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INTRODUCTION TO THE COLLOQUIUM¹⁾

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Ladies and Gentlemen,

My first words must be words of welcome to all of you.

It gives the organisers great pleasure that so many researchers and designers from all over the world have come to Delft, to attend this colloquium of the "International Association for Bridge and Structural Engineering" on "Advanced mechanics of reinforced concrete".

A special word of welcome I should like to address to

Prof. Thürlimann,	President of the I.A.B.S.E., who will open the congress in a few minutes;
Dr. van Spiegel,	Director-general of the Ministry of Science policy who will deliver the opening address;
and Prof. Veltman,	the Rector Magnificus of the Delft University of Technology, who will speak on behalf of the University.

I also should like to welcome the representatives of the international societies:

- le Comité Euro-International du Béton;
- la Réunion Internationale des Laboratoires d'Essais et des Matériaux,

as well as the representatives of the following Netherlands institutions:

- the State Public Works;
- the Netherlands Organisation for Applied Scientific Research,

- the Institute for Building Materials and Constructions,
- the Board of Governors of the Delft University,
- the Department of Civil Engineering,
- the Royal Institute of Engineers,

and last but not least

- the Netherlands Committee for Research, Codes and Specifications for Concrete.

The organizing committee is pleased that this colloquium receives so much attention from these authorities.

The title of the colloquium "advanced mechanics of reinforced concrete" sounds perhaps a bit ambitious and we feel the need for a short explanation on the subject and the aim of the colloquium.

The enlarged scale of structures such as bridges, tunnels, highrise buildings and the new applications in areas which have not been explored before, like nuclear reactor containments, liquid natural gas storage facilities and offshore structures, have led to a growing interest in describing the behaviour of a structure in a realistic way, which implies the introduction of the real properties of the materials involved, such as the elasto-plastic behaviour of steel reinforcement, the nonlinear behaviour of concrete, the formation of cracks in concrete and so on.

¹⁾ Delivered by Prof. Dr.-Ing. H.W. Reinhardt



Research is needed because in many cases it is not possible to extrapolate from classic knowledge. This is one reason why we see in the last decade a real explosion of research in the field of the behaviour of concrete structures all over the world.

However, there is also a second reason for this phenomenon. That is the rapidly growing influence of the computer which acts as a driving force and which has stimulated new, powerful numerical techniques, which permit us to go more into detail and to get information about the behaviour of a structure on a smaller scale, taking into account a more complicated material behaviour. This, in turn, asks for material research which describes the characteristic properties of the material by means of basic models, which can be handled in the numerical computations.

The aim of this colloquium is - as stated before in the preliminary invitation to the colloquium - to stimulate the synthesis of experimental investigation and numerical analysis of reinforced concrete structures trying to speak one language, the language in which nature speaks to us in this field, that is mechanics.

It was the intention to have just a small colloquium of experts on this subject. We estimated the number of participants at between 150 en 200. The number of participants turns out to be 250. Of course we are glad that the colloquium has received so much attention, and the number is not too large. There will still be sufficient opportunity for everybody to enter into the discussions and to have personal contact.

We received many papers, up to about 90, and this gave rise to a serious problem, because we did not want to have a rush of many short - say 5 minutes - lectures. On the contrary, we decided to give each speaker sufficient time to present his lecture thoroughly and in such a way that it can really be understood by the audience. For this reason we allotted each speaker 20 minutes, which implied that we had to select 23 papers for oral presentation. This meant a severe and sometimes painful selection. Because there were so many good papers we decided to publish a greater number of them. Therefore, you will find in the Working Papers 45 contributions. These contributions will all be published in the Final Report and they are all open for discussion.

We think a look at these Working Papers is very encouraging. Indeed we are very glad with them and we think they are a real contribution in the field of advanced mechanics of reinforced concrete.

Before the beginning of the colloquium I should like to express - on behalf of the organising committee - our gratitude to all institutions which have supported and made possible this colloquium. In this context I should especially mention:

The Delft University of Technology for the hospitality we receive here in this interesting concrete building

and the Netherlands Committee for Research, Codes and Specifications for Concrete for their substantial financial support.

Now I should like to pass the word to the President of the International Association for Bridge and Structural Engineering, Prof. Thürlimann from Zürich, who will open the Colloquium.

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