



International Society of Biomechanics Newsletter

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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

I would like to begin this quarterly report by thanking you, the members of the International Society of Biomechanics, for your confidence in me when you voted for a President-Elect in 1997. It is a great honour for me to accept the responsibility of leading our society into the next century, indeed into the next millennium! The basis for this report is the brief address that I gave to the members who were at the General Assembly meeting in Calgary last month (more about that later).

Since being elected onto the ISB Executive Council at the meeting in Perth in 1991, I have had the good fortune to serve under four outstanding Presidents: Aurelio Cappozzo from Italy, Ron Zernicke from Canada, Peter Cavanagh from the USA, and Guenter Rau from Germany. Not only were they fine leaders of our society but they are also all successful scientists in their own right. They certainly set an excellent example for me and I can assure you that in the next two years I will strive to uphold the very best traditions of our Society.

All of you, I am certain, are regular users of the Internet and subscribe to that excellent list-server Biomch-L, the brainchild of the late Herman Woltring (one of the real characters in the ISB) and Ton van den Bogert. Well, Biomch-L has almost 4,000 subscribers who all derive some benefit from their membership. Despite the obvious popularity of biomechanics as a field of research endeavour, the ISB membership (*i.e.* those people who pay their dues regularly!) constitutes less than 20% of Biomch-L. Why is this? One obvious answer is that Biomch-L is free, whereas ISB membership costs just about \$50US. While this may be a lot of money for those of us in developing countries, in reality it is a small sum for scientists from the developed world.

Well then, what are the benefits of membership of the ISB? One of them is right here in front of you, the Newsletter. It comes out four times a year and is packed with information including editorials, award announcements, conference reports, and of course our editor's zany brand of humour! Those societies which have dropped their newsletter in favour of a web-based format have been greeted with howls of protest from their members. Despite our apparent love affair with the web and all things electronic, it would appear that hardcopy still has some enduring value! Another benefit of membership is the student grant programme, initiated by Peter Cavanagh and implemented so

effectively by Mary Rodgers over the past two years. The student reports, some of which will be published in our newsletter, have convinced me that our initiative has already had a vital and positive impact on our mission of promoting the field of biomechanics around the world. Other benefits of membership are the reduced journal subscriptions, the discounted conference fees, and the support and moderation of Biomch-L.

All of these are reason enough to join the ISB but there is one other benefit and that is our web-site. When the ISB first launched this site we became a publisher. Until now the information has been provided freely, whether the visitor to our site was an ISB member or not. Our plan is to enhance the value of our web-site to our members. There will be two strategies: first, certain areas (*e.g.*, software and data) will be restricted so that only members can access them; and second, we will be adding content (more about that in the next newsletter). I believe this could be one way in which we entice more biomechanical scientists to join our society.

You are all probably aware of the crucial role that our commercial partners play in the affairs of our society. They help to defray the cost of printing this newsletter by taking out advertisements. They purchase exhibition space at our biennial meeting and thereby reduce the cost of our registration fees. They underwrite many of our prestigious awards that we celebrate at our meetings. I believe we need to provide increased value to our current sponsors (*cf.* inside back cover of this newsletter) and one potential mechanism we will explore is via our web-site. I want to emphasise that our intention will not be to pick "winners" or "losers", or indeed compromise our commitment to good science, but rather to acknowledge the important contribution of these companies in a positive manner. In so doing, I am hopeful that we will be able to persuade other companies to join our partnership.

It is my vision that the ISB will continue to focus on good science. What does it take to be a good scientist? We saw some excellent examples in Calgary recently. As our Wartenweiler Lecturer and Nobel laureate, Sir Andrew Huxley, demonstrated in his presentation on the sliding filament theory of muscle contraction, we need to be versatile. This means understanding basic cell biology at one end of the spectrum, while also being able to solve partial differential equations at the other end. We need to be able to ask the right question, as Paavo Komi, our Muybridge Medallist, showed in his lecture on

muscle fatigue. Sten Grillner, Chairman of the Nobel Prize committee for Physiology or Medicine, demonstrated the power of computer modelling when he showed how a simulation of swimming in the lamprey could provide fascinating insights to the central pattern generator theory of locomotion. Another attribute of good science, but difficult to duplicate, is serendipity, or the chance finding that leads to a major breakthrough. An example from Calgary was the presentation by Patrick Lee whose research, although not in biomechanics, has made a seminal contribution to the treatment of cancer. Finally, as exemplified in the presentation on neural networks by one of my old graduate students, Francisco Sepulveda, who's now at the University of Aalborg in Denmark, biomechanics should be fun!

