

tal will be left to invest towards renewals. Hence the iron would seem to have the advantage.

XXXV. But the above comparison is too superficial and general to be entitled to a great deal of confidence, except, perhaps, as it regards the sustaining of a given weight by a simple post, or suspending it by a bar or rod of iron or wood. In the complicated assemblage of pieces forming the superstructure of a bridge, there are numerous other facts and considerations which materially vary the results. First, there is a difficulty in connecting pieces of timber in such a manner that every part may be proportioned to the strength required of it, to the same extent as can be done with iron. Second, it is frequently necessary to use considerable quantities of iron in bolts and fastenings, for putting together a structure of wood requiring great stability. Third, wood soon loses a portion of its strength by partial decay, and consequently requires additional strength in the beginning, that it may be safe for a time after decay has commenced.

Hence, but little can be predicated upon the simple general comparison of wood and iron as to strength and cost, relative to the comparative economy of the two materials for bridge building.

It is only by comparing the results of actual experience, or, where this has not been had, by comparing the results of detailed estimates, upon well matured plans, founded on well established principles, that a satisfactory conclusion can be arrived at.

With regard to wooden bridges, much experience has been had, and the reasonable presumption is, that a good degree of economy has been attained in their construction. But the idea of building iron bridges in this country is of recent date, and but little has been experimentally proved in relation to their cost and qualities.

XXXVI. This much, however, my own experience has demonstrated. Having received Letters Patent for an "Iron Trussed Bridge" upon the general plan of the arched truss shewn in Fig. 8, and constructed two bridges