

railways from £4,000 to £5,000 per mile. On the other hand, inflation and watering of stock are computed to have added from £2,000 to £3,000 per mile to the actual cost of American roads. The actual charges for construction are thus brought down to, say, £35,000 per mile in the United Kingdom, and to £10,000 in the United States. Making all allowances for the differences in the value of the properties and surrounding conditions, it is evident that railway construction must be carried out more economically in America than in England and in Europe generally.

Mr. Dorsey claims that a railway can be constructed on the American system at from one-half to one-fourth the cost of the English system, and be in working order in from one-half to one-fourth the time. In the rapid opening out and development of flat countries, and especially in aiding military operations of a transitory character, these qualifications, if well-founded, are of the highest importance. An examination of the principles and of the details of the American practice, where they differ from the English, may throw light on these points, and show whether it may not be possible to introduce modifications into English practice abroad, which shall render it equally capable of satisfying the requisite conditions for securing remunerative returns and outlay in a short time.

The essential differences between American and English practice originate in the universal use by the former of the bogie-truck, with short rigid wheel-base and flexible connections between the wheels and bodies for all rolling stock, as compared with the general use of longer wheel-base and more rigid connections by the latter. The developments from this initial difference cover an immense field, and all that can be attempted in this Paper will be to select the more prominent peculiarities of the American system, so far only as they may relate to economy and efficiency of results. Notices and illustrations will be given of standard types, when these exist, as used in the latest ordinary practice; and a few examples of the extreme difficulties overcome in the alignment of roads will be added. A discussion of the principles regulating such alignment will close the Paper.

It should, however, be remembered that the working of the railway-system in North America has been undergoing a great revolution within the last few years, owing, firstly, to the introduction of steel rails and rigid fish-plates, which have been found able to bear weights and wear-and-tear much heavier than the iron ones for which they have been substituted; and, secondly, to the very severe competition between the leading trunk lines for the