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Mr. President of the Japanese Organizing Committee -

Mr. President of I A B S E -

Ladies and Gentlemen -

The Japanese Organizing Committee has asked me - as Chairman of the Technical Committee - to give a report at this Closing Ceremony. Let me first say:

The 10th Congress of our Association in Tokyo was just marvellous, and I am sure that all participants had been impressed deeply.

The pre-congress publications, Introductory Report and Preliminary Report, contained already many valuable papers to the themes which were chosen. The lively interest of the engineers from all over the world in the problems and solutions put before us, was well displayed by the many different contributions in the prepared and free discussions. The amount and range of new and valuable information is so large that it is impossible for me to give a just appraisal or summary of the results to any of the different themes. I shall try, however, to collect my general impressions and draw from them some recommendations for our future work:

Most deeply I was impressed by the amount and quality of studies and research work which has been done during the last decade by Japanese engineers. I am sure that all foreign participants agree when I express my gratitude to our Japanese colleagues for making available so valuable results of their work to our profession by their numerous contributions. Research in our structural engineering field is throughout the world on a good path by combining the theoretical approach with testing models and measuring strains or deformations at built structures. Our task is to find truth, this means to know the real response of our materials not only in laboratory specimens but also in the structures themselves. Many interesting examples of such testing have been described. The techniques of model testing and measurements at structures have considerably improved and some highly specialized institutes in this field dispose of valuable experience. It is desirable that this special know-how will be discussed and exchanged in a symposium in the near future.

Theories are often based on idealized assumptions and these assumptions must be checked by such test results. Only those theories which are based on true

physical data can be fully approved for practical design. Such data are often complex and complicated but the computer allows us to consider them correctly. Several contributions - e. g. in the field of fire resistance - demonstrated such good use of computer aid.

In the field of computer-aided design optimization I am not too optimistic about the soundness of the proposed methods. To design a structure or a bridge is a process of creativity, even of intuition based on a very wide range of knowledge in many aspects. The computer has no creativity, it cannot change or vary the conceptual design idea or develop an improved fabrication or construction method. Such computer-aided optimization programs may even be a handicap for the creative thinking of the design engineer, leading him into too narrow channels and limiting the horizon of his thoughts, of his vision and fantasy.

Being in Japan, we should study the methods of the century-old schools of Japanese art, how to become a master in his art: It is by concentrated studies of all the basic knowledge of this art, by learning all about the tools which are necessary to exert this art and by practising the use of these tools until they are available without the need to think of them so that the mind can concentrate on the creative act in a synthetic way almost in the state of subconsciousness.

This perfection of creative art is too difficult to be reached in engineering. There are too many aspects and too many different fields of science which are our tools, which must be considered and rational thinking cannot be left behind. But we can learn from Japanese art that the use of knowledge and methods must be well trained that we must govern our tools and aim at the synthesis. The difficulty is that the quantity of the necessary knowledge is so very large and that the tools to use the knowledge are also manyfold so that a single individual can almost not collect all what is needed for a good design. This can only be overcome by teamwork, by the good will to respectful cooperation. Such co-operation should also be fostered with those who are in charge of inspection and maintenance. There had been some contributions pointing to this necessity to learn of damages under the impact of service and weather. Such experience must be fed back to the design offices. We have too many engineers who drill a deep hole for finding some small knowledge, which we need, but his drilling took so much of his mental capacity that he lost the survey. We need more engineers who can collect results and can judge interdependences and can assemble all these analysing work to a good synthesis.

In order to reach this aim, we must stop to make everything more and more complicated, we must stop to see scientific glory in getting so sophisticated, that the average engineer can no more understand. It was Mr. Dicke who told us a fine story ending with the request to keep things simple. The highest level of art is simplicity.

This Association plans to publish surveys, state-of-art reports, in order to help engineers to get again a wider range of knowledge and tools for their design work. These survey reports must also be kept simple and understandable. I think that we are already on the way in this direction and that many of you will join us in these efforts.

Our structures must fulfil functional, social and economic requirements. Social requirements include environmental aspects. If we look at structures which had been built during the last decades, then we find only few which please us by their appearance in the environment. Real beauties, which would enjoy us like Japanese ladies in their beautiful kimonoes, are very rare. So we should give more emphasis to aesthetic features of our design work. We engineers should not leave that to the architects alone, there should be a good cooperation which requires that engineers themselves study the rules of aesthetics. There are national commissions at work for this task. Our Association plans also to get active in this field and I would appreciate help from our members. We plan to have a session on aesthetics of engineering structures at our next Congress in Vienna.

This Association has also the aim to promote international cooperation and understanding. International exchange of newly gained knowledge and practical experience becomes more and more important; it can help to save a lot of national money and to improve the service which our work shall give to society.

One of the barriers to improve this cooperation is the language problem. It can be overcome if we follow the principle that everybody should be able to speak his mother tongue and English. This Congress has shown us again that we need such a simplification. I would much like to ask the many university professors who are attending this Congress from countries other than English speaking, that they may take influence on their educational authorities to have English as primary foreign language. They should also send their assistants and as many students as possible to English speaking countries. But let us get effective courses in good pronunciation! In about twenty years we should have such congresses with one language only. But in the cultural field, each nation should preserve and cultivate her national customs, art and specialities to avoid annoying uniformity.

The President of the Japanese Organizing Committee, Mr. Yoshihiro Inayama, mentioned in his speech at the opening ceremony that engineers should help to build a peaceful world and avoid war. We all emphatically agree. Engineers can be proud of the great progress they have achieved in improving the living conditions and welfare of mankind. We have learned also that technical progress itself is not sufficient to satisfy society. Progress must be controlled by ethics, by assuming the moral and ethic responsibility for how technical and scientific progress is used.

Modern war is misuse of technical achievements, it cannot solve problems but causes only suffering and destruction. I believe that it is in the power of us engineers to stop misuse of the fruits of our work. It is our duty to fight against such misuse. We should refuse to do anything which in our knowledge leads to destruction and suffering. Peace can be strengthened if natural scientists and engineers join in solidarity and refuse to do harmful work. Our profession's aim and duty must be to serve society and mankind for improvement of life, and avoid any destruction. In this sense, this Congress was a Congress for Peace.

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