INTRODUCTION

Background

The *American Academy of Mechanics* has the unique charter to (1) serve all nations of South, Central, and North America and (2) recognize and encourage achievement in mechanics without regard to the professional orientation of the contributor, eg, whether mathematician, engineer, geophysicist, or solid state scientist. In January 1989 the first *Pan American Congress of Applied Mechanics (PACAM I)* took place in Rio de Janeiro, initiated and organized by the Academy. Cosponsoring the event was the *Associação Brasileira de Ciências Mecânicas*, and serving as host was the *Departmento de Engenharia Civil, Pontificia Universidade Católica do Rio de Janeiro.* In attendance were around 150 participants from North America and 50 from Latin America.

By all considerations, the Congress was a success. The unanimous recommendation of the participants at PACAM I was that another such meeting should be held. This despite the plethora of meetings on local and international levels, prompting a consideration of the reasons for such enthusiasm. The city was a delight and the arrangements by the hosts were excellent, but deeper currents were present.

North and Latin America share severe economic problems, a substantial portion of which can be attributed to a "crisis of quality" in consumer (including aerospace) products. For a long-term improvement in design, it is necessary that first rate work in mechanics be encouraged and utilized, rather than be considered a dispensable luxury. Although this lesson has been learned in a few Pacific rim and European countries, one may argue that it has been forgotten in the United States.

Some Latin American countries have attempted to follow the economic leaders with aggressive plans for improving engineering quality by sending students abroad for graduate training. We may hope that such plans with long-term goals are not undermined by the present massive public indebtness in North and Latin America. Now, and in the past, a number of students sent abroad either stay abroad or go abroad again after a few years back home, at least partly because of the isolation from the centers of mechanics activity. The main stream of communication in the international mechanics community is between North America and Europe, with Asia moving in rapidly. Thus PACAM I was a step toward a sustained level of significant technical interchange between North and Latin America.

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The present volume is evidence of the potential of such interchange. The papers contained in this volume were selected from those presented at PACAM I by a committee consisting of the co-editors and the following participants: J D Achenbach, W Altman, Z P Bazant, P Glockner, R E Johnson, P Kittl, P H McDonald, D T Mook, J N Reddy, J L Sackman, and F Y M Wan. The selection was based on the quality of the short paper appearing in the PACAM Proceedings and on the quality of the oral presentation, with some consideration for a representative distribution of subject matter.

As it worked out, the distribution of countries represented in this volume is similar to that of PACAM participants, with the largest representation from the USA and from the host country of Brazil. The wide range of subject matter shows the vitality of applied mechanics, but also the difficulty in defining the subject. Most of these papers represent advances in areas of research actively pursued by a large number of investigators the world over, while some contain very novel approaches and/or novel applications virtually unique to the author. We are grateful to A W K Metzner, Editor of *Applied Mechanics Reviews*, for the opportunity of gaining a wide distribution of this valuable material in the format of this Supplement.

Future of PACAM

Following the recommendations of the participants at PACAM I, plans were made and have been approved by the Board of Directors of the American Academy of Mechanics for a second Pan American Congress of Applied Mechanics. PACAM II will be hosted by the *Universidad Tecnica Federico Santa Maria,* located in Valparaiso, Chile, and will occur in January 1991. D T Mook (Virginia Polytechnic) is the general chairman, and G Reinke will serve as chairman of the local arrangements committee.

For PACAM II, in addition to the general contributions, a focus will be on selected areas of common concern such as seismic and pollution engineering. A formal invitation has been received for a subsequent PACAM III, and mechanicians at other sites in Latin America have indicated interest in future PACAM's. It appears therefore, that the present volume will be the first in a series which will provide archival documentation of improvement in collaboration across the Americas.

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