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THE LUMBERING AND WOOD-WORKING INDUSTRIES

By C. F. Watson, Normal School, Stevens Point.

FEW states have been so richly endowed with timber as Wisconsin, and in few states have the lumbering and wood-working industries played so important a part in the industrial life of the people. When the early French traders and trappers first paddled their canoes silently down the rivers of Wisconsin, they found the greater part of the land covered with magnificent forests. Over one hundred billion board feet of white pine studded the banks of its rivers and intervening uplands. The area originally covered with merchantable timber was so great that the forests ranked second only to the soil as a natural resource. When the lumbering industry was at its height, the value of the output of the mills was almost \$70,000,000 annually. This exceeded the average annual gold output for the whole United States.

Although the greater part of the state was originally under forest, lumbering has been the dominant industry only in the northern half. Saw timber of economic value was confined largely to that portion lying north of an irregular line running from the shores of Lake Michigan, near Milwaukee, in a broad curve northwestward past the southern end of Lake Winnebago, across southern Portage county and the Wisconsin River to the St. Croix River near its falls. North of this line, lie forty-five counties and parts of counties, with an area of approximately 18,700,000 acres, almost all of which carried heavy growths of pine or mixed forests. Over thirty per cent of this area was under some species of conifer, and even in the mixed forests, pine formed a conspicuous part. Jack pine, white pine, Norway pine, hemlock, oak, spruce, maple, birch, basswood, elm, and tamarack made up the greater part of the mixed forests. White pine, the most valuable tree of all our northern woods, was to be found in almost every township, and from its lofty trunks has been secured the bulk of the lumber which has gone into the buildings not only of the 2,333,000 citizens of Wisconsin, but also, in a large measure, into the fences, barns, and dwellings of the inhabitants of the prairie states from Indiana to the western plains of Kansas.

The "pineries" of Wisconsin belong to that belt of forest which originally covered northern New England, New York, southern Canada, Michigan, and the greater part of Minnesota, with an extension southward along the Appalachian Highland to Georgia. So great was this white pine area and so dense the forest that from it has been obtained the main timber supply of the nation until quite recent years. The drain upon this resource, however, together with the wasteful methods of lumbering employed, have proven so great that what might have been made a permanent source of supply of the finest lumber, is now rapidly approaching exhaustion.

The center of the lumbering industry, which was originally located in New England, slowly shifted westward through this forest belt until now there are only very small areas which have not been cut over. It moved

gradually toward the lake region as the people of the Atlantic States crossed the Appalachian Highlands and began to settle the upper Mississippi Valley. Much of this region, being prairie, was devoid of timber suitable for building

FIGURE 1. SCENE IN ONE OF THE FORESTS OF NORTHERN WISCONSIN NORTH OF CHIPPEWA FALLS.

These forests have yielded far more wealth than the gold mines of California. purposes, and as the settlers became more and more numerous the demand upon this, the most accessible forest, grew ever greater. The Mississippi and the Great Lakes, with the tributaries which flow into them, afforded com-

paratively easy lines of approach to what appeared an almost unlimited supply of lumber.

HISTORY

Even before Wisconsin Territory became a state, scores of saw mills were already located along the banks of its numerous streams. Hundreds of men were busy each winter cutting and hauling the logs, and piling them on the banks of the rivers down which they were to be floated to the mills on the high water of the spring freshets. The state was particularly fortunate in having its forest area drained by no less than seven large rivers upon which log driving could be carried on. As a result of the favorable drainage, well defined lumbering districts developed in the following regions: (1) on the shores of Green Bay, (2) on the Wolf River, (3) on the banks of the Wisconsin, (4) along the Black River, (5) in the valleys of the Chippewa and Red Cedar Rivers, and (6) on the Wisconsin branch of the St. Croix.

The first saw mill built in the state was put up in the Green Bay district near De Pere in 1809. Important lumbering operations did not begin here, however, until 1834. The next year witnessed the opening up of the Wolf River district. The building of Fort Winnebago (Portage) in 1826 and of Fort Crawford (Prairie du Chien) three years later indicates the time when logging began on the Wisconsin. A mill was built on Black River as early as 1819, but, owing to Indian troubles, lumbering did not gain a permanent foothold there until 1839. The aborigines also interfered in the Chippewa district, and it was not until 1826 that a successful mill was finally established on the present site of Menomonie. This, in brief, is the history of the beginning of the industry.

