



International Society of Biomechanics Newsletter

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TABLE OF CONTENTS

From the President	2
Job Market	3
The Internat'l Shoulder Group	3
4 th Symposium of the ISB Technical Group on Footwear Biomechanics	4
You could have been there	5
Upcoming Meetings, Etc.	6
Places to Go	8
Reports from ISB Grant Awardees	8
Let's put your day in perspective	11
Physics meets product liability notices	12
Personal/Professional Relationships	13
Sensitive engineers avert your eyes	13
ISB Membership News	14

AFFILIATE SOCIETIES OF ISB:

American Society of Biomechanics; British Association of Sport and Exercise Sciences; Bulgarian Society of Biomechanics; Canadian Society of Biomechanics/Société canadienne de biomécanique; Chinese Society of Sports Biomechanics; Comisia de Biomecanica Inginerie si Informatica (Romania); Czech Society of Biomechanics; Formosan Society of Biomechanics, Japanese Society of Biomechanics; Korean Society of Sport Biomechanics; Polish Society of Biomechanics; Russian Society of Biomechanics; Société de biomécanique (France).

From the President: Kit Vaughan

Earlier this decade, I had the good fortune to serve as the newsletter editor for the American Society of Biomechanics. Each edition I would pick a theme to explore – hypotheses, the potential impact of the World Wide Web (way back in 1994 I might add!), grant writing, industry vs academia, etc. – and in May 1993 the spotlight fell on slide-making. I included a cartoon in which the speaker was droning on about "... this diagram clearly explains the principle underlying this very important concept; next slide please ..." while members of the audience were either fast asleep or needed a pair of binoculars to read the fine detail of the slide! Those of you who know Dick Nelson, one of our Past Presidents, will recall that this issue of good quality slides which are legible to all in the audience is one of his favorite hobby horses. It's a topic about which I feel strongly too.

In a study done ten years ago, measurements of projected image sizes were made at five scientific meetings, and for those seated in the rear, the eye-to-screen distance averaged 10 times the projected image width. This applied to both large and small meeting rooms. Remember this ratio as it will enable you to evaluate how legibly your slides will project. Simply view the original figure, or the slide itself, from a distance 10 times its width. For example, a 35mm slide should be viewed from 350mm: hold the slide up to the light and you should be able to read every detail with the naked eye (assuming, of course, you have normal vision!). These days most slides are created on the computer and here again you can use the ten-to-one guideline. Assuming you have a 15" monitor, the actual width of the screen is approximately 270mm. Once you've created the slide and set the program to display mode (in PowerPoint, for example), you should get out your chair and stand 2.7m away from the monitor. If you cannot read every item on the slide, you have tried to include too much information. As you can imagine, there is a huge difference between your normal viewing distance when seated at your workstation (less than 0.5m) and the ten-to-one rule. If every speaker followed this simple approach, I am convinced that the quality of presentations at scientific meetings would improve dramatically.

In exploring this topic further, I would like to share with you a life-changing experience that I had in Calgary. During one of the keynote

presentations, I was having difficulty understanding one of the speaker's slides because I could not read the scale on his graph. I was busy cursing him under my breath for not following the ten-to-one rule when, on a whim, I turned to the person sitting next to me and asked him if I might borrow his glasses. It was a revelation. Not only could I now read the scale but the pixels (the speaker was using a data projector) literally jumped out of the screen at me! I determined then and there to have my eyes tested as soon as I returned to Cape Town. The next time you see me, I will be appropriately equipped!

The mention of data projectors brings me to the main point of this message. First personal computers and now the ubiquitous data projectors have changed the way we present our research material at scientific congresses. At the recent ISB conference in Calgary it was my impression that over 50% of the speakers chose the electronic approach. Despite the inevitable technical glitches (and my problems with myopia, alluded to above!), I was impressed with the quality of many presentations and the creativity of the authors. One powerful feature of electronic projection is animation, which is particularly relevant to our field where understanding movement is often so crucial. I can clearly recall the gasps in the audience during Scott Tashman's presentation when he demonstrated how the tibia and femur move relative to one another in the absence of the anterior cruciate ligament. Scott had combined bi-lateral X-rays of a running dog with CT data of the underlying anatomical structures to create a 3D animation that was stunning in its simplicity. The thought occurred to me that this information should be made available to every student of biomechanics – whether the person is an orthopaedic surgeon, an engineer or a sports scientist – and not just those few who were fortunate enough to attend Scott's presentation.

I mentioned in the last ISB newsletter that we should be looking at ways to enhance the value of our web-site to our members. We currently have a section that includes both software and data sets. I would like to propose that we add a new category -- electronic presentations -- where members would be encouraged to archive their files. In this way, the impact of their work would be far greater and we would, I believe, be promoting the exchange of information in a way that is consistent with the mission of the ISB. I realise that my suggestion is not without some potential problems, particularly on the issue of copyright, but I am confident that the

benefits far outweigh the risks. I foresee a time in the not-too-distant future where the ISB website will contain a repository of presentations on every imaginable topic, enabling both teachers and students of biomechanics to enhance their knowledge.

For my suggestion to work, it will be necessary for all of us to embrace the concept. Traditionally, scientists have been loathe to lend a 35mm slide to a colleague (they'd sooner lend their tooth brush!), but I believe that this current era of openness, particularly embodied by the Internet, augers well for my initiative. I would encourage you to contact me with your suggestions as we seek to advance our chosen field.

By the time you read this we will be in the next century. I trust you have all survived the Y2K crisis! May all your hypotheses prove to be true (or false as the case may be!) and I wish you everything of the best in the year 2000.

Job Market*

The Job Market may be accessed via:

<http://www.lri.ccf.org/isb/jobs/>

*The ISB Newsletter has adopted a policy by which it will accept currency in exchange for posting some position announcements. For an example, see the following section.