Benno Nigg and his Calgary team -- Walter Herzog, Darren Stephanyshyn, Ron Zernicke, Janet Ronsky, and others -- provided us with a superb meeting. We thank them for all their hard work on our behalf. We are confident that Edgar Stuessi and Alex Stacoff and their colleagues in Zurich will similarly provide us with a memorable scientific gathering in 2001. In closing, I would like to thank the outgoing members of the executive council -- Peter Cavanagh, Bruce Elliott, Toshio Moritani, Gisela Sjogaard, and Leendert Blankevoort -- and acknowledge their contributions to our society, and congratulate our incoming members: Sandy Olney, our new President Elect, plus Stu McGill, Walter Herzog, Julie Steele, and Senshi Fukushima. I look forward to their support and yours over the next two years!

**From the Past-President
Guenter Rau**

The ISB Congress 1999 in Calgary has been a great success and an outstanding scientific event which will markedly influence the future research and applications in the field of Biomechanics of Human Movement. I wish to congratulate and to thank Benno Nigg, the driving force of the Organizing Committee, and the Dean of Kinesiology, Ron Zernicke, for making this congress happen in a fruitful, stimulating, scientifically rewarding atmosphere fostering personal contacts and renewing or initiating new friendships. Walter Herzog established an excellent scientific program with outstanding invited lectures and high caliber symposia. Finally, Darren Stefanyshyn took care of the splendid

organization on the operational level, and Ursula Heinz served as the coordinating person keeping track of all actions. What a team with all members of the Human Performance Laboratory! And lastly, the participants who made this congress alive and definitely a highlight for ISB by their extremely active contributions in form of presentations and discussions.

A congress has many functions, and I was very pleased by the strong engagement of our industrial partners and especially the sponsors who had a meeting with the ISB officers and the chairpersons of the congress. It was my pleasure to thank them on behalf of the ISB, while being supported by a large number of ISB Past Presidents, at the Past Presidents' Luncheon). I wish to expressly thank the exhibitors and sponsors for their participation and support as well as the awards that have been endowed by them to recognize high ranking research at ISB.

Another function of a congress is to improve or strengthen cooperation or relationships with other related societies. For this purpose, a joint scientific session of ISEK/ISB was organized that demonstrated some overlap of interest in both societies. In place of Prof. Arthur Sherwood, president of ISEK, the session was chaired by Prof. Bertrand Arsenault (Montreal) jointly with the ISB president.

At the end of my term as president, I wish to thank the council members who have given continuous support to me and who have served to the ISB in many ways. A large workload was imposed on them and it was enjoyable to see the progress. Special thanks to Peter Cavanagh who gave me valuable advice, to Kit Vaughan who took the gavel as new president, to Brian Davis who does the Society's paper work and also initiated a program of student support funded by the Whitaker Foundation. Graeme Wood has excellent control of the finances - congratulations. Graeme is probably the most integrating force of the ISB (some consider him as the "glue of the Society"!): Thank you for your support and advice which has been very valuable to me.

Also, I wish to thank the council members who have served the ISB during the years. I would like to give some special recognition to the following individuals. Bruce Elliot who, over many years, served as liaison to sponsors and industrial partners. Ton van den Bogert, who has

been so innovative in making use of information and information technologies for ISB purposes. Mark Grabiner, who has cared for the ISB Newsletter: We also still believe in paper! Leendert Blankevoort, who has handled the ISB awards procedures in such a dedicated and highly responsible way. These people deserve our high appreciation.

At the Calgary Congress, the terms of Gisela Sjogaard, Leendert Blankevoort, Toshio Moritani and Bruce Elliot on the ISB council ended. I thank you for your valuable input. I welcome the new council members Senshi Fukushima, Julie Steele, Stuart McGill, Walter Herzog who begin their terms with President Kit Vaughan. Last, but not least, I congratulate Sandra Olney as President-Elect. I wish the new executives and council success and good luck.

Biomechanics is a very dynamic field. Many new developments initiated by novel discoveries in basic sciences will have tremendous impacts in the future, but these sciences will be deeply influenced by Biomechanics, which tends to become a key issue in life sciences. Tissue Engineering is a basic field but "Functional Tissue Engineering" will play a key role in clinical applications and open new ways in health care.

Now, we are looking forward to the first ISB Congress in the next millennium organized by Edgar Stüssi and Alex Stacoff in Zurich, Switzerland. In this congress the above mentioned approaches will be covered more explicitly as in the past - and ISB will become stimulated by new, probably unexpected input. The situation in Biomechanics remains interesting and exciting. Within the upcoming years we will have not one boring minute. The ISB can give you encouraging and optimistic perspectives, and it is our joint privilege to work in this field.

Job Market

The Job Market may be accessed via:
<http://www.lri.ccf.org/isb/jobs/>

Upcoming Meetings, Workshops, Etc.

