We would not advise taking so great a risk, even if the structure were more economical.

V. Mr. W. S. Pope proposes for the Detroit Bridge Works a suspension bridge, with an auxiliary girder. The cables are to be of steel wire, and the form of the long spans as shown on plate V.

The information accompanying the plans is more full and complete than any other which we have received. The strain sheets, computations of quantities, and description of parts are so intelligently arranged as to give a clear idea of every part of the design.

We cannot agree, however, with some of the assumptions made as to the distribution of the strains. The stiffening girder which carries the roadway across the great spans is suspended from the cable and also from a series of inclined stays, which reach about one-half of the distance from the end towers to the centre, as at the Niagara Suspension Bridge. So far as both of these systems extend, it is assumed that one-half of the loads will be carried by the cables and the other half by the inclined stays. These form two distinct and independent systems of suspension, and there is no evidence whatever that the load at any one point will distribute itself in the particular proportion assumed. However accurately the two systems may be adjusted when first erected, the changes of temperature are sure to change their relative positions and lengths and to vary the relative proportions of the loads which they bear. This is the case with the Niagara Bridge, the contraction of the cable on a cold day in winter raising up the platform and taking the weight from the stays, so that they become loose and are visibly crooked. The cables in that bridge are therefore made strong enough to do all the work, with a factor of safety of about 4\(\frac{1}{2}\), and the stays are merely relied on to stiffen the truss.

We find, moreover, that this design does not provide for strains arising from changes of temperature, which will be very considerable in the long spans.

The aggregate cost condemns the plan. It is estimated at $3,700,000, without the tunnel. It is fair to state, however, that this includes an allowance of twenty per cent to cover engineering and contingencies, and that, when these are de-