Position Announcement

Tenure-track faculty position available at the Assistant Professor level in the Department of Exercise Science commencing July 1, 2000. Must have fulfilled all requirements for their Ph.D. degree by the time of appointment. The degree earned should be relevant to the areas of muscle mechanics, muscle physiology, muscle metabolism, biomechanics and/or any specialization area that would be relevant to the current research efforts of the Exercise Science Department at USC. Must demonstrate evidence of scholarly productivity and potential for external funding. Responsibilities include development of an independent research laboratory, publication in peer-reviewed journals, acquisition of external funding for research, instruction at the undergraduate/graduate level and supervision of graduate students.

Applicants should provide a cover letter including research goals and teaching philosophy, a current curriculum vitae, 3 letters of reference, and samples of publications (3 max) to:

Dr. Lorraine Turcotte
Department of Exercise Science
University of Southern California
3560 Watt Way, PED 107
Los Angeles, CA 90089-0652
Email: turcotte@usc.edu
Fax: 213-740-7909

The International Shoulder Group (ISG) Submitted by DirkJan Veeger

During the last ISB congress in Calgary, the ISB members accepted the International Shoulder Group as a Technical Group within the ISB. As a new Technical Group it might be useful to introduce ourselves.

The International Shoulder Group has its roots in Los Angeles. During the XII ISB congress, a first meeting was held for which all attendants with a special interest for the upper extremity (and especially the shoulder) were invited. This meeting only comprised discussions on the possibilities for joining forces. In 1994, a one-day meeting was organized during the World Congress on Biomechanics in Amsterdam. However, the official first conference of the International Shoulder Group took place in Delft, the Netherlands. This meeting was quite small (~25 people), and mainly had a background in biomechanics. During that meeting it was decided that the ISG should become a more official organization and should eventually apply as a technical group. The actual application took place during 1998.

Why a special shoulder group? In the last decades, shoulder and upper extremity research has not exactly been part of the mainstream of biomechanics research. This might have been due to instrumentation difficulties. Since Braune & Fischer concluded in 1885 that the three-dimensional procedures they felt necessary were too time consuming to apply on a more general basis, we had to wait a few years before things changed. Also, developments in movement registration did not do much for the difficulties related to measurement of scapular motion (in addition, application of the x-ray technique as advocated by Braune & Fischer proved to be a bit more hazardous than was thought at that time). These two problems might have led to a strong focus on subjects that could reasonably be

studied in two dimensions and or with opto-electronic techniques.

If one is not in the mainstream of research, it is more difficult to exchange views and experiences related to the specific research problems one is facing. The best way of creating a situation in which this is possible, is to organize one's own forum.

The aim of the ISG is to further (biomechanical) research on the upper extremity and especially on the shoulder. To reach this goal, the ISG focuses on the stimulation of contacts between researchers and -groups, but also between researchers and people working in the field, i.e. physical therapists, clinicians and ergonomists. Exchange of ideas and knowledge is seen as the key tool for progress.

Some of the activities of the International Shoulder Group thus far are:

- organization of meetings on the topic of shoulder biomechanics
- standardization of movement descriptions and development of example measurement protocols. During the last meeting of the Shoulder Group, it was decided that the ISG should try to comment on and work according to a standardized movement description. It was decided that a small committee should be formed that would have to try to formulate a protocol that applied for the shoulder and arm and that would have to look at the consequences of a standardized procedure for the different research groups within the ISG. As a starting point, the protocol by Van der Helm was chosen. See <http://isb.ri.ccf.org/standards/> for the latest news on standards.
- stimulation of information exchange by:
 - setting up a web site. However, as most of you know this is easily done, but less easily maintained. As a consequence the ISG server has not been available for a while. The site is now back in the air, though at another address (<http://www.wbmt.tudelft.nl/mms/dsg/intersg/isg.html>). The site has not yet been renovated, however....
 - making relevant software available. Within a few weeks, when the ISG website is back in the air, a special page will be set up that contains relevant software related to the standardization effort described earlier;
 - integral publication on the internet of antropometric data for modeling. At this point a large amount of antropometric data on the shoulder and arm is already available (see

http://www.fbw.vu.nl/research/Lijn_A4/shoulder/overview.htm). This data base will be extended, but will also be combined with data bases on other (parts of) extremities in the near future; stimulation of student exchange.

Following the general meeting, a special meeting on the upper extremity was held at Calgary University. About forty enthusiasts met for two days to discuss research on the upper extremity and to practice both their upper extremities (playing pin-ball and drinking beer) and lower extremities (speed skating in the Olympic Oval). The programme reflected the aim of the ISG to integrate research and (clinical or ergonomic) application, as well as different scientific disciplines. Also, it is safe to say that important and pleasant contacts between participants have been established during these two days. For all of you who missed this just a picture to check who was there:



Of course, Proceedings from the meeting will become available. We are now in the process of editing the short papers for these proceedings. If you are interested in receiving the proceedings when they are published, or if you want to know more about the ISG, just send us an e-mail (ISG@fbw.vu.nl).

**Fourth Symposium of the ISB Technical Group
on Footwear Biomechanics
Submitted by Darren Stefanyshyn**

The Fourth Symposium on Footwear Biomechanics was held as a satellite meeting of the XVIIth Congress of the International Society of Biomechanics. The symposium was held in Canmore, Canada, August 5-7, 1999. The meeting attracted 109 participants who witnessed a strong scientific program with over 40 oral presentations

Congratulations to the following award winners:

Applied Research Prize presented by Adidas International

Anton Arndt, P. Westblad, I. Ekenman, A. Lundberg

A Comparison of In Vivo Local Metatarsal Deformation Wearing Two Different Military Boots

Basic Research Prize presented by Nike, Inc.
Martyn Shorten, B. Xia, T. Eng, D. Johnson
In-shoe Pressure Distribution: An Alternative Approach to Analysis

Young Investigator Prize presented by Mizuno Corp.

