

Table IV. is a comparison which shows: First, the ratio existing between the resistances of lines A, B, and C, a grade of 1 in 200 being taken as a grade of double power (see Wellington); second, the resistances by the formula; third, the fuel needed for the service per train mile, as taken from Tables I., II., and III., with that for the line C prorated to the full weight of train.

TABLE IV.

—				Lines.			Ratios.		
				A.	B.	C.	= a.	b.	c.
Feet per mile <i>plus</i> 26·4	...	...	...	6·40	7·25	9·00	= 1	1·13	1·41
26·4	...	...	...						
Resistance by formula	...	...	...	67·00	76·50	96·10	= 1	1·14	1·43
Fuel consumed	...	...	...	12·06	14·90	18·52	= 1	1·235	1·53

These comparisons justify the conclusions as to cost of motive power on these lines, and suggest that line B should, in practice, prove more favourable than shown by these computations.

Cost per Assistant-engine Mile.

The cost of wages, *plus* one-tenth of all the other items that make up the cost of the engine mile, is the cost per mile for the distance not run by the assistant engine (see Wellington), and which is given in Table V. in amount and per cent. of the road-engine mile.

TABLE V.—ASSISTANT-ENGINE COST STANDING WITH STEAM UP FOR DISTANCE NOT RUN, PER MILE.

Type of Engine.				Pence.	Per Cent.	Remarks.
B	...	...	...	5·35	34·1	For line A.
B	...	...	...	5·49	32·1	For other lines.
85-ton	...	...	...	5·98	27·2	
90-ton	...	...	...	6·06	26·6	

The assistant-engine average daily mileage on the several lines will be as shown in Table VI., that for line B being based on an assistant-engine mileage from Otira to the summit and return. For all lines except B the assistant-engine mileage is the same as the train mileage, while for B it is assumed that the assistant engine will be cut out at the summit, returning thence to Otira.

TABLE VI.—AVERAGE DAILY MILEAGE OF ASSISTANT ENGINES.

Annual Trains each way.				Line A.	Line B.	Line C.	Line C1.	Line E.	Line F.
500	...	...	...	27·4	25·6	33·8	34·8	34·0	33·9
700	...	...	...	38·3	35·9	47·4	48·7	47·5	47·4
1,000	...	...	...	54·7	51·3	67·7	69·5	68·0	67·8
340	...	...	...	18·6	17·5	23·0	23·6	23·1	23·0
477	...	...	...	26·1	24·5	32·3	33·2	32·4	32·3
681	...	...	...	37·3	35·0	46·1	47·4	46·3	46·2

Putting the values found in Tables V. and VI. in the formula for cost of assistant engine per train mile, $1 + \left(\frac{80-m}{m}\right)p$, where *m* is the variable average daily mileage from Table VI., and *p* is the per cent. or ratio from Table V., the costs in pence of Table VII. result.

TABLE VII.—COST OF ASSISTANT ENGINE PER TRAIN MILE IN PENCE.

Type of Engine.				Trains per Annum.	Line A.	Line B.	Line C.	Line C1.	Line E.	Line F.
B	...	...	...	500	25·9	23·4	...	...	24·5	...
				700	21·5	19·5	...	...	20·8	...
				1,000	18·1	16·5	...	...	18·1	...
				340	35·2	...	30·7	30·2	...	...
				477	28·4	...	25·2	24·8	...	...
				681	23·4	...	21·1	20·9	...	...
85-ton	...	...	...	500	...	...	30·2	29·8	30·0	30·1
				700	...	...	26·1	25·8	26·0	26·1
				1,000	...	...	23·0	22·9	23·0	23·0
				340	...	35·3	36·8	36·2	...	...
				477	...	28·9	30·8	30·4	...	...
				681	...	24·2	26·3	26·1	...	...
90-ton	...	...	...	500	...	...	...	...	30·9	...
				700	...	...	...	...	26·9	...
				1,000	...	...	...	...	23·8	...