

By reason of greater constructional complication the simple truss or cantilever span is in general less pleasing than a girder bridge. Articulation, which is the distinctive feature of the truss, conveys the impression of complication, and renders the layman less capable of appreciating the strength and sufficiency than in the case of a girder, arch, or suspension span, which, in addition, have many centuries of use behind them in which the race has grown familiar with these forms. The superior aesthetic value of the suspension bridge over the cantilever is well illustrated by the two adjacent bridges which span the St. John River at St. John, N.B. (Fig. 14). The graceful sweep of the cables and simplicity of the whole construction in the case of the suspension span is in striking contrast to the sharp angles in the upper chord of the cantilever and the complex web system.

(4) PROPER BALANCE OR HARMONY OF PARTS.

Proper balance of parts in a structure requires that no part shall contain a suggestion of undue strength or undue weakness in comparison with any other part, but that all shall be equally efficient. Difficulty in producing proper balance is very often introduced by the choice of different materials for adjacent spans, but quite as frequently in the proportioning of the various structural elements of a single span, or in the relation of substructure to superstructure.

Where two widely different materials are used in adjacent spans of the same bridge, the effect of equal strength throughout is not easy to produce, since the mind is compelled to suddenly change its standards for estimating the sufficiency of adjacent spans. For example, the massiveness of the approach spans of the Ingool River Bridge, Russia (Fig. 15), is in almost ridiculous contrast to the slender proportions of the superstructure. If the structure be an arch the effect is much better, as may be seen in the case of the Washington Bridge, New York (Fig. 16). This arises because of the greater massiveness of the main span or spans, and because the mind demands ample evidence of sufficient mass back of the springing to oppose the thrust of the arch rib. A notable example of an aesthetic defect arising from incorrect relative proportioning of structural elements is seen in the case of the Niagara Falls and Clifton arch (Fig. 17), where the light approach spans and the almost invisible abutments excite wonder as to the means by which the enormous rib thrust is resisted.