLIN COUNTY.

2 R. 6	May 5	550	Clearing land	\$4,500
Jerusalem	May 18	15	Locomotive	100
Lang	July 8	4	Unknown	30
Coplin	July 8	2	Lightning	20
Coplin	July 8	2	Lightning	10
No. 6	July 10	100	Unknown	5
No. 6	July 11	70	"	5
Lang	July 11	4	"	30
3 R. 4	July 22	1	Lightning	3
Jerusalem	July 23	10	"	20
		758		\$4,723

HANCOCK COUNTY.

No. 10	April 26	25	Unknown	\$50
No. 10	" 28	50	"	100
No. 10	" 28	200	"	200
No. 21	May 4	150	"	50
No. 7	" 6	600	"	3,000
No. 10	" 6	15	"	75
No. 9	" 6	500	Locomotive	1,000
No. 16	" 14	15,000	Fishermen	2,500
No. 10	" 15	2	Unknown	5
No. 20	" 16	3,000	River drivers	3,000
No. 22	" 16	10,000	Unknown	10,000
No. 22	" 16	2,000	"	2,000
No. 22	June 1	1	Old fire	3
No. 16	Oct. 17	25	Hunters	100
		31,568		22,083

## FIRES—1911.

## PENOBSCOT COUNTY.

TOWNSHIP.	Date.	Acres.	CAUSE.	Damage.
Stacyville.....	May 8.....	500	Clearing land.....	\$2,000
Stacyville.....	" 8.....	125	".....	400
2 R. 8 N. W. P.....	" 13.....	45	Locomotive.....	100
Drew.....	" 14.....	500	Unknown.....	400
Drew.....	" 14.....	2,000	".....	500
1 R. 6.....	" 17.....	50	River drivers.....	250
8 R. 6.....	" 17.....	30	".....	200
6 R. 8.....	" 19.....	40	Unknown.....	200
Indian Twp, No. 3.....	" 20.....	20	Clearing land.....	100
3 R. 9.....	" 29.....	25	Lightning.....	50
Long A.....	June 11.....	4	Locomotive.....	16
Long A.....	July 16.....	1	Unknown.....	5
No. 4.....	July 16.....	10	".....	40
Total.....		3,350		\$4,261

## PISCATAQUIS COUNTY.

Kingsbury.....	May 13.....	25	River drivers.....	\$200
3 R. 10.....	" 16.....	2	Unknown.....	10
4 R. 10.....	" 16.....	1,360	".....	6,800
1 R. 10.....	" 19.....	6,467	".....	32,335
4 R. 10.....	" 16.....	960	Lightning.....	5,000
Days Aca. Grant.....	July 5.....	10	".....	100
East Middlesex.....	" 5.....	3,000	Unknown.....	15,000
Elliottsville.....	" 6.....	10	Lightning.....	30
Frenchtown.....	" 4.....	6,000	".....	39,000
A. R. 12 & 1 R. 12.....	" 6.....	1,500	".....	7,500
Lily Bay.....	" 7.....	30	".....	300
West Burbank.....	" 9.....	20	Unknown.....	100
5 R. 12.....	" 10.....	10	Lightning.....	100
A. R. 11.....	" 11.....	2,840	".....	16,000
9 R. 11.....	" 12.....	75	".....	300
1 R. 11.....	" 16.....	40	Unknown.....	200
East Middlesex.....	" 23.....	1	Lightning.....	6
3 R. 13.....	" 12.....	1,808	".....	9,000
1 R. 12.....	" 18.....	1,884	Unknown.....	9,420
2 R. 11.....	" 18.....	2	".....	10
Big Squaw.....	" 22.....	2	Lightning.....	16
		27,046		\$141,427

## SOMERSET COUNTY.

Highland.....	May 8.....	5	River drivers.....	\$20
Bald Mt.....	" 10.....	1	Unknown.....	5
Long Pond.....	" 12.....	25	Clearing land.....	100
Bow Town.....	" 25.....	1	River drivers.....	5
Tomhegan.....	" 29.....	1	".....	10
Rockwood Strip.....	" 31.....	2	Campers.....	20
Pleasant Ridge.....	June 9.....	1	Unknown.....	3
3 R. 6; 4 R. 7 B. K.P.W.K.R.	July 3.....	10,000	Lightning.....	50,000
Sandwich Aca.....	" 3.....	1	".....	5
Dennistown.....	" 5.....	1	".....	5
Stony Brook.....	" 9.....	1	".....	3
Dennistown.....	" 10.....	640	".....	800
1 R. 4 N. B. K. P.....	" 12.....	1,158	Unknown.....	5,193
Schoomook.....	" 12.....	3,500	".....	17,500
Attean.....	" 18.....	2	".....	10
Moxie Gore.....	" 11.....	1	Lightning.....	
Sapling.....	" 12.....	3,000	Locomotive.....	15,000

SOMERSET COUNTY—CONCLUDED.

TOWNSHIP.	Date.	Acres.	CAUSE.	Damage.
Mayfield.....	" 16...	1	Lightning .....	4
Bald Mt. 2 R. 3.....	" 22.....	1	" .....	3
Indian Pond.....	" 22.....	12	" .....	60
Dead River.....	Oct. 14.....	4	Hunters.....	20
Total.....		18,358		\$88,769

WASHINGTON COUNTY.

Hinckley.....	April 27...	500	Unknown .....	\$400
10 & 11 R. 5.....	" 27.....	5	" .....	10
10 & 11 R. 3.....	" 28.....	900	Locomotive.....	900
No. 43.....	" 28.....	75	Unknown.....	12
No. 24.....	May 5.....	1,280	Blueberry burn.....	1,500
No. 14.....	" 7.....	35	Unknown.....	140
Codyville.....	" 5.....	20	River drivers.....	10
7 R. 2.....	" 8.....	60	Cigar stub.....	75
No. 24 M. D.....	" 8.....	400	Fire adjoining Twp.....	300
No. 14.....	" 8.....	150	Fishermen.....	350
No. 14.....	" 8.....	10	Clearing land .....	50
Hinckley.....	" 10.....	250	" .....	400
No. 21.....	" 14.....	1,200	Unknown .....	3,600
No. 19 E. D.....	" 14.....	30	" .....	5
1 R. 3.....	" 14.....	4	Locomotive.....	20
8 R. 4.....	" 17.....	11,400	Unknown .....	14,000
No. 19 E. D.....	" 23.....	10	" .....	50
Hinckley.....	July 6.....	3	Lightning .....	30
No. 5.....	" 6.....	10	" .....	75
Total.....		16,342		\$21,927

OXFORD COUNTY.

4 R. 2 W. B. K. P.....	July 16...	1	Lightning .....	\$10
4 R. 1 W. B. K. P.....	" 16.....	1	" .....	2
Letter C.....	Sept. 5.....	140	" .....	100
Total.....		142		\$112

SUMMARY OF 1911 FIRES.

Unincorporated Townships.

County.	Acreage.	Damage.
Aroostook.....	2,090.....	\$ 5,750
Franklin.....	758.....	4,723
Hancock.....	31,568.....	22,083
Oxford.....	142.....	112
Penobscot.....	3,350.....	4,261
Piscataquis.....	27,046.....	141,427
Somerset.....	18,358.....	88,769
Washington.....	16,342.....	21,927
	99,654	289,052

## FOREST FIRES OF 1912.

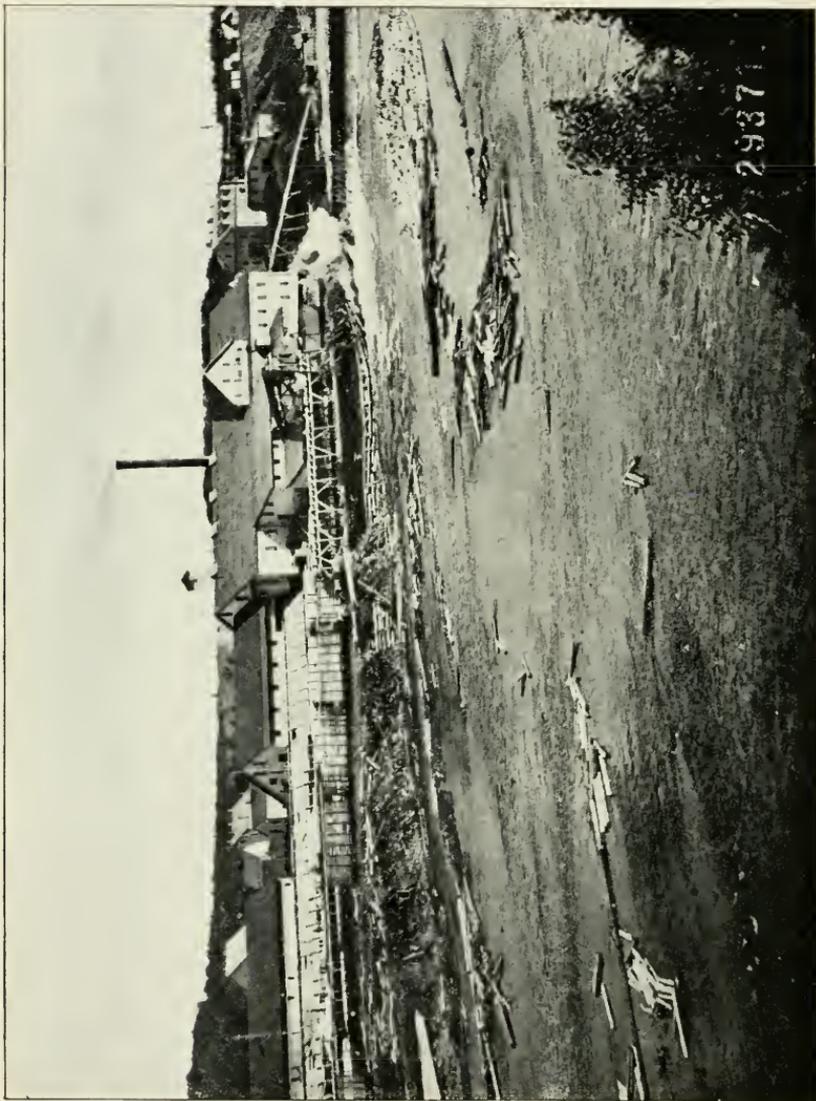
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The year of 1912 offered a great relief after the hazardous fire season of 1911. There was plenty of moisture during the early spring months and the green growth had gotten a good start before it became dangerously dry. In fact there was but one danger period for the entire season, which occurred during the extremely hot weather, the first ten or twelve days of July. At that time numerous fires were started and a repetition of 1911 fires was promised but fortunately, rains came, ending the danger.

The danger period was characteristic of the previous year in the way of severe electrical storms and twenty-one of the fires reported were described as having been set by lightning. With the exception of 1911 that is considerably more than the average of forest fires from this cause. A peculiarity of the electrical storms of both 1911 and 1912 was that but very little rain fell thus allowing the fires a good headway unchecked.

Of the fires in unincorporated townships Piscataquis County suffered the heaviest in number of acres burned, Hancock County being second in acreage lost. Aroostook County was exceptionally free from fires. A notable feature of the fires reported from the incorporated towns was the small number ascribed to clearing land which has been a great source of forest fires, in past years. It is an indication that the farmers are becoming more cautious and heed the warnings and examples given them. Portable mill operators are apparently taking more care in the running of their mills as only one fire of 1912 was assigned to that cause. The danger of sending up hot air balloons was illustrated by one fire but fortunately it did no great damage. The danger of such balloons alighting in the woods is, however, very great and some legislation should be passed prohibiting the use of that form of toy balloons.





Ashland Lumber Company's Mill, Ashland, Me.

The causes given for the fires of 1912 occurring in the Maine Forestry District and the incorporated towns were as follows: unknown, 37; lightning, 21; fishermen, 7; locomotives, 6; campers, 5; clearing land, 4; blueberry burn, 2; farm buildings, 2; burning nests, 1; cigar stub, 1; hot air balloon, 1; portable saw mill, 1; lighted match, 1; surveying party, 2; bark crew, 1; fire crackers, 1.

The tabulations follow:

## Fires on Unincorporated Townships.

## AROOSTOOK COUNTY.

TOWNSHIP.	Date.	Acres.	CAUSE.	Damage.
Moro Pl.....	July 4.....	3	Fishermen.....	50

## ANDROSCOGGIN COUNTY.

Minot.....	April 24...	30	Unknown.....	200
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## CUMBERLAND COUNTY.

Standish.....	May 4.....	3	Unknown.....	6
Harpwell.....	June 14...	1	Clearing land.....	50
Baldwin.....	June 15...	20	Match.....	250
Baldwin.....	July 6.....	20	Lightning.....	50
Baldwin.....	July 20....	5	Unknown.....	25
		49		381

## FRANKLIN COUNTY.

New Sharon.....	May 4.....	50	Unknown.....	100
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## HANCOCK COUNTY.

Amherst.....	May 2.....	300	Unknown.....	1,200
Brooklin.....	May 2.....	150	Clearing land.....	300
Dedham.....	May 3.....	75	Clearing land.....	300
Otis.....	May 8.....	50	Fishermen.....	100
Orland.....	June 29...	10	Campers.....	50
Amherst.....	July 2.....	75	Campers.....	300
Southwest Harbor.....	July 9.....	6	Unknown.....	100
		666		2,350

## KNOX COUNTY.

Vinalhaven.....	July 9.....	50	Unknown.....	200
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## KENNEBEC COUNTY.

Farmingdale.....	June 9....	25	Burning nests.....	25
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## PENOBSCOT COUNTY.

Orrington.....	May 3.....	40	Unknown.....	30
Medway.....	July 1.....	10	".....	50
East Holden.....	July 2.....	300	".....	2,500
Kenduskeag.....	July 10....	150	Clearing land.....	150
		500		2,730

SOMERSET COUNTY.

TOWNSHIP.	Date.	Acres.	CAUSE.	Damage.
Caratunk Pl. ....	April 27...	25	Cigar stub.....	10

SAGADAHOC COUNTY.

Woolwich.....	May 3....	400	Locomotive.....	2,000
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WASHINGTON COUNTY.

Perry.....	July 3....	20	Unknown.....	100
Edmunds.....	July 10...	400	Lightning.....	3,000
		420		3,100

WALDO COUNTY.

Unity.....	June 10...	2	Locomotive.....	150
Unity.....	" 20.....	1	".....	15
Unity.....	" 27.....	8	".....	300
Prospect.....	July 1.....	1	Unknown.....	5
Unity.....	" 12.....	1	Locomotive.....	10
		13		480

YORK COUNTY.

Shapleigh.....	April 21...	400	Unknown.....	2,000
Limington.....	" 29.....	1,000	".....	5
Acton.....	May 3.....	1	Portable saw mill.....	125
Biddeford.....	May 19.....	200	Unknown.....	10
Acton.....	July 4.....	10	Hot air balloon.....	30
Limington.....	" 10.....	200	Unknown.....	300
		1,811		2,470

SUMMARY OF 1912 FIRES.

Incorporated Towns.

County.	Acreage.	Damage
Aroostook.....	3.....	\$ 50
Androscoggin.....	30.....	200
Cumberland.....	49.....	381
Franklin.....	50.....	100
Hancock.....	666.....	2,350
Knox.....	50.....	200
Kennebec.....	25.....	25
Penobscot.....	500.....	2,730
Somerset.....	25.....	10
Sagadahoc.....	400.....	2,000
Washington.....	420.....	3,100
Waldo.....	13.....	480
York.....	1,811.....	2,470
	4,042	\$14,096

## Forest Fires 1912 on Unincorporated Townships.

## AROOSTOOK COUNTY.

TOWNSHIP.	Date.	Acres.	CAUSE.	Damage.
Twp. 14, R. 7.....	June 30...	8	Fishermen.....	\$ 50
Twp. 19, R. 12.....	July 7....	40	Surveyors.....	300
Twp. 12, R. 6.....	" 11....	50	Unknown.....	400
		98		\$750

## FRANKLIN COUNTY.

Jerusalem Pl.....	July 2....	5	Laborer on road.....	10
Twp. 3, R. 5.....	" 7....	1	Lightning.....	10
7 Pond Twp.....	" 8....	10	".....	50
Twp. 2, R. 5.....	" 10....	1	Unknown.....	4
Stetson Towns.....	" 11....	6	Lightning.....	100
Chain of Ponds.....	" 12....	3	".....	25
Lang Pl.....	" 13....	1	Unknown.....	1
Letter D.....	" 14....	1	".....	3
		28		203

## HANCOCK COUNTY.

Twp. No. 32.....	April 5....	100	Unknown.....	\$300
Twp. No. 22.....	" 25....	300	".....	300
Twp. No. 33.....	May 1....	100	Burning for blueberries...	50
Twp. No. 10.....	" 2....	200	Unknown.....	500
Twp. No. 10.....	" 2....	50	farm buildings.....	100
Twps. No. 7 & No. 10.....	" 3....	1,200	Unknown.....	800
Twp. No. 39.....	" 3....	100	".....	150
Twp. No. 39.....	" 10....	50	".....	175
Twps. No. 21 & No. 22.....	July 2....	3,000	".....	15,000
Twp. No. 28.....	" 10....	1	Lightning.....	5
Twp. No. 28.....	" 13....	1	".....	5
		5,102		\$17,385

## OXFORD COUNTY.

Twp. 4, R. 5.....	June 30...	1	Campers.....	\$ 1
Twp. 4, R. 3.....	July 9....	1	Unknown.....	5
		2		\$6

## PENOBSCOT COUNTY.

Twp. 6, R. 3.....	May 11....	2	Burning for blueberries...	\$5
Grand Falls.....	July 3....	40	Unknown.....	200
Twp. 2, R. 8.....	July 17....	50	Fishermen.....	100
		92		\$305

## PISCATAQUIS COUNTY.

TOWN.	Date.	Acres.	CAUSE.	Damage.
Big Squaw Twp.....	May 3.....	8	Locomotive.....	\$48
Twp. 2, R. 13.....	June 29....	200	Unknown.....	1,000
Twp. 3, R. 5.....	July 1.....	350	Fishermen.....	1,750
Twp. 3, R. 13.....	" 3.....	6,000	Lightning.....	24,000
Twp. 3, R. 14.....	" 8.....	780	".....	3,900
Twp. 1, R. 12.....	" 10.....	20	".....	10
Lobster Mt.....	" 10.....	1,920	Unknown.....	375
Twp. A, R. 12.....	" 12.....	4	Lightning.....	20
		9,282		\$31,103

## SOMERSET COUNTY.

Twp. 3, R. 3.....	June 29....	1	Unknown.....	\$5
Indian Gore.....	July 3.....	4	".....	20
Twp. 2, R. 1.....	" 4.....	2	Lightning.....	10
Twp. 2, R. 4.....	" 5.....	1	".....	5
Twp. 9, R. 17.....	" 5.....	300	Campers.....	1,400
Bald Mt. Twp.....	" 7.....	14	Unknown.....	40
Twp. 5, R. 5.....	" 7.....	2	Lightning.....	10
Twp. 2, R. 4.....	" 9.....	4	".....	40
Twp. 2, R. 7.....	" 10.....	1	Unknown.....	5
Jackman Pl.....	" 10.....	1	".....	5
Twp. 4, R. 5.....	" 14.....	1	Lightning.....	5
Pittston Twp.....	" 15.....	1	".....	5
Twp. 3, R. 4.....	" 24.....	1	Building burning.....	5
Boyd Town.....	Aug. 20....	10	Unknown.....	10
		343		\$1,565

## WASHINGTON COUNTY.

Twp. No. 19.....	June 24....	100	Fishermen.....	\$ 500
Hinckley Twp.....	" 27.....	1	Incendiary.....	10
Twp. No. 7.....	July 2.....	5	Surveyors.....	25
Twp. No. 25, M. D.....	" 3.....	500	Fishermen.....	200
Twp. No. 5.....	" 8.....	40	Bark crew.....	600
Hinckley Twp.....	" 9.....	1	Lightning.....	5
Twp. 6, R. 1.....	" 9.....	250	".....	1,750
Twp. No. 10, R. 3.....	" 10.....	1	Fire crackers.....	5
Twp. No. 24.....	" 10.....	1	Lightning.....	5
Twps. No. 7 & No. 10.....	" 10.....	75	Unknown.....	500
Twp. No. 31.....	" 10.....	75	".....	500
Twp. No. 21.....	" 10.....	1	Campers.....	10
Hinckley Twp.....	" 13.....	1	Fishermen.....	25
Twp. No. 31.....	" 13.....	200	Unknown.....	2,000
		1,251		\$6,135

## SUMMARY OF 1912 FIRES.

**Unincorporated Townships.**

County.	Acreage.	Damage.
Aroostook.....	98.....	\$ 750
Franklin.....	28.....	203
Hancock.....	5,102.....	17,385
Oxford.....	2.....	6
Penobscot.....	92.....	305
Piscataquis.....	9,282.....	31,103
Somerset.....	343.....	1,565
Washington.....	1,251.....	6,135
	<hr/> 16,198	<hr/> \$57,152

## PATROL AND LOOKOUT SYSTEM.

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Watchman Telephoning News of Fire  
from Lookout Station.

In the work of patrolling the two seasons of 1911 and 1912 there was a wide difference. The former season calling for really a larger number of patrols than the money available would warrant. In 1912 it was very late in the season before many patrolmen were put at work and at no time in the season did the number of employes anywhere near equal the number at work in the corresponding period of 1911. In some of the isolated sections, men were kept at work for the greater part of the season dating from July 1st, 1912 but in every

case where it was not necessary the men were taken off or not put at work at all, thereby making a great saving in that kind of work.

The telephone system has been improved during the past two seasons in nearly all parts of the district but there is considerable to be done yet to perfect that part of the fire system. More extended reference to the new lines will be found in the reports from the several chief wardens.

Three new mountain lookouts were built and put in operation during 1911, one on Bald Mountain in Twp. 4 R 3 N. B. K. P.; one on Williams Mountain in Twp. 2 R 7 B. K. P. W. K. R. and another on West Kennebago Mountain in T. 4 R 4 W. B. K. P. All of these were needed and did effective service. There are a number of locations where these stations could be placed to advantage and would lessen the danger from fire and at the same time reduce the patrol force, making a saving thereby. The locations of the stations are as follows:

No.	LOCATION.	CHIEF WARDEN.
1	Lead Mt., Twp. 28, Hancock County.....	Ezra N. Williams, Great Pond..
2	Pleasant Pond Mt., Caratunk.....	Albert Webster, Bingham.
3	Attean Mountain, Attean Twp.....	Burned 1908.
4	Tumble Down Mt., Twp. 5, R. 6, W. K. R.....	E. P. Viles, Skowhegan.
5	Squaw Mt., Twp. 2, R. 6, B. K. P., Piscataquis County	Louis Oakes, Greenville.
6	Snow Mt., Twp. 2, R. 5, Franklin County.....	E. P. Viles, Skowhegan.
7	Mt. Bigelow, Bigelow Twp., Somerset County.....	E. P. Viles, Skowhegan.
8	White Cap Mt., T. 7, R. 10, N. E. corner East Bow- doin College Twp.....	E. C. Mooers, Milo.
9	Spencer Mt., Middlesex Grant, Piscataquis County...	Edward Koite, Seboomook.
10	Rocky Mt., So. part T. 18, R. 12, W. E. L. S.....	H. B. Buck, Bangor.
11	Trout Brook Mt., Twp. 5, R. 9, Piscataquis.....	James W. Coady, Patten.
12	Otter Lake Mt., T. 3, R. 4, W. E. L. S.....	H. G. Tingley, Island Falls.
13	Mt. Chase, Mt. Chase Town.....	Leon Irish, Haynesville.
14	Ragged Mt., Twp. A, R. 9, W. E. L. S.....	R. H. Lancaster, Lagrange.
15	Mt. Kineo.....	Louis Oakes, Greenville.
16	Mt. Coburn, No. 3, Range 6, W. K. R.....	J. B. Comber, The Forks.
17	Wesley Mt., Wesley, Washington County.....	John R. Sullivan, Whitneyville.
18	Depot Mt., Twp. 13, R. 16, W. E. L. S.....	H. B. Buck, Bangor.
19	Soper Mt., Twp. 8, R. 12, W. E. L. S.....	H. B. Buck, Bangor.
20	Round Mt., Twp. 11, Range 8, W. E. L. S.....	H. B. Buck, Bangor.
21	Aziscoos Mt., Lincoln Pl., Oxford County.....	S. F. Peaslee, Upton.
22	City Camps, Twp. 4, R. 9, W. E. L. S.....	Katahdin Pulp & Paper Co.
23	Bald Mt., Twp. 2, R. 3, E. K. R.....	J. B. Comber, The Forks.
24	Kibbie Mt., Twp. 1, R. 6, W. B. K. P.....	L. P. Barney, Skinner.
25	Priestly Mt., Twp. 10, R. 13, W. E. L. S.....	H. B. Buck, Bangor.
26	Boundary (Bald Mt.) T. 4, R. 3, N. B. K. P.....	George G. Nichols, Jackman.
27	Williams Mt., T. 2, R. 7, B. K. P. W. K. R.....	L. P. Barney, Skinner.
28	West Kennebago Mt., T. 4, R. 4, W. B. K. P.....	S. F. Peaslee, Upton.

#### REPORTS FROM CHIEF WARDENS.

At the close of the season of 1912 many of the chief wardens made reports of the improvements and additions to the system in the sections over which they had charge. From these reports the following extracts are taken:

H. B. Buck, chief warden for the Allagash and St. John River systems in Maine says of his work in 1911: "The territory covered by this patrol includes ninety-five townships, embracing an area of 2,317,119 acres, valued at \$9,527,199 per State Assessors' report of 1910. The fire district tax of one and one half mills upon this valuation amounts to

\$14,290.80. In patrolling, this territory was divided as follows: Aroostook and Machias waters, including the Aroostook river watershed west of the Allagash branch of the Bangor and Aroostook Railroad; the Machias river watershed; and the territory adjacent to Spider Lake, Pleasant Lake and Harrow Lake on the Allagash drainage; the watershed of Churchill Lake; the watershed of Eagle Lake and the watershed of Allagash Lake and stream; the Allagash river watershed from the mouth to Churchill Lake; the St. Francis river watershed in Maine; the main St. John river watershed from the mouth of the St. Francis river to the mouth of Big Black river, and Little Black river in Maine; the watershed of the St. John river from the mouth of Big Black river to north-west branch of St. John river; the watershed of Big Black river in Maine; Depot Stream and Lake; the Canadian Boundary adjoining townships 15 R 5, 14 R 6, 13 R 6, 12 R 17, and 11 R 17; the watershed of Chemquassabanticook Lake and stream—the head waters of the Allagash.

“In addition to the telephone lines as enumerated in my reports to the Forest Commissioner for 1909 and 1910, the following lines were built in summer of 1911, by the patrolmen, at such times as patrolling was not necessary. M. E. Richardson with assistance of the patrolmen on the Aroostook river, extended the telephone line from the state camp at mouth of Mooseleuk, Twp. 8 R 8, to the sporting camp on Munsungun Lake in Twp. 8 R 10 a distance of about 15 miles. Messrs. Libby Bros. have sporting camps on the Aroostook river waters and they hauled the material from the railroad station at Masardis and furnished a team on the construction of the line, for the privilege of using the telephone.

“Harry E. Hasey, with his regular patrolmen, during wet times extended the telephone line from the Castonia farm on Twp. 16 R 12 to the mouth of Big Black river in Twp. 15 R 13. Claude L. Sawyer extended the telephone line from Hunter's farm in Twp. 14 R 14 down the St. John a distance of 10 miles to mouth of Big Black River on Twp. 15 R 13. This work was done by the patrolmen at different times during the season when the conditions did not require a patrol. The wire used was from that purchased in 1910 and shipped to H. E.

Hasey St. Francis and by his men boated to Big Black river. The telephone lines need to be gone over carefully each spring and put in good repair.

"As in case of the past several years, this territory was fortunate in that there were no large fires. The several small fires were extinguished by the patrolmen and duly reported on regular blanks.

"Upon notice that the state fund was practically exhausted and for that reason all patrols would be dispensed with on Aug. 15, 1911 excepting the watchmen at the fire lookout stations, I called a meeting of the landowners interested in the lands under my care. At that meeting I was authorized to continue the patrols for the remainder of the season, and assess the expense to each owner in the lands. The patrols were continued as so arranged at an expense to the said owners of \$1,936.

"In the spring of 1911 I put the men on early to follow the driving crews and I feel that many early fires were thus prevented. In this territory, located so far from railroads, our only hope is to keep fires from getting well started. When once under way, with the vast amount of inflammable material in the woods, I think it would be next to impossible to extinguish a fire, even with an unlimited number of men, until rain came to aid in the work. Therefore, I would urge that the funds available for this section be used for the prevention of fires, rather than reserve any great part for the possible extinguishment of fires once beyond the control of the fire wardens.

"In 1912 the same territory was under my charge as during the previous year. In this territory there are five lookout stations located as follows: One on Depot mountain Twp. No. 14 R 16; one on Rocky mountain Twp. No. 18 R 12; one on Soper mountain, Twp. No. 8 R 12; one on Round mountain, Twp. 11 R. 8; one on Priestly mountain, Twp. No. 10 R 13. The station on Rocky mountain was built by the land owners in 1907. The stations on Depot mountain, Soper mountain and Round mountain were built by the state in 1909. The station on Priestly mountain was built by the state in 1910. The state has living camps in connection with the above stations and also a camp on the St. John river near the mouth of Big

Black river in Twp. No. 15 R 13. This camp is used for storing fire fighting tools belonging to the State and general headquarters for the patrolmen. During the summer of 1912 owing to the favorable weather conditions, it was not deemed necessary to keep watchmen at all of these lookout stations. The station on Round Mountain in Twp. No. 11 R 8 on Machias waters in Aroostook County, and the station on Soper mountain in Twp. No. 8 R 12 Penobscot waters, in Piscataquis County, were not opened during the season.

"During the months of April and May the patrolmen then at work devoted most of their time to repairing the various telephone lines. During the winter, with the heavy snows and winds these lines get out of order and need to be thoroughly repaired each spring, to insure anything like satisfactory service when needed.

"The area patrolled equalled 2,317,119 acres, costing \$4,918.37 or a small fraction over two mills per acre.

"There were but two fires which got beyond the control of the patrolmen reported during the past season. On Twp. 19 R 12 Aroostook County, started July 7, 1912. Reported by Harry E. Hasey as burning over about 40 acres causing a damage of \$300; On Twp. No. 12 R 6, Nashville Plantation in Aroostook County, started July 11, 1912. Reported by J. B. Bartlett, as burning over 50 acres, causing a damage of \$400.

"No new fire fighting tools have been purchased by the state for this territory since 1909 and my report for that year gives a list of what was then on hand and the different locations where stored. From this should be deducted a certain amount for breakage and loss, though I am told the equipment is nearly complete.

"With the weather conditions as they were during the past season one not familiar with the nature of the work and the peculiar situation of this territory, would expect to carry on the patrol work with a much less force than was employed. But to get the proper men for the work, it is absolutely necessary to engage them early in the season, and having so engaged them, it is necessary to put them to work as near the usual time as possible. Then, too, after the men are once located on the patrols, it is impracticable to take them off, because of a wet period. The class of men best fitted for sat-

isfactory patrol work need, and can command, steady employment, and in this remote territory, one must figure on employing a certain number of men, even though the season, as the one just past, is a most favorable one. In no way is the old saying "an ounce of prevention is worth more than a pound of cure" more applicable than in the matter of protection of our forests from fire.

"The more I have to do with the work the more firmly convinced I am that our greatest efforts and expenditures of money should be directed toward an efficient patrol, with the hope of discovering fires in season to be extinguished by the patrol, and thus prevent a large conflagration, the extent and damage of which cannot be estimated. The results obtained from the patrol in this northern district during the past eight years clearly demonstrate that an efficient patrol does protect."

Chief warden E. C. Mooers of Milo submits the following report of the work done in patrolling and extinguishing fires in the District comprising the territory of the East and West College Grant; T. 7 R. 9; Elliottsville Plantation; Katahdin Iron Works; T. 5 R. 9; A. R. 11; A. R. 12; B. R. 11; Lakeview Plantation; Barnard; 4 R 9, for the years 1911 and 1912:

"After my appointment as chief fire warden in the spring of 1911 I had hardly gotten patrolmen on the ground and arrangements made for systematic patrolling of the district when on account of the extremely dry weather numerous and extensive fires broke out in several localities which threatened to destroy large areas of valuable timber land.

"The chief of these fires started on Boardman mountain in Township A Range 12 and assumed such alarming proportions it was deemed advisable to put an extra force of men on the ground at once. In order to obtain the large number of men necessary for dealing successfully with the alarming conditions, application was made to Mr. E. M. Hamlin, Manager of the American Thread Company, in Milo, who immediately shut down his works and turned over his entire crews to the service of fighting the fires. Through the courtesy of Vice President Todd of the B. & A. Railroad a special train carried these men to the scene of the conflagration. By means of this large additional force everything that could be done to check the spread of the fires was accomplished although on account of the ex-



*Loading a schooner with lumber, South Gardner*



ceedingly bad conditions that existed the results were not wholly satisfactory and a large area was burned over before the welcome rains which followed extinguished the fires and for the time being removed the dangerous conditions. Later, however, although the long drought brought a return of these conditions, since the expense of fighting the numerous forest fires throughout the state had more than exhausted the appropriation made for this purpose, by your orders the patrolmen were taken off and for the rest of the season the only protection to the district was afforded by the lookout men on White Cap mountain whose only means of reporting an outbreak of fires was by a roundabout telephone route through Roach River and Greenville, which proved rather unsatisfactory on account of its poor condition and the large number of stations connected with it.

“On the whole, considering the unusually long period of dry weather and the very bad conditions which existed during the greater part of the summer, the district was exceedingly fortunate in escaping even more serious conflagrations than those that occurred; for while the men employed as patrolmen were on the whole efficient and conscientious workers the abnormal conditions obtaining throughout the season rendered their efforts less satisfactory than would have otherwise been the case.

“The spring of 1912 opened up with much better promise for the safety of the forests than that of the preceding year, but the experience gained during the previous summer taught that the means of protecting the forests were very inadequate in a very dry time. Accordingly after receiving appointment for the next year we immediately repaired the telephone line from North Brownville to B. Pond, a distance of 25 miles, which was owned by Messrs. McNulty and Whittier of Bangor, with whom I had made arrangements whereby the use of this valuable means of reporting fires was obtained in return for the work laid out upon it. Later this line was extended to the summit of White Cap mountain, a distance of about eleven miles, thus establishing direct communication between this point and the central office at Brownville. By means of this line most of the patrolmen could have daily communication with the lookout man and the chief fire warden.

"We also repaired the line from White Cap station to Roach River, which, on account of the lumber operations in this section during the previous winter was down in several places and rendered entirely useless. This covered a distance of about eleven miles and when repaired formed a reliable means of communication in this direction, making connection with the central office at Greenville. When this work was done we had repaired between 35 and 40 miles of old line and constructed 11 miles of new, about 16 miles of which is the property of the State while 11 miles is owned jointly by the State and Mr. C. H. Randall. These have been kept in repair during the summer and are now in good condition.

"The conditions of the past summer have been so favorable that the number of patrolmen employed in this district has been very small and their term of service short. No serious fires have occurred although several which would have proven such were discovered and reported through the vigilance and efficiency of the lookout man in time to prevent their doing much damage. These fires were fully reported at the time of their occurrence and were undoubtedly the result of lightning.

"In closing I will add that under ordinary conditions the system now employed is fully adequate for the protection of the district in so far as it is possible to protect such a large territory with limited means. The telephone is proving a most efficient instrument for reporting incipient fires and with well placed look-out stations manned by reliable and vigilant men a large territory can be protected at a moderate expense. As is the case of fires occurring in buildings, the factor of time is a most important one and every means should be employed to get men on the ground at once for after a forest fire gets well under way in a dry time the efforts of a multitude of men are likely to prove of but little avail.

"In regard to the system employed at the present time in my own district, I would recommend its extension and perfection rather than a change to any other. The telephone should be employed more widely as a means of reporting fires and of keeping in touch with the patrolmen and look-outs. In fine the things which seem to me to be most important in this connection are the following:

1. To have as reliable and efficient men as possible in charge of lookout stations, men who may be relied upon to remain on duty at all times during dry weather.

2. To employ as patrolmen only men who are acquainted with the woods and have had experience in camp life.

3. To instruct all patrolmen to report at regular and definite times to the lookout and to the Chief Warden.

4. To have each patrolman keep a record of the names of all hunting parties and campers that he may meet.

5. For the chief warden to visit his patrolmen frequently, keep them well supplied with fire notices, see that they are posted at frequent intervals and keep each patrolman acquainted with his duties."

L. P. Barney, chief warden at Skinner says: "In the spring of 1911 a fire station was built on Williams Mt. and was put in operation early in the spring. As an illustration of the value of this particular station, on July 5th 1912 a watchman located a fire near Brassua pond and on July 10th a fire was noted on the west part of Misery, near Cold Stream pond. The first fire started by lightning and the other by some heedless person dropping a match. Had it not been for this station and telephone connections, a great deal of damage would have been done. As it was, in three hours from the time the lookout notified me, we had a dozen men on the job with good results. Both fires were extinguished at a cost of \$150 to the state and the land damage was very small, wherein, had it not been for the station the fire no doubt, would have gotten a big headway burning over numbers of acres. Another season a telephone line should be built from Jackman to Skinner in order to have outside connections from Kibbie Mt."

S. F. Peaslee, chief warden for Franklin and Oxford Counties reports that the bulk of the improvements made in his territory during the past two seasons consisted of a lookout station built on West Kennebago Mt. in Oxford County. About two and one-half miles of telephone line was used to connect said station by telephone.