October

IV International Symposium on Computer Methods in Biomechanics & Biomedical Engineering, 13-16 Oct, 1999, Lisbon, Portugal. Contact: John Middleton, Biomechanics Research Unit, Cardiff Medicentre, Heath Park, Cardiff CF4 4UJ, Wales, UK. Tel/Fax: + 44 (0) 1222 682161, Email: MiddletonJ2@Cardiff.ac.uk

23rd Annual Meeting of the American Society of Biomechanics, 21-23 Oct 1999, University of Pittsburgh, Pittsburgh, PA, USA. Contact: Savio Woo, PhD. Musculoskeletal Research Center, Department of Orthopaedic Surgery, University of Pittsburgh, E1641 Bioscience Tower, Pittsburgh, PA, USA, Tel: 412.605.3219, Fax: 412.648.2001, Email: cphil@pitt.edu

VIIIth Association des Chercheurs en Activités Physiques et Sportives (roughly Association of Researchers on Physical Activity and Sports), 31 Oct - 3 Nov, 1999, Macolin, Switzerland. Contact: Claude-Alain Hauert, FPSE - Université de Genève, 9, route de Drize, CH-1227 CAROUGE, Tel: +41 22 705 97 70, Email: Claude-Alain.Hauert@pse.unige.ch, <http://www.bham.ac.uk/sportex/ACAPS>

November

European Medical & Biological Engineering Conference, EMBEC'99, Vienna, Austria, 4-8 November 1999, <http://www.univie.ac.at/EMBEC99/>

December

3rd International Course Sports Rehabilitation and Biomechanics, 2-4 Dec 1999 and **1st World Conference Sports Braces**, 5 Dec 1999. www.edisons.it/homepages/letpeoplemove/

2000

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

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>

11th International Conference on Mechanics in Medicine and Biology, 2-5 Apr 2000

Maui, Hawaii. <http://www.icmmb11.com/>

19th Southern Biomedical Engineering Conference, 14-15 Apr 2000, Virginia Tech, Blacksburg, Virginia, <http://sbec.abe.msstate.edu/2000/19welcome.html>.

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>

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>

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

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/>

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

This website scans for unusual ideas that have just been patented:

http://www.abcnews.go.com:80/sections/business/patentlyweird/patentlyweird_index.html

Thanks to Alan Litsky, the Ohio State University, for passing this on...

ISB Student Travel Grant Report
Gavin Pinniger
Biomechanics Research Laboratory
University of Wollongong, Australia

Approximately 15 months ago I received news that I was a recipient of one of the International Society of Biomechanics Student Travel Grant awards. With this award I was able to travel to Sweden where I had the fortunate opportunity to work in the Laboratory of Biomechanics and Motor Control at the Karolinska Institute in Stockholm under the guidance of Professor Alf Thorstensson and Dr Andrew Cresswell. My time in Stockholm was primarily spent investigating the neural control of lengthening and shortening actions of the human soleus muscle. Two of the studies conducted during this period were recently presented at the XVIIth International Congress of the International Society of Biomechanics in Calgary.

The primary objective of these studies was to investigate the regulation of tension during controlled lengthening and shortening actions of the soleus muscle. Healthy subjects performed plantar flexor efforts on an ankle torque motor through 30° of ankle displacement at lengthening and shortening velocities of 5, 15 and 30°·s⁻¹. Plantar flexor efforts were performed under three test conditions: i) maximal voluntary activation; ii) constant submaximal (30% of

MVC) voluntary activation of SOL; and iii) submaximal percutaneous electrical activation of soleus (to 30% of MVC).

The results showed that inhibition mechanisms may exist during both maximal and submaximal conditions as lengthening torques during maximal and submaximal voluntary activations were independent of velocity and remained at isometric level, whereas electrically stimulated torques were greater than isometric and increased at higher lengthening velocities. In the second study, the influence of antagonist (tibialis anterior) activation during submaximal voluntary actions was removed by applying an anaesthetic block to the common peroneal nerve. In this case, the lengthening torque surprisingly did not increase following the block. This result indicates that, in the submaximal condition, coactivation was not a limiting factor to lengthening torque, suggesting a complex neural control of lengthening and shortening actions.

Apart from the hours spent working on these experiments, I also had many enjoyable social and cultural experiences during my time in Stockholm. Without a doubt, my most memorable occasions was attending the presentation of the Nobel Prize awards, which was truly a motivating experience.

During my Scandinavian stay, I was also fortunate to participate in the Copenhagen International Summer School in Sensory and Motor Control. This was a fantastic course incorporating a two week theoretical section with lectures from many of the world leaders in sensory and motor control research. It was followed by a three week practical course which enabled me to gain hands on experience with many new research techniques that I can now incorporate into my own research.

