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Special issue on symposia organized by the American Society of Biomechanics at the 7th World Congress of Biomechanics



First, a bit of historical background adapted from the founding documents of the American Society of Biomechanics (original author unknown)... The American Society of Biomechanics (ASB) was founded in 1977 by a group of 53 scientists and clinicians. There were at the time several regional and national organizations in the United States that regularly or occasionally assigned portions of their broader meetings to biomechanics content. However, people associated with the parent fields generally attended those meetings, with more sparse attendance by front-line biomechanists. As a result,

there was little opportunity for the kind of exchange between people working in biomechanics across different fields of application that would clearly benefit all concerned. ASB was formed to meet that need. The ASB mission is:

*To encourage and foster the exchange of information and ideas among biomechanists working in different disciplines and fields of application, **biological sciences, exercise and sports science, health sciences, ergonomics and human factors,** and*



Fig. 1. This collage highlights but a few moments from ASB activities at the 7th World Congress of Biomechanics. (Jing-Sheng Li and Cara Lewis generously provided the photographs.).

engineering and applied science, and to facilitate the development of biomechanics as a basic and applied science.

ASB has endeavored over the years to engage scientists in these five core scientific disciplines. Holding its Annual Meeting last year in conjunction with the 7th World Congress of Biomechanics provided the members of ASB an opportunity to recall the organization's original mandate, while also engaging with the broader biomechanics community. With a limited number of dedicated podium sessions available, the ASB Executive Board decided to hold five discrete symposia based on the core scientific disciplines and highlighting some of the best and most recent activities in them. Organizers were identified and approached, they generously agreed to take up the challenge, and their efforts culminated in the following ASB Symposia that took place the week of July 7–11, 2014 (Fig. 1).

Technology, Health and Rehabilitation

Organizers: Mary Rodgers, PT, PhD–University of Maryland and Irene Davis, PT, PhD–Harvard University

Simulation Models of Sport and Exercise

Organizer: John Challis, PhD–The Pennsylvania State University

Subject- and Patient-Specific Musculoskeletal Modeling

Organizer: Don Anderson, PhD–The University of Iowa

New Approaches to Biomechanics in Ergonomics/Human Factors

Organizers: Richard Hughes, PhD–University of Michigan and Rakié Cham, PhD–University of Pittsburgh

Metabolic Energy Use in Movement: Basic Principles to Human Health

Organizers: Brian Umberger, PhD–University of Massachusetts Amherst and Jonas Rubenson, PhD–The Pennsylvania State University

Following the meeting, we approached the editor of this esteemed journal with the idea of distilling the content of these symposia into a special issue of the journal. The “baker's dozen”

papers included in this issue represent the culmination of this effort.

The papers range in topical content from efforts at better understanding the biomechanical basis of the metabolic cost of human movement to predicting the influence of that movement on the development of arthritis... from exploring muscle redundancy to peering (virtually) inside the joint to understand hip pathology... from the musculoskeletal burden of overhead work to the application of knowledge of hand function to guiding inclusive design... from guiding toy development and game play for neuromuscular therapy to a better understanding of locomotor adaptation following stroke. The discipline of biomechanics is as healthy and vibrant as ever, and the papers in this special issue reflect well on this reality.

We would like to thank the authors for submitting these manuscripts, the reviewers who were generous with their time and thorough with their critiques, and the authors (again!) for taking the critiques to heart and producing the final high quality final papers published herein.

Enjoy the read!

Guest Editors

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