C. C. Murphy, chief warden of the Rangeley section writes us in reference to the Kennebago Lookout: "In addition to the actual service received from this station that it has a good effect upon the many summer visitors in that section as the

visitors are greatly interested in the working of the station and a great many take a trip to the top of the mountain to see it. It shows them the danger of forest fires and they see the necessity of being careful with their camp fires."

Geo. G. Nichols of Jackman writes us "Regarding improvements for fighting forest fires in this district in the year of 1911 that a fire station was established and a camp built on Bald Mountain Boundary and a long distance telephone was connected through the Heald Pond Camps.

"In 1912 a good trail was cut from Heald Pond Camps to the top of said Bald Mountain and a good cellar has been made at the camp.

"At Wood Stream in Dennistown, a trail has been cut from the East Branch to the West Branch dam, a distance of two and one-half miles. Some work was also done on a trail from the Harris and Holden saw mill to Little Churchill Stream.

"In this district a small amount of trail-cutting was done as the season being so wet, not much patrolling was found necessary.

"The telephone connection at Heald Pond from said Bald Mt. Boundary is not satisfactory and I suggest as a matter of much importance that direct connection be made with the central office at Jackman.

"I further suggest that better results will be obtained by further establishment of lookout stations on the surrounding mountains and less money spent for patrolling."

Fred C. Knowlen, chief warden at Stockholm writes: "There is no lookout station in my district, and all the telephone that the state owns any interest in is some four or five miles that was put up in April 1912 by Mr. John Yerxa to connect his sporting camps with a private line owned by the Stockholm Lumber-Co. The material was furnished by the Maine Forestry District. Much could be done to improve the service here, but the most important to all parts of the district would be a lookout station on one of the high hills on Twp. No. 15 range 6. The place is easy of access and would cover not only my entire district but as large an area to the south and west.

"Since the state took up the work of patrolling the forest, we have not lost any timber by fire, worth mentioning, the patrols being able to get men on in time to prevent the fires from spreading for more than a few hours at the start. This is partly due to prompt action on the part of the patrols and the hearty coöperation of the citizens of this section has had much to do with the control and extinguishment of the many fires that have sprung up from time to time."

Leonard A. Pierce, chief warden of Houlton says "The only new telephone line with which I have had any particular connection has been that from the Square Lake Camp on Twp. 16, Range 5, to Stockholm. It seems to me that in the wild townships near the settlements and in the plantations where it is not the custom to have patrolmen that the pay of the deputy wardens should be increased. If the warden is any good at all and takes any interest in the protection of the territory, under his charge, he necessarily spends a good many parts of days in watching over such which he does not receive any pay for. Furthermore, most of the wardens in such localities are farmers and fires frequently occur during their busiest seasons, for this reason, is it impracticable to pay them for time not actually spent in patrolling or fighting fire, it would seem to me that a slight increase in pay for them would not only be just to the men but would aid in maintaining the personnel of the service and consequently improve its efficiency. When the men are working on straight time, the same arguments do not apply, but the land owners in this vicinity, and I, have had hard work to persuade some of our best deputies not to resign."

James W. Coady chief warden for the East Branch waters writes: "The lookout station on Trout Brook Mt. in Twp. 5 R. 9 Piscataquis Co. has been placed under excellent repair and ought to last for six or eight years. A telephone line has been put in from the lookout station to the Trout Brook line a distance of three miles. There is now a through connection with the Patten central office and greatly facilitates matters. A good trail has been swamped from the Trout Brook tote road to the lookout station. The Mt. Chase station is in good condition and a fine trail has been made to the lookout."

Chas. W. Burr, chief warden for the Chesuncook region writes: "A change has been made in the telephone line running

from the Spencer Mt. lookout to Roach River, which has never given the best of satisfaction. Another season it is planned to have it run from Grant farm to the Spencer Mt. and thus continuous service can be had without the delay and trouble that has been experienced. Much less patrolling was needed in 1912 than for several seasons. Arrangements were continued for use of motor boat when necessary."

Louis Oakes, chief warden for Moosehead Lake sections says: "The work in this district during the past season has been mainly repairs. On Squaw Mountain and Kineo Mountain trails and telephone lines have been kept in good condition. For permanent improvements another season would suggest the building of a watchman's camp on Squaw Mountain about two and one-half miles from the summit where there is a good spring of water situated near the trail leading from the station."

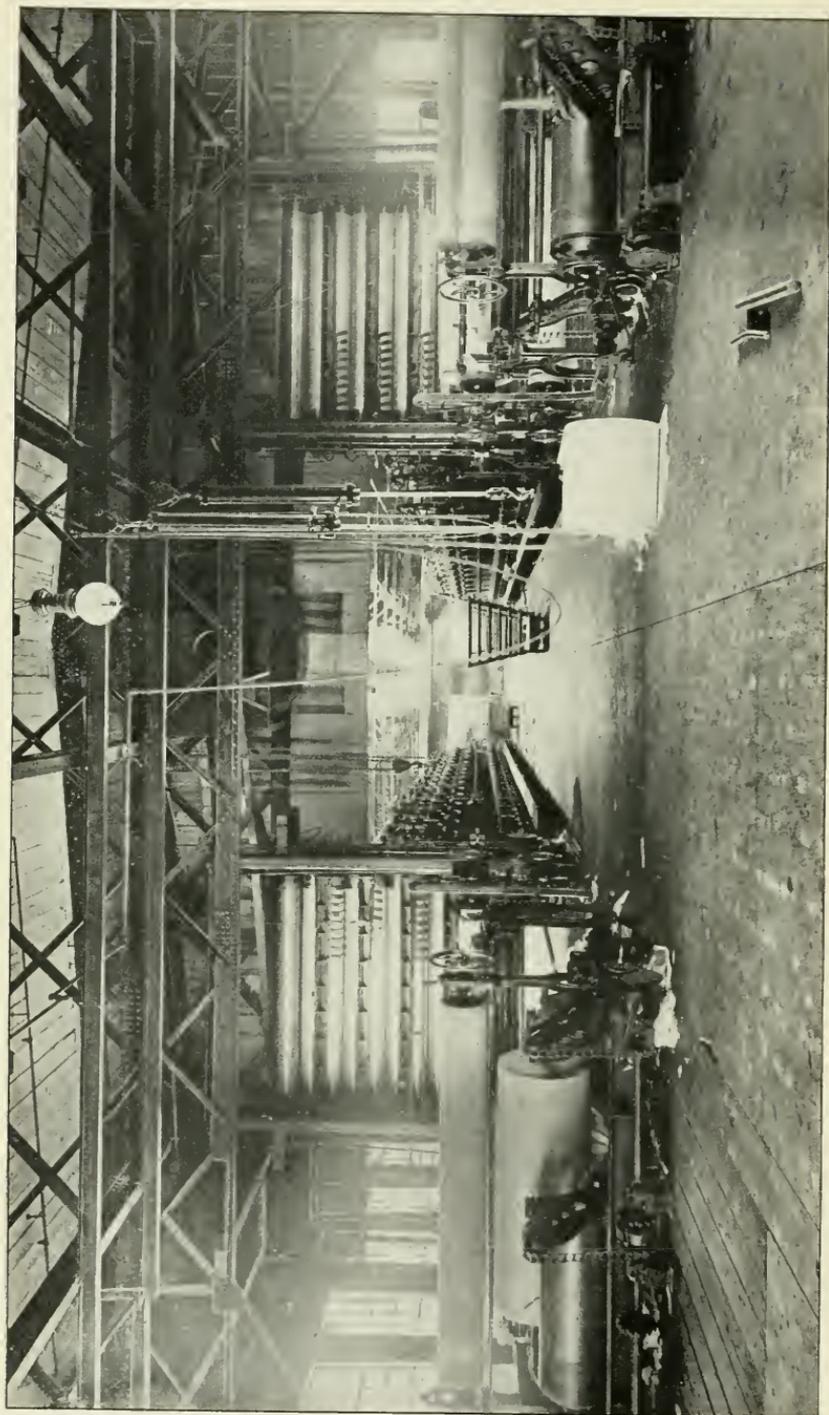
Leon C. Irish, chief warden for the southern Aroostook division says: "In the past two years a telephone has been built through Reed Pl., Macwahoc and up Silver Ridge which is a great benefit in controlling fires, and other lines have been built in different places which help the system very much. In the way of new lookout stations, I think we should have one on top of Crow Hill in the town of Linneus and one on top of Peckaboo Mt. in the town of Weston. By doing this five or six patrolmen could be dispensed with making less expense."

R. D. Porter, chief warden for the Portage Lake region strongly recommends the building of a lookout station and new telephone lines in his district as there are none now located in that section and he believes that it would greatly lessen the danger and also the expense of patrolling.

D. G. Lane, chief warden for the St. Croix waters says: "There has been nothing accomplished along the line of telephone construction in this locality except the New England Co. built in 1911 from Danforth to Brookton, a distance of 12 miles with the intentions of connecting with their line at Princeton, but it has not been completed."

A. B. Haynes, chief warden for the Jo Mary Lake section writes us: "The telephone lines have been thoroughly repaired from Norcross across Indian Twp. No. 4 to Cooper Brook and a new line put up around South Twin Lake; also a new line built from the main line to the lookout station on Ragged





Paper Machine Room of Pulp and Paper Mill

Mountain. Three new telephone instruments have been put in, one at the post-office at Norcross and the other two at convenient points along the line. Patrolmen have improved the woods trails and fire tools have been distributed at each section making it possible for them to extinguish small fires without summoning extra help. Tools have also been placed at Yoke Pond at Wadleigh's camp on Gulliver Brook, at Lewis Ketchum's camp on Rainbow Town, at Chas. Daisey's camp on Sourdnhunk Lake, at Alex Resignol's Millinocket Lake, at Stephen Cunningham's camp at Norcross and at the camps at Jo Mary Lake.

"I have batteaux and canoes suitable to take a crew of men, tents, supplies and with the excellent telephone line to Millinocket could, if a fire starts, place a crew on the spot in a few hours which is the key to the situation in lessening fire danger."

Albert F. Webster, chief warden who looks after the Lower Somerset and Franklin County townships writes: "In my district there has been no building of telephone lines or lookout stations, nor do I think that these things are necessary in this particular district. In other parts of this section the lookouts and telephones are in good order, and have rendered valuable service in the prevention of fires, I consider these appliances of greatest importance, and they should be kept up to the highest state of efficiency. It is also necessary to have some of the country covered by patrolmen."

William H. Hinckley, chief warden for the south branch of St. John river waters advocates the building of telephone lines throughout the townships in that portion of the district, stating that there are no high mountains on which lookout stations could be placed to advantage.

E. P. Viles, chief warden for the Dead River region, reports his territory as practically free from any disastrous fires. Only a few patrolmen have been employed in that region, more dependence being placed on the watchmen on the lookout stations. The telephone lines have been kept in good repair throughout both seasons.

Chief warden, Ezra N. Williams of Great Pond having the townships in the northern part of Hancock County under his control reports that the different deputies are well supplied with fire tools and about eight miles of telephone line has been built

from Great Pond to Brandy Pond, with two new instruments, making a difference of getting a crew onto those townships of from five to eight hours. Mr. Williams recommends that a telephone line be built from Aurora to Twp. No. 28 a distance of about nine miles.

## FINANCIAL STATEMENT.

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The money available for the use of the Maine Forestry District for the years 1911 and 1912 consisted of a balance of \$9,576.77 from 1910 the assessed tax of \$67,922.47 for each year together with sums received from the federal government \$9,986 in 1911 and \$6,508.50 in 1912, making a total of \$161,916.21.

While there was a small balance carried over from 1911 to 1912, there was in reality a large deficiency, owing to the fact that when it was seen that the money available for the use of the Forestry District was not sufficient to pay the fire bills, the timber land owners came forward and paid bills amounting to nearly \$50,000.

The favorable season of 1912, with the few bad fires and little need of patrolling except in isolated places resulted in a saving of about \$40,000. Had it not been for the large deficiency of 1911, the balance remaining would make a good reserve fund, but in paying the timberland owners the amounts due them, the surplus will be entirely wiped out.

At about the time this report was sent to the printers an offer was made to those to whom the Maine Forestry District was indebted, to settle their accounts on the basis of 80 per cent, there being just about money enough to do that and start 1913 free of debt. While a few had accepted the proposition it was not known what the others would do, and a settlement on the above basis depended upon all accepting.

A summary of expenditure for the two years follows:

## SUMMARY FOR 1911.

Chief Wardens .....	\$ 8,353.93
Deputy Wardens .....	493.91
Expense Extinguishing Fires .....	20,980.44
Lookout Stations and Telephone Lines .....	7,428.01
Patrolling Account .....	30,074.76
Tools and Supplies .....	1,076.70
Other Expenses .....	1,969.61
	<hr/>
*Total .....	\$70,377.36

\*This total does not include the \$9,986 paid by the federal government for patrolmen and watchmen on lookout stations.

## SUMMARY FOR 1912.

Chief Wardens .....	\$ 4,702.54
Deputy Wardens .....	366.71
Expense Extinguishing Fires .....	14,187.04
*Lookout Stations and Telephone Lines .....	1,737.79
Patrolling Account .....	8,582.37
Tools and Supplies .....	166.67
Other Expenses .....	1,633.12
	<hr/>
**Total .....	\$31,376.24

\*This sum does not include the \$6,508.50 paid in salaries to the watchmen, by the federal government.

\*\*This total was for the money expended up to Nov. 15, 1912.

## FEDERAL COOPERATION.

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After the passage by the National congress of the act known as the Weeks bill, steps were taken by the Maine Forestry department early in 1911 towards getting a share of the funds available under that act. Considerable correspondence passed between the State and federal government relative to terms, allotment, etc. and a trip to Washington for a personal conference with the federal authorities was made in June. As a result of this conference an allotment of \$10,000 was made for Maine in 1911, the maximum amount allowed any state and only one other state, Minnesota, received a like amount. One of the conditions under which any state could receive aid was that it should have an organized fire system and a special appropriation. The Maine Forestry District met these requirements in all respects.

Under the terms of the bill only such watersheds could receive the benefit of the coöperation as were included in territory drained by navigable streams within the state. In drawing up the agreement for 1911, the watersheds of the Kennebec, Penobscot, Union and Narraguagus rivers were decided upon as applicable.

Detail of the coöperation is shown from the following extracts taken from the report made to the federal government at the close of the season 1911:

### PATROLS AND LOOKOUTS.

“Owing to the early drying of the underbrush and lack of moisture in the forests the patrolmen were placed upon their trails along the river systems several weeks sooner than contemplated. During the month of May there was an average of

102 men at work, 80 of these men being located on territory afterwards designated under the coöperative agreement, as Federal territory. In addition to the regular patrolling, watchmen were sent to the lookout stations in the several counties.

"In June the average number of men on patrol was 143 and of this number 98 were located within the Federal territory. All of the lookouts were in service.

"In July the coöperative agreement having been signed between the Federal Government and the State of Maine, whereby the United States Forest service allotted to Maine, \$10,000 of the appropriation for protection of the forests, under the terms of the "Weeks Law" it was decided, after due consideration, to place the larger number of patrolmen upon the Federal pay roll, particularly as the large expense of fighting the many forest fires that were raging, was fast diminishing the State appropriation.

"As a consequence 128 men were designated as federal patrolmen and assigned work in the counties included in Kennebec, Penobscot and Narraguagus watersheds. These men were kept at work watching for fires along the trails of fishing streams, railroads, territory around the hunting and sporting camps and other dangerous places. Thirteen watchmen on the lookouts within the designated districts were included in the list of federal employees for July. These men remained at the stations on the high mountains maintaining a constant watch over a large area, ready to telephone at any moment the first sign of smoke seen in any direction, always notifying the chief warden of some person nearest the point where the fire was apparently burning.

"The large number assigned to the Federal work for July used the most of the Federal allowance as the pay roll forwarded to Washington for that month amounted to \$8,949.50. In addition to the men included in the Federal list the Maine Forestry District had at work and paid for 34 patrolmen and two watchmen within the federal lines. Outside the federal district the State had in July an average of 52 patrolmen and nine watchmen.

"In August the Federal government paid the salary of 12 watchmen on the lookouts amounting to \$879.00. All of the patrolmen were paid by the state but owing to the lack of funds

practically all patrolling was discontinued by August 15. The average number of patrolmen employed up to that date was 106 within the Federal district and 50 outside. The Federal government paid the salary of four watchmen for work in September, which practically used up the allotment of \$10,000.

### *Permanent Improvements.*

"During the past season three new lookout stations were completed and equipped, two of these stations, the Boundary Bald Mt., located in Township 4, Range 3, North of Bingham's Kennebec Purchase, and Williams Mt., located in Township 2, Range 7, Bingham's Kennebec Purchase West of the Kennebec River, are within the limits of the Federal District and both on the Kennebec watershed. The third station, West Kennebago Mt. is located in Township 4 Range 4, West of Bingham's Kennebec Purchase in Oxford County outside of the Federal limits.

"Boundary Bald Mt., was built at a cost of \$538.77 the construction of the building costing \$140; furnishing and supplies, \$43.36; telephone line and equipment, \$355.41. The construction of the building for Williams Mt. cost \$46.39; furnishing and supplies, \$30; telephone line and equipment, \$106.95, making a total of \$183.34. The total cost of the West Kennebago station was \$190.34, there being paid for construction of the building, \$45.20; furnishing and supplies, \$131.07; telephone, \$14.07.

"In addition to the construction of the new stations, new telephone lines for other stations and patrol service, have been constructed, general permanent repairs made and new outfits purchased, bringing the total expense for this kind of work for the season, up to \$1805.19.

"Shovels, pails, mattocks and axes were purchased to the amount of \$367.03 and distributed where the old tools had become useless or where additions were needed. Sixteen new tool boxes were constructed at a cost of \$159. The total amount expended under the head of permanent improvements has been \$2,331.22."

## COOPERATION IN 1912.

The agreement for 1912 was signed by the federal and state departments in April. The territory was increased by the addition of townships included with the water sheds of the Androscoggin and Machias rivers. The allotment for the season was the same as for 1911, \$10,000 but only \$6,508.50 was expended.

It was understood by the state department that the allotment could be used to pay the salaries of either lookout watchmen or patrolmen. However, after paying for a number of patrolmen who were employed within the lines of the federal district in the month of July the federal office, in charge of state coöperation notified the forest commissioner that no more patrolmen would be paid. This limited it to the watchmen on the lookout stations and the short season did not require only about two thirds of the allotment.

Twenty lookout stations came within the federal district under the 1912 agreement and the payment of the salaries of the men on these stations of course relieved the Forestry District.

There is no question as to the advisability of the federal government continuing an appropriation for the coöperative work as the good accomplished in this state cannot be measured wholly in dollars especially in such a season as 1911. From advice received from the federal department the end of the appropriation of \$200,000 is in sight and the limit of allotment to any state for 1913 will be but \$7,500. This amount Maine expects to get. Future increased appropriation by congress will be advised and is anticipated.

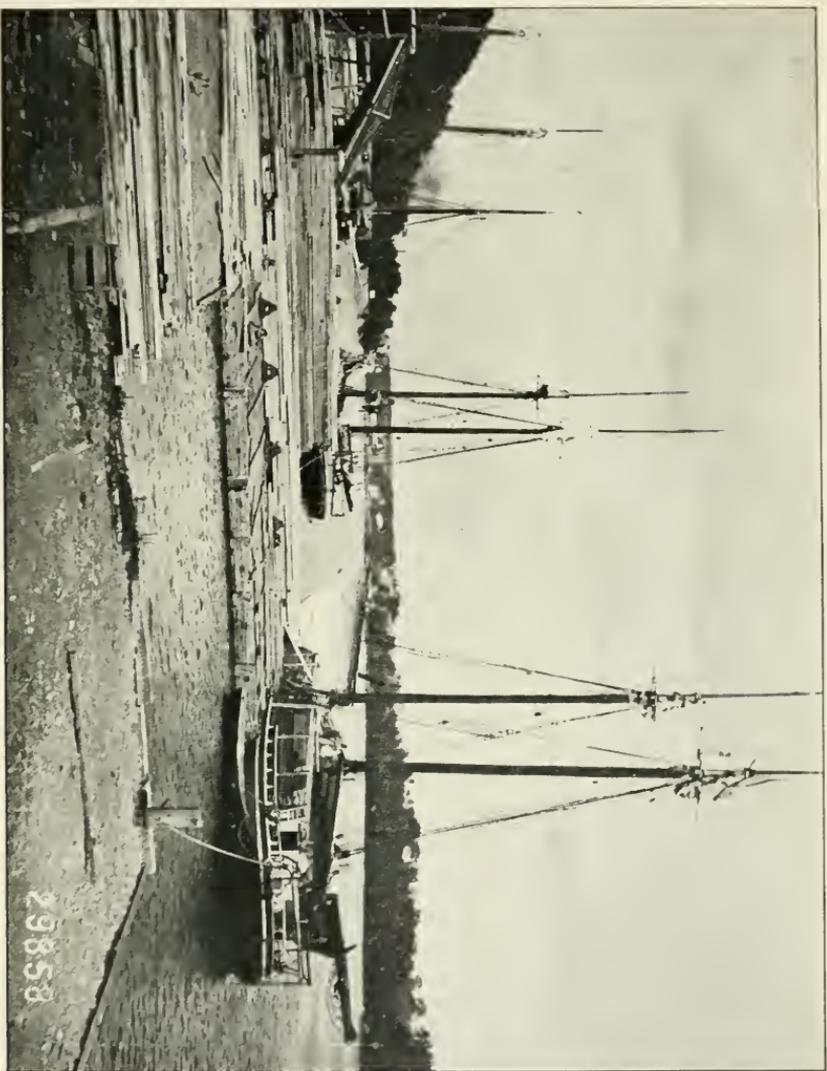
## FORM OF AGREEMENT.

The form of agreement between the Secretary of Agriculture and the state for the protection from fire of the forested watersheds of navigable streams is as follows:

## UNITED STATES DEPARTMENT OF AGRICULTURE.

Agreement for the protection from fire of the forested watersheds of navigable streams under section 2, act of March 1, 1911 (36 Stat., 691).

This agreement, made by and between the Secretary of Agriculture of the United States, under authority of Section 2 of



Vessels taking on cargo, Bangor



the act of congress approved March 1, 1911 (36 Stat., 691) and the State of . . . . . by and through its State Forestry Commission, witnesseth:

That, whereas, the said State has requested the coöperation of the said secretary in the protection from fire of the forested watersheds of navigable streams; and

Whereas, the said state has provided by law for a system of forest-fire protection;

Now, therefore, the said parties do mutually promise and agree with each other as follows:

1. To establish and maintain a coöperative fire protective system covering any or all private or state forest lands within the State of . . . . . and situated upon the watersheds of navigable rivers; and to furnish for this purpose Federal and State patrolmen or to take such other protective measures as may be deemed advisable, under the conditions hereinafter provided.

2. The state commission shall furnish maps showing the watersheds and areas which are proposed to be protected under this agreement. The coöperation shall be limited to such watersheds and areas in so far as they shall be approved by the secretary. The said commission shall indicate the periods during which protection from forest fires is proposed under this agreement; the number of patrolmen, with their stations, which will be employed by the State; the character and extent of other protective measures which it is proposed to put into effect at the expense of the state; and the localities in which it is desired to place Federal patrolmen furnished by the Forest Service.

3. The State commission shall secure for the Federal patrolmen furnished under this agreement, by appointment as deputy State fire wardens or otherwise, without additional compensation, such police powers for the prevention and control of forest fires as may be granted under the laws of the State of . . . . ., and shall equip such Federal patrolmen with such fire-fighting tools or devices and shall authorize them to employ such assistance in fighting fires as its funds and the state fire laws and regulations will permit.

4. The State forester of . . . . ., acting as employee of the state commission, shall be appointed collaborator in the Forest Service in the United States Department of Agriculture at the salary of one dollar (\$1.) a month, and acting in such capacity shall have direct charge of the force of Federal patrolmen employed under this agreement. The State forester shall select the Federal patrolmen, subject to approval by the secretary, instruct them in writing as to their duties, supervise their work, and certify to their services on pay rolls of the Forest Service.

5. The Federal patrolmen so selected shall be appointed as temporary laborers in the Forest Service at a per diem rate not exceeding

..... dollars (\$....); provided that they shall be employed exclusively in the protection of areas on the watersheds of navigable rivers which shall have been approved by the said secretary.

6. The total sum to be expended by the Federal government during the term of this agreement for the purposes of this agreement may equal but shall not exceed ..... dollars (\$....); but in no case shall the amount expended by the Federal government in any Federal fiscal year exceed the amount appropriated by the said state for and expended by it during the same period for the purpose of protecting from fire forested watersheds of navigable streams in said state.

7. Payment for the services of Federal patrolmen employed under this agreement shall be made at the end of each calendar or fractional month on vouchers certified by the State forester as collaborator, and forwarded to the Forester, Forest Service, Washington, D. C., provided that no patrolmen will be employed except during the real danger season from forest fires on the watersheds and areas approved by the Secretary under this agreement.

8. The said secretary and his authorized representative shall have full authority to inspect the protective areas and the force herein authorized, and at his option, by giving the state commission written notice, may withdraw his approval of any such area or portion thereof, or terminate the employment of any Federal patrolman or patrolmen or of the State forester as collaborator in the Forest Service.

9. The State forester shall be responsible for seeing that each patrolman keeps a vigilant lookout for forest fires in or threatening his district, and that he makes every possible effort to extinguish such fires as occur whether they are on lands belonging to the State, the Federal government, or a private owner, provided that during the patrol period when in the judgment of the State Forester patrol is unnecessary the patrolmen may be used on other fire-protection work. The State forester or his representative shall from time to time make such personal inspection of the cooperative fire-protection work done under this agreement as may be necessary to promote the effectiveness of said work.

10. The said State forester shall, with respect to all private forest land afforded protection against fire under this agreement, use every proper means to bring about the active cooperation of the owner in such protection, including aid from him in the form of hire of one or more patrolmen, construction of permanent improvements, and the like.

11. Both the State commission and the Forest Service of the United States Department of Agriculture shall have equal right to publish the results of the cooperation under this agreement: Provided, that any results intended for publication, except press notices of momentary or local interest, be approved by the commission and by the secretary. In all such publications it shall be plainly stated that the results were secured through cooperation between the commission and the secretary.

12. This agreement shall terminate on the thirty-first (31st) day of December, 1912: Provided however, That it may be renewed, and be in force thereafter, from year to year, by mutual consent of the parties hereto, expressed in writing.

In witness whereof the said commission has hereunto caused its name and seal to be affixed by its proper officers, on the ..... day of ....., and the said Secretary has hereunto set his hand and affixed his official seal on the date below written.

.....

*President, State Forestry Commission.*

.....

*Secretary of Agriculture.*

Signed and sealed by the Secretary of Agriculture this ... day of .....

## CO-OPERATION WITH NEW HAMPSHIRE.

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Early in the season of 1910 through correspondence with Hon. E. C. Hirst, state forester of New Hampshire, a system of coöperation was entered into whereby Maine gets the benefit of the Kearsarge Mountain station, located in Chatham, N. H. This station can be reached by telephone through North Conway and it overlooks a considerable territory in Maine. Other stations overlooking Maine forests near the border are contemplated by New Hampshire. In return for this service the Maine Forestry District gives to the bordering state any information of fires discovered from the Aziscoos Mountain station, located in Lincoln Plantation, Oxford County, which has a view of quite a number of thousand acres of forests across the border line.

According to the agreement entered into between the foresters of the two states, when a New Hampshire lookout man discovers a fire in Maine he shall immediately telephone to the fire warden for the township where the fire is located, such telephone bills to be paid by the Maine department at the end of each month. Likewise when a Maine lookout man discovers a fire in New Hampshire he shall immediately telephone the fire warden nearest said location and for such telephone service New Hampshire department is to pay the bills at the end of each month.

REPORT FORESTRY DEPARTMENT OF THE UNIVERSITY OF MAINE TO THE FOREST COMMISSIONER. NOVEMBER 1ST, 1912.

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To the Honorable Frank E. Mace,  
*Forest Commissioner,*  
Augusta, Maine.

Sir:—

I have the honor to submit the following report of the Forestry Department for the years 1911 and 1912.

The Forestry Department of the University of Maine was established in 1903. It is, therefore, the oldest undergraduate school of forestry in continuous existence in the United States giving a four years course. In the state of Maine where the lumber and pulp interests are so great, the need of such a department was early recognized. The object of the department is to promote forestry throughout the state and to provide a body of men suitably trained for the intelligent handling of forest land. Beside extension work and the general propagation of information on forestry subjects throughout the state the department strives to reach two classes of students—first, agricultural students who should have some knowledge of forestry for the conservative handling of wood lots, and second, students who intend to make forestry their profession. For the first class a course of lectures on forestry in general is given for two hours each week during the spring semester of each year. This course is required of all agricultural students and it may be further supplemented by electing any other forestry course for which the student has had sufficient preparation. For the second, a complete curriculum for the entire four years has been arranged and is required of all students electing forestry as their major subject.

## CURRICULUM.

This curriculum is arranged to serve as a basis not only for practical work in forestry but also for a liberal education. During the first two years much attention is given to biology, chemistry, and civil engineering, all of which are important fundamentals upon which are built the more technical forestry courses. A knowledge of the principles of forestry in its various branches is given to the student and considerable practical work is done in silviculture, mensuration, lumbering, and management. The wood lands belonging to the University, together with adjacent lands covered by young growth, furnish a field for the study of many forest problems. Field trips are made and demonstration thinnings and plantings made at various places throughout the state. Particular attention is given to the collection and presentation of statistical data in report form.

Detailed descriptions of the courses, as well as scholarships and prizes offered by the University, may be found in a special catalog of the Forestry Department, which will be mailed to anyone upon request.

The instruction in this department consists of lectures, recitations, laboratory and field work; the latter consuming a considerable portion of the scheduled time during the junior and senior years. Instruction in technical forestry subjects is given by the professor in charge of the department. This is supplemented by work given in other departments of the University. Five recitation hours a week of successful work for one semester entitle a student to one credit, and a minimum of seventeen hours a week leading to three and two-fifths credits is required. A total of thirty credits, or one hundred fifty semester hours, is required for graduation. Upon the completion of this work the student received the degree of Bachelor of Science in Forestry. Students who complete this curriculum are admitted to advanced standing in most graduate schools of forestry and are thus able to shorten the time required to obtain a Master's degree.

Graduates are prepared to go directly into practical work and up to the present time there have been good opportunities for obtaining such work. There are also openings for students to

obtain work in the Maine woods during the summer vacations while pursuing the course, and many take advantage of the opportunity to get practical experience and at the same time aid in defraying the expenses of their University education.

A course in wood technology has been added to the curriculum during the current year. This course is at present elective for seniors majoring in Forestry and for other students who have passed general biology and plant morphology. It will later be made a part of the regular requirements for the Forestry Department. Other courses are needed and will be established as soon as sufficient funds and a suitable teaching force can be secured.

#### OBJECT OF THE CURRICULUM.

The object is to give the student the best possible preparation for his future work, either in actual forest management or in the further pursuit of the subject at one of the graduate schools of forestry. The curriculum is not an easy one and is suitable only for students who have good health and a strong constitution, and are moreover able and willing to stand considerable physical as well as mental exertion. It is meant to prepare men for the requirements of the actual work that they will have to do after they have completed their college education, and it is by no means a sanitarium for those who simply desire to lead an out-door life.

#### REGISTRATION.

The freshman registration for 1911-12 was 18. This is 50% more than for the previous year and makes a total registration of 44 students majoring in forestry; beside this there are 85 students in other departments who are taking one or more courses in forestry, making a total of 129 students under instruction during the year. 21 freshmen registered in the fall of this year (1912); an increase of about 17% over last year. Which shows that the Department is steadily growing.

#### DISTRIBUTION OF STUDENTS.

Of the 44 students registered in 1911-12, 33 are from Maine, 8 from Massachusetts, 2 from New York, and 1 from Penn-

sylvania. This shows that while 75% of the students are from Maine the school is not unknown outside of the state.

#### EQUIPMENT.

During the year the equipment has been considerably increased. Among the important acquisitions are a barograph, camera, compasses, aneroid barometers, tapes, and other smaller articles. A room in the upper hall of the Agricultural building has been equipped with cases and cabinets for the display of forest tree seeds and other forest products, and for the storage of wood specimens. This collection of woods now includes some 40 different species and will be added to materially during the coming year. It promises to be one of the most useful and instructive adjuncts to the general equipment. Besides small hand specimens for use in laboratory work, sample boards 4 feet long and 8 to 12 inches wide have been secured of many species. These are planed on one side and rough on the other, thus showing the appearance of the wood in all stages of manufacture. An extensive collection of photographs from originals on file in the United States Forest Service has also been secured. These cover the whole field of lumbering, silviculture, and forest products. A set of lantern slides, showing logging operations in Maine from the construction of the roads in summer to the end of the drive, has also been secured during the year.

The collection of books in the library pertaining to forestry subjects is being continually increased as rapidly as the funds available will permit.

#### FORESTRY CLUB.

The Forestry Club—an organization composed of all students majoring in this Department—has been reorganized and made more effective. It not only brings the student in Forestry of all classes together but it is becoming more and more an important factor in their forestry education. Its primary object is to provide opportunity for informal discussion of topics of special interest to forestry students and to promote social intercourse. The meetings are held on alternate Wednesday evenings throughout the College year and at least once a month an

expert in some line of forestry work is secured to address the Club. Among those who have been kind enough to comply with these invitations during the past year are Professor F. F. Moon of Massachusetts Agricultural College; Professor J. H. Foster of New Hampshire State College; Mr. E. S. Bryant of Bryant, Fisher, and Olmstead consulting foresters of Boston; Hon. E. E. Ring, ex-Forest Commissioner, Orono; Mr. John Appleton, consulting forester of Bangor; Mr. H. S. Robinson, forest engineer and expert forest examiner, of Patten.

## ALUMNI MATTERS.

During the year letters were sent to all the alumni of the Forestry department with return cards for reply to a list of questions. These included the present place and kind of employment, salary received, whether the graduate was in a position to employ other men with technical training, and his opinion of the work given by this Department; also any suggestions for the betterment of the school.

There are 29 graduates of this Department (not including 6 who graduated in June 1912, who are counted as students in this report). Of these Mr. Fred D. Davis, 1910, is deceased, and two others failed to answer even after a second letter had been sent out; so that the data which follows are obtained from the remaining 26 graduates who answered the inquiries. A few very interesting facts were brought out by this investigation; among these are:

## THE GEOGRAPHICAL DISTRIBUTION OF ALUMNI.

<i>Before graduation</i>		<i>After graduation</i>	
Maine .....	19	Maine .....	5
		Massachusetts .....	3
Massachusetts .....	3	New Hampshire .....	1
		New York .....	6
New Hampshire .....	2	California .....	1
		Canada .....	1
New York .....	1	Michigan .....	1
		North Carolina .....	1
Ohio .....	1	Oregon .....	2
		Utah .....	2
		Vermont .....	1
		West Virginia .....	2
	—		—
Total .....	26		26

*Kind of Work*—80% of these men are in technical or executive forestry work; 8% are teaching forestry; and 12% are now engaged in work other than forestry.

*Salaries*—Their salaries vary from \$750 (minimum) to \$2,500 (maximum) per annum.

- 2 men (8%) receive not more than \$750 per annum
- 7 men (27%) receive between \$750 — \$999
- 8 men (30%) receive between \$1000 — \$1250
- 4 men (15%) receive between \$1250 — \$1499
- 2 men ( 8%) receive between \$1500 — \$1999
- 3 men (12%) receive between \$2000 — \$2500

*Present Positions*—Graduates of the school are in the employ of the United States Forest Service and in charge of important state, private, and educational forestry work. Six of these are already employing students during the summer vacation and assisting them in securing permanent positions after graduation. Two of them have taken post graduate work at advanced schools of forestry and have received the degree of Master of Forestry.

*Approval of Course*—They are unanimous in affirming that they made no mistake in taking four years under-graduate work at this University; even those who are now doing work other than strictly forestry—such as horticulture and work in connection with wood using industries—agreed in this opinion.

*Suggestions*—It has been suggested that a closer coöperation between the Forestry department and the local lumber interests would be advantageous to both, and that the department should be further developed along the present lines.

### CONCLUSION.

This Department has been in existence for nine years and seven classes have now graduated, not including the present year's. The reports from these graduates show that the school has been doing good work; that there is a field for men properly trained in technical forestry and that the graduates of this school are "making good" in the work of their chosen profession. The requirements for a professional training in forestry have, however, been steadily increasing during the past decade, and the number of schools and colleges giving courses in fores-

try has multiplied out of all proportion to the demand or the necessity for them.

Owing to this increase in the number of schools and the diversity in the amount and kind of instruction, a conference of forest schools was held in Washington in December 1911. At this conference a committee consisting of the following distinguished men was appointed to draw up a curriculum which shall set the standard for a first class forest school:

Professor H. S. Graves, Chief Forester, United States; Dr. B. E. Fernow, Dean, Forestry Department, University of Toronto; Professor Filibert Roth, Dean, Forestry Department, University of Michigan; Professor R. T. Fisher, Dean, Forestry Department, Harvard University; Mr. Gifford Pinchot, Ex-Forester, United States. This standardization of the requirements for a professional forestry education has now been agreed upon and it includes more work upon technical forestry lines than is now given by this department. The opinion expressed at this conference was so unanimous and the moral ability to enforce that opinion is so powerful, that it would be worse than useless to attempt to oppose it. To fail to bring the course up to the present standard would not only place the University in a false light, but would be exceedingly unfair to the students for they would be spending four years in securing a degree not recognized as of standard value by authorities and heads of the profession which they are about to enter.

