

ance of way due to grades and curves is the result. To this must be added about 50 per cent. for the effect of the pusher on cost of maintenance of way (see Wellington, page 620), and we have:—

TABLE XI.—COST OF MAINTENANCE OF WAY PER TRAIN MILE.

Line.	Rise and Fall and Curvature per Mile.		Percentages of Increased Cost per Train Mile for Maintenance of Way.			1 + Total per Cent. of Increase.	Maintenance of Way Cost per Train Mile in Pence.
	Feet.	Degrees.	Rise and Fall.	Curvature.	Assistant Engine.		
New Zealand railways ...	23	40·0	3·58	4·53	...	1·0811	22·15
A	70	43·6	10·90	4·94	50	1·6584	33·95
B	73	77·0	11·37	8·72	50	1·7009	34·82
C	91	90·0	14·18	10·20	50	1·7438	35·70
C1	89	113·0	13·86	12·80	50	1·7666	36·17
E	100	90·0	15·58	10·20	50	1·7578	36·00
F	114	90·0	17·76	10·20	50	1·7796	36·40

The last column of figures is obtained by prorating them to the preceding column from the average of all New Zealand roads, 22·15d.

Multiplying the cost in pence per train mile from the last column of Table XI. by the train mileage for each case gives the total costs per annum of maintenance of way shown in Table XII.

TABLE XII.—ANNUAL COST OF MAINTENANCE OF WAY IN POUNDS.

Line.	500 Trains per Annum.		700 Trains per Annum.		1,000 Trains per Annum.	
	Train Miles.	Cost.	Train Miles.	Cost.	Train Miles.	Cost.
A	8,540	1,208	11,950	1,692	17,080	2,417
B	9,800	1,423	13,710	1,990	19,600	2,841
C	10,560	1,572	14,790	2,200	21,120	3,142
C1	10,850	1,635	15,200	2,290	21,700	3,270
E	10,600	1,590	14,840	2,226	21,200	3,180
F	10,575	1,604	14,800	2,245	21,150	3,208

Carriages and Wagons.

The cost per train mile for carriages and wagons, New Zealand Railways Statement for 1901, was 4·75d.

The cost in repairs for carriages and wagons, due to 600 degrees of curvature, is 120 per cent. of its cost per train mile, and for 26·4 ft. rise and fall it is 4 per cent. of the same (see Wellington). If the average rise and fall of the New Zealand roads is 23 ft. per mile and the curvature 40 degrees per mile, the cost on lines A, B, C, C1, E, and F will be the figures in the last column of Table XIII., which are proportional to those in the preceding column.

TABLE XIII.—COST OF REPAIRS OF CARRIAGES AND WAGONS PER TRAIN MILE.

Line.	Rise and Fall, Feet per Mile.	Curvature, Degrees per Mile.	Percentage of Cost.		1 + Total per Cent. Increase.	Cost per Train Mile in Pence.
			Rise and Fall.	Curvature.		
New Zealand lines ...	23	40·0	3·49	8·00	1·1149	4·75
A	70	43·6	10·61	8·72	1·1933	5·08
B	73	77·0	11·07	15·40	1·2647	5·39
C	91	90·0	13·80	18·00	1·3180	5·61
C1	89	113·0	13·50	22·60	1·3610	5·80
E	100	90·0	15·16	18·00	1·3316	5·67
F	114	90·0	17·29	18·00	1·3529	5·77

Multiplying the cost in pence per train mile from the last column of Table XIII. by the train mileage for each case gives the total cost of carriages and wagons per annum shown in Table XIV.