

FOREWORD

Biomechanics is a rapidly developing field of applied mechanics. It ranges, *grosso modo*, from cellular biomechanics to orthopaedic biomechanics. As usual in mechanics, important role is played by modelling and numerical analysis, here applied to the description of bone and soft tissue behaviour, bone – implant system, etc.

This special issue of *Engineering Transactions* is concerned with several aspects of biomechanics. Particularly, the modelling of influence of marrow on bone response is investigated by using Padé approximants. Bone remodelling is studied both from the theoretical point of view and cells functioning. Two papers deal with experimental investigation of bone by using ultrasonic techniques. One paper is concerned with computer simulation of muscles at the molecular level. Two papers deal with isotropic and anisotropic macroscopic models of soft tissues. The mechanism of lubrication of animal joint is unknown. New features are revealed by modelling the synovial fluid as a liquid crystalline matter. The cartilage is viewed as an anisotropic, inhomogeneous and multiphase, deformable porous material. Biomaterials play important role in bone surgery. One paper deals with a specific class of such materials, namely bioceramics.

Four papers study various aspects of orthopaedic biomechanics, including femur – implant system, unilateral external fixators, hip stem optimization and idiopathic scoliosis.

All in all, the present issue offers interesting insight into many aspects of currently important problems of biomechanical modelling.

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