The Department of Forestry is maintained by a special appropriation, and entails little, if any, expense upon the University itself. Although students in agriculture pay no tuition, forestry students are required to pay tuition, and yet have not the benefit of an equal amount of instruction in the work of their chosen profession.

At the present time all important forestry schools have at least two or three men on the instructional force, who give their time solely to forestry subjects. Maine has one. Yet the forestry students represent about 5% of the total registration of the University up to the present year.

The inadequacy of the present appropriation made by the state for this purpose is well illustrated by comparing the increase in the number of students with the number of instructors and the funds available for the Department.

College Year	No. of Students	No. of Instructors	Funds Expended
1903-4	5	1	\$2500
1904-5	10	1	2500
1905-6	17	1	2500
1906-7	26	1	2500
1907-8	47	1	2500
1908-9	42	1	2500
1909-10	43	1	2500
1910-11	40	1	2500
1911-12	44	1	2500

This comparison shows that, while the number of students has increased from 5 students in 1904 to a maximum of 47 in 1908, and maintained an average of 40 to 45 students per annum for the last five years, the number of instructors and the funds expended by the department of Forestry have not been increased from its institution to the present date.

Again, a comparison of the required work described in the Catalogs for 1903-1904 and the present curriculum will give an enlightening idea of the growth and development of the Department:

1903.

“When Forestry is taken as a major subject the following are requisite courses for receiving a degree at graduation:

<i>Subject</i>	<i>Hours</i>
General Botany .....	4
General Forestry .....	6
Forest Botany .....	8
Forest Botany Field & Lab.....	8
Silviculture .....	8
Silviculture Field work .....	9
Forest Measurements .....	4
Forest Measurements Field & Lab.....	5
Lumbering .....	2
Forest Management .....	2
Report on lumbering .....	5
Total .....	<u>61 Credits</u>

To-day the program of the student majoring in forestry is as follows:

1912.

## FORESTRY CURRICULUM.

## FRESHMAN YEAR

<i>Fall Semester</i>		<i>Spring Semester</i>	
Subject	Hours	Subject	Hours
Biology 1 .....	5	Biology .....	5
Chemistry 1 .....	2	Chemistry 2 .....	3
Chemistry 3 .....	2	Chemistry 4 .....	2
Drawing 1 .....	2	Drawing 2 .....	2
English 3 .....	2	English 4 .....	2
Mathematics 2 .....	5	Mathematics 1 .....	3
Military 1 .....	1	Mathematics 3 .....	2
Physical Training .....	$\frac{1}{2}$	Military 2 .....	1
		Physical Training .....	1
	<hr/>		<hr/>
	19 $\frac{1}{2}$		21

## SOPHOMORE YEAR

Agronomy 1 .....	2	Forest Entomology .....	4
Agronomy 2 .....	1	Forest Botany .....	4
Forest Botany .....	4	Civil Engineering, 2b, 2c....	1 $\frac{1}{2}$
Civil Engineering 1a, 2a .....	2 $\frac{1}{2}$	English 1b .....	1
English 1a .....	1	English 2b .....	1
English 2a .....	2	Horticulture .....	4
History 6 .....	3	Military 2 .....	1
Military 1 .....	1	Modern Language .....	2
Modern Language .....	3	Electives .....	
Electives .....			
	<hr/>		<hr/>
	19 $\frac{1}{2}$		18 $\frac{1}{2}$

## JUNIOR YEAR

Plant Histology .....	4	Plant Physiology or Plant Pathology .....	4 or 3
Civil Engineering 4b, 4c .....	2	Civil Engineering 9a .....	1
Geology 5 .....	3	Civil Engineering 9b .....	2
Forest Measurement .....	2	Forest Measurement .....	2
Landscape Gardening .....	3	Modern Language .....	2
Modern Language .....	3	Physics 6 .....	2
Electives .....		Electives .....	4
	<hr/>		<hr/>
	17		17 or 16

## SENIOR YEAR

<i>Fall Semester</i>		<i>Spring Semester</i>	
Subject	Hours	Subject	Hours
Principles of Breeding .....	2	Plant Physiology or Plant Pathology .....	4 or 3
Political Economy .....	2	Money & Banking .....	3
History of Forestry .....	2	Silviculture .....	2
Silviculture .....	2	Silviculture Field work .....	2
Silviculture Field Work .....	2	Forest Management .....	1
Lumbering .....	5	Forest Technology .....	1
Electives .....	2	History 2 .....	3
		Thesis .....	5
	17		21 or 20

Total of 150 hours.

If the Department of Forestry of the University of Maine is to hold the place in forestry education that it has already made, it is necessary to strengthen the curriculum by the addition of several courses and to provide at once an increased appropriation to secure an adequate force of instruction for giving technical work in the subject as required in a first class forest school. In a work of this kind it is impossible to stand still, we must either proceed to develop the department as the demands upon it increase, or we are bound to fall below the standard of requirements. It seems, however, that we should go ahead rather than backward in this matter, for we have one of the oldest established undergraduate schools of forestry in the United States, and there is no other undergraduate school of forestry north of Pennsylvania, at the present time, giving or as able as we are to give the required work. To accomplish this efficiently we must have at least double the present appropriation. The State of Maine is one of the best wooded states east of the Mississippi river and the whole prosperity of the state is dependent in no small degree upon the proper care and protection of the forest. There is moreover a demand for men properly trained in technical forestry. The school is well established and housed and equipped in a better manner than many other larger schools. The men are already here seeking

this training. Is it not the duty of the state to provide the very best and most efficient training possible for them and to have a school of forestry in Maine that is second to none in its class in the United States?

Respectfully submitted,

JOHN M. BRISCOE,

*Professor of Forestry.*

## CONCLUSIONS AND RECOMMENDATIONS.

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In concluding, this my first report, as Land Agent and Forest Commissioner, I wish to thank all who have coöperated with me in the various work of this department, the spirit of coöperation shown having made my duties easier and pleasanter. As the months have passed since my appointment I have become more interested in the work and some of the changes that to my mind would increase the efficiency of the department are embodied in the following recommendations:

It is evident from the experience gained since the passage of the act incorporating the Maine Forestry District that several changes in the law could be made that would be of great benefit and particular attention should be given to the provision of funds with which to carry out the spirit of the law. As the law now stands it is very evident that the tax of a mill and one-half will not produce sufficient funds to meet the bills of the Forestry District in any particularly dry year in which forest fires of any magnitude may occur. No better illustration can be had than in the year 1911 when in the brief period of a few weeks all of the appropriation was entirely exhausted and had it not been for the fact that the timberland owners came forward and settled the fire bills, the Maine Forestry District might have received a blow from which it would have been hard to recover, as men who worked could not have been paid, and not receiving their pay it would have been impossible to have ever induced them to work again no matter how great the danger.

It was the intention of the law to have the surplus of each year to continue to the next and the framers of said law hoped thereby to create a fund to be drawn upon in just such years as 1911.

The expense of starting the system, building lookout stations, telephone lines, purchasing tools, etc. together with the employment of necessary help to make the law at all effective has used practically all of the assessments and after four years the treasury has nothing to the balance of the Maine Forestry district, or that will be the state of affairs when all bills are paid and the season of 1913 commences.

Not being able to provide a surplus as was intended it is quite evident that an additional tax will have to be made upon the lands included in the Maine Forestry District and I would strongly recommend that for at least one year an extra mill be assessed which would provide between forty and fifty thousand dollars and had we had such a sum in 1911 there would have been no outstanding bills.

I also think that the law should be amended in some way so that payment of the men could be made more promptly and would strongly advise that such amendment make the Forest Commissioner the dispersing agent; he to render to the State Auditor a report in detail with proper vouchers showing the disbursement of all money paid out by the department. Following the present method of first auditing and approving the bills by the Forest Commissioner, then forwarding them to the State auditor for a second auditing at the convenience of his clerical force, and then again awaiting action by the Governor and Council and payment by the State Treasurer makes a long process and a delay that is hard to explain to a crew of men who are waiting for their money. The conditions in this respect are much different than in any other department as the men employed in fighting fire are in most instances transients, who are at one place today and another tomorrow and if not paid promptly it is sometimes hard to locate them and is almost certain that they cannot be relied upon to work again unless they receive their pay.

It is hardly right to expect the timberland owners who have been assessed for their portion of the forestry tax to be expected to pay the men and then waiting the State's pleasure for reimbursement which in the case of 1911 meant to them the expenditure of a number of thousands of dollars and with no absolute assurance of reimbursement.

In making a study of the working system of the Maine Forestry District my observations lead me to conclude that the best service is obtained from the lookout stations. The number of these stations have been added to until there are 26 stations in actual service and the results from each have been very satisfactory. Some improvements will have to be made at the old stations but in the main they are in very good repair and working order. A man on a lookout station has a view of a large territory and on a clear day can detect a smoke rising from most any direction even many miles away. Observing such smoke and immediately telephoning the fire warden not much time is lost in getting on the spot and extinguishing the fire.

To make the lookout stations of the most value there must be perfect telephone connections and much has been done to perfect these lines. Experience has taught that best results come from a line leading direct from the station to the home of the chief warden or deputy or to some place where men are employed. While the patrol system has its value, I think that much more can be accomplished by lessening the number of patrols and building more lookout stations.

A man on patrol is somewhat limited to the amount of good work that he can do from the fact that the territory covered is such that while he may be constantly at work a fire may break out on the opposite end of his route and he would be entirely ignorant of the same for some hours before he discovered it. While on the other hand a man on the lookout station could see the smoke almost immediately and send word in regard to the same.

In 1909 the law relative to forest fires in incorporated towns was amended but such amendment has not accomplished all that was desired. If constitutional, towns and plantations bordering on the Maine Forestry District and which are separated therefrom only by an imaginary line should be included within the jurisdiction of the said district or some special law provided that would give the timberlands in such towns or plantations similar protection to that afforded under the Forestry District law. I am of the opinion that in place of the selectmen of the town being fire wardens that a competent warden should be appointed or elected by the town whose duties would be to attend to the forest fire matters. With the law resting in any

three men, as is now the case in towns the old adage is again proven that "what is everybody's business is nobody's business."

There has been a growing demand that the State Forest Commissioner have the supervision of the incorporated as well as the unincorporated townships but before making such a change along that line considerable investigation as to the advisability of such a change ought to be made.

Conservation of which we hear so much in these days should certainly be practised in the forests of Maine. In its nearly ten millions of acres of wild land the State has an asset that will last for many years to come providing proper care and attention is given. Much has been accomplished in the later years in the way of conservative cutting and the larger concerns nowadays scarcely think of attempting any big operation without first getting the advice of its expert forester whose training has been along such lines as will best preserve and perpetuate the forest lands.

I believe that cutting over the lands taking trees down to the size of 12 inches to the swell of the roots means that the remaining growth will be sufficient to produce another crop of merchantable timber within a reasonable number of years. The methods of cutting have changed greatly in recent years and the waste that formerly went into high stumps is now nearly eliminated. This is brought about by sawing down the trees before the snow is deep. Of course these rules vary in some instances as in case of side hill stands, and other places, where the wind would be likely to blow down the small trees after the larger ones are cut. In such cases it is advisable to make a clean cut taking everything of any value.

The forestry department of the University of Maine which has been conducted as a part of the state department of land and forestry has grown to such proportions and importance that it would seem to me advisable to place this wholly under the direction of the president and trustees of the University. In 1903 as a result of considerable agitation for public instruction in forestry in which the women's clubs of the State took an active part an appropriation of \$2500 was made for the work. It was decided the best way to accomplish the desired result was to establish a chair of forestry at the University of Maine. This was done under Section 65 of the act providing for the Forest

Commissioner, and stating that among his duties that he shall take such measures as State Supt. of Schools and the president of the University of Maine may approve, for awakening an interest in behalf of forestry in the public schools, academies, and colleges of the state. In the nine years much has been accomplished but as above stated it certainly seems that this work should be wholly under the direction of the president and trustees of the Institution, as the Land Agent or Supt. of Schools has little time to attend to it and in fact, knows little of the work that has been done with the exception of approving the bills and going over what reports may be furnished him from time to time. In order to carry out the work it will be necessary to make a larger appropriation than has been the custom and it would now seem that it would be an opportune time to make the change suggested.

Agitation was started and an attempt was made at the last session of the Legislature to establish a state nursery, but as it was quite late in the session when the bill was introduced it failed to pass. I thoroughly believe that such a nursery should be established as the demand is constantly growing among the farmers and owners of wood lots in the state for some place in Maine where they can obtain seeds and seedlings. My idea of such a nursery would be to raise seedlings and sell same to the residents of the State of Maine at actual cost. For the first few years it would take an appropriation of a few thousand dollars to start the nursery but it should eventually become nearly self supporting from the sale of seeds and seedlings. I trust that the coming Legislature will give this matter close attention and that a start may be made another spring:

The constant application to this department from parties who wish to buy small islands upon the coast and the fact that many of these islands, while actually belonging to the State, have been overlooked and no record made of them, leads me to believe that there should be a close investigation made of the same. From the growing demand there is for these islands for fish weir and other purposes would indicate that an income of several thousand dollars annually would accrue to the state, if they were properly looked after. In my estimates of 1913 and 1914 I have recommended an appropriation to deter-

mine the ownership, location, and value of the islands along the coast of Maine, now owned by the State and I hope that the Legislature will see fit to grant the same.

Another appropriation which should be made is a suitable sum for re-tracing and defining the lines around our school or public lots. In many of the plantations the old lines have become indistinct, causing much trespassing and loss to the plantations. In some plantations the lots have never been set off and this should be done.

In closing I wish to add a word appealing to all citizens in the State to coöperate with the efforts that are being made to keep the fires out of the forest lands. Eliminate the carelessness to which a large percentage of the fires can be attributed and you have added and guaranteed thousands of dollars worth of taxable property. Fire raging twenty-four hours in a heavily timbered tract does more damage than years of conservation can replace. The fires not only burn the merchantable stand but ruin the young growth and frequently consume the soil itself, leaving a barren waste on which nothing will ever again grow. If everyone travelling through or near the woods would have for his motto "Beware of Fire" there would be few fires of any magnitude.

FRANK E. MACE,

*Forest Commissioner.*



# State of Maine

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Frank E. Mace, Forest Commissioner

In Cooperation With the Forest Service

U. S. Department of Agriculture

Henry S. Graves, Forester.

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## WOOD-USING INDUSTRIES OF MAINE

By J. C. NELLIS, Forest Assistant

1912

The study upon which this report is based was made by the Forest Service in coöperation with the State of Maine under the direct supervision of Frank E. Mace, Land Agent and Forest Commissioner, and O. T. Swan, In Charge, Office of Products, United States Forest Service. The statistics were compiled from data collected in the spring of 1912, covering a period of one year from January 1 to December 31, 1911, inclusive. By the terms of the coöperative agreement, the State is authorized to publish the findings of the investigation.

## THE WOOD-USING INDUSTRIES OF MAINE.

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### FORESTS AND WATER POWER IN MAINE.

The total land surface of Maine is 29,895 square miles. About 12 per cent of this, or 2,420,000 acres, was originally forested. It is estimated that as late as 1869, the virgin forests of Maine covered an area seven times as large as that of the famous Black Forest of Germany. Then, as now, white pine, spruce, and hemlock, were the common and most widely distributed species. At first white pine was considered to be the only timber worth cutting on a large scale and until recent years it made up the bulk of the lumber cut in the State. As a consequence most of the virgin pine of Maine was early converted into lumber, so that now one seldom sees Maine white pine on the market except that cut from second-growth timber.

As the production of white pine lumber decreased spruce came into prominence, and to-day the State of Maine produces more spruce lumber than pine, while the pulp mills of the State use more spruce for pulp than the sawmills cut into lumber. At the present time spruce is supplying more wood than any other tree of the Maine forests.

As white pine became scarcer lumbermen turned their attention to hardwoods which were previously considered of little value. To-day important industries depend for their existence upon a continued supply of these hardwoods.

The southern half of Maine offers water power sufficient for extensive manufacturing and the State is perhaps unequaled in the extent, volume, and constancy of its water power. The constancy of the supply depends on the northern forests which absorb the abundant rainfall like a sponge, and to the 1,500 lakes which serve as reservoirs. The volume of power depends on the fall of the streams on the average, 600 feet in 150 to 200 miles. When it is realized that the commercial supremacy of the State depends largely upon the manufacture of its own

raw materials, the question of available water power becomes significant. The important relation between forests and continuous water power is now generally understood, and it is a fact that in Maine the forests themselves are an important factor in controlling the power for the manufacture of their own products.

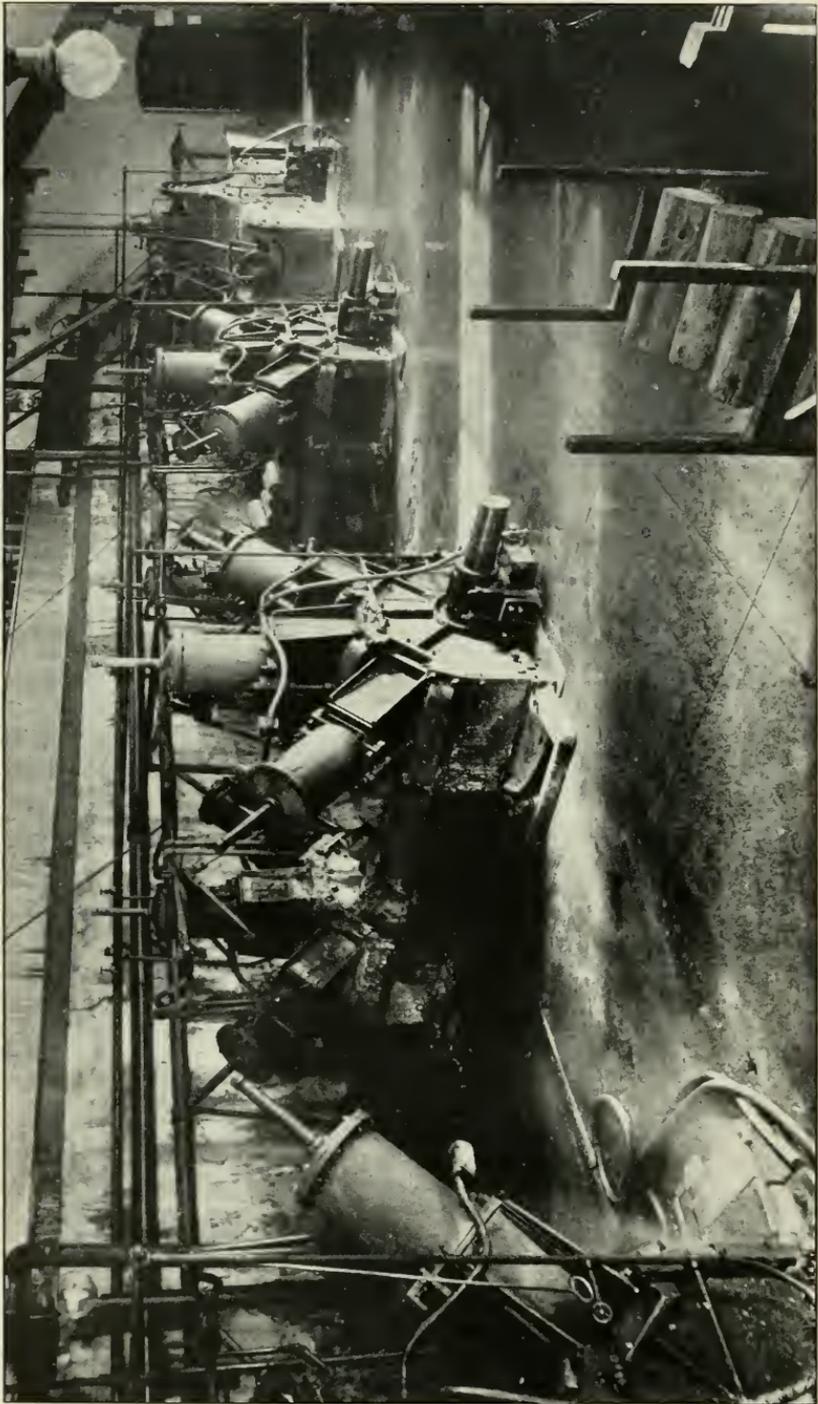
Forest conservation has long received the serious consideration of the people of Maine, and the State was one of the first to establish a State forest service.

#### PURPOSES AND METHODS OF THE STUDY.

This report deals primarily with timber consumption in the manufacture of wood products in the State of Maine. Maine has long been accustomed to an abundant supply of many kinds of wood and is industrially organized as a wood manufacturing State. Yet the demand and supply are changing from year to year so that knowledge of the kinds and amounts of woods manufactured and of the quantity supplied by the State and by outside sources is of special value as a basis for judging future conditions. Previous investigations and reports have had to do mainly with conditions in the forests and their protection from fire; the present study represents the first attempt to ascertain the extent to which the lumber produced in Maine is further manufactured within the State, and how much of the lumber consumed by woodworking establishments has to be brought from the Canadian provinces or other States. Aside from generalities, little information of this character has ever been available.

In the spring of 1912 the United States Forest Service, co-operating with the Maine Land Agent and Forest Commissioner, undertook a study of the wood-using industries of the State. Complete lists of manufacturers engaged in the conversion of lumber or timber into finished products were compiled, and blank forms were sent to them, together with requests that they be filled out and returned. The inquiry sought to ascertain the kinds of wood used, the products manufactured, the amounts required annually, the cost f. o. b. factory, and the source of the raw material. A second request was mailed to those who did not reply to the first. Later, members of the





Grinder Room of Pulp and Paper Mill

Forest Service visited those who had not replied, and made special visits to many of the larger plants of the State, in order to complete the statistics and to secure as much first-hand information as possible.

The wood-using industries of Maine draw from the forests of the State, and from the adjoining States and Canada, large quantities of lumber and also secure a considerable amount from the South and from the West Coast. The various species used will be discussed with the idea of indicating their relative importance to the manufacturing interests of the State, and to any program of forest conservation and planting that may be adopted. The amount of each kind of wood required by each industry and the special uses for which the woods are adapted will be shown. Of course, every manufacturer is now using the woods he considers best suited for his purpose, but it is quite possible that in some cases substitutions may be made which will bring into use woods that are now of little value, or which will allow the use of quantities of material now classed as waste. As the manufacturing plants of Maine turn out wooden products ranging in size from shoe-pegs to ships there is an excellent opportunity for the waste from some industries to find use as the raw material for others.

It is intended that this report shall not only indicate the extent and importance of the wood-consuming industries of the State, but that it shall also assist in a better utilization of forest products. The timber owner who, perhaps, has a small amount of some kind of timber for which he knows no market, can ascertain from the list of wood uses the articles manufactured from that wood, and from the directory pick out the firms in his part of the State manufacturing such articles. The manufacturer who is making a product that leaves waste in comparatively large sizes may be able to supply raw material to some other plant which is using the same kinds of wood for smaller articles at a price which will be advantageous to both plants. The more costly the wood, the further its utilization can be carried.

#### ANNUAL PRODUCTION.

In 1910 the sawmills of Maine produced 860,273,000 feet, board measure, of lumber. More than 42 per cent of this was

## Summary of Kinds of Wood Used in Maine.

TABLE I.

KINDS OF WOOD.		QUANTITY USED ANNUALLY.			Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine, Feet, B. M.	Grown out of Maine, Feet, B. M.
Common Name.	Botanical Name.	Feet, B. M.	Per cent.					
White pine.....	<i>Pinus strobus</i> .....	87,942,350	35.80	\$1,638,880.00	84,268,350	3,674,000		
Paper birch.....	<i>Betula papyrifera</i> .....	38,821,500	15.81	21.72	843,325.50	650,000		
Red spruce.....	<i>Picea rubens</i> .....	31,304,000	12.74	17.38	544,222.00	3,195,000		
Balsam fir.....	<i>Abies balsamea</i> .....	16,593,000	6.75	14.42	239,352.00	1,480,000		
Yellow birch.....	<i>Betula lutea</i> .....	12,742,500	5.19	18.11	230,804.50	10,170,000		
Sugar maple.....	<i>Acer saccharum</i> .....	11,064,500	4.50	17.90	198,055.50	914,000		
Longleaf pine.....	<i>Pinus palustris</i> .....	6,822,500	2.78	35.12	239,586.00	6,822,500		
Hemlock.....	<i>Tsuga canadensis</i> .....	4,878,000	1.99	14.72	71,822.50	65,000		
Basswood.....	<i>Tilia americana</i> .....	4,775,100	1.94	20.98	100,145.50	813,000		
Aspen (popple).....	<i>Populus tremuloides</i> .....	4,358,500	1.77	14.38	62,687.50	4,358,500		
Beech.....	<i>Fagus atropurpurea</i> .....	4,120,500	1.68	15.35	63,236.50	3,010,500		
Loblolly pine (N. C. pine).....	<i>Pinus taeda</i> .....	3,735,000	1.52	29.71	121,357.50	510,000		
Red oak.....	<i>Quercus rubra</i> .....	3,682,600	1.50	25.69	97,088.50	3,337,500		
White ash.....	<i>Fraxinus americana</i> .....	2,600,000	1.06	26.32	96,913.00	432,100		
White oak.....	<i>Quercus alba</i> .....	1,835,400	.75	38.88	101,119.00	1,697,100		
Bald cypress.....	<i>Taxodium distichum</i> .....	1,400,000	.57	42.36	77,755.00	1,835,400		
Western yellow pine.....	<i>Pinus ponderosa</i> .....	880,900	.36	35.00	40,000.00	1,400,000		
Yellow poplar.....	<i>Liriodendron tulipifera</i> .....	805,600	.33	52.69	46,410.50	880,900		
Northern white cedar.....	<i>Fraxinus nigra</i> .....	605,600	.25	22.46	18,082.00	238,500		
Red maple.....	<i>Thuja occidentalis</i> .....	532,500	.22	24.97	15,120.00	566,500		
Norway pine.....	<i>Pseudotsuga taxifolia</i> .....	470,000	.19	45.65	24,309.00	605,600		
Western red cedar.....	<i>Acer rubrum</i> .....	291,500	.12	16.01	7,525.50	335,000		
Chestnut.....	<i>Pinus plicata</i> .....	139,500	.06	17.08	6,970.00	298,000		
Mahogany.....	<i>Castanea dentata</i> .....	113,600	.05	48.27	14,070.00	139,500		
Southern white cedar.....	<i>Sietenia mahagoni</i> .....	107,500	.04	28.37	3,957.00	291,500		
Tamarack.....	<i>Chamaecyparis thyoides</i> .....	100,500	.04	157.62	17,906.00	113,600		
Western white pine.....	<i>Larix laricina</i> .....	100,000	.04	23.28	2,340.00	107,500		
	<i>Pinus monticola</i> .....	100,000	.04	35.00	3,500.00	100,000		

Red gum.....	Liquidambar styracitius	58,000	.02	48,63	2,820 50	58,000
Red cedar.....	Juniperus virginiana	40,000	.02	62 00	2,480 00	40,000
Cotton gum.....	Nyssa aquatica	29,500	.01	43 00	1,268 50	29,500
Black willow.....	Salix nigra	25,500	01	12 16	310 00	25,500
African mahogany.....	Ulmus americana	25,000	01	130 00	3,750 00	25,000
White elm.....	Ulmus americana	22,000	.01	14 14	311 00	22,000
Redwood.....	Sequoia sempervirens	18,500	.01	53 92	997 50	18,500
Black cherry.....	Prunus serotina	16,000	.01	92 81	1,485 00	15,000
Shortleaf pine.....	Pinus echinata	14,000	01	31 00	434 00	14,000
Lignumvitae.....	Guaiacum sanctum & G officinale	12,300	.01	64 63	795 00	12,300
Cork elm.....	Ulmus racemosa	11,500	*	23 83	274 00	11,500
Sycamore.....	Platanus occidentalis	8,500	*	59 12	502 50	8,500
Hickory.....	Hicoria <i>sp.</i>	7,500	*	45 67	342 50	7,500
Sweet birch.....	Betula lenta	5,000	*	18 00	90 00	5,000
Butternut.....	Juglans cinerea	3,000	*	85 00	255 00	3,000
Black walnut.....	Juglans nigra	2,000	*	120 00	240 00	2,000
Rosewood.....	Dalbergia nigra	500	*	235 00	112 50	500
Teak.....	Tectonia grandis	500	*	400 00	200 00	500
White mahogany.....	Tabebuia donnell-smithii	500	*	250 00	125 00	500
Cocobola.....	Cedrela odorata	300	*	150 00	45 00	300
Spanish cedar.....	Quercus robur	200	*	175 00	35 00	200
English oak.....	Ostrya virginiana	100	*	250 00	25 00	100
Hornbeam.....		100	*	20 00	2 00	100
Totals.....		245,614,150	100.00	\$20 18	\$4,957,035 50	212,021,650
Additional figures from 1910 reports of the Bureau of the Census (see table 54).....		485,596,833				
Grand total.....		731,210,983				

\* Less than 1-100 of 1 per cent.

spruce, 31 per cent was white pine, and 10 per cent hemlock. About one-tenth of the total cut, or 82,273,000 feet b. m., consisted of mixed hardwoods, principally birch, oak, and maple.

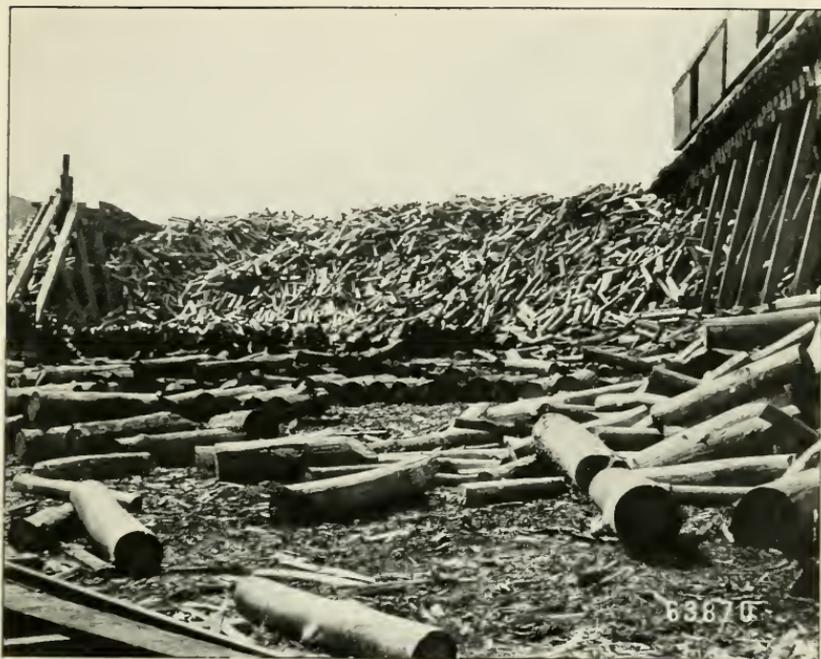
As shown by this investigation, the wood-using industries of the State which require lumber as raw material consume 245,614,150 feet b. m. in one year. About five-sixths of this was grown within the State, while the remainder was brought in from other States or foreign countries.

The kinds of wood used, the quantity of each, the average cost at the factory, and the sources are shown in Table 1.

Trees are classified as hardwoods, or broad-leaved species, and softwoods or needle-leaf species. The softwoods include the pines, spruces, fir, hemlock, and cedar; while among the hardwoods are the oaks, maples, birches, ashes, and beech.

#### NOMENCLATURE.

The manufacturers of Maine report the use of 52 kinds of wood, but there is doubtless a greater number because many species are not distinguished in the trades but are sold under general names. For example, this report lists all spruce reported by the manufacturers as red spruce; but there is no doubt that some white and some black spruce is included in the figures, since about 15 per cent of the spruce stand of the State is white spruce, and about 5 per cent black spruce. The red spruce is, of course, the most valuable for lumber and for pulp, while white spruce is used to some extent, and black spruce almost not at all. The same lack of definite distinction holds with other trees. As shown in Table 1, a large quantity of aspen was used. This includes, without doubt, both the quaking aspen and the large-tooth aspen. Some gray birch was used with paper birch in making spools and other turned articles, but reports do not indicate the relative amounts. Among the oaks it is quite possible that in the reports on red oak there is included some scarlet oak; and that some burr oak and some swamp oak are included with white oak. Manufacturers report soft maple, meaning either red maple or silver maple. Because of the large proportion of red maple in the State, it has all been classed as red. Again, manufacturers recognize two kinds of ash; white and brown. The larger part of this so-



Aspen Pulpwood



Paper Birch Logs



called brown ash, which is second-grade material, is known botanically as black ash.

Nearly all commercial woods are called by different names in different localities; and a great many strictly local names are the result. White wood in the North is yellow poplar or tulip tree in the South; and what was formerly known as juniper in Maine is now commonly called hackmatack, while the name for the same tree used throughout the other northern and Lake States is tamarack. White pine, however, is almost always known as such, although such terms as "pumpkin pine," and "soft pine" are in use, referring usually to the character of the wood grown in particular localities. In order to avoid confusion the United States Forest Service has established standard names for all commercial trees; these names appear in a compilation known as the "Check List of the Forest Trees of the United States," and the English names there set down are followed in all Forest Service reports. The scientific or botanical name generally derived from Latin, is used by botanists and foresters throughout the world. Table 1 gives in the first column the Forest Service name of the tree and in the second column the botanical name. The English names in parenthesis are those common to New England or Maine; and are inserted to prevent a confusion of terms.

#### PROPORTIONS USED.

Nearly every wood grown in Maine, and many woods from other States even as distant as the Pacific Coast, and also a number of rare foreign species are represented in Table 1.

White pine supplied over one-third of the wood reported and nearly 65 per cent of the total was made up of white pine, paper birch, and spruce. These three woods alone were worth nearly two and one-half million dollars as raw material at the factories. Though these few conifers furnished nearly two-thirds of the woods used, a large number of hardwoods met the diversified needs of the industries at a higher average cost.

Willow at \$12 per 1,000 feet b. m. was the cheapest domestic wood reported, while some of the foreign woods cost from \$200 to \$400 per 1,000 feet b. m., the latter value being reported for teak. Black walnut at \$120 per 1,000 feet b. m. was the most costly domestic wood.

## WOODS USED.

*White Pine.*

TABLE 2.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Boxes and crates.....	60,673,500	68.99	\$15.81	\$959,439 00	58,973,000	1,700,500
Planing-mill products.....	15,384,500	17.49	20.90	321,540 50	15,319,500	65,000
Sash, doors, blinds and general mill work.....	7,815,000	8.89	33.57	262,365 50	6,290,000	1,525,000
Ship and boat building.....	1,044,500	1.19	36.35	37,967 00	961,500	83,000
Toys.....	875,000	.99	15.00	13,125 00	875,000	.....
Miscellaneous.....	802,000	.91	18.08	14,500 00	502,000	300,000
Caskets and coffins.....	557,500	.63	21.15	11,789 00	557,500	.....
Laundry appliances.....	270,000	.31	22.44	6,060 00	270,000	.....
Matches and toothpicks.....	150,000	.17	19.00	2,850 00	150,000	.....
Car construction.....	109,500	.13	20.86	2,284 00	109,500	.....
Patterns.....	79,850	.09	31.85	2,543 00	79,350	500
Furniture.....	61,000	.07	20.00	1,220 00	61,000	.....
Fixtures.....	50,000	.06	26.20	1,310 00	50,000	.....
Woodenware and novelties.....	34,000	.04	32.11	1,102 00	34,000	.....
Vehicles and vehicle parts.....	11,000	.01	25.91	285 00	11,000	.....
Printing materials.....	10,000	.01	25.00	250 00	10,000	.....
Dairymen's, poulterers' and apiarists' supplies.....	10,000	.01	16.00	160 00	10,000	.....
Chairs.....	5,000	.01	18.00	90 00	5,000	.....
Totals.....	87,943,350	100.00	\$18.64	\$1,638,880 00	84,268,350	3,674,000

Additional figures from 1910 reports of the Bureau of the Census (see appendix).

Pulp.....	1,116,000	.....	.....	.....	1,116,000	.....
Slack cooerage.....	695,333	.....	.....	.....	695,333	.....
Grand totals.....	89,753,683	.....	.....	.....	86,079,683	.....

White pine grows most abundantly in the northeastern and Lake States, with a southward extension along the Appalachian Mountains. It reaches its best development in the region of the Great Lakes. While it makes its most thrifty growth on light, sandy, fresh soils, it does well on a large range of soils from dry to moist. It is a rapid grower and is one of the most important conifers of the United States. The wood is light and soft, but not strong. It is free from resin and easily worked, and the heartwood is fairly durable in contact with the soil. Because of the extent of the original forests of white pine and the size which the tree attained, it was the first timber cut in all northern logging operations, from Maine to Minnesota, and it, therefore, became at once the most popular timber for construction, house and cabinet work, box manufacture, and many minor uses. Arkansas shortleaf pine, California sugar

pine, and western yellow pine, are all finding their way into eastern markets and are sold as substitutes for white pine, or under the names of white or soft pine; thus bearing evidence to the reputation gained by white pine before the period of its increasing scarcity and cost. The list of uses to which white pine has been put is, of course, extremely long. To the manufacturing interests of the State it is still one of the most important woods as shown by the large quantities which enter into the manufacture of boxes, a commodity required by nearly every industry. Box lumber is cut mainly from the lower grades while the better parts of the tree go into clearer stock of larger sizes which command better prices and meet more exacting requirements. The most common uses of white pine have been in house building, heavy construction, ship building, car and wagon building, cooperage, crates, boxes, and patterns. As is shown by Table II, its largest uses in Maine are in the box and planing-mill industries. Its popularity for work requiring a soft, easily-worked wood is indicated by the large amount manufactured into sash, doors, and blinds.

