and the stand of this species has been estimated at about 40 billion feet. The productive forest area in Ontario probably consists of from 70 to 90 million acres.

South of the southern Laurentian type we find the northern fringe of the great central hardwood type of the United States. This type of forest covers the middle west and eastern states of the Union and extends across the boundary to Southern Quebec and Ontario.

Ontario in 1913 cut 1,101,066,000 board feet of lumber, of which white pine formed about half of the total. The cut was made up as follows: White pine, 46.9%; hemlock, 13%; red pine, 12.0%; spruce, 9.5%; maple (the most important hardwood), 5.6%, and twenty-two other kinds of wood, making a total of twenty-seven kinds.

Quebec, with its recently added territory, now contains a land area of 442,153,600 acres (690,865 square miles). Of this, about 367 million acres belong to the Northern Forest type of pure conifers, 50 million to the southern Laurentian type of conifers with mixed hardwoods and about 5 million acres to the hardwood type. The eastern counties of Quebec, south of the St. Lawrence, belong to another type which is characteristic of the Maritime provinces, and is similar to the southern Laurentian. This type in Quebec covers about twenty million acres.

The Quebec government has reserved 111,400,320 acres (114,063 square miles) of forest land. The greater part of this lies in the northern portion of the province, either in southern Laurentian or Northern Forest type and most of it is not heavily timbered.

Quebec in 1913 cut 630,346,000 feet of lumber. Spruce here forms 65.4% of the total, white pine only 11.4% and hemlock 6.1%; birch comes fourth on the list with 5.4%, and is the most important hardwood. Generally speaking, the rest of the lumber output is similar in composition to that of Ontario.

The provinces of New Brunswick and Nova Scotia and the eastern counties of Quebec, or in short that part of Canada lying south of the St. Lawrence River, is covered by a forest type often called the Acadian. This consists chiefly of birch, maple and beech, with smaller quantities of basswood, ash, elm, oak and butternut. Red spruce is the most important conifer as compared to white pine in the southern Laurentian, and white spruce in the northern forest type. White and red pine are found in the Acadian type often in great abundance, but pure stands are scarce and most of the best material has been removed. The forest area might make up a total of 14 million acres, and is supposed to contain in round figures 100 billion feet of lumber. There are no forest reserves in the Maritime Provinces.

New Brunswick has a land area of 17,863,040 acres (27,911 square miles). The forest area has been estimated at 12 million acres, but this, of course, includes more than commercial saw timber land. The standing timber has been estimated at 22 billion feet of the following composition: Spruce, 60%; pine, 10%, hemlock, 5%; cedar, 5%, and hardwoods, 20%. With the spruce in this estimate would be included balsam fir which is often sold mixed with spruce. New Brunswick in 1913 cut 399,247,000 feet of lumber of the following kinds: Spruce, 79.3%; white pine, 7.8%; hemlock, 5.5%; balsam fir, 4.3%, and birch (the most important hardwood), 1.4%.

Nova Scotia's land area is 13,483,520 acres (21,068 square miles). The forest area has been estimated at 5,744,000 acres, and the coniferous saw timber at ten billion feet board measure. The hardwoods might provide five billion feet. The standing timber (conifers) would have the following composition: Red spruce, five billion feet; hemlock, three billion; white pine, one billion, and the remainder, balsam fir, tamarack, red and jack pine, and white and black spruce. The hardwoods would be: Beech, 40%; sugar maple, 30%; yellor birch, 20%, and white and wire birch, soft maple, red oak, white ash and black ash, the remaining 10%. Nova Scotia cut about 274,722,000 board feet of lumber in 1913. Spruce formed 56.9% and hemlock 23.2% of this total. Seventeen kinds of wood in all have been reported from this province.

The forest area of Prince Edward Island is too small to be considered in a general estimate of this sort as the entire area of the province is only 1,397,760 acres (2,184 square miles). The annual production is 6,771,000 board feet, of which spruce forms a half and balsam fir a quarter. Fifteen kinds of wood in all were reported in 1912.

WOLFE ISLAND MACADAM ROAD.

Some figures pertaining to macadam road construction appear in the recently issued 1914 report on highway improvement in Ontario. The publication prepared by the Ontario Office of Public Roads, under the direction of Mr. W. A. McLean, provincial engineer of highways, describes the construction of a model macadam road, on Wolfe Island, adjacent to the city of Kingston. The road selected for construction is one which receives a large part of the traffic of the Island in reaching Marysville, from which a municipal ferry runs to Kingston, to which market the produce of the island is carried.

The road is constructed of broken limestone, quarried on the island and adjacent to the road. The width of grade is 26 feet between ditches, with stone spread from 12 to 14 feet wide, and uniformly 9 inches in thickness. The distance macadamized was 1.41 miles, the work being carried out in accordance with the specifications of the Highways Department.

Before improvement, the road had only a clay surface, was badly cut up, without drainage, and almost impassable during spring and fall months.

In constructing this road, suitable drainage was provided and the following concrete pipe culverts were laid: One 15-inch, three 18-inch, and one 24-inch; also one 36-inch corrugated metal pipe culvert; all bedded in concrete and having concrete head-walls. There are also two 4 ft. x 4 ft. reinforced concrete culverts 24 feet in length.

The unit cost per square yard of stone surface was not quite 73 cents, as follows: Culverts and tiling at farm entrances, $0.157; grading, $0.060; ditching, $0.023; crushing, $0.130; macadamizing, $0.106; rolling and sprinkling, $0.068; coal and oil, $0.042; supervision, $0.094; tools and repairs, $0.014; plans and surveys, $0.008; sundries, $0.022. Unit cost per square yard, $0.724.

The first central-station system for supplying electrical energy for light and power purposes was put into operation at Holborn Viaduct, London, on January 12, 1882. This plant, however, was for purely exhibition purposes and could hardly be called a commercial installation. Appleton, Wisconsin, can probably claim credit for starting the first commercial central station installation in the world, on April 20, 1882. This plant was necessarily small. The first large installation erected anywhere in the world was that of the Edison Electric Illuminating Company of New York, which commenced operation in the fall of the same year.