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FOREWORD/EDITORIAL

HYDROELASTICITY IS OF CONCERN in various areas of marine technology, such as high-speed vessels, floating airports, floating bridges, buoyant tunnels, risers, various cable systems and umbilicals for ROVs, and flexible containers for water transport and oil spill recovery. Analysis for design of such structures or systems necessitates integration of hydrodynamics and structural mechanics; hydro-elastic behaviour is the key phenomenon to be modelled.

The topic of hydroelasticity began to attract increasing attention in the 1970s, stimulated in part by the expanding concern for ship vibrations at the design stage, and also by the development of very large offshore structures for exploiting hydrocarbons in deep waters. As far as we are aware, the first international conference with several papers devoted to various aspects of this subject was that held in 1974, at University College London, on "The Dynamics of Marine Vehicles and Structures in Waves". This was organized by R.E.D. Bishop and W.G. Price, who led the way in emphasizing the importance of hydroelasticity to the naval architect, as crystallized by their 1979 book "Hydroelasticity of Ships".

Increasing interest in hydroelasticity during the late 1980s and early 1990s led to organization of the International Conference on "Hydroelasticity in Marine Technology" at Trondheim, Norway, in 1994. This was followed by the Second International Conference at Fukuoka, Japan, in December 1998. It is planned to hold the Third Conference in Oxford in 2002.

The papers in this Special Issue of the *Journal of Fluids and Structures* had their origins in the Fukuoka conference. Those we selected for submission to the journal (and which in due course were expanded and/or revised to meet the requirements of the referees) are representative of the major areas of current interest. Perhaps the greatest effort recently on research into hydroelasticity has been concerned with very large floating platforms of extremely small rigidity relative to their size. There is particular interest in such floating structures in Japan (for example for floating airports) and in the U.S.A. (in the context of mobile offshore bases). Hence, of the nine papers in this Special Issue, four are devoted to *Pontoon-type floating platforms* (which are effectively very thin floating plates); and two are concerned with *column-supported floating platforms* (which comprise large numbers of vertical columns grouped in flexibly connected units). Hydroelastic effects in these structures may be generated by waves, tsunamis, impacts and moving loads (the last two associated with aircraft operations, for example). Behaviour of a flexible membrane structure in waves, namely the seal bag of a Surface Effect Ship, is the subject of another paper, typical of hydroelastic phenomena arising for various *special craft*. Lastly, an area of great importance is that of marine risers, pipelines, cables and umbilicals. Two papers in this Special Issue are therefore concerned with hydroelastic effects in *cables and rods*.

Perhaps we could be permitted to close with a personal reflection. We first met at the 1974 London conference. The papers we presented there concerned wave interaction effects in multi-column structures, and modal analysis for representing hydroelastic behaviour. While we believed 25 years ago that the topic of our research was worthwhile and would find application, we would not have anticipated that our interests in hydroelasticity would converge in the context of flexible marine structures of up to 5 km in length (as being developed within the Japanese Megafloat project). And we certainly would not have

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predicted that we would be jointly editing a Special Issue of the *Journal of Fluids and Structures*!

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