The ship builders require exceptionally valuable stock and pay the highest average price reported for this species, \$36.35 per 1,000 feet b. m.

The consumption of white pine by industries is shown in Table II.

*Paper Birch.*

TABLE 3.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B.M.	Grown out of Maine. Feet, B.M.
	Feet, B. M.	Per cent.				
Shuttles, spools, bobbins, etc.....	16,960,000	43.69	\$25 71	\$436,010 00	16,860,000	100,000
Dowels.....	5,948,000	15.32	14 90	88,631 50	5,878,000	70,000
Handles.....	4,200,500	10.82	18 83	79,089 00	4,200,500	.....
Boot & shoe findings.....	3,740,000	9.63	16 13	60,340 00	3,740,000	.....
Matches and toothpicks.....	2,575,000	6.63	30 20	77,775 00	2,500,000	75,000
Woodenware and novelties.....	2,347,000	6.05	19 43	45,611 00	2,077,000	270,000
Boxes and crates.....	1,900,000	4.89	18 21	34,605 00	1,900,000	.....
Laundry appliances.....	329,000	.85	17 26	5,679 00	329,000	.....
Toys.....	218,000	.56	24 49	5,339 00	218,000	.....
Miscellaneous.....	200,000	.51	18 00	3,600 00	65,000	135,000
Bungs and faucets.....	135,000	.35	18 70	2,525 00	135,000	.....
Brushes.....	110,000	.28	15 64	1,720 00	110,000	.....
Butchers' blocks and skewers.....	100,000	.26	14 00	1,400 00	100,000	.....
Planing-mill products.....	27,000	.07	15 00	405 00	27,000	.....
Furniture.....	22,000	.06	18 00	396 00	22,000	.....
Sporting and athletic goods.....	10,000	.03	20 00	200 00	10,000	.....
Totals.....	38,821,500	100.00	\$21 72	\$843,325 50	38,171,500	650,000

Paper birch is commonly known in Maine and through parts of New England as white birch although the name "paper birch" is generally used in other localities. This species is native to the northern United States, and grows best in fairly deep, loose, well-drained, sandy loam. The wood is fairly hard, strong, and tough, and has a close grain and uniform texture. Its many uses depend upon the fine grain, uniform texture, and its ability to hold its shape after seasoning. The ease with which it turns upon the lathe, and the smooth, clean surface which it presents after turning adapt it to numerous purposes for which accuracy and niceness of finish are required. Examples of such uses are: spools, shoe pegs, shanks, dowels, tooth-picks, handles, and turned-wood boxes. It is quite probable that more different articles are made from this wood than any other wood in the State, since any novelty mill has in its tool room hundreds of patterns of boxes, handles, toys, and various novelties. Practically the entire quantity shown in Table II as going into shuttles, spools and bobbins, went into spools, these articles being classed together as one industry in reports of this kind. The handles made from this wood were small tool handles, and the boot and shoe findings were shoe shanks, and pegwood, or shoe pegs. The amount charged to the match and toothpick industry all went into the latter articles. Wood-ware, as the term is generally used, is not often made from paper birch, but the thousand and one things known as novelties are made in Maine, more often from this wood than from any other. Boxes made from paper birch are small turned boxes. The wood is also used for clothespins, clothes driers, cork tops—listed under bungs and faucets, skewers, finish and flooring.

While the average value of birch at the main sawmills is less than \$13 per 1,000 feet b. m., the average price paid by the industries, \$21.72, was more than 60 per cent higher indicating that most of the factories require the higher grades.

#### *Red Spruce.*

While white pine is the wood used in largest quantities by the manufacturing plants of Maine, there is much more spruce taken out of the forests of the State. In 1910 the sawmills of the State reported cutting 272,509,000 feet of pine and 363,691,000 feet of spruce, while in the same year the forests of the

State furnished to the pulp mills 500,280 cords or the equivalent of 250,140,000 feet of spruce. Red spruce is found scattered throughout the entire State, and grows on well-drained uplands and mountain slopes. White spruce grows along swamps, lakes, and streams. Black spruce grows in similar locations, and sometimes in sphagnum bogs. The wood of red spruce is light, soft, strong, and close-grained, but is not durable. It is cut largely for building material and also enters largely into the

TABLE 4.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Boxes and crates.....	21,873,500	69.90	\$14 81	\$323,894 50	19,898,500	1,975,000
Woodenware and novelties.....	3,879,000	12.39	22 63	101,744 00	3,814,000	65,000
Planing-mill products.....	3,243,000	10.36	18 43	59,755 00	2,403,000	840,000
Car construction.....	889,000	2.84	21 67	19,264 50	889,000	
Ship and boat building.....	854,000	2.73	27 69	23,649 00	714,000	140,000
Miscellaneous.....	220,000	.70	29 57	6,505 00	120,000	100,000
Laundry appliances.....	175,000	.56	28 00	4,900 00	175,000	
Furniture.....	75,000	.24	32 00	2,400 00		75,000
Sash, doors, blinds and general millwork.....	44,000	.14	23 02	1,013 00	44,000	
Vehicles and vehicle parts.....	18,500	.06	19 03	352 00	18,500	
Handles.....	18,000	.06	25 00	450 00	18,000	
Patterns.....	5,000	.02	19 00	95 00	5,000	
Totals.....	31,294,000	100.00	\$17 38	\$544,022 00	28,099,000	3,195,000

Additional figures from 1910 reports of the Bureau of the Census (see appendix).

Pulp—logs or bolts.....	331,856,500				250,140,000	81,716,500
Pulp—slabs (see appendix).....	29,231,500				29,231,500	
Slack cooperage.....	11,052,333				11,052,333	
Grand totals.....	403,434,333				318,522,833	84,911,500

manufacture of ships and of boxes. For pulp manufacture it is the most popular wood in this country, and furnishes nearly 60 per cent of all material used by the pulp mills. Next to pulp mills, box factories use the largest amount of spruce. The amount made into woodenware went largely into pie plates, butter tubs, and ladders.

Norway spruce, an introduced species, is more rapid in growth than the native spruce, and is well adapted for planting for pulpwood on cut-over lands of the Northeast. It will adapt itself within certain limits to situations formerly occupied by the spruce forests, and is in many respects a superior tree. It

does not demand a deep, rich soil, but will grow well in a fresh, moderately porous soil, whether fertile or not, and will thrive in comparatively dry situations. The timber is light, soft, non-resinous, and fairly durable. It works well, splits easily, and seasons without serious warping. Abroad it is used largely for construction purposes and paper pulp.

#### *Spruce Gum.*

It has been estimated by men closely connected with the business, that about 150 tons of crude spruce gum, valued at \$300,000, are gathered annually in Maine. There are about 100 professional gum gatherers, and 900 occasional ones. The most favorable season for collecting the gum is from September 1 to June 1. It is said that all three species of spruce yield gum, but it is probable that most of the supply comes from red spruce. Crude gum is worth from 12 1-2 cents to \$4 a pound. That which brings only 12 1-2 cents is the scrap, which consists of gum and bark not separated. A grade which sells at 75 cents a pound is largely used for medicines, such as cough sirups. The higher grades are cleaned, and find their way into drug stores to be sold as chewing gum. Druggists often buy their supplies directly from the collectors. The scrap is put through a steam process which separates the bark from the gum, and the gum is later put up in small blocks, wrapped in tissue, and sold as chewing gum. New York and the New England States constitute the principal markets for this product. The gum does not exude from trees until the trunk has been injured, but intentional bruises seldom produce a flow. Some men claim to know how to wound a tree in order to secure a flow. It would seem that possession of such knowledge might be utilized in the establishment and working of gum orchards similar to turpentine orchards in the South.

#### *Balsam Fir.*

Balsam fir is a medium sized tree found throughout the northern white pine region. It is a rapid grower, preferring cold, damp woods and swamps, and is valuable as undergrowth, as a nurse tree, or for planting in poorly-drained situations unsuited for other species. Balsam is commonly milled by oper-

TABLE 5.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B.M.	Grown out of Maine. Feet, B.M.
	Feet, B. M.	Per cent.				
Boxes and crates.....	16,248,000	97.92	\$14 38	\$233,585 50	14,768,000	1,480,000
Planing-mill products.....	152,000	.92	15 81	2,402 50	152,000	.....
Laundry appliances.....	100,000	.60	16 00	1,600 00	100,000	.....
Miscellaneous.....	65,000	.39	21 17	1,375 00	65,000	.....
Sash, doors, blinds and general millwork.....	25,000	.15	14 00	350 00	25,000	.....
Woodware and novelties.....	3,000	.02	13 00	39 00	3,000	.....
Totals.....	16,593,000	100.00	14 42	\$239,352 00	15,113,000	1,480,000

Additional figures from 1910 reports of the Bureau of the Census (see appendix).

Pulp.....	16,430,500	.....	.....	.....	16,430,500	.....
Grand totals.....	33,023,500	.....	.....	.....	31,543,500	.....

ators cutting pine and spruce, and is sold with the latter species without distinction. The wood is very light, soft, not strong, and not durable in the soil. Its uses do not make a long list, the more common are box boards and pulp. In 1910, 16,430,500 board feet were made into paper pulp. Maine manufacturers also report small quantities made into house finish, sheathing, and ironing boards.

### *Yellow Birch.*

Yellow birch is the other important birch of the State. This is a tree which prefers a cool, moist atmosphere, and grows best on a moderately deep, loose, moist soil. It is, however, very hardy and will grow well under other conditions. It is a rapid grower and rather persistent. The wood is heavy, hard, and strong, and takes a good polish. It is used for finish, and furniture, and wheel hubs. Young yellow birch, known in Maine as silver birch, finds its way into novelty mills along with the paper birch, and is used extensively for handles. The amount classified under shuttles, spools and bobbins, went largely into the last named article. For small spools paper birch is the exclusive wood, but basswood, tulip poplar, and red gum are coming into use for three-piece spools. Yellow birch was also made into clothespins, veneer boxes, and shoe

lasts and shanks. The amount credited to bungs and faucets was used for cork caps.

TABLE 6.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Shuttles, spools, bobbins, etc. ....	1,853,000	14.54	\$17.76	\$32,913.00	1,853,000	.....
Laundry appliances.....	1,338,000	10.50	13.16	17,604.00	1,338,000	.....
Boxes and crates.....	1,280,000	10.04	14.99	19,190.00	1,280,000	.....
Furniture.....	1,258,500	9.88	20.54	25,849.00	498,500	760,000
Boot and shoe findings.....	1,140,000	8.95	15.88	18,105.00	1,140,000	.....
Toys.....	1,080,000	8.47	19.94	21,530.00	35,000	1,045,000
Handles.....	838,500	6.58	15.58	13,066.00	838,500	.....
Dowels.....	782,000	6.14	15.41	12,054.00	682,000	100,000
Planing-mill products.....	649,500	5.10	23.99	15,580.50	478,500	171,000
Ship and boat building.....	557,000	4.37	23.41	13,038.00	529,500	27,500
Woodware and novelties.....	505,000	3.96	22.60	11,412.00	352,000	153,000
Miscellaneous.....	367,500	2.88	18.66	6,857.50	202,500	165,000
Vehicles and vehicle parts.....	361,000	2.83	16.27	5,873.50	361,000	.....
Sash, doors, blinds and general millwork.....	220,000	1.73	33.68	7,410.00	116,000	104,000
Chairs.....	151,500	1.19	19.96	3,024.00	141,500	10,000
Bungs and faucets.....	150,000	1.18	19.00	2,850.00	150,000	.....
Butchers' blocks and skewers.....	70,000	.55	15.14	1,060.00	70,000	.....
Dairymen's, poultryers' and apiarists' supplies.....	70,000	.55	16.00	1,120.00	70,000	.....
Fixtures.....	34,000	.27	46.12	1,568.00	2,000	32,000
Brushes.....	20,000	.16	15.00	300.00	20,000	.....
Sporting and athletic goods.....	17,000	.13	23.53	400.00	12,000	5,000
Totals.....	12,742,500	100.00	\$18.11	\$230,804.50	10,170,000	2,572,500

Additional figures from 1910 report of the Bureau of the Census (see appendix).

Slack cooperage.....	469,333	.....	.....	.....	469,333	.....
Grand totals.....	13,211,833	.....	.....	.....	10,639,333	.....

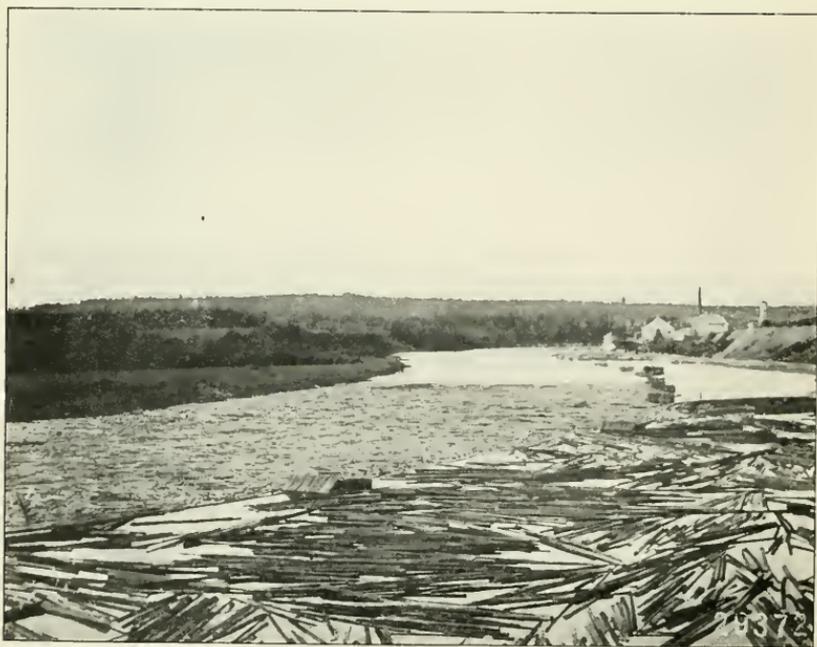
### *Sugar Maple.*

The sugar maple is, next to the paper and yellow birches, the most important hardwood of the State. It is widely distributed in the eastern United States, and is most abundant in the Lake States, New York, Maine, and in the Appalachians. It prefers a fresh, well-drained soil, but grows well on almost any rich soil. It is a somewhat slow-growing but a long-lived tree. Sugar maple is well adapted for planting as a filler. Its tolerance and heavy crown make it one of the best species available for under planting in open forest or plantation to protect the soil. The chief value of the sugar maple for economic planting is as a sugar producer. The sap contains from two to six per cent of sugar. Three to nine per cent of the total sap content





File of logs for winter supply of pulp mill



Mill and river from R. R. bridge, Ashland, Me.

TABLE 7.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B.M.	Grown out of Maine. Feet, B.M.
	Feet, B. M.	Per cent.				
Boot and shoe findings.....	4,738,500	42.83	\$17.38	\$82,341.00	4,738,500	.....
Shuttle, spools, bobbins, etc.....	1,605,000	14.50	16.18	25,975.00	1,405,000	200,000
Handles.....	776,000	7.01	20.31	15,757.00	776,000	.....
Printing materials.....	523,000	4.73	21.20	11,087.50	523,000	.....
Furniture.....	420,000	3.80	20.32	8,535.00	195,000	225,000
Dowels.....	340,000	3.07	14.72	5,005.00	340,000	.....
Laundry appliances.....	322,000	2.91	13.34	4,296.00	322,000	.....
Miscellaneous.....	310,000	2.80	18.02	5,587.00	175,000	135,000
Toys.....	310,000	2.80	19.77	6,130.00	20,000	290,000
Ship and boat building.....	302,000	2.73	23.32	7,441.50	300,000	2,000
Woodenware and novelties.....	297,000	2.68	16.42	4,878.00	297,000	.....
Planing-mill products.....	287,500	2.60	22.92	6,590.50	243,500	44,000
Boxes and crates.....	225,000	2.03	15.00	3,375.00	225,000	.....
Dairymen's, poulterers' and apiarists' supplies.....	220,000	1.99	16.00	3,520.00	220,000	.....
Sporting and athletic goods.....	130,000	1.17	17.88	2,325.00	125,000	5,000
Butchers' blocks and skewers.....	72,000	.65	15.42	1,110.00	72,000	.....
Vehicles and vehicle parts.....	62,500	.56	20.64	1,290.00	62,500	.....
Sash, doors, blinds and general millwork.....	60,000	.54	23.75	1,425.00	60,000	.....
Chairs.....	25,000	.23	17.12	428.00	15,000	10,000
Fixtures.....	21,000	.19	21.19	445.00	21,000	.....
Brushes.....	5,000	.05	15.00	75.00	5,000	.....
Car construction.....	5,000	.05	35.00	175.00	5,000	.....
Pulleys and conveyors.....	5,000	.05	30.00	150.00	5,000	.....
Patterns.....	3,000	.03	38.00	114.00	.....	3,000
Totals.....	11,064,500	100.00	\$17.90	\$198,055.50	10,150,500	914,000

Additional figures from 1910 reports of the Bureau of the Census (see appendix).

Slack cooperage.....	556,333	.....	.....	556,333	.....
Grand totals.....	11,620,833	.....	.....	10,706,833	.....

of the tree may be utilized for sugar making without dangerously lessening the tree's vitality.

The wood of sugar maple is heavy, strong, dense, and hard, but it is not durable in contact with the soil. It is used in large quantities for shoe lasts, bobbins, finish and flooring, musical instruments, furniture, woodenware, handles, and cooperage. This wood, together with birch and beech, is used in other States, notably, New York, Pennsylvania, and Michigan, for wood distillation, the products of which are wood alcohol, acetate, and charcoal. Handles made from sugar maple are principally for peavies and cant-hooks. This wood is used almost exclusively in the manufacture of die and print blocks. Veneer boxes are made from it, and Table VII indicates a long list of other uses.

*Longleaf Pine.*

TABLE 8.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Ship and boat building.....	3,582,000	52.50	\$38 55	\$138,093 00		3,582,000
Sash, doors, blinds and general millwork.....	1,290,000	18.91	22 71	29,300 00		1,290,000
Planing-mill products.....	1,210,000	17.74	25 58	30,950 00		1,210,000
Car construction.....	585,500	8.58	62 48	36,583 00		585,500
Miscellaneous.....	155,000	2.27	30.06	4,660 00		155,000
Totals.....	6,822,500	100.00	\$35 12	\$239,586 00		6,822,500

Longleaf pine is at present the most important of the southern yellow pines and is the principal pine cut in all of the Gulf States. The wood is heavy, hard, tough, strong, and durable. It is cut chiefly for lumber, dimension stock, and construction timbers; the naval-stores industry of the United States depends almost entirely upon this tree. More than half of this species brought into Maine was used in the shipyards. Large amounts were also used for sash, doors, and blinds, and for house finish.

*Hemlock.*

TABLE 9.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Boxes and crates.....	4,704,000	96.43	\$14 72	\$69,241 50	4,639,000	65,000
Planing-mill products.....	171,000	3.51	14 78	2,527 00	171,000	
Patterns.....	3,000	.06	18 00	54 00	3,000	
Totals.....	4,878,000	100.00	\$14 72	\$71,822 50	4,813,000	65,000

Additional figures from 1910 reports of the Bureau of the Census (see appendix).

Pulp.....	7,258,000				7,258,000	
Grand total.....	12,136,000	100.00	\$14 72	\$71,822 50	12,071,000	65,000

When white pine was abundant in the northeast and Lake States, hemlock was little cut for lumber, and trees which were cut for the bark were usually left in the woods. To-day the

quantity of white pine cut in the United States does not greatly exceed that of hemlock, while in such States as Michigan and Wisconsin more hemlock than pine is cut. Hemlock grows on light, loamy, well-drained soil, in cool and moist situations. It grows slowly when young, but rather rapidly after a few years. The wood is light, soft, rather strong, not durable, and holds nails well. It is usually manufactured into lumber and dimension stock. It is also cut largely for ties, and the bark of the species is the principal tanbark used in the northern States. Hemlock is used principally in Maine for the manufacture of boxes where it is often substituted for sapling pine. The table shows that nearly all the supply of hemlock demanded by wood-working establishments was made into boxes and that an even larger quantity was used by pulp mills.

*Basswood.*

TABLE 10.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Toys.....	843,000	17.66	\$22.52	\$20,985.00	218,000	625,000
Boot and shoe findings.....	785,700	16.46	18.62	14,627.00	785,700	.....
Woodenware and novelties.....	720,000	15.09	21.95	15,805.00	405,000	315,000
Laundry appliances.....	601,000	12.59	22.11	13,288.00	601,000	.....
Planing-mill products.....	559,000	11.71	17.50	9,784.00	559,000	.....
Brushes.....	500,000	10.48	20.00	10,000.00	500,000	.....
Boxes and crates.....	301,400	6.31	17.83	5,373.00	301,400	.....
Furniture.....	203,000	4.25	21.11	4,285.00	203,000	.....
Vehicles and vehicle parts.....	102,000	2.14	21.69	2,212.50	102,000	.....
Sash, doors, blinds and general millwork.....	57,000	1.19	20.07	1,144.00	57,000	.....
Shuttles, spools, bobbins, etc.....	50,000	1.05	25.00	1,250.00	50,000	.....
Fixtures.....	18,000	.38	44.44	810.00	.....	18,000
Caskets and coffins.....	10,000	.21	23.00	230.00	10,000	.....
Pulleys and conveyors.....	10,000	.21	15.00	150.00	10,000	.....
Handles.....	8,000	.17	14.00	112.00	8,000	.....
Chairs.....	5,000	.10	18.00	90.00	5,000	.....
Totals.....	4,773,100	100.00	\$20.98	\$100,145.50	3,815,100	958,000

Basswood is found throughout the eastern part of the United States, from New Brunswick to Alabama, and westward to Texas and Nebraska. The tree is best suited to a deep, rich, river-bottom soil, and to cool situations, but it is recommended for planting only where the soil is moist and well-drained, and where droughts are infrequent. The rate of growth is fairly rapid during early age, being about the same as that of red

oak. Basswood is a prolific sprouter, and the renewal of the stand may be secured by taking advantage of this characteristic. To secure vigorous sprouts the trees should be felled in winter and the stumps cut low, smooth, and slanting.

Basswood timber is soft, straight-grained, and easily worked, but not durable in contact with the soil. It is not strong and shrinks considerably in drying. Throughout the country it is used for furniture, woodenware, cooperage, and ties. Its ease of working made basswood the favorite wood among Maine toy makers. Much of it was made into certain kinds of lasts and fillers, and much into woodenware. Most of the wood going into boxes was cut into thin veneer and made into the very small boxes used by the drug trade. This wood also went into three-piece spools.

*Aspen (Popple.)*

TABLE 11.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B.M.	Grown out of Maine. Feet, B.M.
	Feet, B. M.	Per cent.				
Miscellaneous.....	2,500,000	57.36	\$15 00	\$37,500 00	2,500,000	.....
Boxes and crates.....	1,352,500	31.02	12 62	16,585 50	1,352,500	.....
Matches and toothpicks.....	325,000	7.46	18 92	6,150 00	325,000	.....
Woodenware and novelties.....	110,000	2.52	11 63	1,290 00	110,000	.....
Planing-mill products.....	21,000	.48	16 14	339 00	21,000	.....
Toys.....	18,000	.41	20 00	360 00	18,000	.....
Vehicles and vehicle parts.....	8,000	.18	18 00	144 00	8,000	.....
Handles.....	7,000	.16	13 00	91 00	7,000	.....
Agricultural implements.....	6,000	.14	15 00	90 00	6,000	.....
Boot and shoe findings.....	5,000	.12	13 00	65 00	5,000	.....
Dowels.....	5,000	.12	12 00	60 00	5,000	.....
Laundry appliances.....	1,000	.02	13 00	13 00	1,000	.....
Totals.....	4,358,500	100.00	\$14 38	\$62,687 50	4,358,500	.....

Additional figures from 1910 reports of the Bureau of the Census (see appendix).

Pulp.....	72,487,000	.....	.....	.....	65,142,000	.....
Slack cooperage.....	103,000	.....	.....	.....	103,000	.....
Grand totals.....	76,948,500	.....	.....	.....	69,603,500	.....

The aspens of Maine include both quaking aspen and large-tooth aspen. Both of these are cold-enduring and moisture-loving trees. For their best growth, they require deep, fresh or moist, porous and well-drained soil; sandy loams mixed with decayed vegetable matter are especially suitable. However,

they are often found in abundance on thin, fairly dry soil as well as in poorly drained situations; but in such places, however, where there are usually more trees to the acre, they never grow so rapidly, so large or to so perfect a form as in the better situations. The wood of both aspens is light, soft, weak, compact, and very perishable in contact with the soil. Aspen lumber is easily worked and seasons rapidly, but warps and checks badly. This wood is, therefore, poorly adapted for such important uses as lumber, ties and poles, but it has been found to be especially adapted for the manufacture of paper pulp, excelsior, and box boards. In the year 1910, nearly nine per cent of all the wood used by the pulp mills of the country was aspen. Aspen lumber has been found excellent for the parts of barns subject to kicking and gnawing by domestic animals. It is tough, wears well, and does not splinter. It is already being used to a small extent in the manufacture of spools and toothpicks. It was found impossible to secure separate reports upon the two aspens. The entire amount is credited to quaking aspen which, undoubtedly, furnished seventy-five to ninety per cent of the supply. The amount indicated in the table opposite "Miscellaneous" was mostly made into excelsior. A large amount went into boxes, and some was used for toothpicks.

### *Beech.*

Beech is one of the woods which has been put to an extensive use only lately. The decreasing supply of such woods as sugar maple and yellow birch first drew attention to beech, which grows, usually, on fresh, rich soils. It is well adapted to limestone soils on rocky, exposed situations. It is a rapid grower, and endures shade exceedingly well, which makes it, like the sugar maple, an excellent tree to use as a filler in open forest or plantation. The wood of beech is heavy, hard, stiff, and strong. It is not durable in the ground, and checks considerably in drying, but wears well and takes a good polish. It is used in this country for furniture, turned articles, and handles. In Maine it was used most extensively for clothespins, bobbins, dowels, lasts, handles, and toys.

TABLE 12.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Laundry appliances.....	1,310,000	31.79	\$13.02	\$17,055 00	1,310,000	
Shuttles, spools, bobbins, etc.....	692,000	16.79	16.25	11,246 00	692,000	
Miscellaneous.....	520,000	12.62	17.98	9,350 00	220,000	300,000
Dowels.....	378,000	9.17	14.63	5,529 00	378,000	
Boot and shoe findings.....	320,000	7.77	15.58	4,985 00	320,000	
Handles.....	313,000	7.60	14.26	4,463 50	313,000	
Toys.....	205,000	4.98	19.95	4,090 00	5,000	200,000
Ship and boat building.....	73,500	1.78	17.50	1,286 00	63,500	10,000
Furniture.....	73,000	1.77	21.03	1,535 00	73,000	
Butchers' blocks and skewers.....	60,000	1.46	15.08	905 00	60,000	
Planing-mill products.....	56,000	1.36	16.41	919 00	56,000	
Woodenware and novelties.....	50,000	1.21	15.00	750 00	50,000	
Dairymen's, poulterers' and apiarists' supplies.....	20,000	49	16.00	320 00	20,000	
Sporting and athletic goods.....	17,000	41	13.82	235 00	17,000	
Sash, doors, blinds and general millwork.....	15,000	36	19.67	295 00	15,000	
Chairs.....	13,000	32	15.23	198 00	13,000	
Brushes.....	5,000	12	15.00	75 00	5,000	
Totals.....	4,120,500	100.00	15.35	\$63,236 50	3,610,500	510,000

Additional figures from 1910 reports of the Bureau of the Census (see appendix).

Slack cooerage.....	397,000				397,000	
Grand totals.....	4,517,500				4,007,500	

### Loblolly Pine.

TABLE 13.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Planing-mill products.....	1,588,000	38.87	\$33.56	\$53,290 00		1,588,000
Sash, doors, blinds and general millwork.....	1,208,000	29.57	28.60	34,544 00		1,208,000
Car construction.....	1,160,000	28.40	24.71	28,659 00		1,160,000
Ship and boat building.....	61,000	1.49	44.68	2,725 50		61,000
Fixtures.....	48,000	1.18	29.98	1,459 00		48,000
Miscellaneous.....	20,000	.49	35.00	700 00		20,000
Totals.....	4,085,000	100.00	\$29.71	\$121,357 50		4,085,000

Loblolly pine is one of the three principal southern yellow pines, and of these is the most important one in the States of Virginia, North Carolina, and South Carolina. The wood is that of a typical hard pine but is usually coarse-grained, with a

wide sapwood. It is cut almost entirely for lumber, and a large proportion of the cut is worked by the planing mills of the States in which it is cut into such products as flooring, ceiling and partition. The lower grades find extensive use in box making. The factories of Maine used it most extensively for house finish, screen doors, and cars.

*Red Oak.*

TABLE 14.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Ship and boat building.....	804,500	21.54	\$28.67	\$23,063 00	800,500	4,000
Furniture.....	723,000	19.76	24.20	17,500 00	533,000	190,900
Car construction.....	705,000	18.87	24.79	17,474 00	696,000	9,000
Toys.....	700,000	18.74	20.60	14,000 00	700,000	.....
Vehicles and vehicle parts.....	260,000	6.96	33.05	8,592 50	225,000	35,000
Planing-mill products.....	181,000	4.85	30.06	5,441 00	139,000	42,000
Sash, doors, blinds and general millwork.....	113,500	3.04	53.96	6,125 00	51,000	62,500
Miscellaneous.....	70,000	1.87	22.43	1,570 00	25,000	45,000
Dowels.....	65,000	1.74	14.54	945 00	65,000	.....
Woodenware and novelties.....	35,000	.94	24.00	840 00	35,000	.....
Chairs.....	30,000	.80	21.00	630 00	20,000	10,000
Handles.....	18,000	.48	17.44	314 00	18,000	.....
Agricultural implements.....	16,000	.43	22.00	352 00	16,000	.....
Fixtures.....	10,000	.27	20.00	200 00	10,000	.....
Boot and shoe findings.....	3,000	.08	8.00	24 00	3,000	.....
Boxes and crates.....	1,000	.03	18.00	18 00	1,000	.....
Totals.....	3,735,000	100.00	\$25.99	\$97,088.50	3,337,500	397,500

Additional figures from 1910 reports of the Bureau of the Census (see appendix).

*Slack cooerage.....	421,667	.....	.....	.....	421,667	.....
Grand totals.....	4,156,667	.....	.....	.....	3,759,167	.....

\* This amount was reported by manufacturers to the Census as "oak".

Red oak is the most abundant oak in Maine, and grows in nearly all parts of the State. It makes its best growth on rich upland soil, but will thrive in any soil except an undrained one. It is the most rapid grower among the oaks and sprouts vigorously from the stump. The wood of red oak is heavy, hard, and strong, but is inferior to the wood of white oak. However, because of the present scarcity of white oak, red oak has found a use in nearly every industry which formerly used white oak alone. Red oak is inferior to white oak where great strength is required, and does not last so long in the ground. However,

it works easier and therefore is often preferred for interior finish and cabinet work. The largest users of red oak are the manufacturers of slack cooperage, furniture, and house finish. It is also important for railroad ties, and tanbark. The table shows that shipyards used large quantities in Maine, and that furniture factories, toy factories, and car shops, required about equal amounts.

*White Ash.*

TABLE 15.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Handles.....	2,903,000	78.83	\$26 22	\$76,131 00	2,590,000	313,000
Woodenware and novelties.....	211,000	5.73	27 78	5,863 00	111,000	100,000
Ship and boat building.....	197,000	5.35	28 83	5,680 00	193,000	4,000
Vehicles and vehicle parts.....	158,500	4.50	23 59	3,739 00	158,500	.....
Furniture.....	54,000	1.47	21 33	1,152 00	54,000	.....
Sporting and athletic goods.....	33,000	.90	18 27	933 00	33,000	.....
Planing-mill products.....	28,000	.76	46 64	1,306 00	3,000	25,000
Shuttles, spools, bobbins, etc.....	25,000	.68	22 00	550 00	25,000	.....
Pulleys and conveyors.....	22,100	.60	26 92	595 00	22,000	100
Boxes and crates.....	20,000	.54	18 00	360 00	20,000	.....
Dowels.....	14,000	.38	15 00	210 00	14,000	.....
Chairs.....	10,000	.27	25 00	250 00	.....	10,000
Sash, doors, blinds and general millwork.....	5,000	.14	20 00	100 00	5,000	.....
Agricultural implements.....	2,000	.05	22 00	44 00	2,000	.....
Totals.....	3,682,600	100.00	26 32	\$96,913 00	3,230,500	452,100

White ash is one of the common but valuable hardwoods of Maine. It grows best in deep, loose, or moist soil that is well drained. The wood is heavy, hard, strong and very elastic. Its strength and toughness have made it exceptionally useful in the manufacture of agricultural implements, vehicle parts, handles, and oars; but it is also used in common with black ash for interior finish, cabinet work, furniture, and flooring. Its largest use in Maine was for tool handles. Large amounts also went into ladders, parts of boats, and canoes, and vehicle parts.

*White Oak.*

White oak trees are not common in the State of Maine, except in the southern part where they are found on sandy or gravelly soils, or on rich uplands and moist bottom lands. In

TABLE 16.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Ship and boat building.....	1,377,100	52.95	\$29.96	\$41,259 00	302,000	1,075,100
Car construction.....	537,500	20.67	29.51	15,862 50	469,500	68,000
Planing-mill products.....	233,000	8.96	72.15	16,810 00		233,000
Sash, doors, blinds and general millwork.....	138,000	5.31	91.17	12,581 00		138,000
Furniture.....	132,500	5.09	54.34	7,200 00		132,500
Handles.....	64,000	2.46	33.44	2,140 00	64,000	
Fixtures.....	50,000	1.92	66.12	3,306 00	5,000	45,000
Vehicles and vehicle parts.....	28,500	1.10	28.65	816 50	28,000	500
Chairs.....	20,000	.77	19.00	380 00	20,000	
Miscellaneous.....	10,000	.38	34.50	345 00	8,000	2,000
Agricultural implements.....	7,000	.27	27.71	194 00	7,000	
Sporting and athletic goods.....	3,000	.12	75.00	225 00		3,000
Totals.....	2,600,600	100.00	58.88	\$101,119 00	903,500	1,697,100

this part of the State the trees grow best upon the upland sites. White oak is the most useful of all American oaks. The wood is heavy, hard, strong and tough, and durable in contact with the soil. It has probably been used for more purposes than any other hardwood. It is largely used in ship building, in the cooperage industry, and in the manufacture of vehicles, agricultural implements, furniture, house finish, and ties. Its largest use in Maine was for ship building, most of the supply coming from Virginia. It was also extensively used in car construction and house finish. As indicated in the table high prices were paid by many industries for grades of this wood suited to their purposes.

Nearly two-thirds of the amount of white oak required by Maine factories was grown in other States.

### *Bald Cypress.*

TABLE 17.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Planing-mill products.....	1,163,000	63.36	\$45.23	\$52,605 00		1,163,000
Car construction.....	275,000	14.98	20.00	5,500 00		275,000
Sash, doors, blinds and general millwork.....	220,800	12.03	47.31	10,446 00		220,800
Miscellaneous.....	90,000	4.90	50.00	4,500 00		90,000
Ship and boat building.....	60,500	3.30	57.64	3,487 50		60,500
Fixtures.....	26,000	1.42	46.54	1,210 00		26,000
Patterns.....	100	.01	65.00	6 50		100
Totals.....	1,835,400	100.00	\$42.36	\$77,755 00		1,835,400

Cypress is a tree of the southern swamps, and the supply now comes mainly from Louisiana. The wood of cypress is moderately light, soft, and stiff. It is very durable in contact with the soil or in exposed situations. In Maine this wood was used principally for interior finish, cars, screens, silos, and boat building.

### *Western Yellow Pine.*

As the value of white pine was increased because of the diminishing supply, an opportunity has been afforded for the competition and substitution of less costly woods. Among these is western yellow pine, common throughout the Rocky Mountains and Pacific Coast States; it is often sold in the East as California white pine, and New Mexico white pine. Western yellow pine is a true yellow pine but is not as resinous as some of the southern yellow pines. The sapwood somewhat resembles the woods of white pine. This species was used in Maine for the manufacture of sash, doors, and blinds entirely, and the amount used as 1,400,000 feet b. m.

### *Yellow Poplar.*

TABLE 18.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B.M.	Grown out of Maine. Feet, B.M.
	Feet, B. M.	Per cent.				
Planing-mill products.....	533,500	60.56	\$54.87	\$29,270.50		533,500
Sash, doors, blinds and general millwork.....	112,000	12.71	56.15	6,289.00		112,000
Shuttles, spools, bobbins, etc....	100,000	11.35	25.00	2,500.00		100,000
Fixtures.....	61,000	6.93	56.85	3,468.00		61,000
Car construction.....	48,000	5.45	64.56	3,099.00		48,000
Vehicles and vehicle parts.....	24,500	2.78	67.80	1,661.00		24,500
Ship and Boat building.....	1,100	.13	70.91	78.00		1,100
Miscellaneous.....	500	.06	60.00	30.00		500
Caskets and coffins.....	300	.03	50.00	15.00		300
Totals.....	880,900	100.00	52.69	\$46,410.50		880,900

The yellow poplar is one of the most important hardwoods of the Central and Southern States because of its size and rapid growth, and the ease with which reproduction may be secured. The wood is light, soft, stiff, not strong, and not durable in the soil. It has an unusually varied list of uses includ-

ing for interior finish, boxes, shelving, clapboards, carriage panels, furniture, and woodenware. In Maine its largest uses were for house finish, doors, and three-piece spools.

