loads it is calculated to support. The smaller the transient weight is in proportion to the weight of the structure, the less disturbance such passing loads will cause in its equilibrium. When a train enters the Niagara Bridge, it produces a slight depression upon that part of it. But this depression cannot take place without a corresponding rise at the opposite end. The greater therefore the weight of the structure, the less its equilibrium will be affected by transient weights. This is certainly plain, and will appear so to the most careless observer. Consequently a high wind, acting upon a suspended floor, devoid of inherent stiffness, will produce a series of undulations, which will be corresponding from the center each way. And from this follows the necessity of introducing the principle of the triangle, so as to form *stationary points* and thus check vibrations, and restore balance. The effect of trains has to be met in the same way by the application of the triangle, either in the form of stays or trusses, or both. Undulations, caused by wind, will increase to a certain extent by their own effect, until by a steady blow a momentum of force may be produced, that may prove stronger than the cables. And although the weight of a floor is a very essential element of resistance to high winds, it should not be left to itself to work its own destruction. Weight should be simply an *attending* element to a still more important condition, viz: *stiffness.* Before enlarging upon the subject, I will here remark, that an engine and tender of 34 tons weight, together with one passenger car, crowded with persons, making a total load of about 47 tons, caused a depression in the center of $5\frac{1}{2}$ inches. This flattening of the