tion there is the timber required for telegraph poles, bridges, buildings, cars, etc.

Mr. Sutor continues as follows:

"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, tie 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

Camping, Lake Obabika, Ontario.

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 considerations of the future tie supply has been made."

The effort to produce trees for ties along the right of way of the railways has not been attended with much success, as forest conditions cannot be obtained and the trees become branchy instead of producing clear trunks suitable for ties. Along every railway however, are tracts of land not well suited to agriculture which would make desirable wood lots upon which trees could be grown for the timber required in the different railroad departments. The experiments with the Catalpa in the United States show it to be a quick grower and a durable wood and the results of experimental plantations have been very satisfactory and demonstrates the possibility of growing the trees at a profit, even with such expense as may be necessary for the care of the plantations, especially in view of the probable scarcity and increased value in the future of timber suitable for ties.

Transferring Mr Sutor's calculations to Canada, we have, according to the last report of the Department of Railways, about 18,000 miles of railway in the Dominion, which would make a total of 45,000,000 ties or 6,500,000 annually. This would mean an annual requirement of 208,000,000 feet or the product of 15,000 acres. While this area but a few square miles may seem small when compared with the vast area of forest land in Canada, the fact must not be lost sight of that this requirement is only for the roadway and does not include timber used for other purposes. Our railway mileage too is increasing steadily and the requirements grow with it. In the old settled districts and on the plains of the west, access to the supply is inconvenient enough to add materially to the cost, so that the possibility of arrangements for the future provision are worthy of attention.

The trees most largely used for ties in Canada are tamarack and hemlock, though most of the other conifers and also oak, are used, where most convenient. Indeed where wood of a satisfactory class is not abundant almost any kind is used, at least in the first work of construction.

There should be no great difficulty in ensuring a supply in Eastern Canada and in British Columbia, as suitable trees can be easily grown and proper foresight and care in preservation will attain this end. On the plains of the west, however, the problem is a different one. When the Canadian Pacific Railway was being built across the Continent, one problem that confronted the company was the supply of ties for the prairie section, and they had to fall back on Eastern Manitoba to furnish what was necessary, and recourse must still be had to outside sources of supply. The railway companies at that time do not appear to have realized the value of the timber supplies along their lines, and large quantities both in British Columbia and the east were swept away by fires which care might have prevented.

But can anything be done for the future supply in the west? Neither the poplars nor the Manitoba maple, which are the quickest growers, is very suitable for ties, and the development of the hardwoods is too slow. The experiments with tamarack at Brandon, show that it grows at a good rate, on almost any soil, while the wood, both in endurance and firmness, has the qualities desired. The Branksian pine also makes a good tie and the conditions in the west should be favorable to its growth. It is indeed the so-called "cypress" of the Cypress Hills. Neither variety of the Catalpa tree succeeds well in northern Ontario and there is no possibility of making a success of it in the west, so that it may be dismissed from the question. Any experiments undertaken should be with the most suitable trees indigenous to the country, as they and their offspring are the only ones that have demonstrated their ability to thrive.

The process of raising such a supply cannot but be a slow one and its practicability cannot be considered too soon. A more exact study of the present tree growth and the accumulated knowledge derived from efforts in propagation should give sufficient material on which to base some plan of experimentation with reasonable expectations of success. Co-operation between the officials of the Government and of the railway companies in the work would make the problem more easy of elucidation.

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The proportion which lumber forms of the freight carried by the railways of Canada is considerable enough to make it a very important item, and in lieu of more profitable freight, particularly in districts where there are practically no other products, the conservation of our