Thorsten Sterzing, E. Hennig
Measurement of Plantar Pressures, Rearfoot Motion, and Tibial Shock During Running 10km on a 400m Track

The organizing committee would like to thank the following major sponsors for their generous support of the Symposium: Nike Inc., adidas International USA, Mizuno Corp. and Converse Inc. Their contributions provided financial support for the 22 student registrants, allowed reduced registration fees for all participants and presented funding for the awards.

The Fifth Symposium on Footwear Biomechanics will be held as a satellite meeting of the XVIIIth ISB Congress in Zurich, 2001.

You could have been there...

ISB-99, 17th Congress of the International Society of Biomechanics,

Submitted by: Benno M. Nigg, Chair and Darren Stefanyshyn, Secretary General

The 17th Congress of the Int. Soc. of Biomechanics took place from August 8 to 13, 1999 at the Convention Center in Calgary, Canada. It attracted 886 delegates from 36 countries and all continents. The largest group of registrants came from the USA (296), the second largest from Canada (185) and the third largest from Japan (101). In total, there were 448 delegates from North America and 438 from the rest of the world.

Total Registrants	886
Students	296
North America	448
Rest of the World	438

The scientific program (organized effectively by Dr. Walter Herzog) consisted of 7 keynote speakers. The Wartenweiler Memorial Lecture was delivered by the Nobel Laureate, Sir Andrew Huxley, UK, certainly a highlight of the conference. Another highlight of ISB-99 was the Muybridge

Lecture, given by Dr. Paavo Komi. The other keynote lecturers were Drs. T. Andriacchi, S. Grillner, W. Hayes, J. de Koning and G. Rau. The quality of the conference was also supported by the quality of the invited speakers (total 24) and the many symposia (organized by Dr. Janet Ronsky).

In total there were 858 abstracts submitted, 819 accepted, 325 podium and 494 poster presentations. The poster presentations were well attended with more than 500 delegates at each of the two poster sessions.

A total of 19 exhibitors were present at the ISB-99. The companies were:

- Advanced Mechanical Technology Incorporated (AMTI)
- Biovision GmbH
- Elsevier Science Ltd.
- Innovative Sports Training, Inc.
- Kistler Instrumente AG
- Measurand Inc.
- Motion Analysis Corporation
- Motion Lab Systems Inc.
- Noraxon USA, Inc.
- Novel GmbH
- Peak Performance Technologies, Inc.
- Qualysis Inc.
- Redlake Imaging Corp.
- RSscan International
- Scientia Marketing Inc.
- Simi-Micromotion
- Skill Technologies, Inc.
- Tekscan, Inc.
- Vicon Motion Systems

A total of 12 awards were given at the congress. The awardees, awards and the funding sources were:

Foot Biomechanics, David Thompson, Novel
Promising Young Scientist, Ralph Müller Peak
Performance
Clinical Biomechanics, Michael Torry Cl.
Biomechanics
Miyashita Award (Asia), Chung-Yu Chen NAC
Miyashita Award (Perf. Symp.), Wolfgang
Schöllhorn, NAC

Young Investigator Oral, Frances Sheehan, J.
Biomechanics

Young Investigator Award Poster, Daniel Lambertz,
Japan ISB Congress

Calgary Awards

Sport Biomechanics, A.J. van Soest, Calgary

Clinical Biomechanics, Sylvia Ounpuu, Calgary

Orthopaedic Biomechanics, Evelyne Hasler, Calgary

Locomotion Biomechanics, Hermann Schwameder,
Calgary

Muscle Biomechanics, David Hawkins, Calgary

A few numbers (all in Can\$)

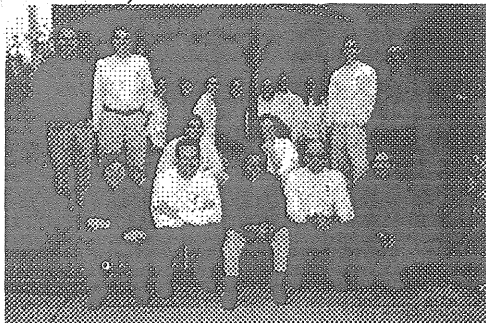
The delegates had box lunches for \$ 50,504, drank coffee for \$ 20,852 and drank wine and alcohol for \$ 27,195. The total food bill was \$ 138,891. The abstract books cost \$ 39,545. The total budget was approximately \$ 490,000. An amount of \$ 9965 was transferred from the congress organizers to the ISB for 131 new ISB members who were recruited during the meeting.

The conference was financially supported by

- Alberta Heritage Foundation for Medical Research
- Whitaker Foundation

**23rd Annual Meeting of the
American Society of Biomechanics
Submitted by Chris Phillips.**

The 1999 meeting of ASB was held at the University of Pittsburgh and hosted by Drs. Savio Woo, Lars Gilbertson, and an outstanding team from the Musculoskeletal Research Center (pictured below).



The scientific program was highlighted by a pre-conference tutorial on the clinical and research applications of gait analysis and a second tutorial on grant writing. The topics of the symposia included Sports Biomechanics, Neural Control, and Cardiovascular Mechanics. A special symposium in honor of Thomas A. McMahon was chaired by Art Kuo and included presentations by

Rodger Kram, R. McNeil Alexander, Andy Biewener and Toby Hayes.

In addition to the opportunity to visit the laboratories of the Musculoskeletal Research Center, the meeting schedule gave attendees a slice of Pittsburgh. The opening Keynote address was delivered by Professor Y.C Fung at the Opening Ceremony that was held at the Carnegie Museum. (Dr. Fung recently celebrated his 80th birthday!). Demetri Terzopoulous delivered the second keynote address at Pittsburgh's Soldiers and Sailors Museum. Bruce Martin delivered the Presidential Lecture at the Closing Ceremony. The conference banquet was held on a river boat that offered impressive views of a great American city. While many played the Monte Carlo tables, one of Pittsburgh's great bands, Pure Gold, brought the rest to the dance floor.

