Preface

All structural design requires that some degree of simplification and approximation be introduced into what are, in reality, complex physical problems. Whilst some of these operate at a fundamental level e.g. a limitation to linear elastic response, consideration of collapse by the formation of a plastic mechanism etc, others are rather more a reflection of computational convenience. An important example of the latter is the treatment of the joints in frame structures as either pinned or rigid, that leads to different analytical treatments for determining the distribution of internal forces and different design approaches for proportioning the individual components.

However, it has long been recognised that practical forms of joints do not function in either of these ideal fashions. Rather, the two classes "pinned" and "rigid" represent the extremities of a spectrum of behaviour. Although this phenomenon was recognised in terms of steel construction quite early this century, and several attempts to move to a more rational basis may be identified in the technical literature, it was not until the 1960's that concerted attempts to understand and utilise the concept of semi-rigid and partial strength joint properties began to attract serious attention. Since then, work in steel construction has rapidly increased, with virtually every country with an active research interest in steel structures now having one or more groups addressing some aspect of the problem. This has been followed by parallel studies in composite construction and, more recently , for concrete frames and timber frames. Several coordinating initiatives have been undertaken as a way of maximising interaction and exchange of information.

However, comparatively few of these have dealt with other than one material interest. A conspicuous exception is the COST C1 Project that has established interest across virtually all European countries and that is distinctive for its spread of activity across all the main structural materials. Some of the work from this programme is reported at the present Colloquium. But, reflecting the worldwide interests of IABSE, the geographical spread herein goes further. The 35 Colloquium contributions cover 15 different countries. They also cover many programmes of work not linked via the COST network. Thus the Colloquium provides further evidence of the important role of IABSE in encouraging the development worldwide of structural engineering through its commitment to fellowship and collaboration.

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