Appropriately, my 12 months of international scientific and cultural experiences finished with the ISB congress in Calgary. This has truly been a fabulous experience that would not have been possible without the assistance from the ISB Student Travel Grant award. I would encourage all young scientists to gain as much experience in different research laboratories as possible. In doing so you not only learn many new research techniques, but are also exposed to different approaches to scientific research which will help in developing your own personal style of independent research.

Finally I would like to thank all the people who have assisted me in the past 12 months. In particular I would like to acknowledge the assistance of the ISB for their financial support. I would also like to thank all those at Copenhagen who made my stay there so enjoyable. And a special thank you goes to Andy Cresswell, Alf Thorstensson and all the members of

the Biomechanics Research Laboratory at the Karolinska Institute and the Stockholm University College of Physical Education and Sports for their guidance and support during my stay in Stockholm.

International Society of Biomechanics (ISB) Student Grant Guidelines

Student members of ISB are eligible for the following three grants. A number of competitive grants will be awarded each year. All grant amounts are shown in US dollars.

The Matching Dissertation Grant Program:

There will be several competitive grants of \$2000 made for doctoral dissertation research. A condition is that the applicant will have a commitment from her/his institution or another source to provide a further matching \$2000. This program is applicable to those who are doctoral candidates and are seeking assistance with costs of their dissertation research. Applications should include the following:

- a) a 3 page summary which includes the purpose, hypotheses, reference to key related literature, study design, methods, timetable for the measurements and budget.
- b) CV of the applicant: 2-3 pages in length (include list of publications, current grade point average, results of any standardized tests that the applicant has taken (ie. GRE)).
- c) a document from her/his institution or other source which ensures provision of the matching \$2000
- d) a one page recommendation from the dissertation advisor who must also be an ISB member at the time of application.

Applications are to be received by **January 28, 2000**. Notification to applicants will be by **March 31, 2000**. Recipients will present results at the ISB Congress and acknowledge ISB support in any publications. A report to the council will include accounting of how funds were spent. Recipients will be encouraged to publish their work in one of the ISB-affiliated journals.

2) The International Travel Grant Program:

In order to allow student members to travel abroad to experience science in other cultures, we will offer several grants of \$2000 for travel related to biomechanics research. A report on the accomplishments during the trip will be expected by the Executive Council. Applications should include:

- a) 3 page proposal which includes the purpose of the visit, timetable, activities to be involved in, the total budget for the visit (including other financial assistance, etc.)
- b) CV of the applicant: 2-3 pages in length (include list of publications, current grade point average, results of any standardized tests that the applicant has taken (ie. GRE)).

- c) a document from the host institution verifying support for the visit
- d) a recommendation letter of support for the travel from the applicant's supervisor who must also be an ISB member at the time of application.

Applications are to be received by **January 28, 2000**. Notification to applicants will be by March 31, 2000. Recipients will submit a brief report to the committee which will be published in the Newsletter.

Grant applications should be mailed to:

Dr. Mary Rodgers
 Department of Physical Therapy
 University of Maryland School of Medicine
 100 Penn Street

Baltimore, MD 21201 USA

Email: mrodgers@umaryland.edu

Telephone: (410) 706-5658

Fax: (410) 706-4903

Student members who do not plan to apply for grants, but would be interested in serving on the student grants committee are asked to contact Dr. Rodgers.

**Minutes of the ISB General Assembly Meeting
 Calgary, Canada
 Submitted by B.L. Davis**

The meeting was called to order by President Guenter Rau at 12.44 p.m. Approximately 90 people were in attendance.

President's Welcome: Rau welcomed the members and asked for a minute silence to remember five colleagues who had passed away since the last ISB Congress: Gerrit Jan van Ingen Schenau, Tom McMahon, Eustachius Willems, Henk Schamhardt and Wolfgang Stangel.

Review of Agenda: Rau reviewed the agenda and requested that certain items (Treasurer Report, Membership and Sponsorship) be grouped together since they were related and time was limited. There were no objections to this.

Approval of minutes of the 1997 General Assembly Meeting in Tokyo: These had been printed in ISB newsletter #69 and were unanimously approved.

Membership: Wood reported that there are now eight Honorary Members of the ISB. This represents an increase of two since the Tokyo meeting. Jim Hay received his certificate for Honorary membership from Rau, who acknowledged the substantial contributions Dr. Hay had made to the field and congratulated him on behalf of the ISB. Since David Winter was not in attendance his certificate would be mailed to him.