*Black Ash.*

TABLE 19.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Furniture.....	613,000	76.15	\$19 35	\$11,880 00	463,000	150,000
Planing-mill products.....	65,500	8.14	38 77	2,539 50	27,000	38,500
Car construction.....	50,000	6.21	40 00	2,000 00		50,000
Sash, doors, blinds and general millwork.....	31,000	3.85	24 84	770 00	31,000	
Ship and boat building.....	20,000	2.49	25 00	500 00	20,000	
Chairs.....	10,000	1.24	17 00	170 00	10,000	
Boxes and crates.....	5,000	.62	15 00	75 00	5,000	
Brushes.....	5,000	.62	15 00	75 00	5,000	
Fixtures.....	3,000	.37	20 00	60 00	3,000	
Woodenware and novelties.....	2,500	.31	13 00	32 50	2,500	
Totals.....	805,000	100.00	\$22 46	\$18,082 00	566,500	238,500

The black ash is a common tree in Maine. It is usually found growing in rich, moist soil, in swamps, or along the banks of streams. It is rather indifferent to drainage, and is, therefore, adapted to undrained situations in a cool climate. The wood is rather heavy and soft, tough and elastic, but is not durable when exposed. It is used largely for interior finish and cabinet work, and also finds some use as barrel hoops and baskets. In Maine the bulk of the black ash was purchased by the furniture factories. Over one-fourth of the quantity required by all industries came from other States.

*Northern White Cedar.*

TABLE 20.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Ship and boat building.....	528,100	87.20	\$26 68	\$14,091 00	528,100	
Boxes and crates.....	72,500	11.97	13 43	974 00	72,500	
Miscellaneous.....	5,000	.83	11 00	55 00	5,000	
Totals.....	605,600	100.00	\$24 97	\$15,120 00	605,600	

Northern white cedar, or arborvitae, grows in all parts of the State, but is more abundant in the northern and eastern parts. It will grow well in almost any soil, and, as all woodsmen know, often makes dense, pure growths in swamps. While it is not a rapid grower it is easily propagated, and therefore desirable for planting in very wet places. The wood is light, soft, brittle, and one of the most durable woods of the country in contact with the soil. Its largest use has been, and still is, for railroad ties, shingles, poles, and fence posts. Its principal use in Maine factories is in the manufacture of canoes; it is used for ribs by practically all Maine canoe builders, and, to some extent, for planking. It is, however, being replaced for the latter purpose by western red cedar because the latter may be had in clear stock and large sizes, whereas white cedar is seldom clear in sizes much larger than rib stock. The entire amount consumed was grown within the State.

*Douglas Fir.*

TABLE 21.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B.M.	Grown out of Maine. Feet, B.M.
	Feet, B. M.	Per cent.				
Ship and boat building.....	350,000	65.73	\$45 71	\$16,000 00	.....	350,000
Sash, doors, blinds and general millwork.....	136,000	25.54	44 00	5,984 00	.....	136,000
Miscellaneous.....	46,500	8.73	50 00	2,325 00	.....	46,500
Totals.....	532,500	100.00	\$45 65	\$24,309 00	.....	532,500

In the year 1910 the State of Washington produced more lumber than any State in the Union, a large portion of which was Douglas fir. The wood of Douglas fir is strong and hard, not very heavy, and fairly durable. It can be used for practically any of the uses to which the eastern pines of both the North and South have been put. Douglas fir is used chiefly for construction, ties, and poles. It is brought to Maine to be used chiefly as ship spars, because of the large size and straightness of the trees. Mature trees in the Pacific Northwest reach a height of 300 feet and a diameter of 10 feet. White pine formerly furnished all the spar material on the



Double cut band saw



Log pond slip, Bangor



North Atlantic coast but it is difficult to obtain it now in pieces of sufficient size and straightness. Douglas fir grown in Washington is also used in the manufacture of sash, doors, and blinds, and for wood pipe. The wood possesses qualities which lead it to command an average price of \$45.65 per 1,000 feet in Maine. This was the highest price paid for any of the soft woods and \$10 higher than the average value of longleaf pine at the Maine factories.

*Red Maple.*

TABLE 22.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Miscellaneous.....	200,000	42.55	\$18 00	\$3,600 00	65,000	135,000
Handles.....	164,000	34.89	11 50	1,894 50	164,000	.....
Shuttles, spools, bobbins, etc.....	50,000	10.64	16 00	800 00	50,000	.....
Furniture.....	20,000	4.26	16 00	320 00	20,000	.....
Sporting and athletic goods.....	20,000	4.26	25 00	500 00	20,000	.....
Ship and boat building.....	10,000	2.13	30 00	300 00	10,000	.....
Woodenware and novelties.....	3,000	.64	13 00	39 00	3,000	.....
Vehicles and vehicle parts.....	2,000	.42	26 00	52 00	2,000	.....
Sash, doors, blinds and general millwork.....	1,000	.21	20 00	20 00	1,000	.....
Totals.....	470,000	100.00	16 01	\$7,525 50	335,000	135,000

The red maple is the most common maple of the State. It makes its best growth on low, wet soils, but will thrive in somewhat dry situations. In Maine it is usually found along streams or on the edges of swamps. It is a rapid and moderately persistent grower. The wood is heavy, not strong, nor durable, but easily worked and will take a good polish. It is inferior to the wood of sugar maple, but superior to that of silver maple. Throughout the country it is used chiefly for cabinet making, turnery, woodenware, and gun stocks. In general the wood sells at low prices.

Undoubtedly a small per cent of the maple shown as red maple in this report is silver maple, as the two kinds were not separated in the individual reports and in such cases were classed as red maple. The silver maple is common throughout the State, except near the coast, and is usually found growing along streams.

*Norway Pine.*

TABLE 23.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Boxes and crates.....	203,000	49.75	\$12 91	\$2,620 00	138,000	65,000
Planing-mill products.....	160,000	39.22	19 31	3,090 00	160,000	.....
Car construction.....	45,000	11.03	28 00	1,260 00	.....	45,000
Totals.....	408,000	100.00	17 08	\$6,970 00	298,000	110,000

While the Norway pine is a common tree in Maine, it is not abundant, and grows singly or in small groves. Although adapted to many soils it grows best on soils suitable for white pine. It is extremely hardy, and is a vigorous and rapid grower. The best quality of timber is produced in well drained sands. The wood is somewhat heavier, harder, and stronger than the wood of white pine and is used chiefly for boxes and construction work. Both in the northeastern and Lake States, Norway pine is handled and sold together with the lower grades of white pine. In Maine Norway pine went into box factories and planing mills with white pine.

*Western Red Cedar.*

The western red cedar is also known as giant arborvitae, as distinguished from the eastern arborvitae. The latter grows only about 50 feet high with a diameter of 18 inches, while western red cedar attains a height of 150 feet and a diameter of 9 feet. The wood of this western species is light, soft, brittle, not strong, but very durable in contact with the soil. It is used largely in the Northwest for the manufacture of shingles, and some lumber is cut from it. It is said that the Indians of the Northwest employed it exclusively for making canoes, and it is for this purpose that quantities are used in Maine each year. In the manufacture of canvas-covered canoes it has been found that the native cedar furnishes the best material for ribs, and that when it can be had in clear stock of sufficient width it makes very satisfactory planking. However, the eastern tree is so small and so knotty that canoe builders had to look elsewhere for material, and this they found in the western red

cedar. This wood makes almost ideal planking for canoes as it is extremely light and meets the requirements of the builder as to clearness and width of stock and ease in working. The quantity brought into Maine from the Pacific Coast States to be used in the manufacture of canoes in 1911 was 291,500 feet. The average value of the wood f. o. b. Maine factories was \$48.27 per 1,000 feet.

*Chestnut.*

TABLE 24.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Caskets and coffins.....	78,500	56.27	\$29 58	\$2,322 00	.....	78,500
Furniture.....	50,000	35.84	21 00	1,050 00	.....	50,000
Planing-mill products.....	11,000	7.89	53 18	787 00	.....	11,000
Totals.....	139,500	100.00	\$28 37	\$3,957 00	.....	139,500

While chestnut grows in the southwestern part of Maine it is not at all abundant. All of that reported by the factories came from other States. It is a tree of the northeastern and Middle States and grows best on well-drained gravelly soils. It is an exceedingly rapid grower and sprouts most vigorously.

The wood is light, rather soft, and stiff but not strong. It shrinks and checks considerably in drying, works well, and is fairly durable. It is used principally for furniture, cooperage, ties and poles. Large quantities of chestnut wood are consumed in some States in the manufacture of tannic acid. Sound wormy stock is used for the invisible parts of caskets, coffins, and furniture. The nuts of the tree are a food product and are gathered both in this country and abroad in large quantities for the market.

*Mahogany.*

The term mahogany should include only the real mahogany (*Swietenia mahogoni*), but a number of valuable foreign woods are now sold under this name in the United States. The real mahogany comes from Southern Florida, Cuba, Mexico, Central American Countries, and Northern South America. It

TABLE 25.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Ship and boat building.....	45,900	40.40	163.92	\$7,524 00		45,900
Fixtures.....	29,000	25.53	160.34	4,650 00		29,000
Sash, doors, blinds and general millwork.....	20,000	17.61	117.50	2,350 00		20,000
Car construction.....	8,000	7.04	170.00	1,360 00		8,000
Planing-mill products.....	6,500	5.72	192.31	1,250 00		6,500
Patterns.....	3,200	2.82	178.75	572 00		3,200
Furniture.....	1,000	.88	200.00	200 00		1,000
Totals.....	113,600	100.00	157.62	\$17,906 00		113,600

is one of the favorite finishing and furniture woods used in this country, and only its price and scarcity prevent more extensive use. It is now used mainly in the form of veneer, and imitations are coming into general use. In the Southern States red gum is often finished to imitate mahogany, and in the northeastern States yellow birch, sugar maple, and beech are often finished in the same way. It was used mostly in Maine as ship, boat, and canoe finish, and for fixtures and doors. In addition to the figures shown in the table, 25,000 board feet of African mahogany were reported. This closely resembles the true mahogany.

#### *Southern White Cedar.*

Southern white cedar differs from northern white cedar but has a like habitat in the swamps of the Atlantic and Gulf States. It grows in Southern Maine, however, near the coast, but is not at all abundant. The wood is white, soft, even-grained, and very durable in contact with the soil. In the South it is used principally for shingles, ties, posts, poles, piles, cooperage, boat building, and woodenware. It was brought to Maine principally to be used in the manufacture of boats and silos. Boat builders used 22,500 feet mostly for the planking of row boats and other small boats and 75,000 board feet were used in the manufacture of silos.

#### *Tamarack.*

Tamarack which is also known as hackmatack or larch, and in Maine quite commonly as "juniper," is found in practically

every part of the State. In Canada this tree is usually found on moist uplands, but in the United States it has been crowded by other species into cold, wet swamps where the others can not grow. The wood is heavy, hard, and very strong, and moderately durable when in contact with the soil. It has been employed largely for ship knees and timbers, posts, ties, and poles, and occasionally for lumber. In this study it was reported only by makers of ship timbers, and 100,500 board feet were used by them. Quantities are undoubtedly cut annually by farmers and loggers for ties, posts, and poles.

It may be of interest to note here that the European larch is somewhat better for planting than the native tamarack or larch. The wood of European larch is heavy, hard, strong, and flexible, and very durable in contact with the ground. It is suited to every use to which the native tamarack is put, and may come to be preferred for planting because of its rapid growth. It will grow on rather poor soil but will do much better on soil that is deep, light, moderately fertile, fresh, and well-drained.

#### *Western White Pine.*

In the search for substitutes for eastern white pine, the white pine growing in the northern Rocky Mountain region and in the Northern Pacific slope country was brought to the attention of manufacturers, and it has been found to be an excellent substitute for the soft pines of the northeastern and Lake States. It is a true white pine, and therefore, more closely related to the eastern white pine than is the western yellow pine. The quantity reported as used in Maine, 100,000 board feet, was used in the manufacture of sash and doors.

#### *Red Gum.*

Red gum is a wood which a quarter of a century ago occupied a place in the estimation of southern lumbermen similar to that held by beech in the northern States. It is now used extensively for furniture, cabinet work, house finish, veneers, and boxes. The wood is rather heavy, soft, strong, stiff, and tough. It is not durable in exposed situations. It shrinks and warps so badly that special treatment has been found necessary in handling it, but since its drying has been successfully accom-

plished it has come to be a favorite cabinet and finish wood. Maine manufacturers used 30,000 board feet for doors and other products made in sash and door factories, 19,000 board feet for furniture, and smaller amounts for fixtures, house finish, and hand bellows.

#### *Red Cedar.*

Red cedar grows through the eastern United States in a variety of sites, including deep swamps, borders of streams, ridges, and hills, and will thrive on a rather dry loose soil. It occurs in Maine, but is not at all common. The wood is light, soft, brittle, and very durable in contact with the soil. It is used largely for posts, ties, and poles, but its adaptability for the manufacture of lead pencils has in recent years made it almost the exclusive wood for that purpose, and the price paid by pencil makers has restricted its other uses. It is still the wood most used for high grade pencils, but its present scarcity has led to the use of other American woods for the cheaper grades. Forty thousand board feet of cedar were used in the State of Maine in the manufacture of chests.

#### *Cotton Gum.*

Cotton gum, or tupelo, is a tree of the Southern States. It is a swamp tree and usually grows and is cut with cypress. The wood is difficult to season, as it has a tendency to warp and check. It is not durable, and is hard to split and work. However, when carefully handled it works fairly well and has come into use for a number of purposes. It is largely used in the South in the manufacture of vegetable and fruit boxes. Twenty-nine thousand, five hundred board feet were used in Maine in the manufacture of wooden pipe and pumps.

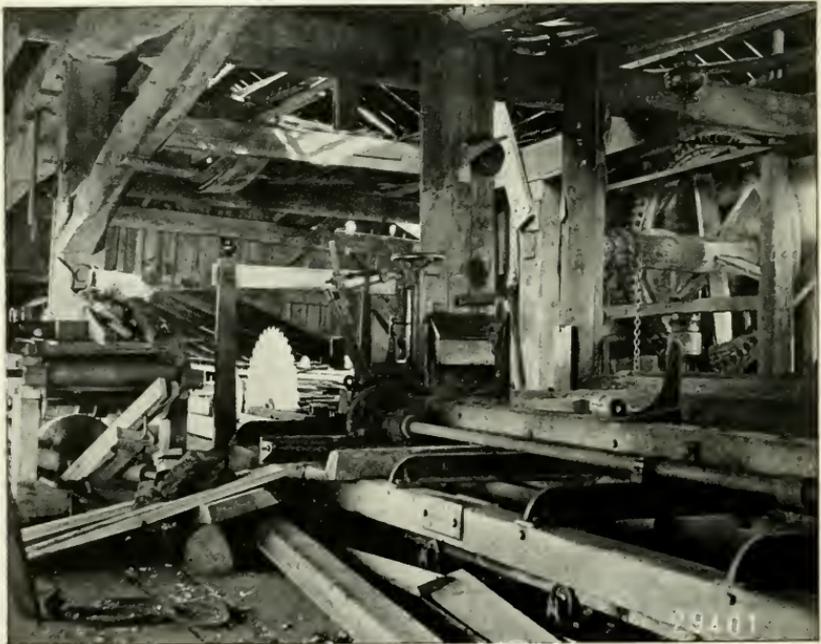
#### *Black Willow.*

Black willow is a rather common tree in Maine and is found growing along the banks of streams and lakes. It is a tree of no great commercial importance. The wood is light, soft, and weak. Twenty-five thousand board feet were used in Maine in the manufacture of packing cases and 500 feet in the manufacture of artificial limbs.





Old tide water saw mills, first started in 1833



View inside one of the old tide mills still running. Shows rotary saw and carriage (modern) old windlass wheel for hauling logs out of the water; and edger.

*White Elm.*

White or American elm occurs commonly throughout the State, usually upon rich bottom lands and along streams. It is a rapid and persistent grower and sprouts well. The wood is heavy, hard, strong, and very tough, but not durable. It is used for cooperage, but also finds use for such articles as wheel and chair stock and furniture. Ten thousand board feet were used for wash benches, 5,000 for baskets, 5,000 for house finish, and 2,000 for wooden shoe heels. In 1910, slack cooperage manufacturers reported to the Census Bureau the use of 48,667 board feet of elm.

*Redwood.*

Redwood grows only in California, where it is manufactured into lumber, shingles, posts, ties, poles, tanks, and tubs. The wood is light, soft, brittle, not strong, but is very durable in contact with the soil. Maine used 17,500 feet for the manufacture of wood pipe and 1,000 feet for casket and coffin mouldings and trim.

*Black Cherry.*

Black cherry is common throughout the State, but is not abundant. It is adapted to almost any soil and situation but does best in deep, well-drained soils. It is a rapid grower and soon reaches a useful size for cabinet wood. The wood is rather heavy, hard, and strong, and of a light red color. It takes a good polish and is a favorite on account of its beauty. It is chiefly used as a finishing material for buildings, cars, and boats, and also for furniture. Ten thousand board feet of cherry were used in Maine for doors, 3,000 for screens, and 1,000 feet each for fixtures, house finish, and boat finish.

*Shortleaf Pine.*

Shortleaf is another of the southern yellow pines. It is somewhat like longleaf but grows more rapidly. The wood is softer and sometimes lighter in color and is used largely for doors, sashes, and blinds. The quantity reported by Maine manufacturers, 14,000 board feet, was used for car construction.

*Lignumvitae.*

Lignumvitae grows in Florida, the West Indies, and on the northern coast of South America. It is a low, gnarled tree, seldom more than 25 feet high and one foot in diameter. The wood is very heavy and exceedingly hard, strong, and difficult to work. It is used for sheaves, pulleys, tool handles, and for bearings for journals rotating in water. The 12,300 board feet of lignumvitae used in Maine were manufactured into yacht blocks and tackle block sheaves.

*Cork Elm.*

Cork elm, or rock elm, grows only on the best of rich, moist, loamy soils. The wood is heavy, hard, very strong, tough, and elastic, and much superior to the wood of other elms. It is used in the manufacture of agricultural implements, wheel stock, bicycle rims, and in all places where a very tough non-cleavable wood is needed. A plant which makes steering wheels for boats used 1,500 feet and 10,000 feet were used in a plant making wheels, sled runners, and hubs.

*Sycamore.*

Sycamore grows throughout the United States east of eastern Kansas, Nebraska, Oklahoma, and Texas, on rich, moist, low ground. The wood is rather heavy and hard but not very strong. It is extensively used in the manufacture of tobacco boxes and to some extent for furniture, interior finish, and butchers blocks, and to a greater extent for woodenware. In Maine 8,000 board feet were used in the manufacture of fixtures, and 500 feet were used for carriage work.

*Hickory.*

The hickory used by Maine manufactrers was reported as hickory only and no attempt to separate species was made. It is quite probable that most of the material came from shagbark hickory. This tree grows in the southern part of the State but is not at all abundant. The wood is very heavy, very hard, strong, tough, and elastic, but is not durable in contact with the soil or when exposed to the weather. It is used chiefly for agricultural implements, vehicles, and ax and tool handles. This

tree also furnishes a superior fuel wood. Maine factories used 7,500 feet for manufacture into various vehicle parts.

#### *Sweet Birch.*

Sweet birch or cherry birch, is widely distributed in Maine but does not grow in large quantities. It grows upon stream banks or in moist, rich upland soils. The wood is heavy, hard, and strong, and takes a fine finish; for this reason it is sometimes used for furniture. Wintergreen oil is distilled from the wood of this species. The small quantity used in Maine, 5,000 board feet, went into the manufacture of pulley arms.

#### *Butternut and Black Walnut.*

Butternut is an occasional tree throughout the southern part of the State. It grows well on rich, moist, soils. The wood is light, soft, not strong, and coarse-grained, and while it takes a good polish it falls far short of being as fine a cabinet wood as black walnut. Its uses throughout the country are largely for finishing lumber, cabinet work, and cooperage. One shipyard in the State used 3,000 board feet.

Black walnut is a tree of the northeastern, central, and southeastern States and usually grows on the best soils. The wood is heavy, hard, strong, and coarse-grained. It takes an excellent polish and for a long time was the favorite cabinet wood in this country. It has also been used for inside finish and is the almost exclusive wood for certain classes of gunstocks. One thousand board feet were used in Maine for screen frames and the same amount for house finish.

#### *Minor Species.*

Rosewood is a term applied to more than twenty tropical woods, but the Brazilian species is the one that is most commonly used in this country. Five hundred board feet were used in Maine for parts of boat steering wheels.

Teak is imported from India and Siam. The wood is very strong and is used in ship-building. Five hundred feet were used in Maine for boat finish.

White mahogany is a tree of southern Mexico and Central America, the wood somewhat resembles mahogany but is much

lighter in color. Five hundred board feet of this wood were reported as going into house finish.

Spanish cedar is the favorite material for the manufacture of cigar boxes. Small quantities of it grow in Florida, but the principal supply comes from Mexico and Central America. In Maine small quantities were used by makers of caskets and coffins.

Cocobola is a Central American wood and is imported into this country to be used for small handles. Two hundred board feet were used for parts of boat steering wheels.

English oak is the common oak of northern and central Europe. One hundred board feet were imported for special screen frame work.

Hornbeam or ironwood is a tree which occurs occasionally through the hardwood forests of this country. It is known to woodsmen as one of the toughest hardwoods and is often cut in the woods for levers. Small quantities were used in Maine in making pins for drop hammers to be used in machine shops.

#### INDUSTRIES.

No raw material is in more general demand by varied industries than wood. To many of them an abundant supply is essential to their continued prosperity and this is especially true in Maine where, because of the original timber resources great industries depending on these resources have developed.

Nearly 30,000 people, or over one-third of those engaged in all manufacturing industries in the State, depend upon the principal forest and wood-consuming industries for employment. Minor industries and the auxiliary use of wood employ many more.

The following table compiled from reports to the Bureau of Census for 1909 indicates the importance of the principal industries in Maine which depend upon the forest.

INDUSTRIES.	Average number of wage earners.	Value of products.
Paper and wood pulp.....	8,647	\$33,950,000
Lumber and timber products.....	15,086	26,125,000
Shipbuilding, including boat building.....	1,755	3,062,000
Cars and general shop construction and repairs by steam railroad companies.....	1,200	2,048,000
Wood, turned and carved.....	1,287	1,870,000
Carriages and wagons and materials.....	472	966,000
Cooperage and wooden goods not elsewhere specified.....	349	842,000
Furniture and refrigerators.....	215	368,000
Agricultural implements.....	121	226,000
Total.....	29,132	\$69,457,000
All manufacturing industries.....	79,955	\$176,029,000

Other large industries, such as those connected with the manufacture of textiles, canned goods, and boots and shoes, depend upon wood in many ways. They require it in the form of boxes or barrels in order to ship their product safely and cheaply, and wooden articles are almost inseparably connected with the manufacture of every imaginable product. For instance, the wooden shuttle is an essential feature of the loom, the maple last is invaluable to the shoe industry, and similarly the list might be extended indefinitely.

The industries which utilize cheap water power are dependent upon the forests in so far as the flow of streams is regulated by the forest cover upon their water sheds.

It is important that the people of Maine should fully realize the relation between the forests and the industries in order that intelligent action may be taken to best employ and perpetuate valuable forest resources. It is believed that this report will assist in reaching correct conclusions in these matters, because it points out the relative importance of each kind of wood to each industry and traces the present channels of supply.

Reports published annually by the Bureau of the Census\* show the amount and kind of wood cut by the sawmills or consumed in the manufacture of cooperage stock, paper pulp, cross ties, poles, veneer, wood distillation, and excelsior. Accord-

\*Forest Products of the United States.

ingly, these industries are not discussed here. They are in fact the primary forest industries and it is the object of this investigation to trace wood through those industries which convert lumber or other partially manufactured wood into finished products through further manufacture.

The following discussion shows the amount of each kind of wood required annually to maintain the various wood using industries of the State. In each case the extent to which this demand is now met by Maine foresters or by importations from other States or foreign countries, is indicated.

TABLE 26.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
White pine.....	60,673,500	55.72	\$15 81	\$959,439 00	58,973 000	1,700,500
Red spruce.....	21,873,500	20 09	14 81	323,894 50	19 898,500	1,975,000
Balsam fir.....	16,248,000	14.92	14 38	233,585 50	14,768,000	1,480,000
Hemlock.....	4,704,000	4 32	14 72	69,241 50	4,639,000	65,000
Paper birch.....	1,900,000	1.74	18 21	34,605 00	1,900,000	.....
Aspen (popple).....	1,352,500	1.24	12 62	16,585 50	1,352 500	.....
Yellow birch.....	1,280,000	1 18	14 99	19,190 00	1,280,000	.....
Basewood.....	301 400	.28	17 83	5,373 00	301 400	.....
Sugar maple.....	225 000	.21	15 00	3,375 00	225,000	.....
Norway pine.....	203,000	19	12 91	2,620 00	158,000	65,000
Northern white cedar.....	72,500	.07	13 43	974 00	72,500	.....
Black willow.....	25,000	.02	12 00	300 00	25,000	.....
White ash.....	20,000	.02	18 00	360 00	20,000	.....
Black ash.....	5,000	*	15 00	75 00	5,000	.....
White elm.....	5,000	*	13 00	65 00	5,000	.....
Red oak.....	1,000	*	18 00	18 00	1,000	.....
Total.....	108,889,400	100 00	\$15 33	\$1,669,701 00	103,603,900	5,285,500

\* Less than 1-100 of 1 per cent.

### Boxes and Crates.

The box-making industry requires an abundant supply of inexpensive lumber, and this requirement is met in the State of Maine by the large quantities of second-growth white pine and by the comparatively large stands of such woods as hemlock, balsam fir, and aspen. The industry thus affords an outlet for low grades of lumber or of wood in little demand for other purposes.

The box makers face sharp competition not only with manufacturers having access to cheap box material in other States but with the makers of various substitutes such as the fiber box. Over 100 million feet made up of sixteen different kinds

of wood are consumed annually by Maine box makers. Nearly all of this material comes from the forests of the State.

While details of manufacture vary in different mills, the process in general is about the same in all box factories which manufacture the same class of goods. Some box factories saw their own logs, and some buy lumber from sawmills. In either case, the logs usually are live-sawed, generally by circular saws, into one-inch round-edge boards. In the box factory these boards are then planed on two sides and cut to a length about one inch longer than that required for the box shook. These short boards are then edged and enough placed side by side to build up the end or side of a box. These sets are tongued and grooved, the inside boards being worked on both edges and the two outside boards on one edge only. The set is then knocked together and the ends are trimmed off square, the total trim seldom being over one inch. Cleats are cut from the same kind of lumber and are nailed on to the shooks by a nailing machine. The waste in box manufacture is mostly in edging, and sometimes in cutting the last board of a set. It is obvious that the smaller the logs the greater the waste in edging, and that therefore a diameter limit in logging operations might be practicable. In cutting the last board of a set, it sometimes happens that a piece several times the size of an ordinary edging must be removed, but since the value of the lumber must be balanced against the wage of the operator, it is generally cheaper to waste lumber.

The table shows that some hardwoods are used within the State for the manufacture of boxes. The softer hardwoods, such as basswood and aspen, are, of course, about as easily worked and nailed as the softwoods, but such woods as birch and maple do not work easily enough for the manufacture of the usual kind of packing box. Hardwoods are used in veneer plants which manufacture furniture panels and drygoods packing boxes. Raw material comes to the mill in the form of logs which are cut on a rotary machine into veneer. The latter is cut to size and dried. The end or side of the box is usually made from three pieces of veneer, the grain of the middle piece being placed at right angles to the grain of the other two. These sheets are glued together under pressure, and later piles of these composite sheets are placed under a hydraulic press,

bound together with heavy wooden bars and iron rods, and left in a dry room for some time. When dry, the box sides are trimmed to exact dimensions by small circular saws. Later cleats are nailed on by machinery. The manufacturers of veneer boxes of this kind aim to produce inexpensive boxes with considerable strength.

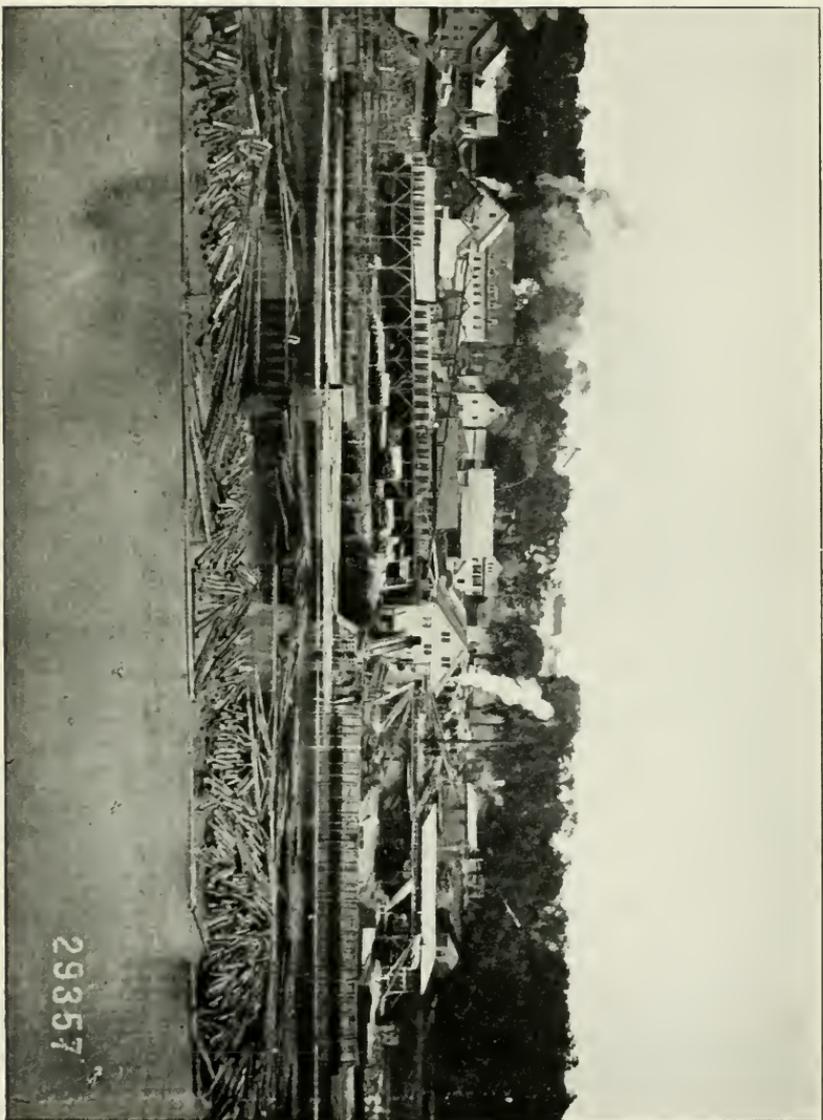
Some box makers recall the time when boxes were made from clear, white pine, but to-day it is extremely unusual to see even one clear board in any pine box. Not only has the advance in lumber values caused the use of cheaper grades of white pine, but the same is generally true in such woods as hemlock and balsam. Fifty years ago in Maine, the grades of white pine now used for boxes were thrown away as of no value whatever.

In this report wood used in the manufacture of baskets is included with that shown under the box industry. White and black ash, white elm, and red oak are used in Maine for baskets.

TABLE 27.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
White pine.....	15,384,500	59.77	\$20 90	\$321,540 50	15,319,500	65,000
Red spruce.....	3,243 000	12.60	18 43	59,755 00	2,403,000	840,000
Loblolly pine.....	1,588 000	6 17	33 56	53,290 00		1,588,000
Longleaf pine.....	1,210,000	4.70	25 58	30,950 00		1,210,000
Bald cypress.....	1,163,000	4.52	45 23	52,605 00		1,163,000
Yellow birch.....	649,500	2.52	23 99	15,580 50	478,500	171,000
Basswood.....	559,000	2.17	17 50	9,784 00	559,000	
Yellow poplar.....	533,500	2.07	54 87	29,270 50		533,500
Sugar maple.....	287,500	1.12	22 92	6,570 50	243,500	44,000
White oak.....	233,000	.91	72 15	16,810 00		233,000
Red oak.....	181,000	.70	30 06	5,441 60	139,000	42,000
Hemlock.....	171,000	.67	14 78	2,527 00	171,000	
Norway pine.....	160,000	.62	19 31	3,090 00	160,000	
Balsam fir.....	152,000	.59	15 81	2,402 50	152,000	
Black ash.....	65,500	.26	38 77	2,539 50	27,000	38,500
Beech.....	56,000	.22	16 41	919 00	56,000	
White ash.....	28,000	.11	46 64	1,306 00	3,000	25,000
Paper birch.....	27,000	.10	15 00	405 00	27,000	
Aspen (popple).....	21,000	.08	16 14	339 00	21,000	
Chestnut.....	11,000	.04	53 18	585 00		11,000
Mahogany.....	6,500	.03	192 31	1,250 00		6,500
White elm.....	5,000	.02	20 00	100 00	5,000	
Red gum.....	3,500	.01	38 71	135 50		3,500
Black cherry.....	1,000	*	90 00	90 00		1,000
Black walnut.....	1,000	*	100 00	100 00		1,000
White mahogany.....	500	*	250 00	125 00		500
Totals.....	25,741,000	100.00	\$23 99	\$617,530 50	19,764,500	5,976,500

\* Less than 1-100 of 1 per cent.



Plant of Augusta Lumber Company, Augusta, Maine



*Planing-Mill Products.*

The term "Planing-mill products" is used to include all products such as are made by a large planing mill run in connection with a sawmill. Flooring, ceiling, siding, finish, sheathing, clapboards and ship lap, are manufactured by such a plant. Plants which manufacture primarily sash, doors, and blinds often also work up quantities of flooring and finish. Sash, doors and blinds are included, however, in this report under a separate industry.

Planing-mill products require two general classes of wood. Sheathing or clapboards require a wood which is easily worked and which will be durable when exposed to the weather. Pine, spruce, and hemlock are most used. For flooring, material must be found which is hard, will work well, and which holds its shape after being placed. Such material is supplied by the native hardwoods—sugar maple, yellow birch, and beech. Cheaper grades of flooring are manufactured from pine and paper birch. In the manufacture of house finish, one of two things is usually considered: first, a satisfactory cheap material; or second, a material that has a pleasing figure and would be used where expense is not the first consideration. For cheaper finish, white pine, basswood, and black ash are used. For the more expensive kinds of finish, the manufacturers of the State draw but little on native woods, but get quartered oak from the central States, red gum and cypress from the South, and mahogany from the West Indies, and Mexico. In the better grades of finish, there is, of course, some native material used,

TABLE 28.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B.M.	Grown out of Maine. Feet B.M.
	Feet, B. M.	Per cent.				
Paper birch.....	16,960,000	79.49	\$25.71	\$436,010 00	16,860,000	100,000
Yellow birch.....	1,853,000	8.69	17.76	32,913 00	1,853,000	.....
Sugar maple.....	1,605,000	7.52	16.18	25,975 00	1,405,000	200,000
Beech.....	692,000	3.25	16.25	11,246 00	692,000	.....
Yellow poplar.....	100,000	47	25.00	2,500 00	.....	100,000
Basswood.....	50,000	23	25.00	1,250 00	50,000	.....
Red maple.....	50,000	23	16.00	800 00	50,000	.....
White ash.....	25,000	12	22.00	550 00	25,000	.....
Totals.....	21,335,000	100.00	\$23.96	\$511,244 00	20,935,000	400,000

but this is mostly the upper grades of sugar maple, and yellow birch, together with a little oak.

*Shuttles, Spools and Bobbins.*

The manufacture of spools and spool stock is one of the most important wood-using industries of the State. Beside the 16,960,000 board feet of paper birch manufactured within the State into spools, three or four million feet of spool bars are now exported annually to Scotland. The spool industry is the most important of those depending upon the paper birch supply. Only the best of birch can be used and the wood must be sound and clear, free from red heart, mildew, stain or pith. In the spool wood operations the trees are usually cut into 4-foot bolts, or sometimes logs, and these are brought to the mill during the fall or winter and are sawed into squares which are usually four feet long and of various sizes, from 5-8" up to more than 3". These bars should be sawn out before the month of May to prevent staining. After sawing, the green bars are stacked in open piles under cover and left to season for several months. Just before further working, they are kiln-dried. The process of spool manufacture varies somewhat in various mills, but the general process is the same. The squares are turned into a dowel. This dowel is cut into short lengths and an automatic machine perforates the blank and turns the spool. In some plants the square is first thrust into a revolving chuck which perforates and rounds it, while a small saw cuts off the spool blanks. The blanks are fitted to an automatic machine which turns out the spools. The spools are next polished by placing them in revolving drums, together with several balls made of wax, paraffin, or a mixture of beeswax and spermaceti. This is the general process by which the ordinary small spool for sewing thread is made, and the only further work is the sorting and packing for shipment. Paper birch is practically the only wood used in the manufacture of small spools, and only sapwood is accepted. It is stated that very often in spool-wood operations, sound gray birch trees of sufficient size are cut into bolts and pass through the mill with paper birch. It is almost impossible to distinguish the wood of the two species and it is quite probable that spool mills can make a satisfactory product out of the best gray birch.