Professor Don Chaffin, from the University of Michigan, was this year's recipient of the Giovanni Borelli Award. Other award winners included Braden .C. Fleming, PhD, Post-Doctoral Award; Frank C. Anderson, Pre-Doctoral Award; Jonathon L. Sakai, ASB-Microstrain Award; Jonathon Dingwell, PhD, *Clinical Biomechanics* Award; Michael G. Conzemius, DVM, *Journal of Biomechanics* Award. Three additional awards, funded by the meeting organizers from the Musculoskeletal Research Center at the University of Pittsburgh were awarded to Peter Vint et al; Kharma C. Foucher et al., Chih-Tung Chen et al.

The ASB meeting was graciously sponsored by The Whitaker Foundation, Aircast, Inc., The Department of Orthopaedic Surgery of the University of Pittsburgh Health System, the Musculoskeletal Research Center, Orthofix, Innovation Sports, Linvatec Corporation, ASIAM Institute for Research and Education, and the School of Health and Rehabilitation Sciences, School of Engineering, and Department of Bioengineering at the University of Pittsburgh.

Upcoming Meetings, Workshops, Etc.

January

2nd International Congress on Skiing and Science in St. Christoph/Arlberg, Austria, 9-15 Jan 2000. Contact: Hermann Schwameder, Secretary General, Email: hermann.schwameder@sbg.ac.at
American Sports Medicine Institute's 18th Annual Injuries in Baseball Course, 27-29 Jan 2000, St. Petersburg Bayfront Hilton, St.

Petersburg, Florida, Contact: Cindy Tow at (205) 918-2167 or email her at cindy@asmi.org
5th Biennial Motor Control and Human Skill Research Workshop, 27-30 Jan 2000, Surfers Paradise, Gold Coast, Australia,
http://www51.gu.edu.au/mc_conf/index.htm

February

3rd Australian and New Zealand Society of Biomechanics Conference, 31 Jan-1 Feb, 2000, Griffith University, Gold Coast, Queensland, Australia, <http://www51.gu.edu.au/abc3/index.htm>
International Symposium on Musculoskeletal Loading and its Implications for Clinical Practice, 11-12 Feb 2000, Charite, Berlin, Germany, <http://www.charite.de/biomechanik>

April

11th International Conference on Mechanics in Medicine and Biology, 2-5 Apr 2000 Maui, Hawaii. <http://www.icmmb11.com/>
19TH Southern Biomedical Conference, 14-16 April Virginia Polytechnic Institute and State university, Blacksburg, Virginia. Contact: K. Forsten, PhD, Department of Chemical Engineering, 141 Randolph Hall, Email: kforsten@vt.edu, or J. Rogers Foy, PhD, Engineering Science & Mechanics Department, 219 Norris Hall, Email: jfoy@vt.edu,
<http://sbec.abe.msstate.edu/2000/19index.html>.

May

Sixth International Symposium on the 3D Analysis of Human Movement, 1-4 May 2000, Cape Town, South Africa. Contact: D. McTeer, Postgraduate Conference Division, Barnard Fuller Building, University of Cape Town, Anzio Road, Observatory 7925, South Africa, Tel: + 27 21 406 6348, Fax: + 27 21 448 6263, Email: deborah@medicine.uct.ac.za,
<http://www.uct.ac.za/depts/pgc/3dhome.htm>
2nd Course in Clinical Gait Analysis, 26-28 May, Royal Children's Hospital, Hugh Williamson Gait Analysis Laboratory, Melbourne Australia. Contact: V Facey, Tel: +61.3.9345.5353, Fax: +61.3.9345.5447, Email: faceyv@cryptic.rch.unimelb.edu.au

June

13th Congress of International Society of Electrophysiology and Kinesiology (ISEK 2000),

25-29 Jun 2000, Sapporo, Hokkaido, Japan. Contact: Ichiro Watanabe, MD, Dept. of Rehabilitation Medicine, Hokkaido University, N15, W7, Sapporo, 060-8638 Japan ; Tel. +81-11-706-6066. Fax. +81-11-706-6067, Email : isek20@med.hokudai.ac.jp ;
<http://soi.med.hokudai.ac.jp/~reha-w/isek2000.htm>
XVIIIth International Symposium on Biomechanics in Sports, 25-30 June 2000, Hong Kong. Contact: Y Hong, PhD, Tel: 852.2609.6082, Fax: 852.2603.5781, Email: isbs2000@cuhk.edu.hk,
<http://www.cuhk.edu.hk/spe/isbs2000/index.htm>

July

24th Annual Meeting of the American Society of Biomechanics, 19-22 July University of Illinois at Chicago, Chicago, Illinois. Contact: R. N. Natarajan, PhD, Department of Orthopedic Surgery, Room 1463 Jelke SC, Rush-Presbyterian-St.Luke's Medical Center, 1653 West Congress Parkway, CHICAGO, Illinois 60612, Tel: 312.942.5367, Fax: 312.942.2101, Email: rnataraj@rush.edu

August

1st International Congress on Tennis Science and Technology, 1-4 Aug 2000, London, England. Contact: Congress Secretariat, International Tennis Federation, Bank Lane, Roehampton, London, SW15 5XZ, England. Tel:+44 (0)181 878 6464, Fax:+44 (0)181 392 4773, Email: tst@itftennis.com
12th Conference of the European Society of Biomechanics, 27-30 Aug, 2000, Trinity College, Dublin, Ireland, Contact: P.J. Prendergast, Chairman ESB2000, Dept. Mechanical Engineering, Trinity College, Dublin 2, IRELAND, Tel: +353-1-6081383, Fax: +353-1-6795554, Email: pprender@tcd.ie

