of the subject, it seems highly probable that one of the
channels in which this tendency of things will develop
itself, will be in the extensive employment of iron in
the construction of important bridges. With this im-
pression, I proceed to some general comparisons as to
the relative cost and economy of wood and iron as
materials for bridges.

LXXXI. The power of cast iron to resist compres-
sion, equals some twenty times that of wood; conse-
quently, it will only require one twentieth as much of
the former to withstand 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 may 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 of section.

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

A cubic foot of cast iron, manufactured for the work
will cost about $18.00. 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 compressive force, as wood.

Again a cubic foot of wrought iron in the work, say
at 7 1/2 cents = $34.00.

Wood is about 1/5 as strong as iron. But about one-
half of its fibres must be separated in order that the