

WOOD CONSUMPTION AND WOOD PRODUCTION IN ILLINOIS AND THEIR RELATION TO THE FUTURE PROSPERITY OF THE STATE

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In order to form an economic back ground for forestry in Illinois the Natural History Survey has been making a study, largely by the questionnaire method, of the amount of wood consumed in the state. The amount of wood produced by growth and the extent to which this total can be increased by better methods of handling existing stands of timber or replacing them with more rapidly growing species form the other side of the problem.

This economic aspect of the question strikes us as the one lying at the root of the whole forestry question in this state. No matter how much we may expand our forest areas by an appeal to the sentimentalist and to the recreationist, we all realize that wood will be grown as a crop only when we can convince people that it is a basic substance, essential to industry, lacking which we shall be forced to lower our present standard of living to that which prevails today in some of the European countries.

This paper deals with some preliminary points which have been found out in following up various sources of information about our present consumption of wood to be elaborated more fully later in a bulletin of the Natural History Survey.

CONSUMPTION OF WOOD BY RAILROADS

Franklin B. Hough, who may be styled the first United States forester, sounded in 1882 a first note of warning about a scarcity of timber for railway ties when he said that at the existing rate of increase in railroad mileage there would come a time in 1893 when a total of 10 million ties would be needed annually by American railroads. What if Mr. Hough should return now? He would find that the American railroads use 125,000,000 ties annually and that the electric and trolley lines use 10,000,000 more, just the amount of his original estimate.

There is located some little distance out from the city of Galesburg a plant which the Academy of Science members will visit as one of the points of interest. I refer to the tie-treating plant of the C. B. & Q. Railway Company, one of the twelve located in this state, which is seeking by preservative treatment to prolong the life of timber, thus contributing their part to forest conservation. The Burlington railroad not only maintains this plant and buys treated ties and timber from commercial treating plants elsewhere in the state, but it has been foremost in maintaining experimental tracks where the durability of untreated ties and those treated by various methods can be studied. It has demonstrated that the average annual renewal of untreated ties in a track of 15 per cent can be reduced by using preservative processes to about 6 per cent. Other roads assure us that where now it requires on an average 250 to 275 ties per mile for renewals this figure can be cut, when all ties are treated, to something like 100 per mile. We can not yet give a figure for the total consumption of cross, switch and bridge ties required on the 25,000 miles of railroad in Illinois but we do have data on many of them and know that the normal consumption of one road alone in Illinois is 20,000 ties per month. On the production side we have definite records showing that 980,000 ties were secured in Illinois in 1921, and believe that this figure could be raised safely to 1,000,000 ties. Perhaps 500,000 of these come from southern Illinois.

CONSUMPTION BY COAL MINES IN ILLINOIS

Perhaps some persons have not thought of wood as an essential in coal production in Illinois but this problem is giving mining engineers some concern. Our own results compiled from answers to questionnaires from 27 large coal companies in this state, combined with material secured by the U. S. Bureau of Mines (Tufft '23)¹, show that on the average close to one-quarter of a cubic foot of timber is required to mine one ton of coal and that the

¹ Tufft, Harry E., 1923. Mine Timbers in Illinois Coal Mines. Reports of Investigations, Bureau of Mines, April, 1923. Department of the Interior. Serial No. 2465.

cost to the operator is not far from 5 cents per ton. Take one-fourth of our coal production, then, and you get almost 20,000,000 cubic feet of wood required yearly for coal mining, costing delivered at the mine almost \$4,000,000. Furthermore, the ordinary mine prop has an average length of life of about two years. Only a few companies in Illinois have begun to apply preservative treatment to mine timbers or to think seriously of perpetuating the supply of mine timbers. Both of these lines of work present worth-while problems in practical forestry for mining companies.

This shortage of timber for mining purposes seems to be rather general. The U. S. Bureau of Mines (Hornor and Hunt '22)² under date of February, 1923, says that in the East and Middle West, the Lake Superior region and the metal mining regions of the West, the sources of mine timber are becoming more remote from points of consumption, the timbers are getting more difficult to obtain and, naturally, more costly. Moreover, the better and more durable varieties are being exhausted rapidly; consequently the less durable varieties must be used in their place.

CHARCOAL

It takes almost 2,000,000 kegs of powder for blasting purposes in Illinois in connection with mining operations. Leaving out smokeless powder, which is made from gun cotton, charcoal is a very important constituent of powder used for blasting and sporting purposes. Some of the facts which we have learned about this industry of charcoal making in Illinois may be of interest.

We have found that in a limited region of southern Illinois near to a supply of second growth bottomland hardwoods over 15,500 cords of wood are reduced annually in brick kilns in the making of charcoal, most of which finds a market in Illinois. Some of the powder companies have their own kilns, one large company getting over 6,000 cords of charcoal wood annually from islands of the Illinois and Mississippi rivers.

