Book Review

Orthopaedic Engineering, Harris, D. and Copeland, K. (Eds.) Biological Engineering Society, London, 271p. £10.00.

This volume comprises the proceedings of the Conference held in Oxford at the Department of Orthopaedic Engineering in 1977.

The material is in four main sections, Spinal Research, Three Dimensional Measurement of the Body, Gait Analysis and Orthotic Design and Fabrication.

The editors have deliberately decided to publish a range of papers in these topics and there is no coverage for other areas in biomechanics such as prosthetics or orthopaedic implants.

There are a total of forty-three chapters and the authors comprise forty scientists or technologists and twenty clinicians from the United Kingdom, there are eighteen from overseas and, of these, six are from North America. The coverage of the professional material is therefore strongly biased towards United Kingdom fields of activity and professional expertise.

The book is A3 in format and the print, though small, is clear and easily legible. Each chapter is well illustrated with line diagrams and where photographic records are presented these are reproduced with satisfactory clarity.

In the spinal research area the papers represent the many different attacks which are currently made on this problem; for example, cadaver investigation and the determination of mechanical properties of the relevant tissue materials; measurement of the biomechanics of the lumbar spine in the living individual and studies of the back muscle activity involving myo-electric techniques as well as investigations of work factors related to industrial incidence of back pain and the effect of spinal orthoses.

In the section on three dimensional measurement the principal problem considered is the measurement of the shape of the trunk and relative movements between spinal segments. The techniques presented are studio photography, Moiré topography, together with ultra-sound and the use of x-rays in static and dynamic analyses.

In the gait analysis section descriptions are given of the use of television cameras interfaced with computers, together with polarized light goniometers, mechanical goniometers as well as force platforms. The applications of the studies relate to, for instance, the interpretation of joint loading, the assessment of patients with arthritic conditions, as well as the investigation of racehorse injuries. There is one paper on prosthetics investigating the angular accelerations of below-knee limbs in order to determine optimal moment angle relationships in respect of knee flexion in the swing phase. The performance of below-knee amputees is assessed with a view to acquiring information relative to the design of mechanisms for application to above-knee prostheses.

In the orthotics design and fabrication section, there are studies of the loads transmitted by particular leg orthoses together with the clinical assessment of particular systems and materials of construction, with presentations relating to specific methods of orthoses construction.

There are also papers relating to the problem of support of the severely disabled patient, taking account of the requirements of stability and the avoidance of pressure sores.

This volume comprises a useful summary of the research activities in its chosen areas and it will be of considerable use to those requiring an introduction to these particular areas of study. It will be a useful book to have on the bookshelf for a limited number of years, recognising the general characteristic of the transient nature of books of this type, reporting the results and discussion of professional conferences and symposia. In due course the material will be stabilized in authoritative text books and the reader will be looking for the research presentations of the future for guidance in the developing fields.

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