tube had the requisite depth and strength? Probably no less than 9 inches. When the Niagara Bridge is loaded with a freight train, covering its whole length, and weighing about 326 tons, the camber is reduced 0.82 ft. or nearly 10 inches. On removal of the load, the structure rises again to its former level. In the case of the Conway Tube the deflection is owing to the elasticity of the iron plates, composing it. In the Niagara Bridge the same cause produces the same effect, but in different directions, and under different circumstances. In the Tube one portion of the iron is exposed to tension, while a greater portion is exposed to compression. But the tensil power of wrought-iron is much greater than its resistance to compression. In a Suspension Bridge on the other hand, nothing but the tensil force of wrought-iron of a form and size, which insures the best quality, is employed. The tubular principle involves a great waste of material when compared to the suspension principle, and consequently, whenever great weights are to be supported over large spans, the first cannot successfully compete with the latter. In a country where the Engineer’s task is to make the most out of the least, the Suspension principle will henceforth take the lead of the tubular, in all ordinary localities. For extraordinary long spans the tube cannot compete on any terms.

Every train that passes over the Niagara Bridge causes a certain depression, but this being far within the safe limits of the elasticity of wire, no injury results from it. Every train that passes through the Conway, or through the Britannia tubes, causes a depression. Now can it be said, that this deflection is an objection to the