²Hornor and Hunt, 1922. "Mine timber preservation". Reports of Investigations, Bureau of Mines, Serial No. 2321, February, 1922. Reprinted in Coal Trades Bulletin, April 17, 1922.

Other powder companies buy their charcoal in other states, the amount used being shown by the fact that one Illinois company in normal times imports over 5,000 bushels per month from Pennsylvania. This is explained doubtless by the fact that operators of retorts and ovens in the East can undersell the men operating brick kilns here because the former secure in the distillation process not only charcoal as a by-product but also wood alcohol and lime acetate for which there is a good demand in the market.

FURNITURE AND WOOD-USING INDUSTRIES

According to the Secretary of the American Walnut Manufacturer's Association, the city of Rockford ranks first in the United States as a consumer of walnut lumber, with Chicago second by a very fair margin. At Rockford most of the walnut goes into the manufacture of furniture but in Chicago it is used by a wide range of industries, among which furniture is the leading one. The total of all kinds of lumber and logs used by the Rockford furniture manufacturers has not yet been compiled, but present figures stand at 11,500,000 board feet annually. The leading species used consist of cedar and mahogany, oak, walnut, gum, birch and basswood, with considerable quantities of rock and red elm, used for crating. A very large amount of this lumber comes from the southern states, the local supply cutting very little figure.

The consumption by wood-using industries in Chicago in the year 1910 was 1,116,855,120 board feet, out of a total of about 2,500,000,000 board feet of lumber shipped into that city. This large amount used by factories of various sorts did not include material used for cross ties, telegraph and telephone poles, mine timbers, shingles, lath, or rough lumber used in construction. Rock Island also used about 30,000,000 feet of lumber in her factories outside of that sold by local lumber yards, while factories in Peoria, Quincy, Aurora, Kankakee, Bloomington and other cities are yet to be heard from.

VENEERS

With the growing scarcity and high prices of logs of the larger sizes in this country, we are coming gradually

to the use of veneered panels for furniture and interior finish where large surfaces must be exposed. The success during the war with waterproof casein glues has led to a marked increase in the manufacture of built-up material, commonly known as "ply-wood" for trunks, automobile tops, shoe findings, airplane propellers, and many other articles requiring both strength and durability. The fact that the fibres of the constituent pieces run in several different directions insures strength, while the waterproof glue makes the built-up piece proof against moisture changes.

Outside of the large amount of wood used for the above, the scarcity of elm and other slack cooperage woods has increased the price of barrels so that there have been introduced into the fruit shipping industry a number of "veneered packages" which are made from wood by slicing vertically or cutting in a rotary direction logs which have been steamed previously to soften the fiber. Egg cases are made also in large quantities from cottonwood and gum by a similar process.

In the face of increasing demand, the amount of wood used for veneers in Illinois has fallen from 22,650,000 board feet to 19,538,000 board feet, a decrease of over 3 million feet or 13.7 per cent in the last ten years. Visits to veneer plants in a limited portion of southern Illinois covered by a recent bulletin show that about 4,000,000 board feet of logs are consumed for veneers in that immediate region, and that some of the mills will be forced to move to Arkansas or Missouri nearer a larger source of supply within five years. Thousands of dollars are paid out in one limited region of southern Illinois for fruit and vegetable containers, and some are imported from other states, especially ladders for fruit-picking. Indications are that larger and larger quantities of both logs and manufactured products will have to be shipped into this region which is in some parts 30 per cent timbered.

TIMBER IN THE ROUND

Large quantities of wood are used in the round for telegraph and telephone poles, piling, and fence posts, which it is almost impossible to estimate. The Illinois

farmer uses a considerable quantity of lumber for farm buildings, and the amount of wood produced and consumed on farms has been made the subject of a special study, some of the results of which will be given in the paper on farm woodlots. This leaves a long list of special uses to be investigated, such as in the manufacture of refrigerators, school equipment, handles, wagons and farm implements, cabs and other vehicles.

If you saw the frame of a certain make of popular cab you would understand better why the "thinking fellow" calls that variety— the frame is built in Chicago or Detroit of second growth Argansas ash, every piece of which is tested carefully for strength before being used. In connection with the use of ash for sporting goods you may be interested in knowing that the American record for the javelin throw of 203 feet, 9½ inches was won by Milton Angier of the University of Illinois at the Drake relay carnival, and that these javelins are manufactured in Urbana of Indiana and Illinois ash, under the supervision of Coach Harry Gill. This same firm turns out the discus, the maple for which comes largely from Wisconsin and Michigan.

Thus wood is a material with which we can not well dispense. We can not afford to reduce our standards of living in this country by dwarfing our use of wood to the 125 board feet per capita of Europe. In spite of substitution for wood along many lines we are constantly going to need more of this basic commodity. The only way to insure against a shortage is to grow more of it now, on our three million acres of farm woodlots in Illinois, on our undrained bottomlands and on our other idle and waste land. The whole question centers back in the right use of land, the devotion of a lot of it, which is just on the margin between profit and loss, to *timber growing*.

April 27, 1923.