November

2nd International Conference on Weightlifting and Strength Training, 19th. to 21st. November, 2000, IPOH, MALAYSIA, Contact: Conference Secretariat, Tel/Fax 605-2545-688, Email: leecp@pc.jaring.my,
<http://members.theglobe.com/promuscle/>

December

10th International Conference on BioMedical Engineering (ICBME), 6-9 December 2000, SINGAPORE, <http://www.nus.edu.sg/DB/icbme/>

2001

XVIIIth Congress of the International Society of Biomechanics, 8-13 July 2001, Zurich, Switzerland, Contact: ISB2001, Wagistr. 4, CH-8952 Schlieren, Switzerland, Tel: +41 (0)1 633 6117, Fax: +41 (0)1 633 1124, Email: isb2001@biomech.mat.ethz.ch, www.isb2001.ethz.ch

2002

3rd World Congress of Biomechanics, University of Calgary, Calgary, Alberta, Canada.

Places to Go

The Hunger Site at the United Nations. Click a button and somewhere in the world a hungry person gets a meal to eat at no cost to you. The food is paid for by corporate sponsors. All you do is go to the site and click. You're only allowed one click per day.

<http://www.thehungersite.com>

ISB Grant Awardee Lee Nolan

To my great surprise one day back in March, I found I had been awarded an ISB travel grant to attend the XVIIth Congress in Calgary. I gave my friends and colleagues this good news at least 17 times, causing them to confiscate the cheque until I stopped mentioning it. After only having previously attended conferences within a 30 mile radius of my department in Liverpool, I was looking forward to this one. In return I was asked to write a brief report for the ISB newsletter - a reasonable exchange for a trip to Canada I thought.

On the first day, I attended the tutorial on the Application of Computer Simulation to the Teaching in Biomechanics given by Krystyna Gielo-Perczak. (My reputation for crashing computers only lead to a small mishap, once). This was an interesting and informative tutorial where we were instructed in Matlab and the use of basic modelling skills to solve problems. It was also a useful introduction to programming in Matlab which I had intended to learn to add to my programming skills, but had not yet had the chance. In the evening, the opening ceremony was followed by the Wartenweiler Memorial Lecture given by Sir Andrew Huxley. It was a great opportunity to hear him speak on the cross bridge action, what is known and what is still uncertain.

The 8 am starts for the rest of the week were easy in the beginning as I was still jet-lagged, but

got progressively more difficult as the week went on, especially as the rain came down harder and the air conditioning got colder. It gave a kind of authenticity to the Winter Sports Symposium. There were many presentations in my area of locomotion and clinical biomechanics. I found the keynote lecture by Thomas Andriacchi very interesting from both a historical development of the study of human locomotion, and implications for future developments in gait analysis. One particularly memorable presentation was the invited lecture on spinal/ brainstem control of walking in humans as seen in human infants by Jaynie Yang. The study gave interesting results, showing a new way to study spinal/ brainstem control of walking by investigating infant gait. Other presentations on cerebral palsy gait, long jump and movement and posture were all on at the same time. I found myself changing rooms every 15 minutes and didn't quite catch all the presentations I wanted to see. That'll teach me to have such diverse interests! One evening, as I hadn't yet seen enough presentations during the day, I attended an additional seminar on ACL injuries held in the Saddledome. The presentations were interesting and well presented. I also got to see some of the facilities in the Saddledome, and a great deal more rain.

I presented my poster on shock and shock attenuation asymmetry during walking for above- and below-knee amputees, but unfortunately for me, the Motion Analysis users group meeting was on at the same time. However, I did get chance to discuss my work with people in my field at other times throughout the conference. I now have another method of analysis to consider for the final study of my Ph.D, and an invitation to collaborate on a research project with a group in the USA.

On the last day of the conference, I was invited to visit Clynch Technologies, a company who have developed a cad/cam system for making prosthetic sockets. As I work in the gait analysis lab in a limb fitting centre, I have had the opportunity to see the traditional method of casting and making sockets. This company uses a laser which replicates the exact shape of the stump and allows the prosthetist to change the shape of the socket slightly by computer. This allows pressure to be taken off the bony parts of the limb, and make the end of the socket non-load bearing, providing a more comfortable fit for the amputee.

Using this method, amputees have already reported an improvement in fit and comfort compared to the traditionally made sockets.

After the conference ended, I also took up the invitation to visit the Shriners Gait Lab at the Sunny Hill Health Centre for Children, Vancouver, B.C. The gait lab sees mainly cerebral palsy children, and Alec Black was kind enough to show me round and demonstrate the equipment they used. I now have some more ideas of how to improve the gait lab I work in (a second force platform would be nice!).

The highlights of the conference for me were Brian Davis's methodology, Jos de Koning's answer to a Rick Hinrichs question on the design of the Klapskate, that half hour of sunshine during the week (yes, there was) and Fred Yeadon being carried off by two cowboys mid speech. As a now self-funded student, I would not have been able to attend my first ISB conference without the help of the travel grant for which I am very grateful. Not only did I get the chance to attend an excellent conference, but I was also invited to see a new method of manufacturing prosthetic sockets, visit a children's' gait lab and collaborate on a study with a US research group. I would like to thank the ISB council for making it possible for me to attend this conference. It was a valuable experience and I had great opportunity to discuss my work with other researchers in my field, make new friends and find many ideas for further research - but after I finish my Ph.D!

**ISB Grant Awardee
Anita Vasavada**

The ISB Congress Travel Grant provided me the opportunity to present my dissertation work at an international conference and interact with the biomechanics community. Without the grant, it was unlikely I would have had the chance to do so. I would strongly encourage other students to take advantage of this opportunity to attend the conference.