Wood reported that the ISB now has 971 active members, with 130 joining as a result of getting reduced fees at the Calgary meeting. Journal subscriptions were as follows: Journal of Biomechanics: 218, Journal of Applied Biomechanics:

203, Clinical Biomechanics: 95, Journal of Electrophysiology and Kinesiology: 34. Wood asked ISB members to provide feedback to him as to why journal subscriptions had declined.

Financial Report: Wood presented the treasurer's report for July 1st 1997 to June 30th 1999. The balance had grown from \$AUS 95,298 (June 1998) to \$AUS 119,575 (June 1999). Sponsorship was low during the 1997/98 period but had rebounded in 1999 when sponsors paid for the full two year period. The net income was \$AUS 3,686 (1997/98) and \$AUS 20,853 (1998/99). Two members appointed by Rau to examine the financial books were Guy Simoneau and Hakan Lanshammer. Simoneau informed the assembly that the profit/loss statements had been examined and found to be consistent with the Tokyo budget. He proposed that the treasurer report be accepted. This was seconded by Kit Vaughan and unanimously approved. Wood then proposed a new budget that was based on the assumption that the ISB would keep its new members. Wood also mentioned that a general services tax (GST) being introduced in Australia may affect the ISB. He will monitor the situation and report back when more information is available. The largest budget item was \$121,000 that had been set aside for the student initiative. This would result in the ISB drawing down on its consolidated revenue by \$AUS26,600 in 1999/00 and \$AUS28,600 in 2000/01. He then proposed that the budget be accepted with the understanding that the ISB Executive Council would monitor the funds being used for the student program. Benno Nigg seconded this motion and there was unanimous approval.

Sponsorship report: Elliott reported that the contributions were as follows: Kistler US\$5,000 p.a., Motion Analysis Corporation US\$2,500 p.a., Oxford Metrics US\$3,000 every 2 years, Peak Performance US\$1,500 every 2 years, NAC/Miyashita US\$1,000 p.a., Parke-Davis US\$1,500 p.a. Rau then thanked Elliott for his efforts and for serving on the ISB council for a full three terms.

Informatics Report: Ton van den Bogert outlined the two main areas of activity; the ISB web site and Biomch-L (which, although independent, is under ISB patronage). The web site has 142 visits per day and has regularly updated sections dealing with jobs, conferences, resumes, thesis abstracts, data and software. He emphasized the need for a focus on material related to education. For this reason, he was looking into the possibility of adding tutorial material. Gerry Smith asked whether conference proceedings could be added, to which van den Bogert replied that this was largely in the hands of the Congress organizers. In the case of the upcoming Zurich meeting, this possibility will be considered. Finally,

van den Bogert asked members to provide feedback on the question as to whether certain sections of the ISB website should be restricted to ISB members. Rau then thanked van den Bogert for all his efforts.

Working and Technical Groups: All the Technical groups had organized satellite meetings that had attracted between 70 and 110 registrants. The International Shoulder Group's application for a change in status to a Technical Group had been approved by Council.

Education Report: Guenter Rau asked Mary Rodgers if this report could be published in an upcoming ISB newsletter. There were no objections to this suggestion.

Elections: Peter Cavanagh indicated that 282 members had voted and that the new members were Julie Steele, Stu McGill, Walter Herzog, and Senshi Fukushima. Cavanagh thanked the outgoing members; Leendert Blankevoort, Gisela Sjogaard and Bruce Elliott for their valuable contributions.

Affiliate Societies: Rau reported that there were joint sessions at ISEK and ISB conferences and the ISB had organized a joint session at the World Congress of Biomechanics in Sapporo.

Awards Committee Report: Leendert Blankevoort reported that there were two Young Investigator awards, one for the best podium presentation (there were nine candidates) and one for the best poster (ten candidates). The winners were to be announced at the Closing Ceremony. Five manuscripts had been submitted for the Clinical Biomechanics Award, with the winners being Torry et al: "Intra-articular knee joint effusion induces quadriceps avoidance gait patterns" There had been six applications for the "Promising Young Scientist" award (sponsored by peak Performance Technologies) and the panel of judges had selected Ralph Müller as the award recipient.

Congress Report: Walter Herzog presented a summary of the Calgary meeting on behalf of Benno Nigg. There were 902 participants from 39 countries, with the largest representation being from the USA (260), Canada (191) and Japan (101). There were 272 student registrants. Each abstract had been reviewed by three referees, all of whom were outside of the organizing committee. Traditionally strong research areas (locomotion, sport and skeletal muscle) were well represented, as well as other areas such as ergonomics and orthopedics.

