

Book Review

□ **Vestibular and Neural Front.** Proceedings of the 12th International Symposium on Posture and Gait, Matsumoto, Japan, 3-7 October 1994. Edited by K. Taguchi, M. Igarashi, S. Mori, Amsterdam, The Netherlands; Elsevier Science B.V., 1994 US\$ 240.00. 624 pages.

In his preface to this book, Professor Taguchi states that the Symposium had two main aims, first to "study recent progress in posture and gait research," and second to provide an international forum to expedite the conversion of laboratory research methods into clinical procedures that will be of direct benefit to patients. The Symposium was organized by the International Society for Posture and Gait Research (ISPGR), which is an eclectic organization whose membership includes pure and applied scientists, physicians, surgeons, physical therapists, and engineers. The Society has, in general, limited its interest in gait to control of gait and disorders of gait arising from sensory and neural dysfunction, so the prospective reader should be aware that there is, intentionally, little mention of orthopaedic problems, a subject that is covered comprehensively by other special interest groups.

It is obviously not possible for a meeting of this type to provide a fully comprehensive survey of current research. A number of researchers who are active in the field did not attend, but despite this the list of attendees contains a substantial proportion of investigators who have published extensively in this area. The participants came mostly from Japan, the USA, Canada, Eastern and Western Europe, and Scandinavia, although there were also contributions from Russia, the People's Republic of China, and Australia.

The book commences with an Opening Lecture, and the following 131 contributions are grouped in 8 sections of varying length (the publisher's advertisement states that over 150

papers were received, as does the Preface to the book). Each section starts with a keynote paper occupying about 10 pages, the remainder of the contributions occupying 4 pages each. In the Opening Lecture, Dr Hinoki compares Fukuda's view of labyrinthine and postural reflexes with those of Bárány and Magnus and discusses the effect of the patient's emotional condition on postural equilibrium.

The first section is entitled "New devices and diagnostic contribution of postural and locomotion measurement." The introductory paper from Dr Black (Dow Neurological Sciences Institute, Portland, Oregon) discusses the findings of computerized dynamic posturography in normal and abnormal populations. The broad section title encompasses an equally broad range of contributions describing the use of various methods of gait and postural measurement for the assessment of the effects of drugs, galvanic stimulation, lower limb prostheses, and various pathologies.

The second section is introduced by Dr Woollacott (University of Oregon) and covers "Development and aging in posture and gait." Dr Woollacott provides an excellent discussion of changes in balancing ability from early youth to old age, and of the effect of balance training at different ages. The contributions that follow cover both sensory and motor aspects of static balance and gait in children and young and old adults. All contributions except one are concerned with human subjects, that from Grigorian and colleagues compares the development of postural reflexes in guinea pigs, rats, and kittens.

Dr Fay Horak (Dow Neurological Sciences Institute) discusses balance rehabilitation in vestibular and neural lesions in section three ("Physical training, exercises and rehabilitation"). The section includes assessments of the effectiveness of exercise programmes in improving postural and motor performance in

elderly subjects, and discussion of various methods of rehabilitation for vestibular disorders and hemiplegia. Two contributions compare the postural performance of athletes from several sports with that of untrained control subjects.

The title of the fourth section, "Biomechanical model of posture and gait," is misleading in that not all of the contributions are concerned with what one would strictly describe as biomechanical models. This is not true, however, of the introduction by Dr Allum and Dr Honegger (ORL Dept, University Hospital, Basel, Switzerland), which I personally found to be one of the most interesting in the book. They describe the use of three different methods for calculating the muscular torques about the various joints in standing subjects, present the advantages and disadvantages of each, and then go on to propose that the quantitative knowledge of joint torques and the changes in them produced by pathology may be the best guide to understanding impairment of postural control. The remaining papers include a number that describe the dynamics of gait and the mechanics of standing posture.

A peculiarity of section 5 is that the long keynote contribution appears halfway through the section, and the section is shorter than most of the others, containing only 9 contributions. The section title is "Autonomic nervous system and other effects on posture and locomotion" and the majority of the contributions discuss the effects of posture on blood pressure (and vice versa in the case of falls). The keynote paper from Dr Jäntti (Geriatric Medicine, Tampere City Hospital, Finland) and Dr Pyykkö (ORL, Helsinki University Hospital, Finland) discusses causes of falls in the residents of a nursing home for elderly people and some related research on orthostatic blood pressure reactions.

