upon every part by such weights, acting by dead pressure. In case of thrust, or crushing force, I have allowed one square inch cross section of cast iron, for every 12,000 lbs. acting on pieces (mostly in the form of hollow cylinders), of a length equal to 18 diameters, and a greater amount of material, where the ratio of length to diameter is greater; always having regard to practicability, as well as theoretical proportions, in adjusting the dimensions of the part.

My estimates, made upon these bases, have fully satisfied me that a bridge of 100 feet span, with track upon the top (with wooden cross-beams), will cost about $2,000, or $20 per foot, assuming the present prices of iron (1846), in ordinary circumstances. If the track pass near the bottom of the trusses, the expense will be increased by two or three dollars a foot.

For a span of 140 feet, by a liberal detailed estimate I make, in round numbers, a cost of $4,000. For 70 feet, I estimate a cost of 9 to 10 hundred dollars, according to circumstances.

Thus it will be seen that actual estimate makes the cost of a single stretch of any length, very nearly as the square of the length, as should be expected from the nature of the case. Hence, knowing the cost of a span of any given length, we readily deduce that of a span of any other length, in similar circumstances, with reliable certainty.

Now, although my investigations have forced the conviction upon me, that where strong and durable bridges are required, iron should be preferred in their construction, still there is a multitude of cases where wooden structures should be preferred; especially in sections of country comparatively new, where timber is