My trip began with a visit to Canmore and Banff and invigorating hikes around the magnificent Canadian Rockies and beautiful Lake Louise. By the time I got to Calgary, my mind was clear and ready to focus on biomechanics. This was the first time I attended an ISB conference, and I found the conference to be comprehensive, well-attended and well-organized.

There were several sessions focusing on spine, muscle and motor control, my areas of interest. In particular, I found the format of symposia led by a keynote speaker to be especially productive.

There were many insightful talks on aging, particularly by Toby Hayes, Al Schultz, Brian Maki and James Ashton-Miller. Ashton-Miller's finding that patterns of light on the floor could affect walking in elderly, showed that simple solutions such as changing the interior design of living accommodations might help prevent falls. At the other end of the aging spectrum, a study by Yang and colleagues of treadmill walking in infants was interesting not only from the perspective of spinal and brainstem control, but also in relation to Maki's work regarding lateral stepping to maintain balance in elderly. The spine symposium, which was led by keynote speaker Stuart McGill and included talks by Ian Stokes, Jacek Cholewicki, Aboufazel Shirazi-Adl, and Jeff Lotz, was particularly worthwhile for me. At the end of the symposium, all the participants remained at the front of the room for a panel discussion, offering the opportunity to answer audience questions from their different perspectives and areas of expertise. Lunchtime lectures on forensic biomechanics and the "Klapskate story" also provoked interesting conversation. Of course, as is often the case at scientific meetings, many productive conversations and connections occurred outside of the lecture halls. In addition to the science, it was fun to see old friends and make new ones.

One of the highlights of the week was the student lunch with Sir Andrew Huxley. It was exciting to hear him talk, both historically about his life in science and scientifically about the latest research in muscle mechanics. More than that, it was truly inspiring to see his continued interest in science and the spark of energy that comes from a lifetime of learning. By the end of the week I was exhausted, but I noticed that Sir Huxley was still attending lectures, viewing posters and asking questions. I left the conference with renewed enthusiasm for biomechanics.

**ISB Grant Awardee
Sanjay Gupta**

I would like to begin this report by expressing my sincere thanks to the International Society of Biomechanics (ISB) for awarding me

the ISB International Travel Grant. The award worth US \$ 2000 is intended for international travel, related to biomechanics research. With this grant I was able to visit the Delft University of Technology, The Netherlands, to complete the final preparations for the Ph.D. degree and to participate in the XVII ISB Congress and the 2nd Conference of the International Shoulder Group (ISG), held in August, 1999 at Calgary, Canada.

The primary objective of this visit to the Man-Machine Systems Group, Faculty of Design, Engineering and Production, Mechanical Engineering and Marine Technology, Delft University of Technology, The Netherlands, was to finalise the preparations for the Ph.D. degree. The doctoral study entitled, "Stress Analysis of the Scapula: Design Considerations of Glenoid Prostheses", was started in September 1994 under the supervision of Prof. Dr. Ir. H.G. Stassen and Prof. Dr. F.C.T. van der Helm at the Delft University. The project is an inter-University collaborative program and therefore a substantial part of the work was also carried out at the Department of Applied Mechanics, Bengal Engineering College (Deemed University) in India.

Total Shoulder Arthroplasty (TSA) is a surgical procedure, which involves the reconstruction of the glenohumeral joint by inserting humeral and glenoid components in the humerus and scapula, respectively. Since the introduction of Neer Prosthesis in 1974, clinical and radiographic feedback (short term: 1-3 years; medium term: 3-10 years; long term: 10 years or more) reveal glenoid component loosening as the most-frequently occurring problem in TSA. The primary objective of this surgical intervention is to restore the large range of motion and patient satisfaction. But in reality, the results are not at all encouraging and are far from normal. The precise relationship between the cause and the effect, regarding aseptic loosening of the glenoid prostheses and the extent to which the mechanical factors play a role in this process, however, are not clearly understood yet. The design of the implant, the choice of materials and the technique of fixation to the bone certainly require a detailed biomechanical investigation.

The primary goal of the study was to obtain a proper insight in the biomechanical aspects of the glenoid prostheses. The study is focussed on investigating the mechanical factors responsible for

loosening of the glenoid prosthesis; eventually causing failure of the implant. Although cement (PMMA) is widely used to fix the prosthesis to the bone, yet uncemented designs with tissue ingrowth materials have also been used in some specific cases. Realistic three-dimensional (3-D) Finite Element (FE) models of the glenoid prostheses (cemented and uncemented) using computer tomography (CT) data have been analysed to understand the glenoid load transfer, potential failure criteria and suggest measures for improved glenoid prostheses.

In order to understand how the loading is being transferred to the various parts of the scapula adequately, 3-D FE stress distributions of a natural scapula have been obtained. Unfortunately, there has been a scarcity of these studies in recent times. A major part of the study, though a sub-goal, was directed towards development, analysis and experimental validation of a realistic 3-D FE model of the scapula based on CT scans, which can predict stresses and strain realistically, during abduction of the arm.

The visit to the Delft University emerged to be absolutely necessary for completion of the Ph.D. degree. Communications by e-mail, fax and telephone had practical problems. Therefore, a three-months stay at the Netherlands along with a two-weeks intermediate stay at Calgary, Canada was planned. The ISB International Travel Grant came at the right time and for the right cause.

The stay at the Delft University from June till September, 1999 was fruitful. During my stay, I was able to do: (1) thorough literature (medical and engineering) review; (2) extensive discussions on experimental and numerical results with my supervisors and associated research groups; (3) incorporate major changes and comments in the thesis; (4) finalise the manuscript of the concept thesis for submission. I am glad to state that the thesis was completed in September, 1999.

