point, that below 30 ft. there is no economy in covering bridges; but above that limit, or something near that, there is a decided advantage in "protection," increasing with the length of stretch.

Many bridges are annually swept away in this country by floods and freshets. Where the permanency of the structure is doubtful, prudence would rather dictate that the structure be made as cheap as possible, consistently with strength and safety.

These remarks upon covering, have more particular reference to common bridges. As to rail road bridges, there is more liability to accident by fire in covered, than uncovered bridges, and the policy may be somewhat more doubtful, unless for considerable stretches.

In the construction of bridges not designed to be covered, it is believed to be worthy of recommendation to saturate the joints, and points of contact of the different pieces of timber, with oil-paint, pitch, or some other substance that may serve to harden the timber, as well as preserve it by excluding water. Those parts are liable to decay much sooner than in other places, as well as being usually the weakest parts, where the timber is cut most to form the connections.

Length of Stretch.

There are cases where the length of the stretches for a bridge is optional, and may be regulated as economy in construction may dictate. For instance, in crossing a broad stream or valley, where piers are not objectionable, as obstructing the current, &c. In such cases it is desirable to know what length of stretch is most favorable to economy.

It may be assumed in the first place, that the cost of a pier is *nearly* the same to support a short, as a long span. Hence the cost of piers will be as their number; or inversely as the length of stretches. Therefore the minimum cost for both piers and superstructure, (for a bridge of indefinite length,) will occur when the cost of a pier is just equal to that of one stretch of the superstructure.