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## Theme V.

### Theory and research work on details for steel structures of welded and riveted construction.

Since the Paris Congress numerous theoretical and experimental questions regarding details of riveted and welded steel structures have been dealt with; for instance important mathematical investigations have been published on various problems of strength and stability (stiffening of the webs of plate web girders; bending, torsion and buckling of thin walled members, rigid frame intersections; stresses in frame corners, etc.). Interesting researches have been carried out on the exact calculation of trusses, the applications of shells in steel construction, the calculation of secondary stresses, the fatigue resistance of welded connections, etc. These investigations enable a useful opinion to be formed of the degree of accuracy which attends the usual methods of calculation. They also afford a check on the correctness of theory when exact measurements can be made on completed structures. Great progress has been made in methods of experiment depending on measurements on models and on completed work, these being especially useful in application to important works or to those structural members which are frequently repeated in constructional design. Measuring methods and apparatus have been improved to a point which makes it possible to use them in a large range of cases. Such measurements should be developed to the greatest possible extent, in order to furnish a basis for methods of calculation with a view to improved understanding of the conditions of stress arising in structures, and finally with a view to promoting the economical and safe design of steel structures.