Ib

Comportement des matériaux et des ouvrages sous les actions dynamiques (Vibrations, fatigue, choc)

En ce qui concerne les actions dynamiques (vibrations et chocs), les communications présentées au Congrès montrent que les moyens de déterminer expérimentalement le comportement dynamique des matériaux et des constructions ont augmenté en nombre et en qualité, que l'on connaît de mieux en mieux le comportement de certains matériaux et de certaines structures à ces types particuliers de sollicitations dynamiques et que l'analyse complexe des problèmes dynamiques s'étend chaque jour davantage à des phénomènes méconnus, bien que d'effet non négligeable.

Les méthodes de calcul numérique applicables au comportement dynamique des constructions doivent encore être développées et perfectionnées.

Par la coordination internationale des recherches, et plus particulièrement des recherches expérimentales, on pourra obtenir des progrès importants dans ce domaine. Pour être pleinement efficace, cette coordination doit comporter la sélection des problèmes, la délimitation des objectifs envisagés et la communication des résultats obtenus.

Ia

Behaviour of materials and structures under statical long-time loading

The papers presented at the Congress constitute an important contribution to the scientific investigation of the behaviour of materials and structures under statical long-time loading. It is most desirable that these valuables researches and tests should be continued, particularly those dealing with rheology which are of great importance for a better understading of the behaviour of materials and structures.

The experimental researches which were reported show the great complexity of the rheological phenomena investigated in structures comprising concrete. It is most essential that these researches should be pursued both on structures and in the laboratory. The problem of the reduction of the strength of concrete in the course of time and with increasing load must be further investigated, as well as the effect of the shapes and dimensions of the actual structural members as compared to the laboratory test-pieces. In order to extend our knowledge in this field as rapidly as possible, it is highly desirable that, whenever structures of any considerable size are being erected, the necessary arrangements should be made for the systematic observation of their behaviour over long periods of time.

For this purpose, it is essential that the staff carrying out the observations and the measuring instruments should be of high quality. Steps must also be taken to ensure that the instruments are constantly checked and that the rheological properties of the materials employed are inves-

tigated at the same time in the laboratory, with a view to the correct interpretation of the results of observations on the structures.

Owing to the lack of agreement between the experimental results hitherto obtained, it is only possible to place a limited reliance on methods for the prediction of the behaviour of structures by means of mathematical theories based on rheological models that have been excessively simplified.

IIb

Behaviour of materials and structures under dynamical loading (Vibrations, fatigue, impact)

As far as dynamic agencies are concerned (vibrations and impacts) the papers presented to the Congress showed that the means for determining experimentally the dynamic behaviour of materials and structures have increased both in number and in quality, that the behaviour of certain materials and certain structures towards these particular types of dynamic stresses is becoming increasingly better known and that the complex analysis of dynamic problems is being constantly extended to phenomena which, although their effects were by no means negligible, were formerly not fully appreciated.

The methods of numerical calculation of the dynamic behaviour of structures must be developed and improved still further.

By the international co-ordination of research, and more particularly of experimental research, considerable progress might be achieved in this field. In order to be fully effective, this co-ordination must extend to the selection of the problems to be investigated, the indication of the objectives to be attained and the publication of the results obtained.

Ia

Verhalten von Baustoff und Tragwerken unter statischer Langzeitbelastung

Die dem Kongress vorgelegten Arbeiten stellen einen wichtigen Beitrag zur wissenschaftlichen Erforschung des Verhaltens von Baustoffen und Tragwerken unter statischer Langzeitbelastung dar. Es ist erwünscht, dass diese wertvollen Forschungen und Versuche, insbesondere diejenigen über das Kriechen, deren Bedeutung für eine bessere Erkenntnis des Verhaltens von Baustoffen und Tragwerken sehr gross ist, fortgesetzt werden.

Die vorgelegten Ergebnisse der Versuchsforschung zeigen die grosse Komplexität der Fliesserscheinungen in Tragwerken mit Bauteilen aus Beton. Es ist unbedingt notwendig, diese Untersuchungen sowohl am Bauwerk wie im Laboratorium weiterzuführen. Das Problem der Festigkeitsverminderung des Betons im Laufe der Zeit und mit wachsender Belastung muss weiter untersucht werden, ebenso der Einfluss der Formen und Abmessungen der wirklichen Bauelemente im Verhältnis zu Probekörpern des Laboratoriums. Um unsere Erkenntnisse in diesem Gebiet