AT 1:40 PM GUENTER RAU HANDED THE CHAIR OVER TO KIT VAUGHAN

2001 Congress: Edgar Stussi gave an overview of the plans for the 2001 ISB Congress to be held July 8 - 13th in Zurich, Switzerland. This city has 363,000 inhabitants and is easily accessible. The venue, Swiss

Federal Institute of Technology (ETH), was where Jurg Wartenweiler once worked and 2001 will be the 40th anniversary of his laboratory. The main topics will include neuromuscular control, locomotion, implants and biomaterials, hard and soft tissues, biofluidmechanics, cells and membranes, remodelling processes, sports, forensic biomechanics, orthopedics and rehabilitation. There will be an additional "Scherb Award" in recognition of Scherb's work in the area of gait and muscle physiology.

2003 Congress: Kit Vaughan reported that there were two applications: one from the University of Otago in New Zealand, and one from The Cleveland Clinic Foundation in the USA. The closing date for bids to host this meeting is April, 2000.

Transfer of Presidency: Kit Vaughan thanked his predecessors Aurelio Cappozzo, Ron Zernicke, Peter Cavanagh and Guenter Rau for their leadership of the ISB during the time he had served on the Council. He then outlined three areas that he would focus on as ISB President: (i) Membership, (ii) Sponsorship, and (iii) Vision for the next 2 years. The current number of financial members of ISB was less than 20% of those who subscribe to Biomch-L, thus he recommended the ISB revisit the services offered and develop strategies to attract more members. On the topic of sponsorship, Vaughan would like to provide increased benefits to corporate sponsors (e.g., through visibility on the ISB web site) and thereby attract new corporate partners. Vaughan emphasized the importance of good science. Biomechanics researchers need to have a solid background with the ability to be versatile and tackle problems that may require solving differential equations, understanding cell biology, or modelling complex systems. While luck often plays a role in scientific advances, the ability to ask questions that would lead to breakthroughs is a key element. Finally, he encouraged everyone to have fun doing their work, and thanked the ISB for electing him as the new president. He ended by encouraging members to approach him with their suggestions.

MEETING ADJOURNED AT 1.52 P.M.

THESIS CORNER

Analysis of dynamic lifting exertions performed by males and females on a hydrodynamometer

A.D.J. Pinder, PhD

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Supervisor: Professor D.W. Grieve

Gender differences in physical capability have implications for worker selection policies. Ability to perform maximal dynamic lifts under controlled conditions is related to the ability to carry out physically heavy employment.

The mechanics of muscular contraction are reviewed in the context of the measurement of dynamic strength. Gender differences in dynamic strength are reviewed in the context of the performance of military tasks.

The principles of fluid mechanics governing the operation of a hydro-resistive dynamometer and its instrumentation and calibration are described, with experimental protocols and methods of data collection. The relationship between force and velocity can be controlled and measurements are repeatable.

Subjects performed maximal dynamic lifts from 0.4 m from the ground to above 1.8 m. Force, position and time were measured, and related measures derived. Usable data from 201 male and 69 female soldiers are reported. Relationships between the different parts of the lift are modelled using linear regression. Differences in performance between subjects from different military employment groups are explored, as are differences in lifting technique.

Gender differences are identified using analysis of covariance. Relative to stature, males and females lift in the same manner. The gender differences almost completely disappear when differences in fat-free mass are taken into account across the range of the lift.

Principal Components Analysis is used to study the underlying features that affect the variability of the lift. The most important factors are the strength of the initial pulling phase and the need to change grip at chest height. The factors obtained are device dependent.

Absolute gender differences in strength limit the entry of women into physically demanding jobs. Therefore, if selection on the basis of gender is to be avoided, actual ability to perform the job should be the paramount selection criterion.

More Evolution of the English Language

The Washington Post's "Style Invitational" asked readers to take any word from the dictionary, alter it by adding, subtracting, or changing one letter, and supply a new definition. These were some that were submitted.

FOREPLOY: any misrepresentation about yourself for the purpose of obtaining sex.

DOLTERGEIST: a spirit that decides to haunt someplace stupid, such as your septic tank.

GIRAFFITI: vandalism spray-painted very, very high, such as the famous "Surrender Dorothy" on the Beltway overpass in Houston.

SARCHASM: the gulf between the author of sarcastic wit and the recipient who doesn't get it.

IMPOTIENCE: eager anticipation by men awaiting their Viagra prescription.

REINTARNATION: coming back to life on earth as a hillbilly.

DIOS: the one true operating system.

INOCULATTE: to take coffee intravenously when you are running late.

HIPATITIS: terminal coolness.

WRITER'S TRAMP: a woman who practices poetic licentiousness.

TATERFAMILIAS: the head of the Potato Head family.

ADULATERY: cheating on your wife with a much younger woman who holds you in awe.

KARMAGEDDON: It's like, when everybody is sending off all these really bad vibes, right? And then, like, the Earth explodes and it's like a serious bummer.