As planned earlier, I could couple this visit with a two-week stay at the University of Calgary, Canada, for the XVII ISB Congress and the 2nd Conference of the International Shoulder Group (ISG). Based on the doctoral research work, two papers, a poster and a podium, were presented at the ISB Congress and the ISG satellite conference, respectively. Both the conferences were a fascinating experience with an outstanding level of scientific interaction between young researchers and eminent scientists. The 2nd Conference of the

ISG was more rigorous and intensive, since it was focussed on the shoulder only.

I would like to thank my supervisors Prof. Dr. Ir. H.G. Stassen and Prof. Dr. F.C.T. van der Helm for encouraging me to apply for this grant. Their support and guidance along with that of Prof. Dr. Ir. Fred van Keulen of Laboratory of Engineering Mechanics has enabled me to complete the research project successfully. In this connection I would also like to acknowledge the ISB for their financial support. I take this opportunity to express my sincere gratitude to all my colleagues at the Man-Machine Systems & Control Group, Delft University of Technology, The Netherlands and the Department of Applied Mechanics, Bengal Engineering College (Deemed University), India for their consistent help and cooperation regarding performing the research work during the past five years.

**ISB Grant Awardee
Elizabeth Cowling**

Firstly I would like to express my appreciation to the International Society of Biomechanics Student Grant Committee for generously awarding me the Student Congress Travel Grant. Without such funding, attending the recent ISB Congress would not have been possible.

Attending my first ISB was indeed an eye-opening experience. It was great to see the interaction of close to 1,000 individuals from such a vast array of countries with the focus of sharing their biomechanics research findings together in the one location. I enjoyed meeting so many new people and putting faces to the names of authors of the journal articles that I have read and referred to in my *own* work. It also provided a chance for me to appreciate what other researchers are doing in their specific field of biomechanics, through the oral and poster presentations, and great opportunities for discussions with many different people both at the conference venue and socially at the end of each day.

It was also a good experience to personally present my research own findings in poster form during the conference. I greatly appreciated the constructive feedback that I received with regard to my research project, and enjoyed the challenge of answering the questions. I look forward to the opportunity of attending the next ISB Conference in Zurich in 2001, and continuing where I left off.

I would again like to thank the International Society of Biomechanics Student Grant Committee for their generous financial contribution to this overseas travel. Attending the ISB conference and the associated Footwear Symposium in Canmore, with my Wollongong colleagues, Dr Julie Steele and Annaliese Dowling, was an experience I will not forget.

Let's put your day in perspective

The average cost of rehabilitating a seal after the Exxon Valdez oil spill in Alaska was \$80,000. At a special ceremony, two of the most expensively saved animals were released back into the wild amid cheers and applause from the onlookers. As they were swimming away they were both eaten by a killer whale.

A psychology student in New York rented out her spare room to a carpenter in order to nag him constantly and study his reactions. After weeks of needling, he snapped and beat her with an ax, leaving her with permanent severe brain damage.

In 1992, Frank Perkins of Los Angeles made an attempt on the world flagpole-sitting record. Suffering from the flu, he came down eight hours short of the 400 day record. His sponsor had gone bust, his girlfriend had left him, and his phone and electricity had been turned off.

A woman came home to find her husband in the kitchen, shaking frantically with what looked like a wire running from his waist towards an electric kettle. Intending to jolt him away from the deadly electrical current, she whacked him with a plank of wood that had been by the back door, breaking his arm in two places. Till that moment he had been happily listening to his Walkman.

Two animal rights protesters were protesting at the cruelty of sending pigs to the slaughterhouse in Bonn, Germany. Suddenly the pigs, all two thousand of them, escaped through a broken fence and stampeded, trampling the two hapless protesters to death.

AND THE WINNER IS.....

An Iraqi terrorist, Khay Rahnajet, didn't pay enough postage on a letter bomb. It came back with "return to sender" stamped on it. Forgetting it was the

bomb, he opened it and was killed in the resulting explosion.

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Thanks to Alan Litsky, Ohio State University, for the previous two submissions

Personal/Professional Relationships

You know it is time to reassess your relationship with your computer when....

You wake up at 4 O'clock in the morning to go to the bathroom and stop to check your email on the way back to bed.

You turn off your computer and get an awful empty feeling, as if you just pulled the plug on a loved one.

You decide to stay in college for an additional year or two, just for the free internet access.

You laugh at people with 28.8 modems.

You start using smileys :-) in your snail mail.

You find yourself typing "com" after every period when using a word processor.com

You can't correspond with your mother because she doesn't have a computer.

When your email box shows "no new messages" and you feel really depressed.

You don't know the gender of your three closest friends because they have nondescript screen name and you never bothered to ask.

You move into a new house and you decide to "Netscape" before you landscape.

Your family always knows where you are.

In real life conversations, you don't laugh, you just say "LOL, LOL"

Thanks to Chris Phillips, University of Pittsburgh, for this submission

Sensitive engineers avert your eyes

Q: When does a person decide to become an engineer?

A: When he realizes he doesn't have the charisma to be an undertaker.

Q: What do engineers use for birth control?

A: Their personalities.

Q: How can you tell an extroverted engineer?

A: When he talks to you, he looks at your shoes instead of his own.

Q: Why did the engineers cross the road?

A: Because they looked in the file and that's what they did last year.

Q: How do you drive an engineer completely insane?

A: Tie him to a chair, stand in front of him, and fold up a road map the wrong way.

You might be an engineer if ...

choosing to buy flowers for your girlfriend or upgrading your RAM s a moral dilemma.

you take a cruise so you can go on a personal tour of the engineroom.

the sales people at the local computer store can't answer any of your questions

at an air show you know how fast the skydivers are falling.

you bought your wife a new CD-ROM drive for her birthday.

you can quote scenes from any Monty Python movie.

you can type 70 words per minute but can't read your own handwriting.

you comment to your spouse that his/her straight hair is nice and parallel.

you sit backwards on the Disneyland rides to see how they do the special effects.

you have saved every power cord from all your broken appliances.

you have more friends on the Internet than in real life.

you know what "<http://>" stands for.

you look forward to Christmas so you can put the kids' toys together.

you see a good design and still have to change it.

you spent more on your calculator than you did on your wedding ring.

you still own a slide rule and know how to use it.

you think that people yawning around you are sleep deprived.

you window shop at Radio Shack.

your laptop computer costs more than your car.

your spouse hasn't the foggiest idea of what you do at work.

you've already calculated how much you make per second.

you've tried to repair a \$5 radio.

