porary character, this is undoubtedly the most economical material for the purpose.

But it is believed that the state of things has now assumed that degree of settled permanency in many parts of this country, and available means have accumulated to that extent which renders it consistent with true economy to give a character of greater permanence to our improvements, and in the erection of important works, to have more reference to durability, even at the cost of a greater present outlay; and in this view of the subject, it seems highly probable that one of the channels in which this tendency of things will develope itself, will be in the extensive employment of iron in the construction of important bridges. With this impression, I proceed to some general comparisons as to the relative cost and economy of wood and iron as materials for bridges.

XXXIV. Cast iron resists a crushing force some 20 times as much as wood, consequently it will only require \(\frac{1}{10}\) as much of the former to resist a given force, provided it can be put into a form in which its liability to flexure and yielding laterally, is not greater than that of wood. This can be accomplished, in part, by giving the iron a hollow form, so as to make the diameter of the pieces approximate to an equality with twenty times the same amount of wood, which must generally be used in a simple rectangular or cylindrical form.

Assuming, then, that a cubic foot of cast iron, will do the same work as 15 cubic feet of wood, (after making allowance for the necessarily smaller diameter of the iron) we can institute a comparison which would seem, upon the surface, to shew the relative economy of the two materials.

A cubic foot of cast iron, manufactured for the work, will cost about $13.00. 15 cubic feet of wood in a bridge will cost, say $6.00. Whence it appears that the cast iron is more than twice as expensive, in the first outlay, for sustaining a crushing force, as wood.