woods they can be thoroughly impregnated with creosote and furnished with suitable tie-plates for 25 to 35 cents per tie and when treated will last 15 years or more in the track.

If 30 cents is allowed as the cost of creosoting ties and equipping them with tie-plates so that they will last 15 years, the annual charge with an interest rate of 4 per cent is for spruce 6·74 cents, jack pine 7·19 cents, hemlock 7·47 cents, Douglas fir 7·55 cents, tamarack 8·00 cents and cedar 8·54 cents. This is a saving of 2·35 cents per year on every jack pine tie, 1·85 cents on spruce, 1·45 cents on Douglas fir, 1·36 cents on hemlock, 0·76 cents on tamarack and 0·20 cents on cedar.

For every mile of track preservative treatment would bring about an annual saving in maintenance charges, of $70.50 where jack pine ties are used, $55.50 on spruce ties, $43.50 on Douglas fir ties, $40.80 on hemlock ties, $21.80 on tamarack ties and $6.00 on cedar ties.

This reduction in regular yearly maintenance expenses represents the earnings at 4 per cent on $1,762.50 per mile of track where jack pine ties are used, $1,387.50 for spruce, $1,087.50 for Douglas fir, $1,020.00 for hemlock, $545.00 for tamarack and $150.00 for cedar.

These figures are conservative. The economics possible to the large railway organizations of Canada would probably enable them to bring the price of treating ties and furnishing them with tie-plates, down to less than 30 cents each. On the other hand it is likely that well treated ties will give efficient service for more than 15 years. Mr. W. F. Sherfesee, in Bulletin 78 of the United States Forest Service estimates that thoroughly creosoted ties will last, on the average, 17 years in the United States, where, on the whole, the climate is more conducive to decay than it is in Canada. Creosoted jack pine ties lasting 16 years would bear an annual charge of 6·86 cents; if they lasted 17 years, which might reasonably be expected, the annual charge would be 6·58 cents. Compared with the present method of using raw or untreated ties the cost of maintaining the road would be $79.50, or $88.80 less per year if treated ties were used giving a service of 16 or 17 years each; at 4 per cent the capital invested in maintaining the road would be $1,987.50 or $2,220.80 less per mile than it is now.

For convenience in making comparisons a summary of these figures is given in Table 4.

TABLE 4.

A Comparison of the service and cost (1) of Treated and Untreated Ties of common Canadian woods, showing the economy in using Treated Ties.

Kind of Wood.	Untreated Ties.			Treated Ties.					
	Cost of each tie in track. (2)	Life in years average.	Annual charge per tie.	Cost of each tie in track (3)	Life in years estimated (4)	Annual charge per tie.	Annual saving per tie.	Annual saving per mile of track	Saving in capital cost of mile of track at 4 p.c
	cts.		cts.	cts.		cts.	cts.	$ cts	$ cts.
Spruce.....	45	6	8·59	75	15	6·74	1·85	55 50	1,387 50
Jack pine...	50	6	9·54	80	15	7·19	2·35	70 50	1,762 50
Hemlock.. .	53	7	8·83	83	15	7·47	1·36	40 80	1,020 00
Douglas fir..	54	7	9·00	84	15	7·55	1·45	43 50	1,087 50
Tamarack...	59	8	8·76	89	15	8·00	·76	21 80	545 00
Cedar	65	9	8·74	95	15	8·54	·20	6 00	150 00

(1) All costs figured at 4 per cent interest.
(2) 20 cents is added to the purchase price of the tie to allow for labour and transportation cost of placing it in the track.
(3) 30 cents added to cost of tie in track for preservative treatment and tie-plates.
(4) Well treated ties are likely to last more than 15 years.