

is rapidly increased to such an extent that the spike no longer holds. Water collects in the enlarged hole and decay sets in. Whenever a spike becomes so loose that it no longer holds, it is pulled out and driven in at another point. This constant respiking rapidly ruins the tie. In place of the ordinary spike the screw spike, such as is now used in Europe, is recommended. Screwed into a hole specially bored for it, it holds the rail firmly and prevents the injurious effects of the straight spike.

In tie plates the principal functions are to distribute the load from the rail on the tie, and to prevent the mechanical abrasion of the tie as far as possible. For the softer and inferior woods it is recommended that wherever possible a flat steel tie plate be used without spikes or flanges on the base of the plate, and that tests be made with wooden tie plates, one-fourth, one-half and five-eighths inches in thickness, 6 to 7 inches long, and the width of the rail base under which they are used.

*Forest Resources of Texas: Wm. L. Bray, U. S. Bureau of Forestry.*

The general impression in regard to Texas has been that it is a prairie country rather than a forested state, and while this is largely true, still this report shows that the forests are of no small importance. The existence of the forest and its composition are to a large extent dependent on the rainfall, and from the low plains on the Gulf of Mexico to the plateaus of 4,000 to 5,000 feet and the mountains of 10,000, the rainfall gradually declines from 50 inches per annum to ten inches. The species of trees present a large variety. In the swamp and hay tracts of the lower region are bald cypress, tupelo, gum, magnolia and other characteristic trees of southern lowlands, with their peculiar adaptations to life on lands generally covered by water. The alluvial bottom lands support a valuable hardwood forest comprising different species of oak, ash, gum, cotton-wood, &c. Black walnut has practically all been cut out. The exploitation of the other hardwoods is developing rapidly, as northern manufacturing firms are reaching out farther for supplies. This is one of the new districts from which the supply for Canada will now come. In spite of this it is remarkable that lands are being cleared for settlement in this district by destroying the trees, a wasteful method that most people have considered was long ago relegated to the past. There are about 7,000 square miles of mixed holly pine and hardwood forest, among which tracts of pure stand of the former give a cut of 12,000 to 15,000 feet to the acre. Short leaf pine is also an important timber tree. The greatest timber producing area in Texas at the present time is that covered by Loblolly pine, comprising a tract of some 5,000 square miles. The stand is practically pure, and the trees make a large and perfect growth, yielding logs of a maximum diameter of from 36 to 40