

The above performance of the American engine compares favourably with engines of the same weight by Sharp, which with 40 tons, had a speed of 37 miles an hour; but with 70 tons she only attained 26 miles an hour. (See Barlow's description in *Tredgold*). . . . The use of 4-wheeled trucks on engines, tender, and cars is a saving of power. . . . It cannot, in opposition, be pretended that the use of trucks is unsafe, when the whole experience of America proves the reverse even at the highest speeds."

NOTE.—The engine Champlain commenced running in December, 1849, and up to March, 1851, had run, in 15½ months, 46,111 miles. This is at the rate of 35,652 miles for the year. This running gives 114·4 miles for every running day the engine was on this road, which is a continued line of curves with a rigid rock foundation. During these 15 months this engine had to encounter the ice and snow of two New York winters, such as engines in England have never come in contact with.—W.W.E.

Vol. 2, page 321. "A paper was read by Mr. Bishop, before the Institution of Civil Engineers, describing the American bogie engines on the Birmingham and Gloucester Railway. He says, 'In a comparative trial of various engines on the inclined plane an American bogie engine, with cylinders 12·5 inches diameter, driving wheels 4 feet diameter, weighing 14 tons, conveyed a gross load of 54 tons up the incline at the rate of 12 miles per hour, while the best of the English engines, with 13 inch cylinders, 5-foot driving wheels, and weighing 22 tons, drew 38 tons up the plane at a speed of 6 miles per hour.'"

NOTE.—From the above it appears that the merits of the American bogie engine were tried and proved in the very heart of England forty-two years ago. The *United States Magazine*, in 1838, published a statement of the above-mentioned engines and their performance in England, and stated that in 1837 the B. and G. Railway Company ordered seventeen locomotives of Norris. They were sent out in 1838, and after being tried an order was sent for more, but in a few weeks the order was countermanded. The reason given was that the builders of locomotives in England had obtained from the Lords of the Treasury (the Board of Trade, I suppose) a decree forbidding the importation of locomotives into England.—W.W.E.

Vol. 3, page 87. "The 4-wheeled-truck contrivance introduced by the Americans has been found to answer admirably, and is now universally used on their railways. Let not, then, jealousy or vain national pride prevent English engineers copying an American improvement, but rather let us thank them for the invention, and confess its excellence by at once adopting it. This is not the only point of superiority in American locomotive engines, as may be seen by a perusal of Mr. Passavant's very sensible remarks thereon: 'But it is the principle of the movable truck for carrying the two pairs of leading wheels that I allude to, and which undoubtedly is the simplest and best plan that can be thought of for accommodating the engine to a curved railway. Sound reasoning convinces me that this alteration would be judicious—long practice in America confirms it—and I hope to see it before long followed in England.' I consider the American engine-framing to be very soundly constructed, and should be glad to see more attention paid to this in England, being convinced that a stronger frame, in some cases, could be made with less metal—that is, putting the strength where the strain is felt. I would principally direct attention to the two fore-mentioned points—the truck for the leading wheels, and a better proportioned framing—believing that by the one alteration the danger of railway travelling may be lessened, and, by the other, the power of the locomotive increased."

NOTE.—It must be recollected that the articles by Mr. Passavant were written and published some twenty-eight or twenty-nine years ago, so it is very clear that this matter of the bogie, the bar-frame, the centre buffers, the oil-tight boxes, and other American railway appliances are not new things; they are old, and their merits have been proved long years ago. All that Americans have done, or tried to do, is to bring these devices to the attention of the railway world outside of the United States, so that they might enjoy the benefit and economy resulting from their use. All the opinions I have given are those of Englishmen, educated gentlemen, and they should have some weight among railway engineers. After giving the opinion of Sir John Hawkshaw on steel fire-boxes and iron tubes, and shown that Mr. Webb and Mr. Worsdell are using steel fire-boxes on the London and North-Western Railway instead of copper, we need not fear the vapourings of those ignorant critics who say the Americans use poor and cheap materials in their locomotives. When we can show that a locomotive with a steel fire-box will cost about \$400 less than one with copper, and that the steel will outlast the copper twice over in hard service, we need not fear the carplings of critics who accuse us of using "miserable, poor materials" and "execrable workmanship." It would be well for some of these would-be wise men of the East to understand that iron and coal are the two great elements of civilization, and not gold or silver, or even copper or brass.—W.W.E.

Captain Douglas Galton, R.E., C.B., F.R.S., English Commissioner to the Philadelphia Exhibition, read a paper, 12th March, 1878, before the Institution of Civil Engineers on "American Railway Appliances." I need not tell Englishmen that Captain Galton is an accomplished engineer; that he was, for a long time, the Chief Inspecting Engineer of Railways in England, and that he is a great authority on all matters relating to railways. After speaking of the merits of the chilled cast-iron wheels, the stability of the locomotives, the importance and uses of the bogie truck, the size, comfort and convenience of the American cars, &c., in the same terms of praise and commendation that other clever and unprejudiced, clear-thinking English minds had often done before, Captain Galton winds up his paper with the following remarks: "The American engineer has been far more fettered by his surroundings in framing designs than his European brother. His appliances have not been such as to enable him, even if he so desired, to follow the precedents of Europe. He has had to make the most of the materials which lay to his hand, and with them to overcome vast natural difficulties. The result has been the development of great originality of design. It is on this ground that the records of the details of American engineering afford the English engineer much food for reflection. It is not probable that American railway appliances could be adopted as a whole in this country; but it is certain that in many of the colonies, and in parts of India, where the requirements of the traffic more nearly resemble the conditions which exist in America than those prevalent in Europe, 'much economy would result from following the American, in preference to the English, pattern of railroad.'"

NOTE.—A writer in a colonial village paper, in commenting on the official review of Mr. Brereton's and Mr. Evans's letters (on the economy of railway machinery) by Mr. Maxwell, says, "Mr. Maxwell pooch-poochs Mr. Evans's and Mr. Brereton's rather gushing tributes in a tone of unconcealed contempt." I wonder if this brilliant editor will extend the same complimentary remarks to the opinions of Captain Galton, to say nothing of those of Sir John Hawkshaw, Sir Charles Hartley, Sir Henry Tyler, Mr. Fox, Mr. Thompson, Mr. Higinbotham, Mr. Bromley, Mr. Brunner, and many more clear but lesser lights.—W.W.E.