While the majority of spools made in Maine are made chiefly from paper birch and are the small spools for sewing thread, there are large numbers of three-piece spools made from other woods. Such woods as yellow, poplar and red gum were used in the manufacture of these spools. The barrel of the spool is cut from one piece of wood and threaded. The ends or heads are disks which are screwed on to the body and glued. The spool is then turned on a lathe and polished. The largest of the three-piece spools holds 12,000 yards of thread, and between this size and the smallest which holds 20 yards, there are all possible sizes and shapes. While this classification includes shuttles, spools, and bobbins, a large per cent of the material shown in Table 28 represented by paper birch, went into the manufacture of spools. The white ash was made into picker sticks. The amounts shown for sugar maple, yellow birch, and beech, went mostly into bobbins. Some paper birch was also used for bobbins. The red maple was used for certain classes of bobbins and three-piece spools. No firm reported the manufacture of shuttles.

TABLE 29.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
White pine.....	7,815,000	59.86	\$33.57	\$262,365.50	6,290,000	1,525,000
Western yellow pine.....	1,400,000	10.72	35.00	49,000.00		1,400,000
Longleaf pine.....	1,290,000	9.88	22.71	29,300.00		1,290,000
Loblolly pine.....	1,208,000	9.25	28.60	34,544.00		1,208,000
Bald cypress.....	220,800	1.69	47.31	10,446.00		220,800
Yellow birch.....	220,000	1.68	33.68	7,410.00	116,000	104,000
White oak.....	138,000	1.06	91.17	12,581.00		138,000
Douglas fir.....	136,000	1.04	44.00	5,984.00		136,000
Red oak.....	113,500	.87	53.96	6,125.00	51,000	62,500
Yellow poplar.....	112,000	.86	56.15	6,289.00		112,000
Western white pine.....	100,000	.77	35.00	3,500.00		100,000
Sugar maple.....	60,000	.46	23.75	1,425.00	60,000	
Basswood.....	57,000	.44	20.07	1,144.00	57,000	
Red spruce.....	44,000	.34	23.02	1,013.00	44,000	
Black ash.....	31,000	.24	24.84	770.00	31,000	
Red gum.....	20,000	.23	55.00	1,650.00		10,000
Balsam fir.....	25,000	.19	14.00	350.00	25,000	
Mahogany.....	20,000	.15	117.50	2,350.00		20,000
Beech.....	15,000	.11	19.67	295.00	15,000	
Black cherry.....	13,000	.10	97.69	1,270.00		13,000
White ash.....	5,000	.04	20.00	100.00	5,000	
Black walnut.....	1,000	.01	140.00	140.00		1,000
Red maple.....	1,000	.01	20.00	20.00	1,000	
English oak.....	100	*	250.00	25.00		100
Totals.....	13,055,400	100.00	33.57	\$438,096.50	6,695,000	6,360,400

\* Less than 1-100 of 1 per cent.

*Sash, Doors, Blinds and General Millwork.*

Manufacturers of sash, doors, and blinds demand material that is of extremely good quality, and years ago in the northern States, the best of white pine was considered none too good. To-day the manufacturers of sash and doors use all the white pine they can possibly get, but it has been necessary to find substitutes for the white pine of the northeastern and Lake States. This demand has been partly met by Arkansas short-leaf, and to a greater extent, by western white pine from Idaho, California sugar pine, and sapwood of western yellow pine. This industry is one that makes use of both rather cheap and very expensive woods. Formerly, doors, and columns were made of solid pieces of wood, but today such work is largely of built-up construction. The invisible parts are of one wood and the visible parts of another. White pine serves well for the core or backing in such work because it holds its shape, does not warp or twist much, and holds glue. Chestnut is also a good core wood, and so also are the western pines. The visible parts of built-up doors, columns, etc., are usually high-grade woods, except when cheap stock is being turned out. Upon a core of pine or chestnut, there are glued such woods as cherry, mahogany, quartered oak, and red gum. It is rather noticeable that Pacific Coast woods are being used largely in this business. Douglas fir is much employed for porch columns, and is also used in doors, frames, and sash. Western red cedar has come into use for window frames, especially the sill, and it is selected for this purpose because of its ability to resist decay.

TABLE 30.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Sugar maple.....	4,738,500	44 14	\$17 38	\$82,341 00	4,738,500	.....
Paper birch.....	3,740,000	34 84	16 13	60,340 00	3,740,000	.....
Yellow birch.....	1,140,000	10 62	15 88	18,105 00	1,140,000	.....
Basswood.....	785,700	7 32	18 62	14,627 00	785,700	.....
Beech.....	320,000	2 98	15 58	4,985 00	320,000	.....
Aspen (popple).....	5,000	.05	13 00	65 00	5,000	.....
Red oak.....	3,000	03	8 00	24 00	3,000	.....
White elm.....	2,000	02	8 00	16 00	2,000	.....
Totals.....	10,734,200	100 00	\$16 86	\$180,503 00	10,734,200	.....

Nearly half of the timber required in the manufacture of these products came from other States.

### *Boot and Shoe Findings.*

The importance of the boot and shoe finding industry is indicated by the fact that more wood is worked up annually into lasts, shoe pegs, and shanks, than is used by the ship yards, and boat and canoe builders of the State. The products made by this class of manufacturers are lasts, fillers, shoe shanks, pegs, or peg wood and wooden heels. More sugar maple goes into the manufacture of such products than any other wood. Practically all of it is made into last blocks, a small amount going into wooden heels. Besides the large amount of sugar maple going into lasts, a part of the yellow birch and most of the basswood and the beech were used for the same purpose.

The manufacture of last blocks is not a complicated process. The logs are cut into bolts, usually 12 1-2 inches long. These bolts are split by a machine and the blanks trimmed down by hand to a size which the lathes will take, and the last is then rough turned.

The paper birch shown in the table was made into such products as shoe shanks and peg wood and a part of the yellow birch was used for the same articles. The yellow birch so used was second growth timber, which is usually known in Maine as silver birch. In the manufacture of shoe shanks, the logs are cut into 22 and 24 inch bolts, which are rossed and one end bored to fit into the lathes. On the lathe a special knife cuts a shaped veneer of the width and thickness of one size of shank. The veneer comes off in long ribbons, which are kept together in rolls. The rolls are put on machines which cut out the separate shanks, each machine making only one size and pattern at a time. The trimmings are sorted out and the shanks pass slowly through a large steam-heated drier and are bagged as they come out. There are several hundred sizes and styles of wooden shanks. They are also made of metal, leather board, and various compositions.

Shoe pegs are made by two processes. The usual way is to work the bolt into small blocks which are split up into pegs. By the other method, bolts prepared as for the manufacture of

shoe shanks are used and a lathe cuts ribbons which are from 1-16 to 1-8 inches thick and 3-8 to 1 inch wide. These ribbons are rolled as taken from the lathe, and each goes next to a machine which sharpens one edge. After leaving this machine the ribbon is rolled again and is kept in a dry room for 10 or 12 hours. It is then run through a compressor, which is also a steam-heated drier; this compresses and thoroughly dries the peg wood, which is then rolled and shipped. In shoe manufacturing plants these rolls of pegwood are used in special machines which automatically cut off and drive the separate pegs.

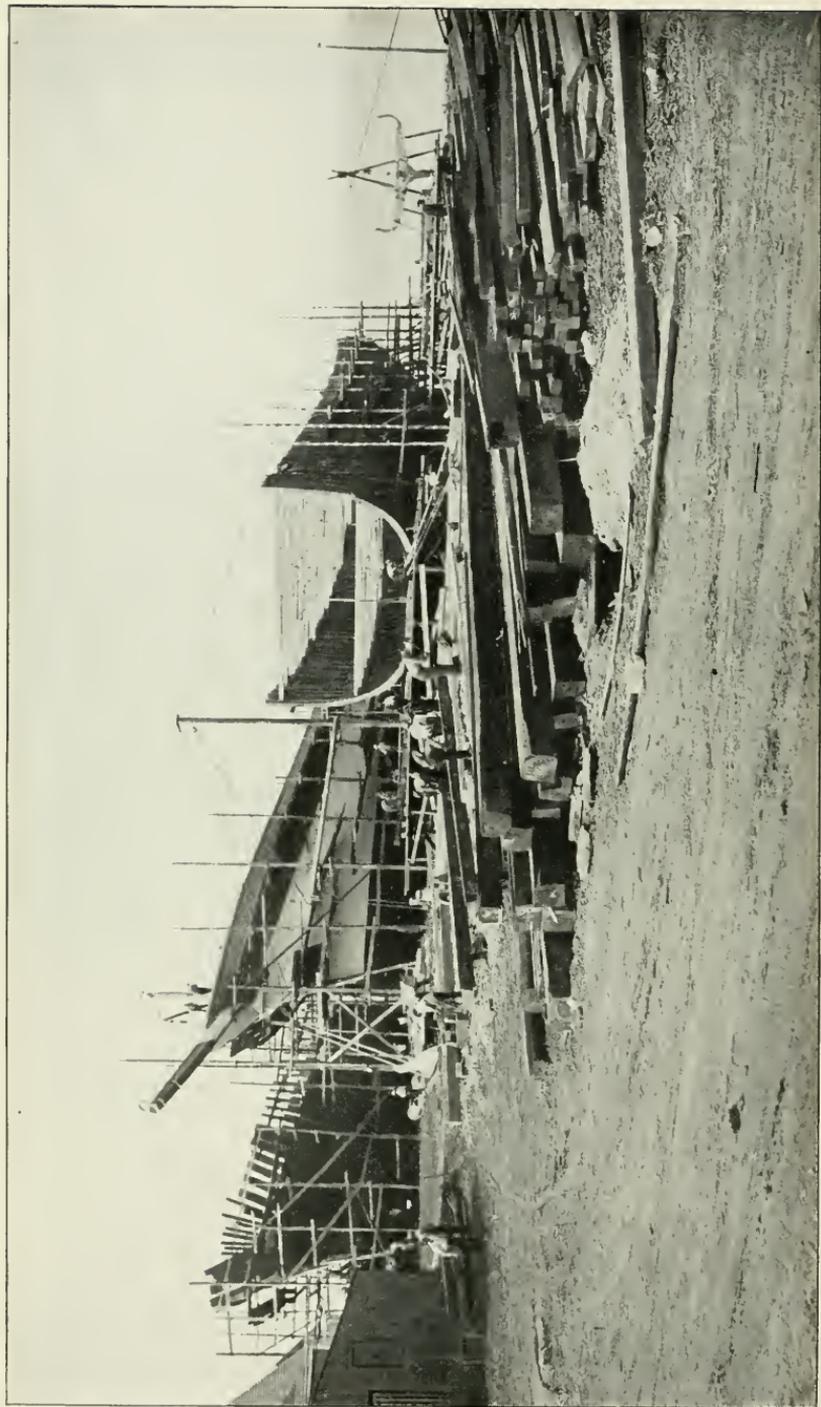
The small quantity of aspen shown in the table, was used for shoe and hosiery forms and fillers. The red oak and white elm and part of the sugar maple, yellow birch and beech, were used in the manufacture of shoe heels.

TABLE 31.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Longleaf pine.....	3,582,000	34.78	\$38 55	\$138,093 00		3,582,000
White oak.....	1,377,100	13.37	29 96	41,259 00	302,000	1,075,100
White pine.....	1,044,500	10.14	36 35	37,967 00	961,500	83,000
Red spruce.....	854,000	8.29	27 69	23,649 00	714,000	140,000
Red oak.....	804,500	7.81	28 67	23,063 00	800,500	4,000
Yellow birch.....	557,000	5.41	23 41	13,038 00	529,500	27,500
Northern white cedar.....	528,100	5.13	26 68	14,091 00	528,100	
Douglas fir.....	350,000	3.40	45 71	16,000 00		350,000
Sugar maple.....	302,000	2.93	23 32	7,441 50	300,000	2,000
Western red cedar.....	291,500	2.83	48 27	14,070 00		291,500
White ash.....	197,000	1.91	28 83	5,680 00	193,000	4,000
Tamarack.....	100,500	.98	23 28	2,340 00	100,500	
Beech.....	73,500	.71	17 50	1,286 00	63,500	10,000
Loblolly pine.....	61,000	.59	44 68	2,725 50		61,000
Bald cypress.....	60,500	.59	57 64	3,487 50		60,500
Mahogany.....	45,900	.45	163 92	7,524 00		45,900
Southern white cedar.....	32,500	.32	60 62	1,970 00		32,500
Black ash.....	20,000	.19	25 00	500 00	20,000	
Red maple.....	10,000	.10	30 00	300 00	10,000	
Butternut.....	3,000	.03	85 00	255 00		3,000
Cork elm.....	1,500	.01	16 00	24 00	1,500	
Yellow poplar.....	1,100	.01	70 91	78 00		1,100
Black cherry.....	1,000	.01	25 00	25 00	1,000	
Rosewood.....	500		225 00	112 50		500
Teak.....	500	.01	400 00	200 00		500
Cocobola.....	200	*	175 00	35 00		200
Totals.....	10,299,400	100.00	\$34 49	\$355,214 00	4,525,100	5,774,500

\* Less than 1-100 of 1 per cent.





Cobb, Butler & Co's Shipyard, Rockland, Me., 1908

*Ship and Boat Building.*

Ship building was one of the very earliest industries of Maine. The first vessel ever constructed in New England was built in 1607, at the mouth of the Kennebec, and a historian of Maine has said that this river was at the time the scene of the largest ship building industry in the country. For years the building of wooden ships was among the most important industries of the State, but when the use of steel and iron in ship building began to increase the ship building of Maine lost its former importance.

Included in this report under the head of "Ship and Boat Building" are what might seem to be three separate industries: ship building, the manufacture of small boats, and the manufacture of canoes. Most of the material used by this industry, over half of which comes from other States, is consumed by the ship yards which build such craft as schooners, barges, and tug boats. These yards do not use a great variety of woods. For frames, some yards use the native spruce. The spruce preferred for this purpose is that which is grown near the coast, since it is considered tougher than that grown inland. Spruce from such sites is known as "black" spruce, but should not be confused with the real black spruce (*Picea mariana*), which is a separate botanical species. Some yards use white oak, which comes mostly from the State of Virginia and is commonly known as Virginia oak. Much native oak is also used and the exact proportion of red and white in this native stock is somewhat a matter of conjecture because of the fact that many ship and boat builders reported the use of oak only. The planking of vessels is usually longleaf pine. For decking, this wood is sometimes used, and sometimes loblolly pine, spruce, or white pine. Cabins are made from white pine or loblolly pine, and once in a while spruce. Spars and masts are usually made from Douglas fir, although small spars are still made from native white pine. In the days of the Colonies, large numbers of mast for the King's Navy were furnished by the white pine trees of Maine, and for many years the ship builders of the State used white pine masts almost exclusively. Today, however, suitable trees can not be secured, and Douglas fir has been found to be the best substitute. For finishing woods in cabins, oak, mahogany, birch, etc., are used. Although not shown in Table 31,

small quantities of black locust (*Robinia pseudacacia*) are used for frame pins.

The manufacture of row boats, motor boats and batteaux, is carried on in many places throughout the State, but no attempt was made to secure a report from every man in the State who builds an occasional boat for sale. There are, of course, numbers of large boat shops working entirely on small boats, but at the same time large numbers of such boats are made by men who do this work in the winter time and other work in the summer, or by men who have a general wood-working shop and build boats in connection with job work for houses. In the manufacture of small boats, oak is most largely used for frames, and the planking is sometimes one of the southern pines, or it may be native white pine. The southern white cedar shown in the table was brought from Virginia almost entirely for the purpose of planking small boats. Small quantities of such finishing woods as mahogany and oak are used in motor boats. The quantity of white ash shown in the table was manufactured mostly into oars and paddles.

The manufacture of canvas-covered canoes has come to be one of the more important wood-working industries of Maine. It is quite impossible to hazard even a guess as to the year in which the first canoe was built in this State, for the reason that the Indians built and used canoes made from the inner bark of paper birch for probably centuries before this country was first visited by white men. Today the paper birch tree contributes little material to the manufacture of canoes, and, in fact, the most of the material in any canoe is probably obtained outside of Maine. Northern white cedar is used almost exclusively for ribs, and canoe makers say that it is the best wood for this purpose. Maine cedar is considered best for canoe ribs because it is tough, bends well, and is light. It is also good for planking, but can not be obtained in clear wide boards, so that western red cedar has come into use and suits the purpose extremely well. Southern white cedar is said to be too brittle for canoe ribs or planking. Gunwales are made of clear spruce or mahogany; the thwarts are of yellow birch or sugar maple, and these woods together with white ash, are used for seats and backs; while paddles are usually made from spruce or hard maple.

Northern white cedar stock comes to the factory in pieces somewhat larger than the rib, and these are sawed to size and shape, steamed and bent in position over a wooden mould, fastened, and left for 24 hours. While on this mould, the gun-wales are put in and all except the last three courses of planking put on and the ends of the ribs snipped off. After the partly finished canoe is taken from the mould, the planking is finished, and the thwarts and decks put in. The canoe is then soaked in linseed oil for 24 hours so that the planking becomes thoroughly saturated. Next the canvas is put on, stretched, and fastened. An interesting detail at this point is that the fuzz on the canvas is singed off by a gasoline torch so that it will not protrude through the varnish. A coat of filler is applied to the canvas and the canoe is put out of doors, bottom side up, for three or four weeks to allow the filler to harden. After this period a second coat of filler is applied and the canoe goes out doors again for several days. Both coats of filler are smoothed down; the second coat with the workman's bare hands. After the second filler has hardened color is applied, and finally, both inside and outside canoe are given a coat of spar varnish.

Canoes built in the State of Maine are sold throughout the United States and Canada, and are designed and built to serve many purposes. There are pleasure canoes for use on the lagoons and canals of city parks, canoes for pleasure trips on inland lakes and rivers; canoes to be used for exploring trips in the wilds of Canada, and extra long "war" canoes used by boys' camps and boat clubs.

TABLE 32.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B.M.	Grown out of Maine. Feet, B.M.
	Feet, B. M.	Per cent.				
Paper birch.....	4 200 500	45 12	\$18 83	\$79 089 00	4 200 500	
White ash.....	2 903 000	31 18	26 22	76 131 00	2 590 000	313 000
Yellow birch.....	838 500	9 01	15 58	13 066 00	838 500	
Sugar maple.....	776 000	8 33	20 31	15 757 00	776 000	
Beech.....	313 000	3 36	14 26	4 463 50	313 000	
Red maple.....	164 000	1 76	11 50	1 894 50	164 000	
White oak.....	64 000	69	33 44	2 140 00	64 000	
Red oak.....	18 000	19	17 44	314 00	18 000	
Red spruce.....	18 000	19	25 00	450 00	18 000	
Basswood.....	8 000	09	14 00	112 00	8 000	
Aspen (popple).....	7 000	08	13 00	91 00	7 000	
Totals.....	9 310 000	100 00	\$20 78	\$193 508 00	8 997 000	313 000

*Handles.*

The handle plants of Maine make two general classes of handles. The first includes ax and tool handles, which require a tough, strong wood, such as white ash and sugar maple. The other class of handles includes package handles and handles for small tools. For this purpose paper birch is mostly used, while yellow birch makes a satisfactory substitute in most cases.

In the manufacture of those kinds of handles which require tough wood, hickory is the favorite material in the Central States, but in Maine, its place has been taken by white ash and to some extent by sugar maple. White ash was used for such articles as shovel and pick handles. Ax handles were made from red and white oak.

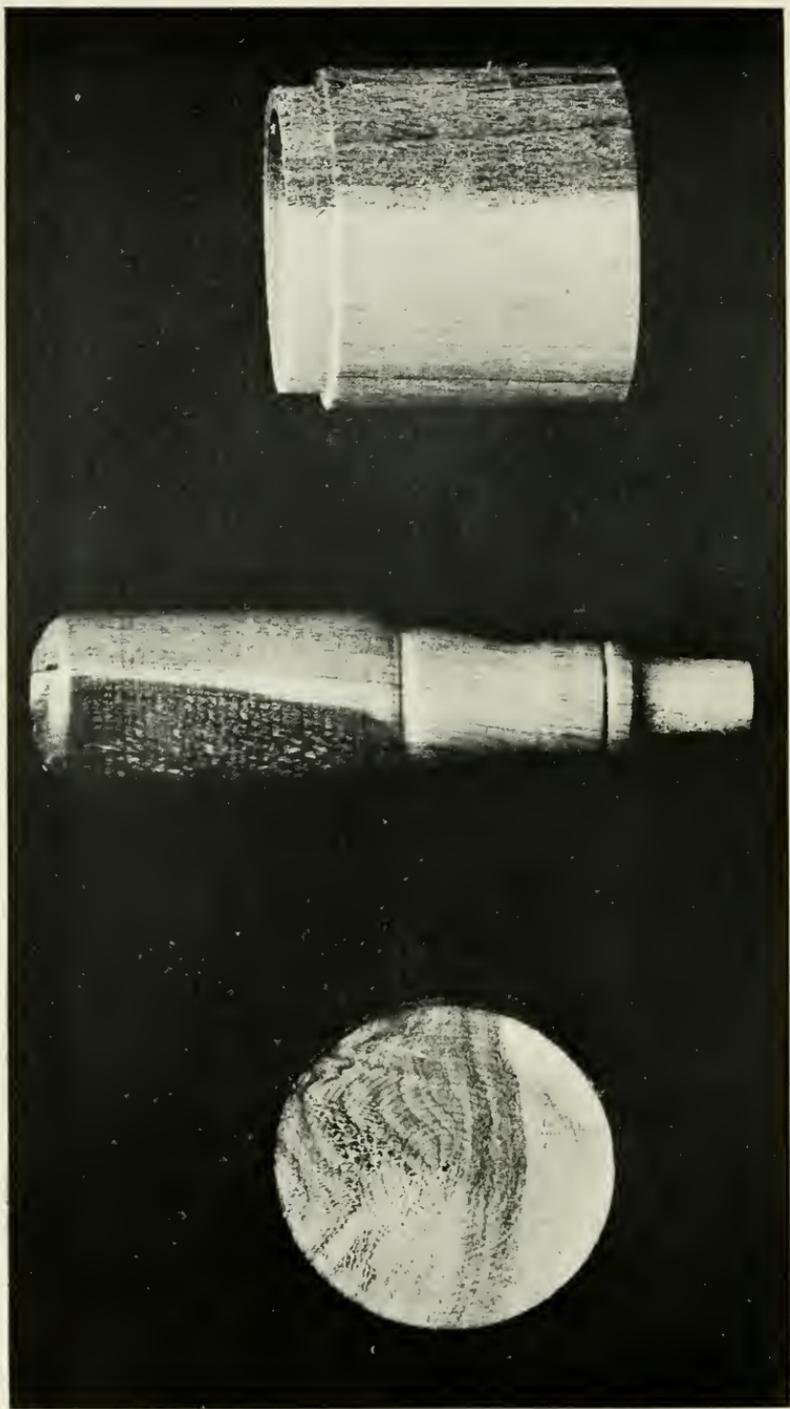
The manufacture of small handles calls for a material which is easily worked on a lathe and for this purpose paper birch is, of course, the best native wood. Among the substitutes for paper birch, yellow birch, particularly young stock known as silver birch has met with some favor, although it is a harder wood than paper birch.

The entire amount of paper birch shown in Table 32 went into the manufacture of small handles, while a part of the yellow birch was used for the same purpose, and a part of it was made into larger handles and such articles as lumber carriers.

TABLE 33.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Red spruce.....	3,879,000	47.33	\$22 63	\$101,744 00	3,814,000	65,000
Paper birch.....	2,347,000	28.63	19 43	45,611 00	2,077,000	270,000
Basswood.....	720,000	8.79	21 95	15,805 00	405,000	315,000
Yellow birch.....	505,000	6.16	22 60	11,412 00	352,000	153,000
Sugar maple.....	297,000	3.62	16 42	4,878 00	297,000	.....
White ash.....	211,000	2.57	27 78	5,863 00	111,000	100,000
Aspen (popple).....	110,000	1.34	11 63	1,290 00	110,000	.....
Beech.....	50,000	.61	15 00	750 00	50,000	.....
Red oak.....	35,000	.43	24 00	840 00	35,000	.....
White pine.....	34,000	.41	32 11	1,102 00	34,000	.....
Balsam fir.....	3,000	.04	13 00	39 00	3,000	.....
Red maple.....	3,000	.04	13 00	39 00	3,000	.....
Black ash.....	2,500	.03	13 00	32 50	2,500	.....
Totals.....	8,196,500	100.00	\$23 11	\$189,405 50	7,293,500	903,000





Box Cover

Handle  
Use of Redheart Paper Birch

Box

*Woodenware and Novelties.*

The terms "woodenware" and "novelties" include a great many different articles, and in the State of Maine, the manufacturers of these classes of products make such things as kitchen woodenware, step ladders, paper plugs, cloth boards, cutting boards, etc. The term novelties used in this connection braces a large class of small wooden articles which can not be classed under toys, handles, or other distinctive heading. The variety of the product is such that no single wood gives all-round satisfaction. For woodenware, which is usually taken to mean kitchen woodenware, a wood must be found which is easily worked and can be easily kept clean; basswood is probably one of the best for this purpose. The manufacture of step ladders requires a fairly strong lumber that is rather stiff. Accordingly spruce is used to a large extent by ladder makers, and in some cases basswood. In making paper plugs there is no special demand for a wood which will turn easily and present a smooth finish, but the demand is rather for very cheap material and so paper plugs are made from sugar maple, beech, yellow birch and paper birch of low grade. About 15 per cent of the paper birch shown in the table was manufactured into paper plugs from cores left after veneer had been cut off.

The manufacture of novelties is usually carried on in the same plants which manufacture small handles, and which turn boxes from paper birch or yellow birch. The average mill of this kind turns a part of its material into boxes, a part into handles and the rest into articles usually grouped together as novelties. What has been said before in this report upon the adaptability of paper birch and also young yellow birch for lathe work applies here.

More than one-third of the spruce was manufactured into butter tubs. A somewhat larger quantity was manufactured into mechanical pulp at one point and this pulp was pressed into pie plates at a plant in a neighboring city. The balance of the spruce was used chiefly for ladders. White ash went largely into step ladders.

Cloth boards were manufactured from white pine, balsam fir, black and white ash, and red maple. Carpenter's bit boxes were made from yellow birch and sugar maple. Aspen was

manufactured into novelties, and pillow sham sticks. Cutting boards were made from white pine and basswood.

TABLE 34.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Paper birch.....	5,948,000	78.97	\$14 90	\$88,631 50	5,878,000	70,000
Yellow birch.....	782,000	10.38	15 41	12,054 00	682,000	100,000
Beech.....	378,000	5.02	14 63	5,529 00	378,000	.....
Sugar maple.....	340,000	4.51	14 72	5,005 00	340,000	.....
Red oak.....	65,000	.86	14 54	945 00	65,000	.....
White ash.....	14,000	.19	15 00	210 00	14,000	.....
Aspen (popple).....	5,000	.07	12 00	60 00	5,000	.....
Totals.....	7,532,000	100.00	\$14 93	\$112,434 50	7,362,000	170,000

### Dowels.

Dowels are small wooden pins used in the manufacture of furniture, sash, doors, etc., and the word is also commonly used to indicate parts of bentwood chairs. Dowel pins are usually cut in long lengths, and the user cuts them down to a size fitted for the work he is doing. Dowels are nearly always made of

TABLE 35.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Aspen (popple).....	2,500,000	43.83	\$15 00	\$37,500 00	2,500,000	.....
White pine.....	802,000	14.06	18 08	14,500 00	502,000	300,000
Beech.....	520,000	9.12	17 98	9,350 00	220,000	300,000
Yellow birch.....	367,500	6.44	18 66	6,857 50	202,500	165,000
Sugar maple.....	310,000	5.43	18 02	5,587 00	175,000	135,000
Red spruce.....	220,000	3.86	29 57	6,505 00	120,000	100,000
Paper birch.....	200,000	3.50	18 00	3,600 00	65,000	135,000
Red maple.....	200,000	3.50	18 00	3,600 00	65,000	135,000
Longleaf pine.....	155,000	2.72	30 06	4,660 00	.....	155,000
Bald cypress.....	90,000	1.58	50 00	4,500 00	.....	90,000
Southern white cedar.....	75,000	1.31	35 00	2,625 00	.....	75,000
Red oak.....	70,000	1.23	22 43	1,570 00	25,000	45,000
Balsam fir.....	65,000	1.14	21 17	1,375 00	65,000	.....
Douglas fir.....	46,500	.81	50 00	2,325 00	.....	46,500
Cotton gum.....	29,500	.52	43 00	1,268 50	.....	29,500
Loblolly pine.....	20,000	.35	35 00	700 00	.....	20,000
Redwood.....	17,500	.31	53 00	927 50	.....	17,500
White oak.....	10,000	.17	34 50	345 00	8,000	2,000
Northern white cedar.....	5,000	.09	11 00	55 00	5,000	.....
Black willow.....	500	.01	20 00	10 00	500	.....
Red gum.....	500	.01	50 00	25 00	.....	500
Yellow poplar.....	500	.01	60 00	30 00	.....	500
Totals.....	5,704,500	100.00	\$18 92	\$105,915 50	3,953,000	1,751,500

hardwood and in Maine the principal hardwood used for this purpose is paper birch. This is, of course, due to the same reasons that fit paper birch for the manufacture of any article which is turned and which needs to come from the lathe with a rather smooth surface. White ash is a favorite dowel wood where exceptional strength is required, but it will be noted that only a small part of the material used by Maine dowel makers was supplied by this wood. A part of the red oak was probably manufactured into dowels for bent chair work. The aspen shown in the table likewise was used for dowels, but in the plant where it was used it constituted only a fraction over one per cent of the entire amount of the material used.

#### *Miscellaneous.*

The term "miscellaneous" is used not to cover any particular class of products, but to include such articles as can not be included in separate tables. There are in every State industries represented by but one or two plants, and if separate tables were presented for such industries the figures would disclose individual operations. For this reason, it is necessary to include in a miscellaneous table all figures compiled from the reports of such plants. Since the figures shown in the miscellaneous table apply to so many classes of products a large number of woods of varying properties are used.

Included in this table are figures upon the manufacture of lawn swings, excelsior, piano parts, pumps, wood pipe, refrigerators, tanks, silos, and trunks. The aspen shown in the table was manufactured largely into excelsior. Lawn swings were made from spruce and yellow birch. Piano backs were made from white pine, beech, sugar maple, red maple, paper birch, yellow birch, red oak and spruce. Beech, yellow birch, and sugar maple were used in the manufacture of electric wire cleats. Wood pipe was made from Douglas fir, redwood and cotton gum, and these woods together with yellow birch, red and white oak were used in the manufacture of pumps. Refrigerators were made from balsam fir, spruce, loblolly pine, and red oak. White pine, longleaf pine, Southern white cedar and cypress entered into the manufacture of silos. Trunks were made from white pine, yellow birch, sugar maple, and

beech, the white pine being used in the form of shooks and the hardwoods being used for cleats.

TABLE 36.

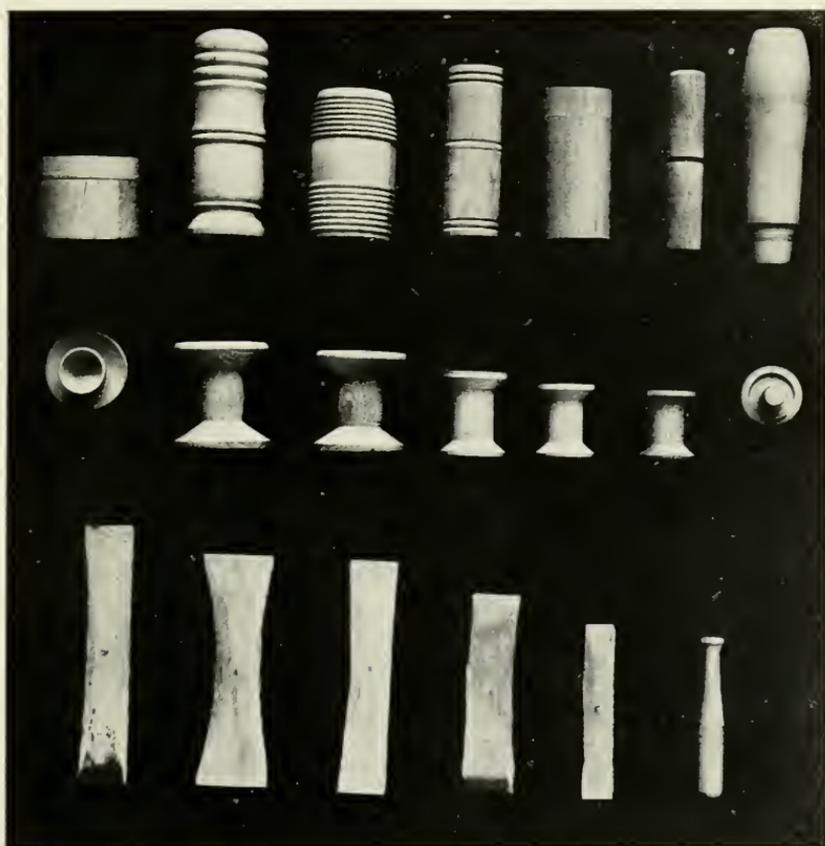
KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Yellow birch.....	1,338,000	30.03	\$13 16	\$17,604 00	1,338,000	.....
Beech.....	1,310,000	29.40	13 02	17,055 00	1,310,000	.....
Basswood.....	601,000	13.49	22 11	13,288 00	601,000	.....
Paper birch.....	329,000	7.38	17 26	5,679 00	329,000	.....
Sugar maple.....	322,000	7.23	13 34	4,296 00	322,000	.....
White pine.....	270,000	6.06	22 44	6,060 00	270,000	.....
Red spruce.....	175,000	3.93	28 00	4,900 00	175,000	.....
Balsam fir.....	100,000	2.24	16 00	1,600 00	100,000	.....
White elm.....	10,000	.22	13 00	130 00	10,000	.....
Aspen (popple).....	1,000	.02	13 00	13 00	1,000	.....
Totals.....	4,456,000	100.00	\$15 85	\$70,625 00	4,456,000	.....

### Laundry Appliances.

The manufacture of laundry appliances in some States includes the manufacture of steam laundry machinery, but in Maine the factories which make laundry appliances make smaller articles such as clothespins, washboards, ironing tables, and clothes dryers. It will be noticed that this industry uses both hardwood and softwoods. The hardwoods are made into clothespins, dryers, wash benches, and wash boiler handles. The softwoods, pine, spruce and fir, were used mostly in the

TABLE 37.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Loblolly pine.....	1,160,000	26.18	\$24 71	\$28,659 00	.....	1,160,000
Red spruce.....	889,000	20.06	21 67	19,265 00	889,000	.....
Red oak.....	705,000	15.91	24 79	17,474 00	696,000	9,000
Longleaf pine.....	585,500	13.20	62 48	36,583 00	.....	585,500
White oak.....	537,500	12.13	29 51	15,862 00	469,500	68,000
Bald cypress.....	275,000	6.21	20 00	5,500 00	.....	275,000
White pine.....	109,500	2.47	20 86	2,284 00	109,500	.....
Black ash.....	50,000	1.13	40 00	2,000 00	.....	50,000
Yellow poplar.....	48,000	1.08	64 56	3,099 00	.....	48,000
Norway pine.....	45,000	1.02	28 00	1,260 00	.....	45,000
Shortleaf pine.....	14,000	.32	31 00	434 00	.....	14,000
Mahogany.....	8,000	.18	170 00	1,360 00	.....	8,000
Sugar maple.....	5,000	.11	35 00	175 00	5,000	.....
Totals.....	4,431,500	100.00	30 23	\$133,955 00	2,169,000	2,262,500



Various articles made from Paper Birch  
Boxes, spools, shoe shanks, etc.



manufacture of ironing boards and washboards. Ironing boards were also made from basswood.

It is quite worthy of note that a rather large quantity of balsam fir was used for the tops of ironing tables, and that a small quantity of white elm was manufactured into wash benches and one thousand feet of aspen into clothes dryers.

### Car Construction.

In the manufacture of cars two general classes of wood find use. For sills and beams, strength is required, and such woods as red and white oak, and longleaf pine are used. For flooring, siding, and lining of freight cars, woods such as loblolly pine, red spruce, and white and Norway pine, are used. For the finishing of passenger cars, builders select woods which show a pleasing figure and finish nicely and for this, such woods as yellow poplar and mahogany are generally used.

The car shops of Maine do a large repair business and build large numbers of freight cars, and some passenger cars. A few of the electric roads do their own repairing. Only half of the demand of the industry is met by homegrown timber.

TABLE 38.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Yellow birch.....	1,080,000	25.42	\$19 94	\$21,530 00	35,000	1,045,000
White pine.....	875,000	20.60	15 00	13,125 00	875,000	.....
Basswood.....	843,000	19.84	24 89	20,985 00	218,000	625,000
Red oak.....	700,000	16.47	20 00	14,000 00	700,000	.....
Sugar maple.....	310,000	7.30	19 77	6,130 00	20,000	290,000
Paper birch.....	218,000	5.13	24 49	5,339 00	218,000	.....
Beech.....	205,000	4.82	19 95	4,090 00	5,000	200,000
Aspen (popple).....	18,000	.42	20 00	360 00	18,000	.....
Totals.....	4,269,000	100.00	\$20 14	\$85,559 00	2,089,000	2,160,000

### Toys.

Doll houses, games, toy wagons, sleds and doll furniture are classed as toys. It is probable that complete reports were not secured on all the material going into toys within the State, for the reason that many mills using paper birch as a raw material manufacture a great variety of articles and consequently report

the manufacture, say of handles, turned boxes, and novelties, meaning to include under novelties many articles such as toys and cork caps.