Progress was slow at first and the annual value of the output did not reach \$1,250,000 until 1850. After the close of the Civil War, however, the growth became much more rapid. The following table, which gives the annual value of the total cut of *rough lumber* for the different census years, shows how great the development has been.

1850 about.....	\$ 1,250,000	1890 about.....	\$61,000,000
1860 about.....	4,500,000	1900 about.....	58,000,000
1870 about.....	15,000,000	1905 about.....	44,000,000
1880 about.....	18,000,000	1910 about.....	30,000,000

So rapid was the expansion of the industry, that, by 1900, Wisconsin had not only overtaken, but had passed every other state in the union in total production. Over a thousand mills were in operation, and in that year they cut 3,361,943,000 feet of lumber. One mill at Chippewa Falls, alone, cut 65,000,000 board feet. The capital invested in the saw milling industry amounted to \$100,000,000, a sum equal to one-third of the assessed value of all the land in the state.

CONDITIONS WHICH INFLUENCED THE DEVELOPMENT OF THE INDUSTRY

The marvelous growth which took place in the manufacture of lumber in

Wisconsin was due in a large measure to geographic conditions. The situation, surface, drainage, and climate were all decidedly in its favor. The long cold winters with plenty of snow made it possible to cut the logs and haul them out to the banks of the streams with the smallest amount of labor and expense, and the melting of snows made it comparatively easy to float them to the mills on the high waters of the spring freshets.

The influences exerted by the favorable surface and drainage conditions have been no less marked than those of climate. The whole area may be described as a plain, nearly all of which slopes gently toward the south, south-

FIG. 2. MILL OF THE NORTHWESTERN LUMBER COMPANY AT STANLEY, IN NORTHERN WISCONSIN.

west, and southeast; and few sections are irregular enough to seriously interfere with the building of transportation lines. The slope of the surface has directed the flow of the rivers southward into the prairies, and the Wisconsin streams were largely used to supplement the work of the railroads as transportation agents. Billions of feet of logs have been floated down these streams far beyond the boundary of the state. The United States Census reports 500,000,000 feet of logs as having been rafted down the Mississippi to points in Iowa, Illinois, and Missouri in 1880.

Of all the geographic conditions that have affected the development of the lumber industry in Wisconsin, the location has, without doubt, been the most important. The close proximity of the "pineries" to the broad prairies

of southern Wisconsin, Illinois, Iowa, and Missouri, and to the Great Plains farther west, made the state for many years the principal source of lumber supply for these regions. This was particularly true after the railroads were built into these states. Bleak, open stretches of country were unfamiliar to the early pioneer who had come from a more or less densely wooded country farther east. The distance from timber and running water made them unattractive to him, and it was not until the coming of the railroads that these prairies began actively to be settled. The railroad companies started to build westward from Chicago and the lake region about 1850, and so rapid was the progress made, that in the next few decades nearly all sections of not only the prairie states but the states of the Great Plains, were supplied with transportation by rail. The settlers of these regions were now able to secure lumber

FIG. 3. ROLLWAYS OF THE WISCONSIN RIVER NEAR TOMAHAWK, LINCOLN COUNTY.

for building purposes at prices within the reach of all. The experience of Peoria, Illinois, illustrates the conditions that prevailed generally throughout the area. In 1838 pine lumber sold in Peoria for \$60 to \$70 per M., but when the railroad reached that point from Chicago, prices dropped more than one-half. If the following table, which shows the increased railroad mileage in the several states from 1860 to 1910, be compared with the census table showing the annual value of the lumber output from 1850 to 1910, it will be noted that the years of greatest activity in railroad building coincide exactly with the years of most rapid growth in the lumber business in Wisconsin.

Railroad Mileage in Different Census Years.