DEIFENESTRATION: to throw all talk of God out the window.

DOPELER EFFECT: the tendency of stupid ideas to seem smarter when they come at you rapidly.

MANUFACTURE: to produce items that break the first time you use them.

IMARGINATION: the fantasy of having sex with Homer's wife.

TELEGANT: Looking good on TV.

OSTEOPORNOSIS: a degenerate disease.

ANARCHRONISM: creating social chaos using outmoded political ideas.

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EDITOR'S NOTE

The ISB Newsletter is published quarterly: February-March; May-June; August-September, and November-December. There are alternative printing schedules that coincide with unbelievable errors. Deadlines for material and articles are the first day of each first named month, which if read literally would make everything due on January 1, but that is not correct. For the alternative schedule there are no deadlines or simply nothing will be accepted. The Newsletter is mailed to members whenever we can get to it except, of course on the alternative schedule which is always on time. Members are encouraged to submit anything they would like to relate to the international biomechanics community. The content of the Newsletter does not necessarily reflect the philosophy and opinions of the ISB but may reflect the mood of the Editor at the time at which the item was received. We presume the content reflects somebody's philosophy and opinion at some time. Naturally, items such as *Letters*, *Special Articles*, *Affiliate Society News*, *Laboratory Features*, *Reports*, or *Announcements of Meetings*, *Conferences*, and *Reviews of relevant conferences* and other biomechanics-related information are desirable and may be considered for publication if there is room. *Thesis Abstracts* can be published if they do, or do not meet any criteria. For example, Thesis abstracts that provide an Introduction that includes the rationale and hypotheses of the study, description of the methods, the key results, and important conclusions are considered desirable. The title of the work student's name, department and institution, the degree earned and the conferring institution and supervisor's name should also be provided. Clearly though, no student has ever done this but its important to have guidelines nevertheless. Material may be submitted electronically or on a computer disk as a text-only file, and must be in some form of English. The Editor reserves the right to translate the some forms of English to yet another form of English thus changing everything. Go ahead, roll the dice. Hard copy submissions of anything are acknowledged telepathically and subsequently placed in a recycle bin. Submission is not a guarantee of a timely or accurate appearance in the Newsletter.



IOC OLYMPIC
PRIZE
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The IOC Olympic Prize Program

The Olympic Prize Program is sponsored by the Olympic Prize Partnership, which was established in 1994 between the IOC Medical Commission and Parke-Davis. The goal of this partnership is to recognize, support and spur significant scientific discoveries related to movement exercise and sport that benefit humankind. The joint projects in this partnership include:

- The IOC Olympic Prize
- The Olympic Academy of Science
- The IOC World Congress on movement, exercise and sport science
- Research Projects associated with the Olympic Games.

The *IOC Olympic Prize* endowed by Parke-Davis is awarded in conjunction with the Olympic Summer and Winter Games every two years to a scientist for contributions that advance scientific activities related to movement, exercise and sport and that make a substantial impact on society. The first two IOC Olympic Prizes (1996 and 1998) consisted of a medal and a cash award of US\$ 250,000. The next IOC Olympic Prize (2000 in Sydney) will consist of a medal and a cash award of US\$ 500,000. The deadline for nominations for this third IOC Olympic Prize is September 1st, 1999. Further information can be found at http://www.parke-davis.com/version_4/index.html.

The *IOC Olympic Academy of Science* is an Academy for outstanding scientists involved in the study of questions associated with human movement, exercise and sport, from the microscopic to the macroscopic level. It is expected that the establishment of the Academy will have a positive effect world-wide on this field. The goals of the IOC Olympic Academy of Science include:

- Providing a framework for interaction of top scientists in the multidisciplinary field of movement, exercise and sport
- Meeting once a year
- Exchanging ideas
- Developing consensus statements on questions

- relating to movement, exercise and sport
- Supporting corresponding scientific activities.

The founding meeting took place during the fifth IOC World Congress in Sydney. The 22 founding members include two Nobel Laureates [Ch. de Duve (cell biology) and A. Huxley (muscle biophysics)] and scientists from the medical, physical, biological and psychological sciences

The *IOC World Congress on movement, exercise and sport* is an international forum held at regular intervals to discuss the multidisciplinary scientific aspects of movement, exercises and sport. The goals of the World Congress include:

- Providing a global forum for the multidisciplinary field of science related to movement, exercise and sport
- Uniting the leaders in this field (in combination with the IOC Olympic Academy meetings)
- Promoting the growth of this young field of science.

