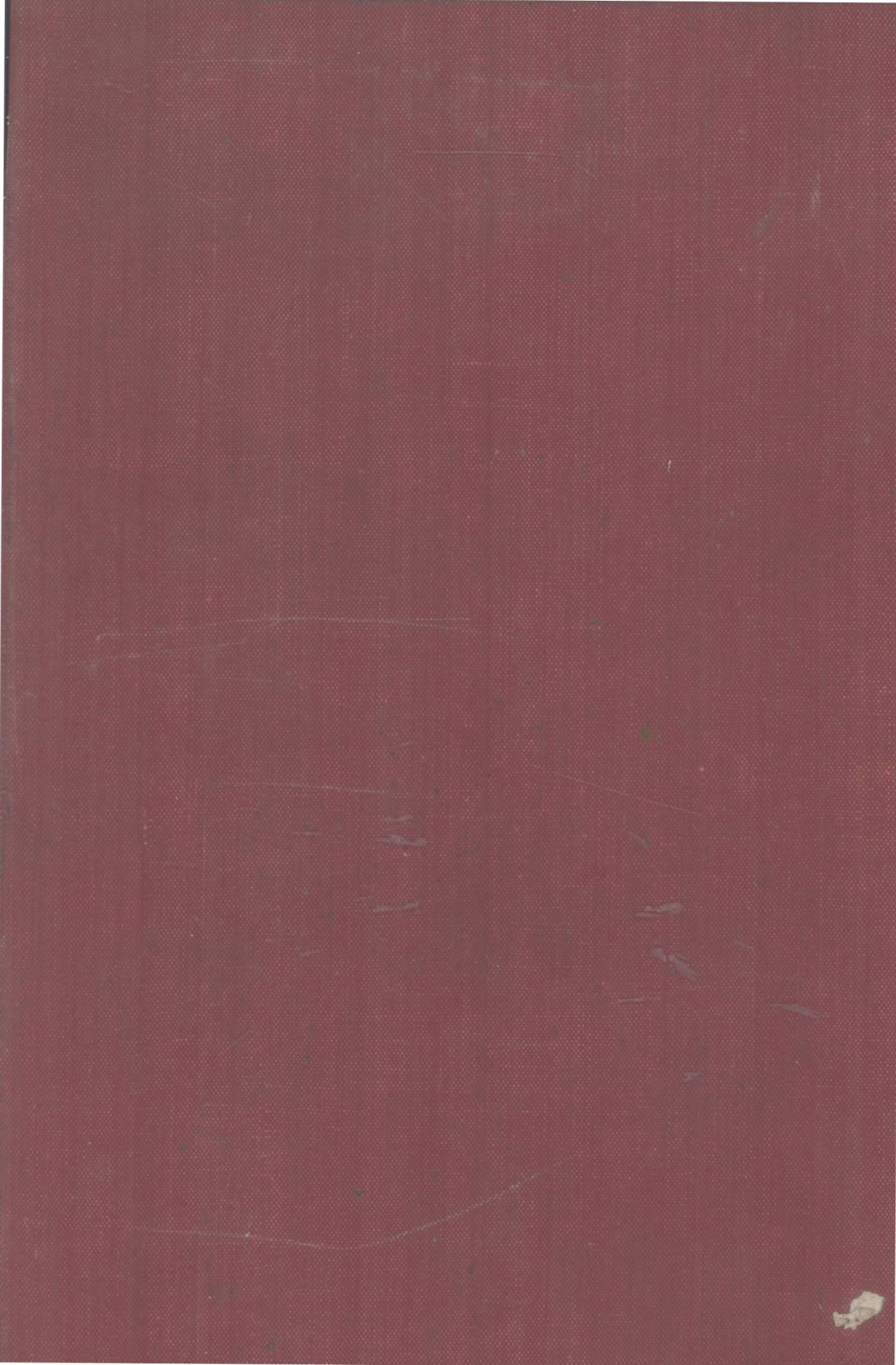


Computational Mechanics '86

Theory and Applications

Volume 1



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Theory and Applications

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Volume 1

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Preface

It is often said that these days there are too many conferences on general areas of computational mechanics, mechanics, and numerical methods. While this may be true, the history of scientific conferences is itself quite short. According to Abraham Pais (in "Subtle is the Lord...", Oxford University Press, 1982, p.80), the first international scientific conference ever held was the Karlsruhe Congress of Chemists, 3-5 September 1860 in Karlsruhe, Germany. There were 127 chemists in attendance, and the participants came from Austria, Belgium, France, Germany, Great Britain, Italy, Mexico, Poland, Russia, Spain, Sweden, and Switzerland. At the top of the agenda of the points to be discussed at this conference was the question: "Shall a difference be made between the expressions molecule and atom?" Pais goes on to note: "The conference did not at once succeed in bringing chemists closer together... It is possible that the older men were offended by the impetuous behavior and imposing manner of the younger scientists" (see references cited in Pais' book). It may be observed that history, in general, repeats itself. However, at ICCM-86 in Tokyo, roughly 500 participants from both the West and the East were in attendance; there were only scholarly exchanges; the young tried to learn from the more experienced, and a spirit of international academic cooperation prevailed.

In the past 25 years, the field of computational mechanics has steadily emerged as a discipline that is poised to make revolutionary changes to the practice of engineering in developed countries as well as in emerging industrial societies. The field has become vast, encompassing the work of the engineer, the mechanician, the mathematician, the numericist, the computer scientist, the systems analyst, as well as the computer enthusiast. The aim of the present series of International Conferences on Computational Mechanics (ICCM), planned to be held every 2 years, is to become a forum for discussion and exchange of scholarly research in those areas of computational mechanics which involve and enrich the rational application of mechanics and numerical methods in the practice of modern engineering. The areas of research that are to be discussed include: solid and structural mechanics; constitutive modeling; inelastic and finite deformation response; transient analysis; structural control and optimization, fracture mechanics and structural integrity; computational fluid dynamics; compressible and incompressible flow; aerodynamics; transport phenomena;

heat transfer and solidification; electromagnetic field, related solid mechanics and MHD; and modern variational methods in general. It is believed that this diversity of topics will play a crucial role in the cross-fertilization of ideas.

That the above-stated objectives of ICCM were amply met at the first conference, held from 25 to 29 May 1986 at the Science University of Tokyo, is evidenced by the excellent work presented by distinguished scholars from all over the world and documented in these proceedings.

The Editors take great pleasure in expressing their sincere thanks to the members of the Organizing Committee, the International Steering Committee, and the National Organizing Committee of ICCM-86, Tokyo for their help in realizing the objectives of this conference. The Editors also thank their colleagues in many parts of the world who have kindly accepted the invitations to present their work at ICCM-86 and prepare their papers for inclusion in the conference proceedings.

It is the sincere hope of the Editors that the readers of these two volumes will find, recorded here, a kaleidoscopic picture of the state-of-the-art in diverse areas of computational mechanics, its theory, and its application in various parts of the world.

May 1986

Genki Yagawa
The University of Tokyo
and

Satya N. Atluri
Georgia Institute of Technology

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