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FLOW-INDUCED STRUCTURAL VIBRATIONS

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Preface

In recent years there has been an unmistakable tendency for research in the fields of hydraulics and fluid mechanics to involve ever more sophisticated study of increasingly detailed aspects of problems, while in the process becoming further and further detached from the realities faced by practising engineers. At the same time, too many hydraulic engineers have continued to conduct model studies with the goal of obtaining ad-hoc solutions for specific problems, while directing little if any of their attention toward elucidation of the underlying mechanics and toward generalization of their results for future application. It was against this background that the International Union of Theoretical and Applied Mechanics (IUTAM) and the International Association for Hydraulic Research (IAHR) were approached and asked to cosponsor the Symposium on Flow-Induced Structural Vibrations, which would have as its objective the promotion of interaction between the active researchers and the practitioners, and of communication between the different disciplines concerned. To this end, invitations were extended to individuals who together represented the full range of the investigation-application spectrum, and contributions were solicited from scientists and engineers who, in general, approach vibration problems along different avenues. In soliciting contributions to the Symposium it was emphasized that priority would be given to

papers which shed light on the constituent phenomena involved in vibration problems and thereby enhance our understanding of the basic vibration-inducing mechanisms.

Included herein are the 49 papers and short contributions selected from among the more than 100 manuscripts submitted to the Scientific Committee, together with the 5 General Lectures and 5 Workshop Reports. The material is presented more or less in the order given in the Symposium program, and in general with only minor editorial changes. Preprints of all papers accepted for the conference were prepared and distributed well in advance of the meeting to the 210 participants, from 27 countries, who preregistered for the Symposium. The many prepared discussions which were submitted as a consequence added significantly to the stimulating atmosphere of the technical sessions. A separate volume containing all contributions to the discussions at the technical sessions is available from the Institute of Hydro-mechanics, University of Karlsruhe, Karlsruhe, Germany.

For many participants, one of the highlights of the Symposium were the workshops organized around the general theme "Research Priorities in Flow-Induced Vibrations". In the workshop reports, which were presented during a Panel Discussion, one will find recommendations extending far beyond research topics to a variety of non-technical questions, including improved communication between researchers and practitioners, long-range cooperation programs between different disciplines, and the necessary structuring and generalization of the rapidly growing and diversifying body of knowledge relevant to flow-induced vibrations. The general consensus that future conferences similar to the one reported herein would be a major step toward achieving these difficult goals was most gratifying to the Symposium organizers.

As chairman of the Scientific Committee, I wish to express my sincere gratitude to all promoters and supporters of the Symposium: to the members of the Scientific Committee for their help in the program planning, for selecting the papers, and for their cooperation in the Panel Discussion; to the Presidents of the sponsoring associations,

Professors H. Görtler (IUTAM) and T. Hayashi (IAHR), and to the President of the University of Karlsruhe, Professor H. Draheim, for their addresses during the opening session; to all Session Chairmen and Co-Chairmen for presiding over the meetings and leading the discussions; and, of course, to the many active participants who supplied a wealth of new ideas and information. Financial support was received not only from IUTAM and IAHR, but also very generously from the German Science Foundation and the Ministry of Cultural Affairs of Baden-Württemberg. Grateful acknowledgement is also given for the financial and other support received from the City of Karlsruhe, the Karlsruhe Alumni Association, the University of Karlsruhe, the German Academic-Exchange Service, the Klein, Schanzlin & Becker Foundation, the Landesgewerbeamt Karlsruhe, and the U.S. Army Karlsruhe Community Leader.

Last, but by no means least, I am happy to have the opportunity here to express special thanks to all collaborators and to my associates at the Institute of Hydromechanics, University of Karlsruhe, who worked with me during the more than two years of preparation that went into making the Symposium and its supporting program a success. I wish to single out for special mention two of the many individuals involved: Mr. Andreas Richter, who like no one else devoted time and effort to this endeavor; and my wife, Brigitte, who carried the responsibility for the ladies program.

Karlsruhe, February 1974

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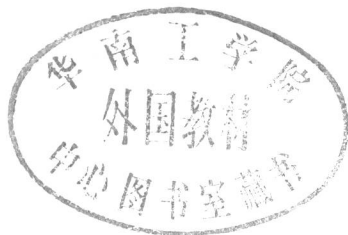
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