Thanks to Kathe Derwin, The Cleveland Clinic Foundation for this submission

ISB Membership News

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**A note from the Treasurer –
Graeme A. Wood**

Enclosed with this Newsletter is your “invoice” for next year’s membership dues and (optional) journal subscriptions. I implore you to pay promptly since the prices shown are based on *today’s* exchange rates between the Australian and US dollar, and the Society is likely to lose money if you delay too long. Also, the publishers of our journals will now only provide a single grace copy of the next years volume before removing a name from their mailing list if no renewal advice has been received from us. Renewal forms can be faxed to me if you are paying by credit card, or even an e-mail authorisation will suffice. The fax number provided is secure, and my e-mail is only accessed by myself.

The prices of Elsevier Science’s journals (JoB, CB & JEK) have increased slightly in real terms, but Human Kinetics (JAB) have kept their prices the same as last year. Membership fees have not changed.

Please also take the time to correct any errors or omissions in your mailing address and/or contact details. This information is now automatically listed on our Web Site, but can be omitted if you so wish. Where the institutional details differ from the street address you’ve given us we designate this with the “>” symbol, and only print the latter on your mailing label.

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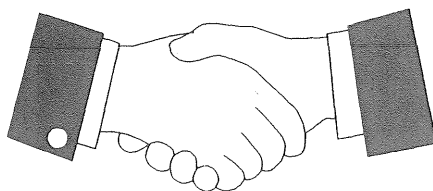
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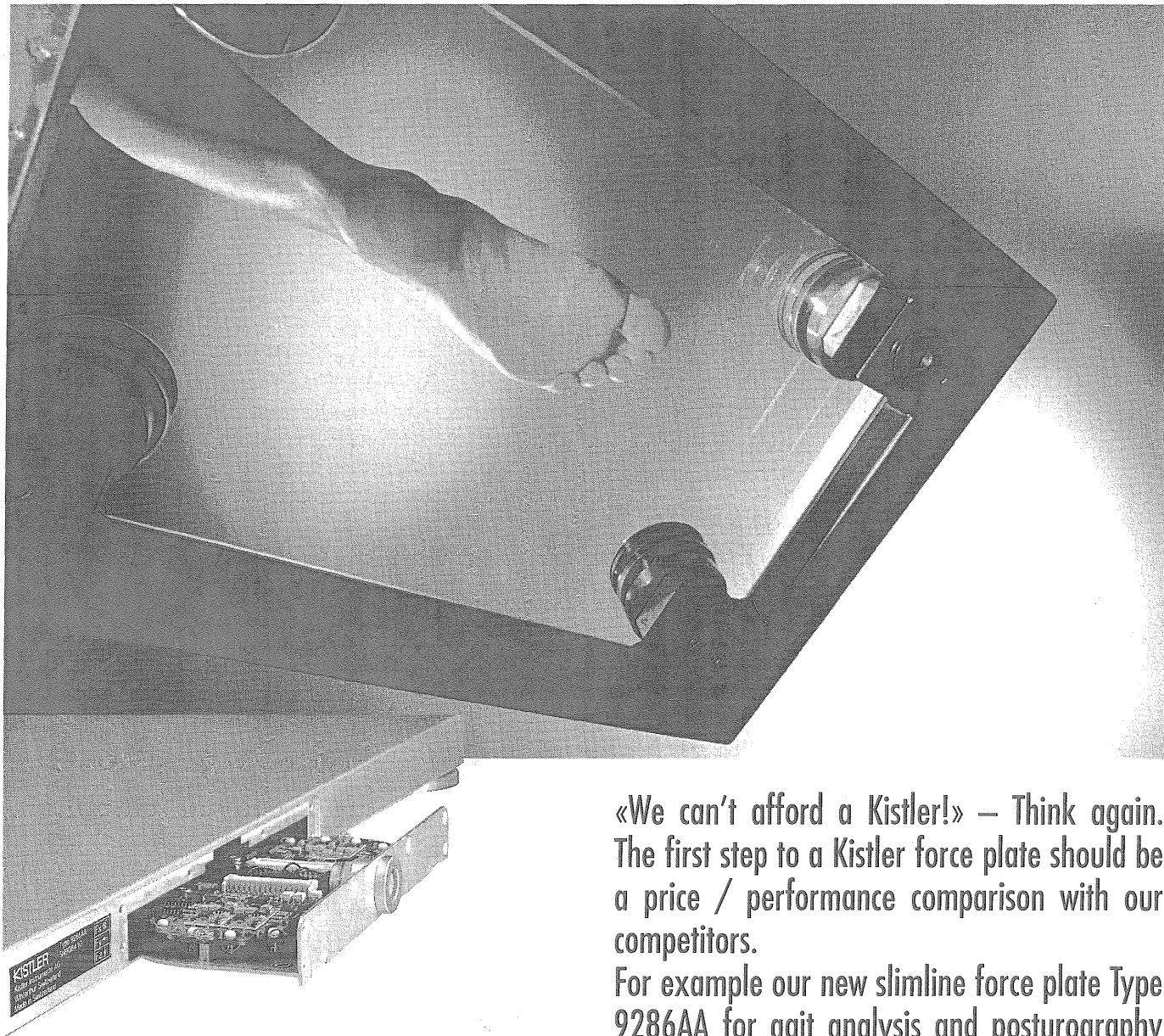
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