

it takes more machinery and more labor to harvest the timber crop. Costs are higher in proportion.

But as each new timbered area becomes exhausted, not only is the lumberman forced to take his timber from locations less favorable to himself and at greater expense, but also his whole industry gradually drifts farther away from the center of population of the country, farther away from the ultimate market. Here is a case where the consumer literally has to "pay the freight." The center of population, according to our recent Census, is in southeastern Indiana. Even as far back as 1914 eighteen to twenty per cent of our total annual lumber consumption was supplied by Washington and Oregon, two thousand miles away. California, Idaho, and Montana have also furnished a very substantial percentage. We use every year altogether about forty billion board feet, which means that we pay an annual freight bill of over a million dollars. Here in the East nearly half of what we pay for a thousand feet of lumber is for freight alone.

An element of price often overlooked is that of time consumed in preparing the article for consumption. For lumber it is the time elapsing during the cycle of stump to consumer, for until the actual use of the wood for the purpose intended it represents the continued investment of capital. When the mill is near the ultimate market, that time is short and the interest earned by the capital is small; but as the supply of timber becomes exhausted and more remote sources must be utilized, time becomes an ever more important factor. A shipment of fir flooring from Seattle destined for New York may be originally valued at \$55 per thousand feet. When it reaches New York eight or ten weeks later, it must be worth almost a dollar a thousand more just to take care of the interest on the money invested.

The fourth way in which depletion of our timber supply affects prices is through waste. When a tree is felled, about thirteen per cent of it is left to rot as stump, top, and branches; at the sawmill, in spite of most modern methods, about forty-three per cent of it goes into sawdust, bark, outside pieces or slabs, etc.; about two per cent disappears in seasoning or drying; if the lumber is planed, three per cent more goes into refuse. We get only about forty per cent in real lumber. And this is no extreme case. In the new logging operations of the West whole trees less than twenty inches in diameter are pulled down in getting out the larger logs and left there to rot, just because the cost of transportation to the mill is more than the price the lumber would bring. As high as thirty-five per cent of the total stand of timber on a given tract of forest is thus wasted outright, to begin with. We cannot blame the lumbermen, for if they were made to utilize every tree the cost of lumber would have to be much higher than we have ever seen it. Nor would it help if those smaller trees were left standing, as they were never rooted to withstand wind and the first storm which

obtained headway in the partially cut forest would surely blow them over. But if that same small timber grew in Pennsylvania, New York, or New England not a tree would be wasted. Furthermore, its very branches would be utilized as fire-wood and its mill waste as fuel or for pulp manufacture. What a difference there is between the lumber industry and the packing industry! There is hardly a part of the slaughtered animal that is not put to some practical use; peepsin, lard, oleomargarine, fertilizer, soap, buttons, pipe-stems, combs, and gut strings are a few of the by-products of a packing-house. In France a tree also is utilized to the very last twig. But France is comparatively small, the center of population is not far distant from the forests, and the problem is consequently different. In what remains of our Eastern forests, where transportation costs do not eat up values, we obtain a far closer utilization of timber by-products. Wood pulp, railway ties, fence posts, boxes, lath, shingles, spools, matches, excelsior, shavings, resin, turpentine, wood alcohol, and tanning liquors may all be obtained from the parts of trees unsuitable for the manufacture of lumber. But for ninety per cent of our entire annual cut of timber, produced as it is far from populous centers and convenient markets for by-products, lumber alone must pay all costs. Probably there is no other way in which the depletion of our timber resources reacts so strongly to raise the price the consumer has to pay as in preventing the practical utilization of waste.

We might still be inclined to discount the effect of this law of exhaustion in our own country were it not for the absolutely analogous situation of our neighbor, Canada. We import, largely from her, a billion and a quarter feet of lumber and logs, two billion shingles, and many other wood products annually. Canada has perhaps been even before us in realizing the situation, and the provinces of Ontario and Quebec are already taking steps to place the cutting of timber upon a more efficient and less wasteful basis, even with the certainty of increasing present lumber and pulpwood prices. There are now those who can even foresee the wiping out within comparatively few years of the hitherto considered limitless forests of British Columbia unless steps are taken to eliminate waste and provide for sufficient reforestation.

Besides having our own houses to maintain and a million extra homes to build, China, Australia, and New Zealand, as well as many European nations, look to us for their future lumber supply. Although as yet we do not export more than about three per cent of our annual production, it is well known that were it not for the heavy discount on European money nearly every nation of Europe would be flooding us with orders.

It is true that all prices fluctuate with changing general economic conditions, but every tendency in the lumber industry itself is upward, not down. The nearer we come to the exhaustion of our forests, the higher will be the price that we will have to pay.

CONTRIBUTORS' GALLERY

SIR PAUL DUKES was knighted for his services as a British secret agent during the war. He was living in Petrograd at the outbreak of the war; unable to pass his physical examination required by the army, he volunteered for the British Secret Service, and was assigned to fill the place of a secret agent who had recently been murdered by the Bolsheviks. He went to work in a Russian munition factory, and was subsequently drafted into the Red army. He developed a valuable courier service and sent important information out of Russia. The July issue of the "Atlantic Monthly" contains his article "The Secret Door," which describes some of his extraordinary adventures.

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