In contrast to the previous section, the next, "Neural mechanisms of posture and gait," is much larger and contains 31 contributions. Dr Pompeiano sets the scene with a comprehensive discussion of animal studies of the role of the lateral vestibular nucleus and the dorso-lateral pontine tegmentum in the control of static and dynamic posture. The remainder of the contributions describe a mixture of animal

studies and studies of a variety of reflex responses in human subjects.

The last two sections, "Nystagmus and abnormal eye movements in relation to body equilibrium" and "Space and posture," are both short. Section 7 contains 6 papers, including the keynote paper by Dr Dieterich and Prof. Brandt (Dept of Neurology, Klinikum Großhadern, Munich) on the association between the symptoms of roll vertigo syndromes and the location of lesions in the brainstem. Section 8 is introduced by Dr Pozzo, Professor Berthoz, and Dr Popov (University of Dijon; CNRS, Paris; IPIT Academy of Sciences, Moscow) with a discussion of the postural/motor strategies used in a lifting task in weightless conditions and under gravity. Two of the 5 papers have nothing to do with space flight or microgravity, and it is not clear why they were included in this section.

The main problem with Proceedings of this type is that the authors do their own editing and refereeing and, in consequence, the quality of the contributions varies considerably. The longer keynote articles are all of high quality and are comprehensively referenced. In the short contributions, some authors have managed to include a great deal of information in the space available, and I would estimate that a little under one-third of the contributions are likely to be read with interest. In slightly more than a third, either the content or presentation is of only average quality, although providing some useful information, and the remainder are either difficult to understand or of poor quality. English is not the first language of a significant proportion of the authors, but the standard varies mostly from passable to good, and there are few spelling errors.

To summarize, as expected the quality of the book is uneven, but about 25% to 30% of the papers were, for me, worth reading. Topics ranged from basic research to research methods and equipment and clinical studies. The 8 sections vary considerably in length and quality, and the section titles do not always provide an adequate indication of the section content. To whom would I recommend this book? First, to those who have limited knowledge of research in this area and are interested

in broadening their knowledge of posture and gait. The longer keynote articles will be of considerable assistance in this; in addition they are well referenced and will provide useful pointers to other sources of information. Assessing the utility of particular references is however hampered by the fact that the standard reference format omits the title of the paper. A proportion of the other contributions will also be helpful; the only caveat is that the inexperienced reader may have trouble in assessing the quality and utility of individual contributions. I do not however think that the book will be useful to investigators interested in specific aspects of posture and gait research, as they will find little that is not currently available, or likely to be available, in the journals. The book may also be useful to people who, like me, were unable to attend the Symposium and would like to have a record of the proceedings.

Overall I have personally found the book useful and interesting, although I cannot say that I have enjoyed reading it straight through, even in several sessions, and I would not recommend anyone to try to do the same. I did find however that reading such a large number of short contributions in succession prompted some general reflections about the research. This point is of particular relevance to the assessment of the success of the second aim of the Symposium, which was to promote the development of clinical applications of research. There are many laboratories in which assessment of control of posture is used during diagnosis and treatment with great success, but these laboratories represent the best current practice and depend on the skills of specific groups of individuals from several disciplines: clinicians, therapists, basic scientists, and engineers. The problem that the Symposium intended to address was that of translating this knowledge into a form that could be used in less specialized clinics with more limited resources of finance and personnel. There will have been informal discussion of this topic at the Symposium, but if there was a more formal discussion it has not been reported in the Proceedings, and it is therefore not possible to say whether the Symposium achieved its aim.

It is obvious from the book that there is lit-

tle consensus about methods of assessment of the quality of control of posture, despite an earlier attempt on behalf of the International Society of Posturography (now the ISPGR) to standardise test methods (1). Many laboratories have their own idiosyncratic test equipment and procedures and analyze the data from their equipment in different ways (this book provides a representative picture of the variety). The Equitest™ and Balance Master™ test systems produced by NeuroCom International Inc. are becoming standards in one sense, as they provide consistent methods of testing subjects and analyzing and presenting data (although one paper in this book describes the use of stimulus software for the Equitest™ that has been individually modified). The problem with this is that not everyone agrees that the test methods and the data analysis are ideal, and the price of the equipment precludes its introduction for general use. It may be the case that the variety of methods in use reflects the fact that the current state of knowledge about control of posture and gait is not sufficiently developed for a consensus to emerge. One way to attempt to answer this question would be for the ISPGR to set up a small working party to perform a meta-analysis of the literature to see whether any particular approaches have clear advantages. Even if this does not turn out to be the case, the working party may be able to provide guidelines for postural testing that would make results from different laboratories easier to compare. Perhaps the most important function of the guidelines in this case would be to advise researchers what not to do so that they avoid mistakes and methods that have been shown not to work.

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