It is somewhat noticeable that in this industry, paper birch stands in sixth place with yellow birch leading. This is because only a small part of the toys manufactured within the State are turned. A large part of the yellow birch shown in the table was made into toy wagons, and sleds, and sugar maple, basswood, beech and red oak also entered into those articles in large quantities. Much of the white pine went into doll furniture, as did small amounts of the two birches, sugar maple and beech. Doll houses, were manufactured from basswood, games from paper birch, basswood, and aspen. A part of the paper birch was manufactured into turned toys.

TABLE 39.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Yellow birch.....	1,258,500	33.43	\$20 54	\$25,849 00	498,500	760,000
Red oak.....	723,000	19.20	24 20	17,500 00	533,000	190,000
Black ash.....	613,000	16.28	19 35	11,860 00	463,000	150,000
Sugar maple.....	420,000	11.16	20 32	8,535 00	195,000	225,000
Basswood.....	203,000	5.39	21 11	4,285 00	203,000	.....
White oak.....	132,500	3.52	54 34	7,200 00	.....	132,500
Red spruce.....	75,000	1.99	32 00	2,400 00	.....	75,000
Beech.....	73,000	1.94	21 03	1,535 00	73,000	.....
White pine.....	61,000	1.62	20 00	1,220 00	61,000	.....
White ash.....	54,000	1.44	21 33	1,152 00	54,000	.....
Chestnut.....	50,000	1.33	21 00	1,050 00	.....	50,000
Red cedar.....	40,000	1.06	62 00	2,480 00	.....	40,000
Paper birch.....	22,000	.58	18 00	396 00	22,000	.....
Red maple.....	20,000	.53	16 00	320 00	20,000	.....
Red gum.....	19,000	.50	40 00	760 00	.....	19,000
Mahogany.....	1,000	.03	200 00	200 00	.....	1,000
Totals.....	3,765,000	100.00	\$23 04	\$86,742 00	2,122,500	1,642,500

### Furniture.

All kinds of household furniture except chairs and kitchen cabinets are included under this heading. The manufacture of chairs is considered as an industry by itself. Usually furniture factories and chair factories are separate enterprises, and it is seldom that a furniture factory makes chairs or a chair factory makes furniture except in small quantities. There is a further distinction, in that furniture makers usually buy their material

as lumber, while chair makers usually purchase dimension stock and dowels.

The manufacture of furniture requires the use of a great variety of wood. A table top requires material that shows a pleasing figure and finishes well. This top may not be a solid piece of wood but may be built up with a fine finishing wood on top, backed by some other cheaper wood, such as chestnut, that holds its shape, takes glue well and stands well in built-up panels. The front of a table drawer needs to be of the same material as the top, but the sides and bottom may be of any kind of wood that works well in this place. Basswood has long been in favor for drawer work.

It will be noticed that furniture manufacturers of the State use woods native to the State and woods brought from outside. As a general thing the native woods are used for cheaper furniture, while expensive woods, such as white oak and mahogany go into the best furniture.

A large quantity of yellow birch entered into the manufacture of chamber suites, tables, hall racks, and children's furniture. The manufacturers of chamber suites use a large number of woods such as basswood, black and white ash, white pine, yellow birch, red maple, white and red oak, chestnut, red gum, mahogany and sugar maple. Red cedar from Tennessee was used in the manufacture of chests. A part of the sugar maple was used in the manufacture of castor wheels. For children's furniture, yellow and paper birch, sugar maple, and beech were used. The manufacture of tables required wood of nearly every kind as shown in Table 37. The spruce shown was used almost entirely for this purpose.

TABLE 40.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Paper birch.....	2,575,000	84.43	\$30.20	\$77,775.00	2,500,000	75,000
Aspen (popple).....	325,000	10.65	18.92	6,150.00	325,000	.....
White pine.....	150,000	4.92	19.00	2,850.00	150,000	.....
Totals.....	3,050,000	100.00	\$28.45	\$86,775.00	2,975,000	75,000

*Matches and Toothpicks.*

The amount of wood converted into matches and toothpicks is shown in Table 40. The paper birch and aspen shown in the table were used in the manufacture of toothpicks and the white pine for matches.

Toothpick manufacturers in Maine apparently prefer paper birch. It is interesting to note that the toothpick manufacturers of Michigan use more than one million feet of birch annually but that they use sweet birch preferably, followed by yellow birch and sugar maple, while reporting no paper birch at all. Since there is much paper birch in the northern part of Michigan, it would seem that it could be used for toothpicks in that State, and, since Michigan toothpick makers have found yellow birch and sugar maple suitable, it would seem that these species might be used for the same purpose in Maine.

Paper birch for toothpicks must be free from knots and red heart. The material is usually especially selected and sells for high prices. The logs are cut into two-foot bolts, peeled, and steamed slightly. The bolts are converted into thin veneer, from which the toothpicks are automatically cut, dried and polished.

Aspen has been found a very satisfactory substitute for some grades of toothpicks, but it must be very carefully handled to give a good product.

TABLE 41.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown ou of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Yellow birch.....	361,000	34.24	\$16.27	\$5,873.50	361,000	.....
Red oak.....	260,000	24.66	33.05	8,592.50	225,000	35,000
White ash.....	158,500	15.03	23.59	3,739.00	158,500	.....
Basswood.....	102,000	9.67	21.69	2,212.50	102,000	.....
Sugar maple.....	62,500	5.93	20.64	1,290.00	62,500	.....
White oak.....	28,500	2.70	28.65	816.50	25,000	500
Yellow poplar.....	24,500	2.32	67.80	1,661.00	.....	24,500
Red spruce.....	18,500	1.75	19.03	352.00	18,500	.....
White pine.....	11,000	1.04	25.91	285.00	11,000	.....
Cork elm.....	10,000	.95	25.00	250.00	10,000	.....
Aspen (popple).....	8,000	.76	18.00	144.00	8,000	.....
Hickory.....	7,500	.71	45.67	342.50	.....	7,500
Red maple.....	2,000	.19	26.00	52.00	2,000	.....
Sycamore.....	500	.05	45.00	22.50	.....	500
Totals.....	1,054,500	100.00	\$24.31	\$25,633.00	986,500	68,000



Four foot bolts of Paper Birch



Spool wood logging



*Vehicles and Vehicle Parts.*

In many parts of the United States the manufacturers of vehicles and vehicle parts use more hickory than any other wood. Such is not the case, however, in Maine. In fact the Maine manufacturers depend upon native woods almost entirely. It was necessary to bring into the State in quantities but three woods, red oak, yellow poplar, and hickory. The manufacturers of vehicles and parts in Maine make wagons, carriages, carts, sleds, pungs, spokes, wheels, and hubs. In the manufacture of vehicles, two classes of wood are needed. Spokes, rims, reaches, and shafts, require a strong, tough wood, and this is supplied in Maine by yellow birch, red oak, white ash, sugar maple, and white oak. The bodies of carriages, wagons and pungs, are best made from material which can be had in extreme widths, and for the finest class of work it should take finish well. Basswood and yellow poplar furnish the best of this material and white pine, spruce and aspen are used for cheaper work.

A large part of the yellow birch and the cork elm was used in the manufacture of hubs. Hub manufacturers buy the material in bolts ranging from 9 inches to 14 inches in diameter, and do not care to buy large sized stock because of the expense in turning down to the size of the hub. The aspen shown in the table was used entirely in the manufacture of pungs. Spoke manufacturers within the State generally used red and white oak. Carriage jacks, or lifters, were manufactured from white ash, and sugar maple. The sycamore shown in small quantity was high grade stock and was used in car-

TABLE 42.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B.M.	Grown out of Maine. Feet, B.M.
	Feet, B. M.	Per cent.				
White pine.....	557,500	86 03	\$21 15	\$11,789 00	557,500	
Chestnut.....	78,500	12 12	29 58	2,322 00		78,500
Basswood.....	10,000	1 54	23 00	250 00	10,000	
Redwood.....	1,000	.15	70 00	70 00		1,000
Spanish cedar.....	300	.05	150 00	45 00		300
Yellow poplar.....	300	.05	50 00	15 00		300
Totals.....	647,600	100 00	\$22 35	\$14,471 00	567,500	80,100

riage work. A part of the yellow birch and sugar maple went into logging sleighs, which are used in connection with steam log haulers. The red maple reported was used for carriage and wagon work.

### *Caskets and Coffins.*

The manufacturers of caskets and coffins obtain the greatest part of their material from within the State, using white pine in preference to any other wood. Much of the white pine, of course, was manufactured into casket and coffin boxes. Much of the chestnut reported was designated as sound wormy stock, and was used for invisible parts covered by cloth. The redwood, Spanish cedar, and yellow poplar, were used for mouldings and trimmings.

TABLE 43.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B.M.	Grown out of Maine. Feet, B.M.
	Feet, B. M.	Per cent.				
Basswood.....	500,000	77.52	\$20 00	\$10,000 00	500,000	.....
Paper birch.....	110,000	17.05	15 64	1,720 00	110,000	.....
Yellow birch.....	20,000	3.10	15 00	300 00	20,000	.....
Beech.....	5,000	.78	15 00	75 00	5,000	.....
Black ash.....	5,000	.78	15 00	75 00	5,000	.....
Sugar maple.....	5,000	.77	15 00	75 00	5,000	.....
Totals.....	645,000	100.00	\$18 98	\$12,245 00	645,000	.....

### *Brushes.*

The manufacture of brushes in this country, is usually carried on by two classes of manufacturers. One class manufactures the brush back or block, which is shipped to another plant where special machines bore holes in the block and insert and fix the bristles. Maine brush manufacturers are of the first class.

The basswood was manufactured into brush backs and part of the paper birch into brush handles. The rest of the paper birch together with the other woods went into brush backs and brush blocks.

TABLE 44.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Sugar maple.....	523,000	98.12	\$21 20	\$11,087 50	523,000	.....
White pine.....	10,000	1.88	25 00	250 00	10,000	.....
Totals.....	533,000	100.00	21 27	11,337 50	533,000	.....

*Printing Material.*

Printing material manufacturers do not make up a large industry in Maine. Die blocks were manufactured from sugar maple and print blocks from sugar maple and white pine. Print blocks are pieces of wood, on which are placed thin metal plates or cuts in order to make the face "type-high," or to bring it up to the level of the surrounding type.

TABLE 45.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Yellow poplar.....	61,000	15.68	\$56 85	\$3,468 00		61,000
White oak.....	50,000	12.85	66 12	3,306 00	5,000	45,000
White pine.....	50,000	12.85	26 20	1,310 00	50,000	
Loblolly pine.....	48,000	12.34	29 98	1,435 00		48,000
Yellow birch.....	34,000	8.74	46 12	1,568 00	2,000	32,000
Mahogany.....	29,000	7.45	160 34	4,650 00		29,000
Bald cypress.....	26,000	6.68	46 54	1,210 00		26,000
African mahogany.....	25,000	6.43	150 00	3,750 00		25,000
Sugar maple.....	21,000	5.40	21 19	445 00	21,000	
Basswood.....	18,000	4.63	44 44	810 00		18,000
Red oak.....	10,000	2.57	20 00	200 00	10,000	
Sycamore.....	8,000	2.06	60 00	480 00		8,000
Red gum.....	5,000	1.29	50 00	250 00		5,000
Black ash.....	3,000	.77	20 00	60 00	3,000	
Black cherry.....	1,000	.26	100 00	100 00		1,000
Totals.....	389,000	100.00	\$59 24	\$23,046 00	91,000	298,000

*Fixtures.*

The fixture industry includes the manufacture of store, office and bank fixtures, lodge furniture, church furniture, bar room, and pool room fixtures. The fixture manufacturers of Maine are principally engaged in the manufacture of show cases, and store, office and bank fixtures. Furniture woods are generally

used, and as in the furniture industry, woods such as yellow poplar, white oak and mahogany are used for visible work, while invisible parts and backs are made from such woods as loblolly and white pine.

The large use of yellow poplar was probably due to its adaptability as a finishing wood and partly due to the fact that it can be obtained in wide panels. It will be noticed that two kinds of mahogany are shown in this table, the real mahogany (*Swietenia mahogoni*), coming from the West Indies, and the wood called African mahogany. Cargoes of African mahogany usually include several kinds of African woods, which closely resemble the true mahogany. Black cherry, red gum, and sycamore, were used for show cases and fixtures. The black ash was used for fixtures.

TABLE 46.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B.M.	Grown out of Maine. Feet, B.M.
	Feet, B. M.	Per cent.				
Sugar maple.....	220,000	68.76	\$16 00	\$3,520 00	220,000	.....
Yellow birch.....	70,000	21.87	16 00	1,120 00	70,000	.....
Beech.....	20,000	6.25	16 00	320 00	20,000	.....
White pine.....	10,000	3.12	16 00	160 00	10,000	.....
Totals.....	320,000	100 00	\$16 00	\$5,120 00	320,000	.....

#### *Dairymen's Poulterers' and Apiarists' Supplies.*

A very small industry in the State of Maine, manufactures supplies for dairymen, poultry raisers and apiarists, the principal product being milk can stoppers. The stoppers made from sugar maple, yellow birch, and beech, were turned upon a lathe and the process is rather interesting. The blanks for this purpose are cut first into large squares, about 2 feet long, and the corners are then ripped off, so that a cross section is an unequal octagon. This blank goes into a lathe, and is so turned that it comes out resembling a line of stoppers, placed end to end, with the small ends and large ends adjacent. These are sawn apart, smoothed and are then ready for shipment. The stoppers made from white pine are cut out of plank with a band saw.

TABLE 47.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Paper birch.....	100,000	33.11	\$14 00	\$1,400 00	100,000	.....
Sugar maple.....	72,000	23.84	15 42	1,110 00	72,000	.....
Yellow birch.....	70,000	23.18	15 14	1,0 0 00	70,000	.....
Beech.....	60,000	19.87	15 08	905 00	60,000	.....
Totals.....	302,000	100.00	\$14 82	\$4,475 00	302,000	.....

*Butchers' Blocks and Skewers.*

Another of the smaller wood-using industries of the State includes the manufacture of meat blocks, skewers, and sheep sets, which butchers use to hang sheep carcasses on.

Sugar maple was used in the manufacture of meat blocks, skewers were made from paper birch, beech, sugar maple, and yellow birch, and the last three woods were used in the manufacture of sheep sets.

TABLE 48.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Yellow birch.....	150,000	52.63	\$19 00	\$2,850 00	150,000	.....
Paper birch.....	135,000	47.37	18 70	2,525 00	135,000	.....
Totals.....	285,000	100.00	\$18 86	\$5,375 00	285,000	.....

*Bungs and Faucets.*

"Bungs and faucets" is a term used in the wood-using reports of the Forest Service, to include the manufacture of bungs, faucets, and corks, and since considerable quantities of cork caps are made each year in Maine, the industry has a place in this report. Cork caps are manufactured by the same plants which make turned boxes, handles and novelties from paper birch. As has been indicated before, the manufacturers of such articles in reporting upon their operations usually indicate two or three general classes of products and do not make de-

tailed subdivisions. For that reason it is quite probable that some of the paper birch, which this report lists as made into novelties really went into cork caps.

Although paper birch is the favorite wood for lathe manufacture, this table indicates that much more silver birch, which is young yellow birch, was used in the manufacture of cork caps.

TABLE 49.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Yellow birch.....	151,500	56.21	\$19 96	\$3,024 00	141,500	10,000
Red oak.....	30,000	11.13	21 00	630 00	20,000	10,000
Sugar maple.....	25,000	9.28	17 12	428 00	15,000	10,000
White oak.....	20,000	7.42	19 00	380 00	20,000	.....
Beech.....	13,000	4.82	15 23	198 00	13,000	.....
White ash.....	10,000	3.71	25 00	250 00	.....	10,000
Black ash.....	10,000	3.71	17 00	170 00	10,000	.....
White pine.....	5,000	1.86	18 00	90 00	5,000	.....
Basswood.....	5,000	1.86	18 00	90 00	5,000	.....
Totals.....	269,500	100.00	\$19 51	\$5,260 00	229,500	40,000

### Chairs.

The manufacture of chairs is a much more important industry in the States of Vermont, New Hampshire and Massachusetts than it is in Maine. This is due to the fact that hardwoods are relatively more plentiful in Vermont, and New Hampshire than in Maine. The chair makers of Massachusetts of course, draw the greater part of their raw material from the forests

TABLE 50.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Sugar maple.....	130,000	56.52	\$17 88	\$2,325 00	125,000	5,000
White ash.....	33,000	14.35	18 27	933 00	33,000	.....
Red maple.....	20,000	8.50	25 00	500 00	20,000	.....
Beech.....	17,000	7.39	13 82	235 00	17,000	.....
Yellow birch.....	17,000	7.39	23 53	400 00	12,000	5,000
Paper birch.....	10,000	4.35	20 00	200 00	10,000	.....
White oak.....	3,000	1.30	75 00	225 00	.....	3,000
Totals.....	230,000	100.00	\$20 95	\$4,818 00	217,000	13,000

of New Hampshire and Vermont. It will be seen by noting the kinds of woods used by the chair manufacturers of the State, that they do not manufacture an expensive line, inasmuch as the woods are all native to the State, although small quantities of four species were purchased outside of the State. Steamer chairs and camp stools were made from yellow birch and sugar maple, and hammock chairs were manufactured from black ash and yellow birch.

### *Sporting and Athletic Goods.*

The manufacturers of this class of articles in Maine make snowshoes, skis, bowling pins, taxidermist's shields, baseball bats, toboggans, and candle pins which are used locally as tenpins.

In the manufacture of snowshoes, white ash is used exclusively, because of its strength and toughness. Snowshoe makers say that this is the best possible wood for snowshoes. In the manufacture of skis several woods find use; yellow birch, beech, and red maple. Toboggans were manufactured from yellow birch, sugar maple and white ash; candle pins from sugar maple and beech; baseball bats from white ash. The paper birch was manufactured into wood floats for fishlines; white oak was used for taxidermist's shields, and sugar maple for bowling pins.

TABLE 51.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
White pine.....	79,850	84.72	\$31 85	\$2,543 00	79,350	500
Red spruce.....	5,000	5.30	19 00	95 00	5,000	
Mahogany.....	3,200	3.40	178 75	572 00		3,200
Hemlock.....	3,000	3.18	18 00	54 00	3,000	
Sugar maple.....	3,000	3.18	38 00	114 00		3,000
Bald cypress.....	100	.11	65 00	6 50		100
Hornbeam.....	100	.11	20 00	2 00	100	
Totals.....	94,250	100 00	\$35 94	\$3,386 50	87,450	6,800

### *Patterns.*

The manufacture of patterns is usually carried on in foundry and machine shops, and seldom in separate plants. The Maine pattern makers are chiefly of the first class. White pine has

long been the favorite pattern wood of this country, and it is interesting to notice that Maine pattern makers were able to use a grade that averaged \$31.85 in price. Pattern makers in other States often use Michigan pine at a cost of \$90.00 or more, but it appears that Maine pattern makers have been able to use native stock almost exclusively.

Mahogany is a favorite pattern wood for use where a pattern is desired which will last a long time, and where a wood which will present corners not easily worn off is desired. The spruce and hemlock were reported as manufactured into foun-

TABLE 52.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
White ash.....	22,100	40.63	\$26 92	\$595 00	22,000	100
Lignumvitae.....	12,300	22.61	64 63	795 00		12,300
Basswood.....	10,000	18.38	15 00	150 00	10,000	
Sweet birch.....	3,000	9.19	18 00	90 00	5,000	
Sugar maple.....	5,000	9.19	30 00	150 00	5,000	
Totals.....	54,400	100.00	\$32 72	\$1,780 00	42,000	12,400

dry flasks. The other woods were used for purposes not usually thought of as related to patterns and are presented here because they are manufactured in the same shops. They were used for the following purposes: The sugar maple, as boards for board drop hammers, the cypress, for pickle tanks, and hornbeam, as pins for drop hammers.

### *Pulleys and Conveyors.*

TABLE 53.

KINDS OF WOOD.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Red oak.....	16,000	39.02	\$22 00	\$352 00	16,000	
Red spruce.....	10,000	24.39	20 00	200 00	10,000	
White oak.....	7,000	17.07	27 71	194 00	7,000	
Aspen (popple).....	6,000	14.63	15 00	90 00	6,000	
White ash.....	2,000	4.88	22 00	44 00	2,000	
Totals.....	41,000	100.00	\$21 46	\$880 00	41,000	

One industry manufactures tackle blocks, pulleys, and similar articles. The manufacturers use native wood to a large extent.

The white ash was manufactured into tackle blocks, the lignumvitae into tackle blocks and tackle block sheaves, the basswood into split pulleys, the sweet birch into pulley arms, and the sugar maple into wood cogs.

### Agricultural Implements.

It would seem in a State where agriculture is important that more material would be used in the manufacture of agricultur-

TABLE 54.

INDUSTRIES.	QUANTITY USED ANNUALLY.		Average cost per 1000 ft.	Total cost f. o. b. factory.	Grown in Maine. Feet, B. M.	Grown out of Maine. Feet, B. M.
	Feet, B. M.	Per cent.				
Boxes and crates.....	108,889.400	44.33	\$15.33	\$1,669,701.00	103,603.900	5,285,500
Planing-mill products.....	25,741.000	10.48	23.99	617,530.50	19,764.500	5,976,500
Shuttles, spools and bobbins.....	21,335.000	8.69	23.96	511,244.00	20,935.000	400.000
Sash, doors, blinds and general millwork.....	13,055.400	5.32	33.57	438,096.50	6,695.000	6,360.400
Boot and shoe findings.....	10,734.200	4.37	16.16	180,503.00	10,734.200	.....
Ship and boat building.....	10,299.400	4.19	34.49	355,214.00	4,525,100	5,774,300
Handles.....	9,310.000	3.79	20.78	193,508.00	8,997,000	313,000
Woodenware and novelties.....	8,196.500	3.34	23.11	189,405.50	7,293.500	903,000
Dowels.....	7,532.000	3.07	14.93	112,434.50	7,362,000	170,000
Miscellaneous.....	5,704.500	2.32	18.92	107,915.50	3,953.000	1,751,500
Laundry appliances.....	4,456.000	1.82	15.85	70,625.00	4,456,000	.....
Car construction.....	4,431.500	1.80	30.23	133,955.00	2,169,000	2,262,500
Toys.....	4,249.000	1.73	20.14	85,559.00	2,089,500	2,160,000
Furniture.....	3,765.000	1.53	23.04	86,742.00	2,122,500	1,642,500
Matches and toothpicks.....	3,050.000	1.24	28.45	86,775.00	2,975,000	75,000
Vehicles and vehicle parts.....	1,054.500	.43	24.31	25,633.00	986,500	68,000
Caskets and coffins.....	647.000	.26	22.35	14,471.00	567,500	80,100
Brushes.....	645.000	.26	18.98	12,245.00	645,000	.....
Printing material.....	533.000	.22	21.27	11,337.50	533,000	.....
Fixtures.....	389.000	.16	59.24	23,046.00	91,000	298,000
Dairymen's, poulterers' and apiarists' supplies.....	320.000	.13	16.00	5,120.00	320,000	.....
Butchers' blocks and skewers.....	302.000	.12	14.82	4,475.00	302,000	.....
Bungs and faucets.....	285.000	.12	18.86	5,375.00	285,000	.....
Chairs.....	269.500	.11	19.51	5,260.00	229,500	40,000
Sporting and athletic goods.....	230.000	.09	20.95	4,818.00	217,000	13,000
Patterns.....	94.250	.04	35.94	3,386.50	87,450	6,800
Pulleys and conveyors.....	54.400	.02	32.72	1,780.00	42,000	12,400
Agricultural implements.....	41.000	.02	21.46	880.00	41,000	.....
Totals.....	245,614,150	100.00	\$20.18	\$4,957,035.50	212,021,650	33,592,500

Additional figures from 1910 reports of the Bureau of the Census (see appendix).

Pulp.....	458,379,500	.....	.....	.....	.....	.....
Slack cooerage.....	24,885,333	.....	.....	.....	.....	.....
Tight cooerage.....	2,332,000	.....	.....	.....	.....	.....
Grand total.....	731,210,983	.....	.....	.....	.....	.....

al implements, than the table shows to be the case in Maine. The woods used here with the exception of aspen are such as are used in other States in the same industry. Plows were manufactured from white and red oak, potato hoes from white oak and white ash, while spruce and aspen were used in the manufacture of potato carriers.

Table LIV summarizes the figures of Tables XXVI to LVIII inclusive. It is similar to Table I, and gives the same information arranged, however, by industries instead of by species.

### *The Use of Waste.*

The right use of the forests of the State has received the serious consideration of officials and public-minded citizens for many years, and some attention has been paid by the manufacturers of the State to the possible use of material usually classed as waste.

Material not used in the manufacture of a product may sometimes be utilized in one or two ways. It may be further converted by machinery, or it may be treated by chemical processes and products obtained, such as paper pulp, wood alcohol, and turpentine. If further wood working is feasible, it is usually necessary that the material shall be uniform in size and shape to avoid unnecessary expense in handling and sorting. If this condition obtains, it is obvious that it is possible to make a line of small articles from the material left from the manufacture of a larger article. In chemical utilization it is not usually necessary that the material be any particular size or shape, since it will be reduced anyway by the chemical process. Very often the cost of further manufacture or the lack of suitable markets for the product form an almost insuperable bar to close utilization.

Manufacturers of spruce lumber have found it profitable to bark their spruce slabs and sell the slabs in carload lots to pulp mills. Undoubtedly some aspen and white pine slabs are sometimes included in these shipments. Softwood slabs are also worked into laths and crating stock. One mill reports that softwood is made into boxes and hardwood waste into furniture squares, while another states that slabs are worked into laths, boxes, boards, pickets, and crating. Planing mills which

get out large amounts of house finish, find a great deal of use for small pieces. In some cases waste stock goes into small mouldings, porch balusters and spindles. Other uses for planing mill waste are rails for cabinet doors, corner blocks, window screen frames, and curtain sticks.

Ship builders and boat and canoe makers also pay considerable attention to the use of waste material. Wedges are made from the waste in one ship yard, while in another oak, pine, both white and longleaf, and cypress are made into lobster traps, and oak, birch and maple are made into lobster pot sills, scallop drags, and soda sink legs. The manufacture of canoes allows the use of much of the hardwood waste for seats, backs, etc. An oar and paddle shop makes its left-over ash, spruce and maple, into boat hook handles and small flag poles. A ship yard works some of its white ash and spruce into oars. Cart thills are made from birch, beech, and maple, and tree nails from tamarack and white ash. Fish sticks were made from oak and basswood, and white ash and sugar maple went into ice pick handles.

The manufacture of boxes permits the utilization of large quantities of low grade stock and mill waste. Small pieces of white pine and basswood can be made into small locked corner boxes. The use of waste for ends of banana and potato crates was reported.

The closest utilization of wood in the State, probably occurs in the factories which make handles and novelties from paper birch. While many of the lines require selected stock the articles are usually so small that the material is worked up very closely and the waste left is fit for nothing but fuel. The largest item of waste in such mills is, of course, due to red heart, and much attention has been paid to the possible utilization of this stock. It has been found that sound red heart can be turned into handles and novelties, which are to be enameled, so that color in the wood is no drawback. Red heart is sometimes shipped to novelty mills outside of the State for further manufacture. Railroad shims and sugar shooks have been made from red heart birch. Besides putting red heart into enamel work, it is entirely possible to use it for cheap turned boxes and other cheap jobs. A spool mill reports that some paper birch waste is made into bushings; another mill, reports

that paper birch waste is turned into handles, cork caps, spools, and a great variety of articles. Novelty mills using paper birch and other hardwoods, report the manufacture of waste into small handles, novelty turnings, package handles and dowels.

In a furniture factory short pieces of oak went into small stands. In one place knife and fork trays were made from basswood and other hardwoods. Sloyd schools were supplied with mahogany from the waste piles of fixture factories. Dowels are extensively made from white ash and small hammer handles are made from white and red oak and white ash. Maple, yellow birch, and beech bobbin waste is used in making novelties and sugar maple goes into shovel handles.

## LIST OF USES OF WOODS.

*African Mahogany.*

## Fixtures

*Aspen (Popple).*

Baby tenders	Novelties
Boxes	Pillow-sham sticks
Clapboards	Pungs
Clothes driers	Potato carriers
Crates	Root carriers
Dowels	Sheathing
Excelsior	Shoe fillers
Flooring	Shoe forms
Games	Shoe lasts
Hosiery forms	Shoe trees
Interior finish	Toothpicks.

*Balsam Fir.*

Boxes	Frames (door)
Boxes (herring)	Frames (window)
Cases	Ironing-table tops
Cases (packing)	Molding
Cases (sardine)	Refrigerators
Ceiling	Sheathing
Clapboards	Shooks
Cloth boards	Siding
Crates	Suit-case frames
Flooring	

*Basswood.*

Baby tenders	Brush backs
Baskets	Carriages
Blinds	Caskets
Boards (Cutting)	Chairs
Boards (Ironing)	Chamber suites
Boards (Pastry)	Clapboards
Bookcases	Clothes driers
Boxes	Desks
Boxes (Mailing)	Doll houses

Doors	Shoe lasts
Fixtures (Bank)	Shoe trees
Fixtures (Office)	Showcases
Fixtures (Store)	Sleds
Furniture	Sleds (Toy)
Games	Sleighs
Handles (Window-brush)	Snow shovels
Hosiery forms	Split pulleys
Interior finish	Stepladders
Kitchenware	Tables
Pungs	Tables (Ironing)
Sash	Toys
Shelving	Wagons
Shoe fillers	Wagons (Toy)

*Beech.*

Boats	Milk-can stoppers
Bobbins	Paper plugs
Brush backs	Piano backs
Candlepins	Rafting wedges
Cars	Sheep sets
Chairs	Ship timbers
Clothespins	Shoe fillers
Doll furniture	Shoe forms
Dowels	Shoe heels
Electric-wire cleats	Shoe lasts
Flooring	Skewers
Furniture	Skis
Hall racks	Sleds (Toy)
Handles (Broom)	Spools
Handles (Package)	Stair work
Handles (Pail)	Tables
Handles (Peavy)	Tenpins
Handles (Sprayer)	Trunk cleats
Hosiery forms	Wagons (Toy)
Interior finish	

*Black Ash.*

Baskets	Desks
Bookcases	Fixtures
Brush backs	Interior finish
Cabinet work	Oars
Cars	Settee Hammocks
Chamber suites	Tables
Cloth boards	

*Black Birch.*

Pulley arms

*Black Cherry.*

Boats	Showcases
Doors	Screens (Door)
Fixtures	Screens (Window)
Interior finish	

*Black Walnut.*

Interior finish	Screens (Window)
Screens (Door)	

*Black Willow.*

Artificial limbs	Boxes
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*Butternut.*

Ship finish

*Chestnut.*

Burial boxes	Coffins
Caskets	Interior finish

*Cocobola.*

Launch wheel drums	Steering wheels
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*Bald Cypress.*

Blinds	Launches
Boat finish	Screens (Casement)
Boats	Screens (Door)
Boats (Tow)	Screens (Window)
Cabinet work	Sheathing
Cars	Shipbuilding
Doors	Showcases
Fixtures (Store)	Silos
Interior finish	Tanks

*Douglas Fir.*

Blinds	Wooden pipe
Ship spars	Wooden pumps

*English Oak.*

Screens (Door)	Screens (Window)
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*Hemlock.*

Boxes	Molding
Cases (Packing)	Sheathing
Crates	Shooks
Foundry flasks	

*Hickory.*

Hubs	Sled runners
Shafts	Whiffletrees

*Hornbeam.*

Drop-hammer pins

*Lignumvitae.*

Block sheaves                      Ship blocks

*Loblolly Pine.*

Blinds	Fixtures (Store)
Boat finish	Interior finish
Boats (Motor)	Refrigerators
Cabinet work	Sash
Cars	Screens (Door)
Doors	Screens (Window)
Flooring	Sheathing
Frames (Door)	Ship cabins
Frames (Window)	Showcases
Fixtures (Bank)	Stair work
Fixtures (Office)	

*Longleaf Pine.*

Blinds	Interior finish
Boats	Sash
Boats (Tow)	Ship beams
Cars	Ship sheathing
Doors	Ship planking
Elevator guides	Silos
Frames (Window)	Tanks

*Mahogany.*

Canoe decks	Fixtures (Bank)
Canoe gunwales	Fixtures (Office)
Chamber suites	Launch wheel drums
Doors	Patterns
Finish (Boat)	Screens (Door)
Finish (Car)	Screens (Window)
Finish (Canoe)	Showcases
Finish (Interior)	Steering wheels
Finish (Ship)	

*Northern White Cedar.*

Boats	Canoe planking
Boats (Motor)	Canoe ribs
Box shooks	Crating
Canoes	Suit-case frames





Steps in the manufacture of a one piece spool from Paper Birch

*Paper Birch.*

Balls	Handles (Floor-brush)
Bobbins	Handles (Package)
Boxes	Handles (Pail)
Boxes (Herring)	Handles (Parcel)
Boxes (Turned)	Handles (Sprayer)
Brush blocks	Handles (Tool)
Cases	Handles (Wash-boiler)
Chairs (Children's)	Knobs
Checkers	Novelties
Clothes driers	Paper plugs
Clothespins	Pegwood
Cork caps	Piano backs
Cork tops	Sheathing
Doll furniture	Shoe pegs
Dowels	Shoe shanks
Flooring	Skewers
Games	Spools
Handles	Tables (Children's)
Handles (Broom)	Toothpicks
Handles (Brush)	Toys
Handles (File)	Wooden floats

*Red Cedar.*

Chests

*Red Gum.*

Chamber suites	Fixtures (Store)
Doors	Interior Finish
Fixtures (Bank)	Hand bellows
Fixtures (Office)	Showcases

*Red Maple.*

Blinds	Handles (Pail)
Bobbins	Handles (Sprayer)
Canoes	Piano backs
Canoe paddles	Sash
Chamber suites	Skis
Cloth boards	Spools
Doors	Wagons

*Red Oak.*

Baskets	Boat keels
Boats	Boat planking
Boat finish	Boats (Tow)
Boat frames	Bookcases

Canoes	Piano backs
Carriages	Plows
Cars	Pump fittings
Carts	Pungs
Chairs	Refrigerators
Chamber suites	Screens (Casement)
Derrick crabs	Screens (Door)
Derrick winches	Screens (Window)
Desks	Shipbuildings
Doors	Shoe heels
Dowels	Sleds
Fixtures	Sleds ('Toy)
Flooring	Spokes
Handles (Ax)	Stair work
Handles (Pick)	Stepladders
Hubs	Tables
Interior finish	Wagons
Lobster traps	Wagons ('Toy)
Locomotives	

*Norway Pine.*

Boxes	Interior finish
Flooring	Sheathing
Freight cars	Shooks

*Red Spruce.*

Boats	Handles (Broom)
Boats (Tow)	Ladders
Boxes	Lawn swings
Boxes (Herring)	Locomotives
Butter tubs	Molding
Canoes	Oars
Carriages	Paddles
Cars	Piano backs
Car flooring	Piazza work
Cases	Potato carriers
Cases (Packing)	Pulp pie plates
Cases (Sardine)	Pungs
Ceiling	Refrigerators
Clapboards	Root carriers
Clothes driers	Sheathing
Crating	Ship cabins
Exterior finish	Ship decks
Flagstuffs	Ship knees
Flooring	Ship masts
Foundry flasks	Ship spars
Frames (Door)	Ship timbers
Frames (Window)	Shooks

Sleds	Tables (Ironing)
Stepladders	Tables (Pool)
Suit-case frames	Wagons
Tables (Folding)	

*Redwood.*

Caskets	Wooden pipe
Coffins	

*Rock Elm.*

Hubs	Sled runners
Launch-wheel drums	Steering wheels

*Rosewood.*

Launch-wheel drums	Steering wheels
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*Shortleaf Pine.*

Cars

*Sycamore.*

Carriages	Fixtures (Office)
Fixtures (Bank)	Fixtures (Store)

*Tamarack.*

Bateaux	Schooners
Boats	Ship knees

*Tcak.*

Boat finish

*Cotton Gum.*

Pumps	Wooden pipe
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*White Ash.*

Axles	Handles
Baskets	Handles (Hoe)
Baseball bats	Handles (Shovel)
Bookcases	Handles (Spade)
Canoes	Handles (Torch)
Carriages	Hubs
Carriage jacks	Interior finish
Carts	Oars
Chairs	Paddles (Canoe)
Chamber suites	Picker sticks
Cloth boards	Pike poles
Dowels	Potato-hoe poles
Flooring	Pungs
Hall racks	Sheathing

Sleds	Stepladders
Sled runners	Tackle blocks
Sleighs	Toboggans
Snowshoes	Wagons

*White Elm.*

Baskets	Interior finish
Shoe heels	Wash benches

*Southern White Cedar.*

Boats	Boat planking
Boat cabins	Silos
Boat decks	Tanks

*Spanish Cedar.*

Caskets	Coffins
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*Sugar Maple.*

Axles	Frames (Machinery)
Boxes (Bit)	Frames (Window)
Boxes (Veneer)	Furniture
Blinds	Hall racks
Boats	Handles
Boats (Tow)	Handles (Broom)
Bobbins	Handles (Canthook)
Bowling pins	Handles (Chisel)
Brush backs	Handles (Package)
Cabinet work	Handles (Pickeroom)
Candlepins	Handles (Tool)
Cars	Hosiery forms
Carriages	Interior finish
Caster rollers	Ironing boards
Chairs	Launch-wheel drums
Chairs (Camp)	Lever
Chairs (Children's)	Logging sleighs
Chairs (Steamer)	Lumber carriers
Clothespins	Meat blocks
Desks	Milk-can stoppers
Die blocks	Oars
Doll furniture	Paddles (Canoe)
Doors	Paper plugs
Dowels	Piano backs
Electric-wire cleats	Print blocks
Fixtures	Rulers
Flooring	Sash
Frames (Door)	Sheep sets

