

RAILROAD FORESTRY.

The reputation which railroad officials have deservedly earned for promptness of action, clearheadedness in emergencies and foresight in anticipating the inevitable, is clouded by a condition which it is singular they have not seriously considered. A reason may exist in the fact that, from the nature of the profession, a railroad official cannot be a recluse, and the active operating officer must mix very much with the public, from whom he absorbs many popular fallacies and becomes a sharer with his fellows in much of the indifference which is manifested in economic questions. While, therefore, in various ways, the profession practices the most commendable economy, to increase the revenues, it has given no attention to a waste which, while not a source of present or immediate loss, will prove a heavy drain in the near future.

The last published report of the Interstate Commerce Commission is for the year ended on June 30, 1898, at which time the total mileage of all classes of tracks of the railroads of the United States is given as 247,532 miles. The territory covered by this association includes the whole of group III and portions of groups V and VI, of the commission classification of railroads, making about 15 per cent of the nation, or say 37,000 miles. The total cost for renewal of crossties in the United States, during the year ended on June 30, 1898, was \$24,769,684, or about \$100 per mile; this does not include labor, and is a very low average. Apportioning this cost to the territory covered by this association, the expense was \$3,700,000.

Computed upon the low average of 2,500 ties per mile, 92,500,000 ties are in the track in the association territory; and as the average life of the ties is perhaps about eight years, nearly 12,000,000 ties are required annually for renewals. The size of the tie is not uniform, but a common size is six inches thick, eight inches face, eight feet long, making 32 feet board measure of timber per tie, or 380,000,000 feet board measure of timber annually cut into crossties alone in the association territory. As many ties are much larger, the gross amount is actually in excess of the above quantity.

Crossties, however, do not constitute the only lumber consumed by railroads. There are 28,000 miles of single main track in the association territory, upon which at least 30 telegraph poles per mile are used, or 840,000 poles; as the life of a pole is only ten years, 84,000 must be replaced in each year. In addition, bridges, trestles, cars, buildings, fences, etc., take large quantities of timber, and in the Central association territory alone, the annual consumption of lumber, by railroads, aggregates several hundred million feet. The quantity

cannot be estimated with accuracy as the roads vary in topography, and the substitution of iron and stone is being made as ability permits.

When the territory of the United States is considered, the quantity of timber cut is astonishing. There are 620,000,000 crossties in the track of the railroads of the country. Many of these are soft wood, which lasts from five to seven years only, so that the average life of ties throughout the nation cannot exceed seven years. Nearly 90,000,000 ties are therefore required annually for renewals, and at the low average board measurement already stated, not less than 3,000,000,000 feet of timber is used annually for crossties alone. To this must be added the lumber for bridges, buildings, cars, etc., and the quantity exceeds our ability to comprehend.

The railroads are not the only users of lumber, for other people must have houses, furniture, bridges, conveyances, etc., and this market is greatly in excess of the railroad purchases. The census of 1890 states that the total consumption in that year (ten years ago) was 23,766,000,000 feet.

The necessities of the railroads demand that toughness and elasticity shall distinguish the timber employed, so that only selected timber can be used. Lumber men assert that not to exceed 300 white oak crossties can be cut from one acre of natural forest, and in many localities the yield will not exceed 100. Such trees must be from forty to sixty years old, and at the highest yield per acre, 40,000 acres of forest must be culled of its best timber annually to supply the ties in the Central association territory. Where the softer woods are used the yield per acre is much greater, yet it is a conservative estimate that 200,000 acres of forest are cleared every year to supply the demands for crossties alone.

Railroad officials are deeply interested in the perpetuity of the material necessary for the maintenance and operation of their property. They are constantly seeking improved methods to reduce expenses, knowing that money saved is money earned. The form of the rail section and the weight of rail per yard have been scientifically studied and discussed; the contour of automatic couplers has had the most minute technical consideration, and in many important articles of construction and operation, the details have been logically analyzed, tested, and improved. Within the experience of many operating officers, the cost of rail renewals exceeded that of ties many fold; now the condition has been reversed. While the quality of rails has been improved, the renewals exceed the cost of rails, and are increasing, yet the cause is not being noted nor any measures being instituted to remedy or improve the situation. Timber is becoming scarce, and that of

the best quality, so that inferior timber, which supplies inferior ties, is becoming the sole source of supply. No material has yet been found as a substitute for the wooden tie, and no satisfactory economical method of preserving the life of the wood or prolonging its durability has been discovered, and, excepting the minor questions of properly seasoning and piling, the use of the tieplate, suitable ballast and perfect drainage, with incidentally climatic conditions, no serious consideration of the future tie supply has been had.

Nearly all the country included in the territory of this association has been settled and developed within a century. Ohio, the oldest of the states, will not celebrate its centennial until three years hence; and when it was admitted to statehood it had less than 50,000 inhabitants. Nearly all the land east of the prairie regions of the Mississippi valley was heavily timbered, and in the eastern states the records preserved show that fine timber grew to the very edges of the bays and rivers. If the destruction of all this wealth, the growth of centuries, has been essential for one century's development, to what degree of distress will our successors be reduced in maintaining it? Surely reason will rap the knuckles of our children, and the sentence of Sinai will be fulfilled in visiting the sins of the fathers upon the children unto the third and fourth generation.

The experiments which have been made, in a very limited manner, in tree-planting on railroad rights of way have not been satisfactory, and cannot be on account of the limited width of such strips. Forest conditions must prevail, and these cannot exist on the right of way. Trees for timber must have trunks and not limbs, and to overcome the natural tendency to make limbs they must be grown close together, when each will seek to outgrow its fellows and reach the higher altitudes, where it can "expand." This effort on the part of each plant is commendable from the standpoint of the cultivator, and is the reward for his labor and patience.

Along every railroad are tracts of land not well adapted to cultivation, which would make desirable wood lots upon which trees could be grown for the timber required in the different railroad departments. Such plantations would perhaps be more secure if not adjacent to the road, as fire is an enemy to forestry; yet the wood lot need not be so far as to make access difficult or expensive for protection, cultivation and supervision. Upon a plantation of catalpas the trees should be placed four feet apart, which would require 2,700 plants per acre. Not all the 2,700 trees would mature, nor is it desirable that they should, but about one-fourth, or 700, would. In fifteen years the yield should be four ties per tree, or 2,800 ties per acre, and by judicious cutting a