	1860	1870	1880	1890	1900	1910
Illinois	2790	4823	7851	10214	11003	11879
Iowa	655	2683	5400	8356	9185	9754
Kansas		1501	3400	8806	8719	9007
Wisconsin	905	1525	3155	5583	6530	7475
Missouri	817	2000	3965	6004	8875	8082

THE EVOLUTION OF THE INDUSTRY

A change no less marked than the rapid growth of the industry, has taken place in the character of the output of the mills. White pine lumber, which originally made up the bulk of the product, has now given place to hemlock. The supply of white pine has become so diminished that hemlock, once considered almost valueless, is now being cut in a large quantity. This tree has come to have a variety of uses. The trunks are used not only for lumber, but also for the manufacture of wood-pulp and paper; and its bark was until recently the main reliance of the tanning industry.

With the gradual exhaustion of white pine has come the utilization of the many different kinds of hard woods that are found extensively over the forest area. Mills that formerly cut only pine are now engaged in the production of oak, maple, birch, basswood, elm and several other kinds of hard-wood lumber. Many mill owners have been forced to enlarge their plants. They have added equipment for making planing-mill products, sash and doors, boxes and other shaped lumber, in order to keep their mills running, and to utilize materials that formerly went to waste. Not all mill owners were able to do this. Some of them were forced to dismantle their plants; others moved away to regions where the industry is now more profitable; still others, who were not in a position to dispose of their property advantageously, began to direct their attention to the development of the various other wood-working industries. In this line of manufacturing they were able to make use of the vast amount of experience which they had accumulated in the lumber business, and it is therefore natural that they should first turn their attention to this phase of the work.

The extent to which wood-working has developed is indicated in a recent publication of the State Board of Forestry. An investigation carried on by that body revealed the fact that there are twenty-one different classes of wood-using industries operating in Wisconsin with an annual consumption of over 930,000,000 board feet. This amount is equal to about one-half of the annual output of rough lumber for the state. About forty-nine per cent of the raw material for these industries is shipped in from other states and from foreign countries. Over forty different kinds of woods are utilized. Of this class of manufactures, the paper and wood-pulp interests are the most extensive. The value of the output of this industry amounted to \$25,963,000 in 1909, an increase of 45.5 per cent in five years. Wisconsin ranked third in the manufacture of wood-pulp in that year. The products of the furni-

ture and refrigerator factories in 1909 amounted to \$18,656,000, an increase of 50.8 per cent over 1904. The same rapid growth that characterized these industries prevailed in many of the other lines of wood-working. Thus it appears that despite the fact that logging is decreasing in the state, the wood-using industries are increasing. The rapid rise of this phase of manufacturing adds still further to the constantly growing demand for lumber.

THE FUTURE

The problem of the future supply is becoming more and more acute each year. Despite the soaring prices of lumber, the state's production has fallen off almost one-half since 1900. To make the situation still more critical hundreds of thousands of acres are constantly being destroyed by fire. In 1908 alone, 1,200,000 acres were burned over, with an estimated loss of about \$9,000,000. This is only one of the many ways in which the timber resources of Wisconsin are being needlessly wasted.

Fortunately, the people of the state have at last awakened to the necessity of the conservation of their forests. The state has already acquired over 400,000 acres of cut-over land for the purpose of reforestation. A system of forest patrol has been put into operation in this area, and will be extended as rapidly as more land is purchased. A State Board of Forestry has been organized whose duty it is to outline and put in execution a vigorous system of forestry. It is estimated that 45 per cent of the area of Wisconsin is still wooded. With this area under scientific management the question of a future lumber supply will become less serious.

DAIRYING IN WISCONSIN

By Edward G. Lange, Normal School, Whitewater.

WE, of the Badger State, are justly proud to know that Wisconsin has become the leader among the states in the dairy industry. Of all marked developments in the broad field of agricultural activity none has kept pace with the recent progress in dairying. The gentle-eyed cow has indeed become the queen of domestic animals within our fair domain. Let us consider briefly a few facts and conditions attending the history and growth of this great industry and seek reasons for its splendid development.

Mr. Ellsworth Huntington in his valuable book, *The Pulse of Asia*, has developed the importance of the geographic basis in the study of the anthropological sciences. He has insisted at the outset, however, that, "in the progress of human knowledge the marked advances in each science have been made under the stimulus of great fundamental principles acting as causes in the development of human activities." Mr. R. H. Whitbeck, in his recent bulletin on *The Geography and Industries of Wisconsin* has emphasized a similar principle showing that modern industries which are extensively carried on in any region are dependent, to a considerable degree at least, upon climate, natural resources, topography and situation, coupled with the stage