also improve the net results by reducing the proportion of standing charges (wages, &c.) to the traffic capacity of the system without making the cost of maintenance or current more than slightly greater. A 15 % increase in average speed means a saving of ¼d. per car mile. The development of parcels traffic is a source of revenue, and addi­tional receipts can be earned by the hiring-out of cars for picnics and other special purposes. An important point is the proper selection of the size of car. A small four-wheeled car is suitable to continual traffic of comparatively small volume, but when the traffic is heavy cars of larger capacity are advisable. A serious burden on tramways is the cost

of insurance against accidents, although the number of serious accidents on electric tramways is exceedingly small in proportion to the number of passengers carried, the ratio of tramway accidents of all kinds being about one accident to every 15,000 passengers.

There are many adjoining towns having separate tramway under- takings which do not provide intercommunication. Experience has shown that a break of tramway facilities reduces the receipts by 20 to 50 % on the lines which have been severed ; and the terminal half-mile, except in populous districts, is the least remunerative section of a tramway route.

*Statistics.—*Each year the British board of trade issues a return of street and road tramways and light railways authorized by act or order, showing the amount of capital authorized, paid up and expended; the length of line authorized and the length open for public traffic; the gross receipts, working expenditures, net receipts and appropriation of net receipts ; the number of passengers conveyed ; the number of miles run by cars and the quantity of electrical energy used; together with the number of horses, engines and cars in use. The return published in January 1909 deals with the figures for local authorities up to the 31st of March 1908 and for companies up to the 31 st of December 1907. The following comparative table summarizes the most important general figures for the United Kingdom provided by this official return:—

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Years ended June 30. | | | | | Year ending Dec. 31 (com­panies) and March 31 (local authorities). |
|  | 1878. | 1886. | 1898. | 1902. | 1907-1908 |
| Total capital authorized | £6,586,111 | £17,640,488 | £24,435,427 | £51,677,471 | £91 ,305,439 |
| Total capital expended | £4,207,350 | £12,573,041 | £16,492,869 | £31,562,267 | 108,100,018 |
| Length of route open (miles) | 269 | 865 | 1,064 | 1,484 | 2,464 |
| Number of horses | 9,222 | 24,535 | 38.777 | 24,120 | 5,288 |
| Number of locomotive engines | 14 | 452 | 589 | 388 | 64 |
| Number of cars | 1,124 | 3440 | 5.335 | 7.752 | 10,908 |
| Total number of passengers carried | 146,001,223 | 384,157,524 | 858,485.524 | 1,394.452,983 | 2,625,532,895 |
| Quantity of electrical energy used, B.O.T. units | — | — | — | — | 431,969,119 |
| Gross receipts | £1,099,271 | £2,630,338 | £4,560,126 | £6,679,291 | £12,439,625 |
| Working expenditure | £868,315 | £2,021,556 | £3,507,895 | £4,817,873 | £7,792,663 |
| Net receipts | £230,956 | £608,782 | £1,052,231 | £1,861,418 | £4,646,962 |

The total figures at the date of the return are summarized in the following table, which is accompanied by one showing the lengths of line worked by various methods of traction:—

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Capital expenditure on lines and works open for traffic. | Total expenditure on capital account. | Length open for traffic. | | | | | | No. of under- ta kings. |
| Double. | | Single. | | Total. | |
| Tramways and light railways belonging to local authorities | *£*  32,978,579 | *£*  44,920,317 | Μ.  1113 | Ch.  77 | Μ.  505 | Ch.  77 | Μ.  1619 | Ch.  74 | 177 |
| Tramways and light railways belonging to com- . panies and private individuals | 18,641,279@@ | 23,279,601 | 408 | 58 | 435 | 46 | 844 | 24 | 128 |
| Total United Kingdom | 51,619,858 | 68,199,918 | 1522 | 55 | 941 | 43 | 2464 | 18 | 305 |

Table showing lengths worked by various methods of traction :—

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Method of traction. | England and Scotland. | | | | Ireland. | | Total. | |
| Electric | Μ.  1922 | Ch.  66 | Μ.  235 | Ch.  35 | Μ.  127 | Ch.  69 | Μ.  2286 | Ch. 10 |
| Steam | 22 | 67 |  |  |  | 45 | 52 | 32 |
| Cable | 4 | 49 | 22 | 72 | 29 |  | 27 | 41 |
| Gas motors | 4 | 2 | *—* |  | — | — | 4 | 2 |
| Horse | 82 | 60 | 4 | 28 | 7 | 5 | 94 | 13 |
| Total | 2037 | 4 | 262 | 55 | 164 | 39 | 2461 | 18 |

The following table gives a few totals, ratios, and percentages for the last two years of what may be called a period of electric traction, in comparison with a typical “steam” period *(i.e.* a period in which the use of steam power in tramways was at its maximum) and a typical “ horse ” period :—

|  |  |  |  |
| --- | --- | --- | --- |
|  | Electric period, 1907-1908. | Steam period, 1896. | Horse period,  1879. |
| Length of route open | 2,464∙22 | 1009 | 321∙27 |
| Total number of passengers carried | 2,625,532,895 | 759,466,047 | 150,881,515 |
| Percentage of net receipts to total capital outlay | 6∙81 | 6∙88 | 3·97 |
| Percentage of working expenditure to gross receipts | 62∙64 | 74·79 | 83∙81 |
| Passengers carried per mile of route open | 1,065,462 | 752,691 | 469,641 |
| Average fare per passenger | 1∙09d. | 1∙61d. | 1∙84d. |

From the above figures it will be noticed that the capital cost per mile has increased as a result of the adoption of electric traction, while at the same time the percentage of the return on the capital has been reduced notwithstanding that the rate of working expenditure has fallen and the number of passengers carried per mile has increased, the fares charged having been disproportionately reduced.

(E. Ga.)

**TRANCE** (through the French, from Lat. *transitus,* from *transire,* to cross, pass over), a term used very loosely in popular speech to denote any kind of sleeplike state that seems to pre­sent obvious differences from normal sleep; in medical and scientific literature the meaning is but little better defined. In its original usage the word no doubt implied that the soul of the entranced person was temporarily withdrawn or passed away from the body, in accordance with the belief almost universally held by uncultured peoples in the possibility of such withdrawal. But the word is now commonly applied to a variety of sleeplike states without the implication of this theory; ordinary sleep\* walking, extreme cases of melancholic lethargy and of anergic stupor, the deeper stages of hypnosis (see Hypnotism), the

cataleptic state, the ecstasy of religious enthusiasts, the self-induced dream-like condition of the medicine-men, wizards or priests of many savage and barbarous peoples, and the abnormal

state into which many of the mediums of modern spiritualistic seances seem to fall almost at will; all these are commonly spoken of as trance, or trance-like, states. There are no well- marked and characteristic physical symptoms of the trance state, though in many cases the pulse and respiration are slowed, and the reflexes diminished or abolished.. The common feature which more than any other determines the application of the name seems to be a relative or complete temporary indifference to impressions made on the sense-organs, while yet the entranced person gives evidence in one way or another, either by the expression of his features, his attitudes and movements, his speech, or by subsequent relation of his experiences, that his

@@@1 These figures include cost of buildings and equipment in respect of certain local authorities’ lines worked in conjunction with other lines.