Ship timbers	Steering wheels
Shoe fillers	Tables
Shoe forms	Tables (Children's)
Shoe heels	Tables (Folding)
Shoe lasts	Tables (Ironing)
Shoe trees	Toboggans
Skewers	Toys
Sleds	Trunk cleats
Sleds (Toy)	Vehicles
Sleighs	Wagons
Spools	Wagons (Toys)
Spring jacks	Wooden cogs
Stair work	

*White Mahogany.*

Interior finish

*White Oak.*

Boat finish	Locomotives
Boats (Motor)	Picture frames
Boats (Tow)	Plows
Cabinet work	Potato hoes
Cars	Pump fittings
Carriages	Sail hoists
Chairs	Screens (Door)
Chamber suites	Shields (Taxidermist)
Doors	Shipbuilding
Fixtures (Bank)	Ship frames
Fixtures (Office)	Ship timbers
Handles (Ax)	Ship water casks
Handles (Hammer)	Showcases
Handles (Sledge)	Stair work
Interior finish	Wagons

*White Pine.*

Balusters	Carriages
Bateaux	Cars
Blinds	Cases
Boards (Cloth)	Cases (Corn)
Boards (Cutting)	Cases (Egg)
Boards (Ironing)	Cases (Packing)
Boats (Motor)	Casing
Boats (Tow)	Caskets
Boxes	Chamber suites
Boxes (Herring)	Clapboards
Boxes (Mailing)	Clothes driers
Brackets	Coffins
Burial boxes	Crating

Doll furniture	Shelving
Doors	Shipbuilding
Fixtures (Bank)	Ship bulkheads
Fixtures (Office)	Ship cabins
Fixtures (Store)	Ship decks
Frames (Door)	Ship flooring
Frames (Window)	Ship masts
Furniture	Ship spars
Laundry appliances	Shooks (Box)
Matches	Shooks (Trunk)
Milk-can stoppers	Showcases
Molding	Siding
Patterns	Silos
Piano backs	Sleds
Porch columns	Stair work
Print blocks	Suit-case frames
Sash	Tables (Card)
Screens (Door)	Tanks
Screens (Window)	Wagons
Sheathing	Washboards

*Western Red Cedar.*

Boat finish	Canoe planking
Canoes	

*Western White Pine.*

Sash	Window frames
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*Western Yellow Pine.*

Sash	Window frames
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*Yellow Birch.*

Baskets	Chamber suites
Boxes (Bit)	Clothespins
Boxes (Veneer)	Cork caps
Boats (Motor)	Desks
Boats (Tow)	Doll furniture
Bobbins	Dowels
Brush backs	Electric-wire cleats
Cabinet work	Fixtures (Bank)
Camp stools	Fixtures (Office)
Canoes	Fixtures (Store)
Carriages	Flooring
Chairs	Hall racks
Chairs (Children's)	Handles
Chairs (Hammock)	Handles (Broom)
Chairs (Steamer)	Handles (Floor-brush)

Handles (Pail)	Ship timbers
Handles (Peavy)	Shoe fillers
Handles (Pump)	Shoe forms
Handles (Sprayer)	Shoe heels
Handles (Stamp)	Shoe lasts
Handles (Tool)	Shoe pegs
Hosiery forms	Shoe shanks
Interior finish	Skewers
Launch-wheel drums	Skis
Lawn swings	Sleds
Lobster traps	Spools
Logging sleighs	Stair work
Milk-can stoppers	Steering wheels
Novelties	Stepladders
Paddles	Tables
Paper plugs	Tables (Children's)
Pegwood	Tables (Folding)
Piano backs	Tables (Ironing)
Pungs	Tables (Pool)
Screens (Door)	Toboggans
Screens (Window)	Trunk cleats
Settee Hammocks	Wagons
Sheep sets	Wagons (Toy)
Shipbuilding	Wash benches

*Yellow Poplar.*

Blinds	Frames (Door)
Boats	Frames (Window)
Bobbins	Hand bellows
Burial boxes	Interior finish
Cabinet work	Launches
Cars	Locomotives
Carriages	Sash
Caskets	Screens (Door)
Casket moldings	Screens (Window)
Casket trimmings	Showcases
Coffins	Spools
Doors	Stair work
Fixtures (Bank)	Topmast balls
Fixtures (Office)	Wagons
Fixtures (Store)	

## DIRECTORY OF WOOD USING PLANTS.

### *Agricultural Implements.*

Peabody Manufacturing Co.,	Houlton
George Varney,	Kennebunk
Hussey Plow Co.,	North Berwick

### *Boot & Shoe Findings.*

Fitz Bros. Co.,	Auburn
American Shoe Finding Co.,	Bingham
Bingham Last Block Co.,	Bingham
U. S. Pegwood & Shank Co.,	Brownville
J. K. Butterfield,	Danforth
C. S. Whitney,	Harrison
Summit Lumber Co.,	Houlton
Eldridge & York,	Island Falls
Flye & Sewall,	Island Falls
C. A. Batchelder Co.,	St. Albans
E. J. Lee Co.,	Wytopitlock

### *Boxes & Crates, Packing.*

Z. G. Horn,	Acton
J. C. Chalmers,	Albion
C. N. Wilson,	Allens Mills
Rand Bros.,	Anson
Athens Lumber Co.,	Athens
F. R. Conant Co.,	Auburn
H. Wesley Hutchins Co.,	Auburn
N. L. Page & Son Co.,	Auburn
Union Box & Lumber Co.,	Auburn
H. H. Harvey,	Augusta
Jos. A. Shaw,	Augusta
James Walker Co.,	Bangor
Grantville Chase Co.,	Baring
Geo. G. Page Box Co.,	Bar Mills
J. C. Durham,	Belfast
Biddeford Box Co.,	Biddeford
Diamond Match Co.,	Biddeford

Scribner Bros.,	Bolsters Mills
Eastern Manufacturing Co.,	Brewer
Smith Planing Mill Co.,	Brewer
Bridgton Machine Lumber Co.,	Bridgton
C. V. Robbins,	Bristol
J. M. Bray,	Bucksport
Calais Box & Lumber Co.,	Calais
O. A. Moody,	Canaan
E. K. Wilson Estate,	Cherryfield
I. L. Clark,	Clarks Mill
L. Hutchins & Sons,	Corinna
S. D. Warren & Co.,	Cumberland Mills
Cathance Lumber Co.,	Dennysville
Dennysville Lumber Co.,	Dennysville
Eldridge Bros.,	Dexter
Frank W. Wood,	East Baldwin
Hiram Lumber Co.,	East Hiram
Blanchard Manufacturing & Canning Co.,	Eastport
Hume & Newhall Co.,	Fairfield
A. Jewell & Son,	Fairfield
Russel Bros. & Estes Co.,	Farmington
W. B. Clow,	Franklin
Freedom Lumber Co.,	Freedom
Edw. F. Libby,	Freeport
Fryeburg Lumber Co.,	Fryeburg
Glidden Box Co.,	Gardiner
A. D. Coburn & Son,	Greene
Veneer Products Co.,	Greenville
Guilford Manufacturing Co.,	Guilford
North Wayne Tool Co.,	Hallowell
N. W. Fish,	Jonesboro
Lawrence Lumber Co.,	Jonesboro
Jenkins & Bogert Manufactur- ing Co.,	Kingfield
American Thread Co.,	Lakeview and Milo
E. K. Merrill,	Leeds
Lewiston Bleachery & Dye Works,	Lewiston
A. B. Leavitt & Son,	Limerick
F. G. Coombs,	Lisbon
Yankee Wood Turning Co.,	Livermore Falls
Columbian Canning Co.,	Lubec
Charles Taft,	Lubec
Machias Manufacturing Co.	Machias
Poland Paper Co.,	Mechanic Falls
A. V. Blaisdell,	Monmouth
Cochenagen Lumber Co.,	Monmouth

Portland-Monson Slate Co.,	Monson
Edwards & Walker,	Newfield
W. H. Straw,	Newfield
Isaac Varney & Sons Co.,	North Berwick
C. H. Bartlett,	North New Portland
H. W. Clary,	North Whitefield
C. B. Cummings & Son,	Norway
A. B. Bates & Co.,	Oakland
Jordan Lumber Co.,	Old Town
Wing & Engel Co., Inc.,	Old Town
James L. Holden,	Oxford
International Manufacturing Co.,	Phillips
J. L. Brackett,	Portland
E. T. Burrowes Co.,	Portland
G. A. Crosman & Sons Co.,	Portland
Portland Co.,	Portland
Portland Match Co.,	Portland
Chas. F. Eaton,	Princeton
L. McKechine & Son,	Princeton
Willard C. Libby,	Raymond
Brunswick Box Co.,	Richmond
Oxford Paper Co.,	Rumford
R. E. Swain,	Rumford
Sanford Mills,	Sanford
United Society of Shakers,	Sabbathday Lake
E. I. du Pont de Nemours Powder Co.,	Sebago Lake
Shirley Lumber Co.,	Shirley
Skinner, French & Co.,	Skinner
C. T. Jewett,	Solon
David Cummings Co.,	South Berwick
C. C. Farmer,	South Bristol
Mason Manufacturing Co.,	South Paris
Paris Manufacturing Co.,	South Paris and West Paris
W. K. Hamlin,	South Waterford
John Gerry,	South Windham
Fred A. Smith,	Springvale
Stratton Manufacturing Co.,	Stratton
C. V. Starbird,	Strong
Kiff & Johnson Mill Co.,	Thomaston
F. E. Merrill,	Turner
E. L. Staples,	Turner
Waterboro Box & Milling Co.,	Waterboro
A. P. Burnell,	West Baldwin
John S. Calkins,	West Lubec
Henry Oliver,	West Mills
Hannaford & Gile.	West Newfield

Boynton & Estey,	Whiting
Thomas Varney,	Windham
Winthrop Mills Co.,	Winthrop
St. Croix Paper Co.,	Woodland

*Brushes.*

Heald Bros.,	Buckfield
C. Withington & Sons,	Buckfield
Hiram Lumber Co.,	East Hiram
Cooper Bros.,	Newport

*Bungs & Faucets.*

Dennysville Lumber Co.,	Dennysville
Geo. Walters Co.	Dixfield
C. H. Bartlett,	North New Portland

*Butcher's Blocks and Skewers.*

R. A. Grove,	Andover
American Die Block Co.,	Buckfield
Reeds Mills Lumber Co.,	Phillips
W. A. Googins,	Waltham

*Car Construction.*

Bangor Railway & Electric Co.,	Bangor
Sandy River & Rangeley Lakes R. R.,	Phillips
Grand Trunk Railway System, Portland Co.,	Portland
Portland Terminal Co.,	Portland
Lime Rock R. R. Co.,	Rockland
Maine Central R. R.,	Waterville
W. W. & F. Ry. Co.,	Wiscasset

*Caskets & Coffins.*

A. B. Haskell,	Bangor
R. S. Osgood,	Blue Hill
Hay & Peabody Casket Co.,	Portland
Skowhegan Casket Co.,	Skowhegan
Thurston Bros.,	South Union
F. E. Moody,	Weeks Mills
E. F. Ridlon & Co.,	West Buxton
J. W. Andrews Sons,	West Paris

*Chairs.*

Bethel Manufacturing Co.,	Bethel
Roberts & Son,	Brooks
Maine Screen & Ventilator Co.,	Fairfield
National Chair Co.,	Portland
J. M. Virgin,	Saco
Skowhegan Novelty Works,	Skowhegan
Paris Manufacturing Co.,	South Paris and West Paris

*Dairyman's, Poulterer's & Apiarist's Supplies.*

Adams-Chalmers Co.,	Auburn
H. E. Thompson,	Skowhegan
Willie R. Trask,	Skowhegan

*Dowels.*

C. B. Cummings & Sons,	Bemis and Norway
Geo. W. Kneeland,	Berry Mills
I. S. Morrill & Son,	Bethel
Julius P. Skillings,	Bethel
Merrill Springer Co.,	Bethel
Dearborn Spool Co.,	Bryant Pond
Earl S. Page,	Burlington
Perkins & Morgan,	East Andover
J. W. Raye & Co.,	Eastport
J. Bartlett,	East Stoneham
L. E. Lord,	East Wilton
J. A. Thurston,	Frye
S. H. Harriman,	Fryeburg
H. B. Smith & Son,	Hanover
A. B. Leavitt & Son,	Limerick
Edwards & Walker,	Newfield
H. F. Thurston,	Newry
Novelty Turning Co.,	Norway
Saunders Bros.,	Sandy Creek
J. A. Kenney,	South Paris
Arthur Crockett,	Summer
Swain & Reed,	Roxbury
E. M. Worthley & Co.,	Rumford
Rolfe Bros.,	West Bethel

*Fixtures.*

C. E. Hoxie & Co.,	Augusta
E. L. Gatchell,	Bangor
W. A. Allen Co.,	Portland
F. O. Bailey Co.,	Portland
New England Cabinet Works	Portland

Smith & Rumery Co.,	Portland
F. A. Stanley,	Rockland

*Furniture.*

Ideal Desk Extension Co.,	Auburn
Ellsworth Hardwood Co.,	Ellsworth
Fairfield Furniture Co.,	Fairfield
Chas. Loubier & Son,	Fairfield
Maine Screen & Ventilator Co.,	Fairfield
J. Frank Hale,	Gardiner
J. B. Roberts,	Hanover
Thos. P. Beals Furniture Co.,	Portland
Bennett Manufacturing Co.,	Portland
E. T. Burrowes Co.,	Portland
Mason Manufacturing Co.,	South Paris
Paris Manufacturing Co.,	South Paris and West Paris

*Handles.*

E. Mansfield & Co.,	Bangor and Orono
Peavey Manufacturing Co.,	Brewer
G. S. Witham & Son,	Caratunk
F. H. McLaughlin,	Clifton
Ames Shovel & Tool Co.,	Cumberland Mills and Oakland
Dennysville Lumber Co.,	Dennysville
Geo. Walters Co.,	Dixfield
Flint & Burnell,	East Hiram
L. E. Lord,	East Wilton
Ellsworth Hardwood Co.,	Ellsworth
Russell Bros. & Estes Co.,	Farmington
Freedom Lumber Co.,	Freedom
A. W. Cook,	Fryeburg
Oakland Manufacturing Co.,	Gardiner
F. H. Colsen,	Great Pond
North Wayne Tool Co.,	Hallowell
Lemuel Cotton & Son,	Hiram
Jenkins & Bogert Manufacturing Co.,	Kingfield
Lewiston Handle Co.,	Lewiston
Maine Wood Turning Co.,	Livermore Falls
Yankee Wood Turning Co.,	Livermore Falls
Humphrey Lumber Co.,	Madison
Stowell & Davenport,	Madrid
Lewis M. Mann & Son,	Milton Plantation and West Paris
C. H. Bartlett,	North New Portland
Novelty Turning Co.,	Norway
Geo. H. Hunt,	Old Town

H. O. Turner,	St. Albans
Eastern Handle Co.,	Salem
Adams & Burns,	Skowhegan
Stratton Manufacturing Co.,	Stratton
L. L. Rogers,	Troy
O. E. Trask,	Vienna
Winslow Bros.,	Webbs Mills
H. C. Lombard,	West Baldwin
J. C. Coombs,	West Buxton
S. B. Ellingwood & Son,	West Paris

*Laundry Appliances.*

F. E. Hooper & Son,	Biddeford
Hill Lumber Manufacturing Co.,	Brownfield
Davis Manufacturing Co.,	Clinton
Spaulding Manufacturing Co.,	Clinton
Geo. Walters Co.,	Dixfield
Flint & Burnell,	East Hiram
Summit Lumber Co.,	Houlton
Lewis M. Mann & Son,	Milton Plantation and West Paris
M. H. Tyler Co.,	Portland
D. B. Washburn,	Sebec Station
Skowhegan Novelty Works,	Skowhegan
Paris Manufacturing Co.,	South Paris and West Paris

*Matches & Toothpicks.*

Dixfield Toothpick Co.,	Dixfield
Forster Manufacturing Co.,	Dixfield
International Manufacturing Co.,	Phillips
Charles Forster Estate,	Portland and Strong
Portland Match Co.,	Portland

*Miscellaneous.*

Stevens Tank & Tower Co.,	Auburn,	Tanks and silos Derrick winches and crabs
H. H. Harvey,	Augusta,	
A. J. Bryer, Jr.,	Bangor,	Hand bellows
J. F. Parkhurst & Son Co.,	Bangor,	Trunks
O. A. Moody,	Canaan,	Suit case frames
F. E. Whitman,	Clinton,	Refrigerators
Fairfield Lawn Swing Co.,	Fairfield,	Lawn swings

Fryeburg Lumber Co.,	Fryeburg,	Piano backs
F. P. Bennett & Co.,	Liberty,	Machinery frames
Boston Excelsior Co.,	Milo,	Excelsior
V. Fabian & Son,	Milo Junction,	Rulers
Cooper Bros.,	Newport,	Electric wire cleats
H. W. Wells,	Oakland,	Artificial limbs
W. H. Norris,	Portland,	Picture frame moulding
Portland Co.,	Portland,	Elevators
J. W. Campbell	Rockland,	Water casks and tanks
Saco Manufacturing Co.,	Saco,	Pumps and wood pipe
Paris Manufacturing Co.,	South Paris & West Paris	Lawn swings

*Patterns.*

Penobscot Machinery Co.,	Bangor
Knowlton Bros.,	Camden
F. P. Bennett,	Liberty
Record Foundry & Machinery Co.,	Livermore Falls
Maine Central R. R. Co.,	Oakland
Thomas Laughlin Co.,	Portland
Frank H. Merrill,	Portland
W. H. Norris,	Portland
Portland Co.,	Portland
Henry R Stickney,	Portland
Noyes Machine Co.,	South Portland

*Planing Mill Products.*

J. C. Chalmers,	Albion
J. H. Flint,	Ashland
M. H. Elliott,	Athens
H. E. Trueworthy,	Athens
Adams-Chalmers Co.,	Auburn
F. R. Conant Co.,	Auburn
Augusta Lumber Co.,	Augusta
C. E. Hoxie & Co.,	Augusta
Hume Newhall Co.,	Augusta
H. Humphrey & Son,	Augusta
Morse & Co.,	Bangor
W. Grindle,	Bar Harbor
C. A. Hodgkins,	Bar Harbor
A. S. Ellers & Co.,	Bath
J. C. Durham,	Belfast
Mathews Bros.,	Belfast
H. Merriam,	Belfast
Myron Goodwin,	Berwick

Steward Bros.,	Bingham
F. S. Meacham,	Bowdoinham
Smith Planing Mill Co.,	Brewer
Bridgton Machinery & Lumber Co.,	Bridgton
Stanley T. Brown & Co.,	Brunswick
H. Allan Bacon,	Bryant Pond
Camden Lumber Co.,	Camden
S. G. Ritterbush,	Camden
Chas. F. Oldham,	Canton
Hight & Page,	Caribou
W. B. Bacon,	Charleston
Gordon Bros.,	Chisholm
L. Hutchins & Sons,	Corinna
C. R. & H. H. Mountford.	Cumberland Center
Leon H. Ingalls,	Denmark
Dennysville Lumber Co.,	Dennysville
Eldridge Bros.,	Dexter
H. L. Gordon,	Dexter
Wm. W. Waite,	Dixfield
C. Tyler Hodgdon,	East Boothbay
A. P. Cobb,	East Brownfield
H. V. Littlefield,	East Stoneham
Ernest E. Stevens,	Fort Fairfield
H. K. Farnham,	Foxcroft
Banton Bros.,	Freedom
G. L. Edmunds,	Freedom
Oakland Manufacturing Co.,	Gardiner
J. G. Roberts,	Hanover
H. H. Bisbee,	Harrison
Frank L. Griffith,	Hartland
Leon C. Irish,	Haynesville
I. H. Davis,	Houlton
Roach Bros.,	Island Falls
C. H. Merrill,	Lee
G. J. Day,	Lewiston
J. W. White Co.,	Lewiston
L. C. Morse,	Liberty
Ballantyne Holmes Co.,	Lincoln
Milton B. Hills,	Lincolnville
Foster & Bryant Estate,	Machias
Machias Lumber Co.,	Machias
Geo. W. Daggett,	Milo
James Murchies Sons Co.,	Milltown
Cochenagen Lumber Co.,	Monmouth
J. B. Palmer,	Monroe
J. H. Lamb,	Naples

Muscongus Lumber Co.,	Newcastle
W. H. Straw,	Newfield
Carrabassett Co.,	North Anson
Hume & Newhall Co.,	North Anson
L. P. Crockett,	North Sebago
H. W. Clary,	North Whitefield
C. B. Cummings & Son,	Norway
H. C. & G. W. Everett,	Norway
Jordan Lumber Co.,	Old Town
Wm. Engel & Co.,	Orono
S. E. Seabury,	Parkman
Patten Planing Mill Co.,	Patten
Perham Lumber Co.,	Perham
L. M. Lord,	Pittsfield
W. A. Allen Co.,	Portland
Delano Mill Co.,	Portland
S. H. & A. R. Doten,	Portland
McDonald Manufacturing Co.,	Portland
Porter-Burnham Co.,	Portland
Jerome Rumery Co.,	Portland
Smith & Rumery Co.,	Portland
Chas. F. Eaton,	Princeton
Raymond Lumber Co.,	Raymond
W. U. Glover Co.,	Rockland
Dunton Lumber Co.,	Rumford
V. A. Linnell,	Rumford
J. T. Marden,	Searsmont
Adams & Burns,	Skowhegan
McQuillan & Pooler,	Skowhegan
Thos. T. Harvey,	South Brooksville
John Gerry,	South Windham
David E. Russell,	Springvale
Frank D. Smith,	Springvale
Fred A. Smith,	Springvale
C. V. Starbird,	Strong
Chas. T. Hodgkin & Co.,	Temple
Dana S. Colby,	Topsham
L. L. Rogers,	Troy
F. M. Fairbanks,	Unity
James J. Keegan,	Van Buren
Van Buren Lumber Co.,	Van Buren
Day & Smiley,	Waterville
Proctor & Bowie Co.,	Waterville
Andrew Ware,	Waterville
Tainter & Schofield,	Weld
Joseph H. Cox,	West Bowdoin
Chas. B. Goodwin,	West Lebanon
St. Croix Paper Co.,	Woodland

Eben Dana, Springer Lumber Co.,	Woolwich Wytopitlock
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*Printing Material.*

American Die Block Co.,	Buckfield
Irish Bros. Co.,	Buckfield
Geo. Fuller's Sons,	Hallowell

*Pulleys & Conveyors.*

Penobscot Machinery Co.,	Bangor
J. S. Jackson & Son,	Bath
Knowlton Bros.	Camden
F. P. Bennett & Co.,	Liberty
Thos. Laughlin Co.,	Portland

*Sash, Doors, Blinds & General Millwork*

Adams-Chalmers Co.,	Auburn
Hume Newhall Co., of Au- gusta,	Augusta
H. Humphrey & Son,	Augusta
E. L. Gatchell,	Bangor
Morse & Co.,	Bangor
J. S. Jackson & Son,	Bath
Mathews Bros.,	Belfast
Myron Goodwin,	Berwick
Smith Planing Mill Co.,	Brewer
R. E. Bent,	Brooklin
Camden Lumber Co.,	Camden
E. R. Wingate,	Cherryfield
Leonard S. Keith,	Chesterville
Gordon Bros.,	Chisholm
Wm. W. Waite,	Dixfield
Eldridge Bros.,	Dexter
E. Bonsey & Son,	Ellsworth
Augustus Learnard,	Fairfield
Maine Screen & Ventilator Co.,	Fairfield
H. K. Farnham,	Foxcroft
Oakland Manufacturing Co.,	Gardiner
Benj. S. Smith,	Gardiner
James Walker & Son Co.,	Gardiner
Lester M. Wentworth,	Harrison
Ira W. Page, Jr.,	Hartland
W. C. Dain Co.,	Lewiston
G. J. Day,	Lewiston
Lawry Tinker & Campbell Co.,	Lewiston
J. W. White Co.,	Lewiston

J. H. Dane,	Madison
H. W. Clary,	North Whitefield
W. F. & E. B. Tubbs,	Norway
E. O. Clement,	Pittsfield
L. M. Lord,	Pittsfield
W. A. Allen Co.,	Portland
E. T. Burrowes Co.,	Portland
Delano Mill Co.,	Portland
S. H. & A. R. Doten,	Portland
McDonald Manufacturing Co.,	Portland
Jerome Rumery Co.,	Portland
Smith & Rumery Co.,	Portland
W. U. Glover Co.,	Rockland
F. A. Stanley,	Rockland
Saco Manufacturing Co.,	Saco
D. B. Washburn,	Sebec Station
E. E. Fairbrother,	Skowhegan
McQuillan & Pooler,	Skowhegan
F. L. Payson & Co.,	South Hope
S. P. Maxim & Son,	South Paris
Kiff & Johnson Mill Co.,	Thomaston
James J. Keegan,	Van Buren
Day & Smiley,	Waterville
Proctor & Bowie Co.,	Waterville
Andrew Ware,	Waterville
G. R. Bennett,	Westbrook
Chandler & Barrows,	West Sumner
Whitcomb, Haynes & Co.,	Ellsworth Falls
Chas. J. Treworgy,	Ellsworth Falls
N. H. Grover,	Amherst

*Ship, Boat, and Canoe Building.*

H. W. Coffin,	Addison
J. H. Flint,	Ashland
L. G. Learned,	Ash Point
L. E. Joyce,	Atlantic
L. V. Joyce,	Atlantic
Seth Joyce,	Atlantic
Ripley Boat Co.,	Augusta
H. F. Johnson,	Bailey Island
D. P. Sinnett,	Bailey Island
T. F. Cassidy & Son,	Bangor
Bath Iron Works, Ltd.,	Bath
Bath Marine Construction Co.,	Bath
W. Blaisdell & Sons,	Bath
Gardner & Deering,	Bath
Kelley Spear Co.,	Bath

Morse Bros.,	Bath
F. W. Parris,	Bath
Percy & Small,	Bath
Wilbur A. Macomber,	Belfast
Angley & Cole,	Brewer
J. E. Littlefield,	Brewer
J. J. Hall,	Bucksport
W. C. Greenlaw,	Calais
Camden Anchor-Rockland Ma- chine Co.,	Camden
Geo. Killam,	Cedar Grove
Gerrish Canoe Co.,	Costigan
L. M. & H. Rice,	Cranberry Isles
M. S. Spurling & G. H. Rose- brook,	Cranberry Isles
Pushee Bros.,	Dennysville
Adams Shipbuilding Co.,	East Boothbay
C. Tyler Hodgdon,	East Boothbay
Rice Bros. Co.,	East Boothbay
Chas. H. Ingalls,	East Machias
L. M. Sanborn,	East Sebago
J. R. Shaw,	East Sebago
Geo. H. Black,	Eggemoggin
Rufus G. Condon,	Friendship
Wilbur A. Morse,	Friendship
A. M. Spurling,	Islesford
Maurice B. Dow,	Jonesport
Geo. H. Chick,	Kennebunkport
B. F. Warner,	Kennebunkport
L. R. Wincapaw,	Lawry
R. L. Colson,	Lubec
Will A. Whitney,	Milo
Sawyer Bros.,	Millbridge
E. W. Wallace,	Millbridge
W. J. Burnside,	New Harbor
M. G. Huntley,	North Cutler
James O. Brown,	North Haven
Geo. R. Stephenson,	Norway
Carleton Canoe Co.,	Old Town
Old Town Canoe Co.,	Old Town
E. M. White & Co.,	Old Town
Shaw & Tenney,	Orono
L. B. & J. C. Batchelder,	Passadumkeag
F. S. Bowker,	Phippsburg
N. A. Jacobs Sons,	Portland
Thomas Laughlin Co.,	Portland
Chas. B. Mallet,	Portland
H. H. Trefethen,	Portland

Cobb Butler & Co.,	Rockland
J. L. Snow & Co.,	Rockland
Edward Wallace,	Sebasco
E. J. Day,	Sedgwick
Thos. T. Harvey,	South Brooksville
Frank D. Staples,	South Eliot
F. C. Osgood,	South Freeport
C. S. Gray,	Southport
Portland Shipbuilding Co.,	South Portland
A. L. Sargent & Son,	Sutton
Chas. A. Morse,	Thomaston
Wingate Simmons Co.,	Union
B. N. Morris,	Veazie
E. H. Smith,	Vinal Haven
Kennebec Boat & Canoe Co.,	Waterville
Wm. A. Stevens & Son,	Wells
John E. Hall,	West Dresden
W. H. Winslow,	West Falmouth
Frank P. Smith & Co.,	West Jonesport

*Shuttles, Spools, Bobbins, etc.*

U. S. Bobbin & Shuttle Co.,	Auburn
Merrill Springer Co.,	Bethel
Julius P. Skillings,	Bethel
Dearborn Spool Co.,	Bryant Pond
N. S. Stowell Spool & Wood Turning Co.,	Dixfield
Geo. Walters Co.,	Dixfield
A. F. Merrill & Son,	East Eddington
Elliott & Bartlett Co.,	East Stoneham
Eli S. Oliver,	Farmington Falls
John MacGregor Co.,	Foxcroft and South Lincoln
Barton Bros.,	Freedom
Geo. E. Leighton Co.,	Gilead
Kezar Falls Bobbin Co.,	Kezar Falls
Huse Spool & Bobbin Co.,	Kingfield
American Thread Co.,	Lake View and Milo
Parker Spool & Bobbin Co.,	Lewiston
E. L. Tibbets Spool Co.,	Locke Mills
Humphrey Lumber Co.,	Madison
Moxie Lumber Co.,	Mosquito
International Manufacturing Co.,	Phillips
E. M. Worthley & Co.,	Rumford
Pike Bros.,	Searsport
Adams & Burns,	Skowhegan

*Sporting and Athletic Goods.*

Ripley Boat Co.,	Augusta
F. E. Whitman,	Clinton
H. E. Dickey & Co.,	Easton
J. Frank Hale,	Gardiner
Lemuel Cotton & Son,	Hiram
Lars Stadig,	Jemtland
A. M. Dunham,	Norway
H. H. Hosmer,	Norway
W. F. & E. B. Tubbs,	Norway
Moosehead Snowshoe Co.,	Portland
Paris Manufacturing Co.,	South Paris and West Paris
L. L. Rogers,	Troy

*Toys.*

Ellsworth Hardwood Co.,	Ellsworth
Dennysville Lumber Co.,	Dennysville
Bennett Manufacturing Co.,	Portland
Mason Manufacturing Co.,	South Paris
Paris Manufacturing Co.,	South Paris and West Paris
L. L. Rogers,	Troy

*Vehicles and Vehicle Parts*

Harding Bros.,	Albion
Auburn Carriage Co.,	Auburn
Auburn Wagon Works,	Auburn
Davis Bar Harbor Buckboard Co.,	Bar Harbor
C. A. Bean,	Bath
F. M. Clark,	Berwick
Myron Goodwin,	Berwick
R. E. Bent,	Brooklin
J. S. Getchell & Son,	Caribou
Volney & Thompson,	Center Montville
Leonard S. Keith,	Chesterville
Chas. H. Marston,	Damariscotta
R. H. Richardson,	Danville
A. P. Cobb,	East Brownfield
A. L. Caverly,	East Newport
Henry E. Davis,	Ellsworth
Elmer E. Rowe,	Ellsworth
C. A. Pinkham,	Farmington
G. L. Edmunds,	Freedom
Frank L. Griffith,	Hartland
Leon C. Irish,	Haynesville
Huggard Bros. Co.,	Houlton

Berry Bros.,	Island Falls
C. W. Hoff,	Kennebunkport
Wade & Dunton Carriage Co.,	Lewiston
Ballantyne Holmes Co.,	Lincoln
Humphrey Lumber Co.,	Madison
R. R. Strout,	Milo
R. H. Jacobs,	Mount Vernon
S. E. Dyer,	Newport
H. C. & G. W. Everett,	Norway
Benson & Wing,	Oakland
L. B. & J. C. Batchelder,	Passadumkeag
J. E. Twitchell & Co.,	Patten
A. E. Stevens & Co.,	Portland
Fred Small,	Richmond
E. O. Philbrook & Son,	Rockland
Sanford Carriage Co.,	Sanford
J. T. Daggett,	Sherman Mills
Gould Perrin & Co.,	Sherman Mills
Cummings Manufacturing Co.,	South Paris
S. R. Day,	Springvale
Dana S. Colby,	Topsham
E. J. Small,	Topsham
Wingate Simmons Co.,	Union
D. U. Clement,	Waterville
Lombard Steam Log Hauler Co.,	Waterville
Geo. H. Sawyer,	Westbrook
J. C. Coombs,	West Buxton
West Falmouth Manufacturing Co.,	West Falmouth
H. A. Parker,	West Farmington

*Woodenware and Novelties.*

Harding Bros.,	Albion,	Paper plugs
Rand Bros.,	Anson,	Novelties
Merrill Springer Co.,	Bethel,	Novelties
Julius P. Skillings,	Bethel,	Novelties
F. E. Hooper & Son,	Biddeford,	Snow shovels
American Shoe Finding Co.,	Bingham,	Paper plugs
Dearborn Spool Co.,	Bryant Pond,	Novelties
American Die Block Co.,	Buckfield,	Cutting boards
Irish Bros. Co.,	Buckfield,	Cutting boards
Davis Manufacturing Co.,	Clinton,	Stepladders
Spaulding Manufacturing Co.,	Clinton,	Stepladders
H. P. Burrill,	Dedham,	Ladders
Dennysville Lumber Co.,	Dennysville,	Novelties
Geo. Walters Co.,	Dixfield,	Novelties

H. W. Burns,	East New Portland,	Novelties
Russell Bros. & Estes Co.,	Farmington,	Novelties
Veneer Products Co.,	Greenville,	Butter tubs
W. Stimson Parker,	Keens Mills,	Cloth boards
Jenkins & Bogert Manufac- turing Co.,	Kingfield,	Novelties
J. W. White Co.,	Lewiston,	Ladders
Maine Wood Turning Co.,	Livermore Falls,	Knobs
Yankee Wood Turning Co.,	Livermore Falls,	Novelties
E. L. Tibbets Spool Co.,	Locke Mills,	Novelties
C. H. Bartlett,	North New Portland,	Novelties
Novelty Turning Co.,	Norway,	Novelties
Bennett Manufacturing Co.,	Portland,	Kitchenware
M. H. Tyler Co.,	Portland,	Stepladders
Skowhegan Novelty Works,	Skowhegan,	Stepladders
Paris Manufacturing Co.,	South Paris and West Paris,	Ladders
Arthur Crockett,	Sumner,	Novelties
Keyes Fiber Co.,	Waterville,	Pulp pie plates
Rolfe Bros.,	West Bethel,	Novelties
Henry Oliver,	West Mills,	Paper plugs

*Appendix.*

The following figures are taken from reports of the Bureau of the Census and of the Forest Service. They may be said to cover the primary forest industries as compared to the secondary wood using industries previously discussed.

*Lumber, Lath, and Shingles, 1910.*

Species.	Feet.	
	B. M.	Average value.
Total .....	860,273,000	
Softwoods .....	778,000,000	
Spruce .....	363,691,000	\$17 94
White pine .....	272,509,000	18 73
Hemlock .....	89,265,000	15 87
Balsam fir .....	42,836,000	14 56
Cedar .....	8,926,000	19 15
Yellow (pitch) pine.....	627,000	14 31
Tamarack .....	146,000	14 40
Hardwoods .....	82,273,000	
Birch .....	54,180,000	18 45
Maple .....	8,773,000	17 99
Oak .....	6,544,000	21 78
Beech .....	4,497,000	16 08
Ash .....	3,104,000	19 73
Basswood .....	2,635,000	16 76
Cottonwood (Aspen or popple)	1,961,000	14 28
Elm .....	554,000	14 25
Chestnut .....	25,000	(17 06 in N. H.)
	Number	
Laths .....	253,752,000	\$2 82
Shingles .....	436,965,000	2 31

## PULPWOOD, 1910.

SPECIES.	Grown in Maine. Feet B. M.	Grown out of Maine. Feet B. M.
Spruce.....	250,140,000	81,716,500
Slabs (mostly spruce).....	29,231,500	
Hemlock.....	7,258,000	
Aspen.....	65,142,000	7,345,000
Balsam fir.....	16,430,500	
White pine.....	1,116,000	
Totals.....	369,318,000	89,061,500
Grand total.....	458,379,500	

## SLACK COOPERAGE, 1910.

SPECIES.	Staves. Feet, B. M.	Heading. Feet, B. M.	Hoops. Feet, B. M.
Pine (white).....	695,333		
Beech.....	397,000		
Elm (white).....	48,667		
Maple (sugar).....	556,333		
Ash (black).....	610,667		
Birch (yellow).....	469,333		
Spruce.....	11,052,333		
Oak (red).....	421,667		
Aspen.....	103,000		
All other.....	2,221,000		
Totals.....	16,575,333	7,644,000	666,000
Grand total.....	24,855,333 Bd. ft.		

## TIGHT COOPERAGE, 1910.

Staves.....	1,424,000	Bd. Ft.
Heading.....	908,000	Bd. Ft.
Total.....	2,332,000	Bd. Ft.

## VENEERS, 1910.

3,554,000 feet of logs cut into veneers.

## FIREWOOD (Estimated) 1908.

	QUANTITY, CORDS.
Farms.....	747,760
Cities, 1,000 to 30,000.....	453,000
Cities, over 30,000.....	7,500
Mineral operations.....	20,140
Total.....	1,228,400

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