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INTRODUCTION

At the 1983 Annual Meeting of the Biomedical Engineering Society, the six papers that follow were presented as a Symposium on Musculoskeletal Mechanics. A main purpose of the Symposium was to illustrate to the Society's members the breadth and depth of current research activity in the biomechanics of the human musculoskeletal system. During the past fifteen years, and from very modest beginnings, that field has grown to become a major endeavor of biomedical engineers. In orthopedic biomechanics, for example, the handful of engineers struggling for recognition of what they knew they had to contribute has grown to a host secure as to society's need for their special backgrounds. More than half of the papers annually presented to the Orthopedic Research Society are now classed as bioengineering research papers, and more than one-third of the present members of the Orthopedics and Musculoskeletal Diseases Study Section of the National Institutes of Health, which has substantial influence on future research directions, have been trained as engineers. Musculoskeletal biomechanics research clearly is thriving, and it is thriving for reasons of substance.

The six Symposium papers were chosen in part to show the diversity of the field. The first two deal with fluid-solid interaction problems. The study of fluid transport through cartilage by Kwan et al. constitutes basic research with the long-term goal of understanding the mechanisms of arthritis; whereas that of Lewis et al. on fluid pressures at bone-implant interfaces is aimed at improving the design of orthopedic prostheses. The paper by Ruff and Hayes considers changes in human bone properties that occur with age, through measurements in the Pecos Pueblo collections of skeletons. An and Chao review techniques for quantifying the often complex kinematics of human joint motions. Gielen et al. report studies of how the human nervous system, that most sophisticated of all control systems, controls wrist motions. Finally, my own paper shows how biomechanical analyses are directing research into the unknown causes of curvature of the spine.

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Albert B. Schultz
Department of Mechanical Engineering
and Applied Mechanics
University of Michigan
Ann Arbor, Michigan