Currently, the IOC Olympic Congresses take place in the years before the Olympic Games, typically in the Olympic cities. The first IOC World Congresses took place in Colorado Springs (1989), Barcelona (1991), Atlanta (1995) and Monaco (1997). Under the theme of "The Science and Medicine of Skilled Performance: Optimization, Injury Prevention and Rehabilitation," the 5th IOC World Congress will take place in Sydney, Australia, October 31 to November 5, 1999.

The *Research Projects associated with the Olympic Games* provide support for scientists to study factors related to performance and/or loading of athletes leading up to and/or during the Olympic Games. The Research Projects also provide an opportunity to distribute knowledge to schools and to a broad audience interested in movement, exercise and sport. Interested scientists may get in contact with the co-ordinator of these activities, Dr. Dick Nelson (rcn1@email.psu.edu), for further information.

The Second IOC Olympic Prize

The second IOC Olympic Prize was awarded to Dr. Savio Woo for his contributions to the understanding of the properties of connective tissues, the effects of exercise on tissue properties and the possibilities for repair of injured tissues. Dr. Woo's scientific work addressed the visco-elastic laws governing connective tissue behavior, effects of immobilization on connective tissue, effects of motion and early mobility on the healing process of ligaments and tendons, mechanical development of ligaments and new methods to quantify stress-strain properties of connective tissues.



Dr. Woo (age 57) is the Ferguson Professor, Vice Chair for Research and Director of the Musculo-Skeletal Research Center of the Department of Orthopaedic Surgery, University of Pittsburgh. He obtained his M.Sc. and Ph.D. at the University of Washington in Seattle in the Departments of Mechanical and Bioengineering.

Dr. Woo's major soft tissue related research activities were performed at the University of California at San Diego (1970-1990) and at the University of Pittsburgh (1990-ongoing). His Research Center in Pittsburgh is one of the most prominent and productive musculo-skeletal research centres in the world. Woo's work is a rare combination of in-depth research into fundamental problems of soft tissue integrity and broad ranging investigation of medical problems of direct clinical relevance. He researched these questions using (and/or developing) state of the art methodologies and a multidisciplinary approach including biomechanical, histological and biochemical

methods. The outstanding scientific quality of his work is underlined by the many prestigious awards he has received, and his election to the National (USA) Academy of Sciences in two different categories, the Institute of Medicine (1991) and the Academy of Engineering (1994).

Considering the frequency of ligamentous injuries due to physical activity his impact on exercise and sport is significant and impressive. Woo's work has influenced the work of every scientist working on connective tissue; the principles he developed are used by biomechanists, orthopaedic surgeons, therapists and rehabilitation specialists.

More than any other individual, Woo has drastically changed the medical procedures and the rehabilitation practices associated with the surgical repair of ligaments. His impact is obvious in basic science departments, in clinical departments and in any research group interested in biological tissue developments. His methods have been applied world-wide and his conceptual path has been followed by a vast number of scientists.

But his greatest contribution to society relates to the health and well being of patients who have joint operations and rehabilitation procedures. Woo's work has demonstrated that in some cases natural healing is superior to surgical repair. Consequently, his findings on repair and rehabilitation of injuries have reduced the number of unnecessary surgical interventions and related pain, reduced expenses and shortened the recovery processes. For those on the receiving end, his innovations are nothing short of miraculous.

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Additional New members

One hundred and thirty of the
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who were not ISB members
opted for the special concession
rate if they wished to join the
Society. Space did not allow for
all their names to be listed in
this issue, but this short-coming
will be remedied in the next
(Nov/Dec) issue.

Texts for the Movement Sciences From Waterloo Biomechanics

**The Biomechanics and Motor Control of Human Gait;
Normal, Elderly and Pathological, 2nd Edition. 1991**
David A. Winter
143 pages, 125 figures, 50 tables, 500 references
\$45.00 CAN, \$35.00 US

**A.B.C.(Anatomy, Biomechanics and Control) of Balance
during Standing and Walking. 1995. David A. Winter**
56 pages, 54 figures, 2 tables, 104 references
\$24.00 CAN, \$18.00 US

**Signal Processing and Linear Systems for the Movement
Sciences. 1997. David A Winter, Aftab E. Patla**
110 pages, 94 figures, 3 tables
\$35.00 CAN, \$27.00 US

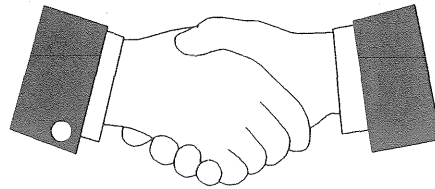
**Introduction to Biomechanics for Human Motion Analysis
1998. D. Gordon E. Robertson**
230 pages, 131 figures, 13 tables, 120 example problems
\$65.00 CAN, \$48.00 US

For flyers and payment information please contact:

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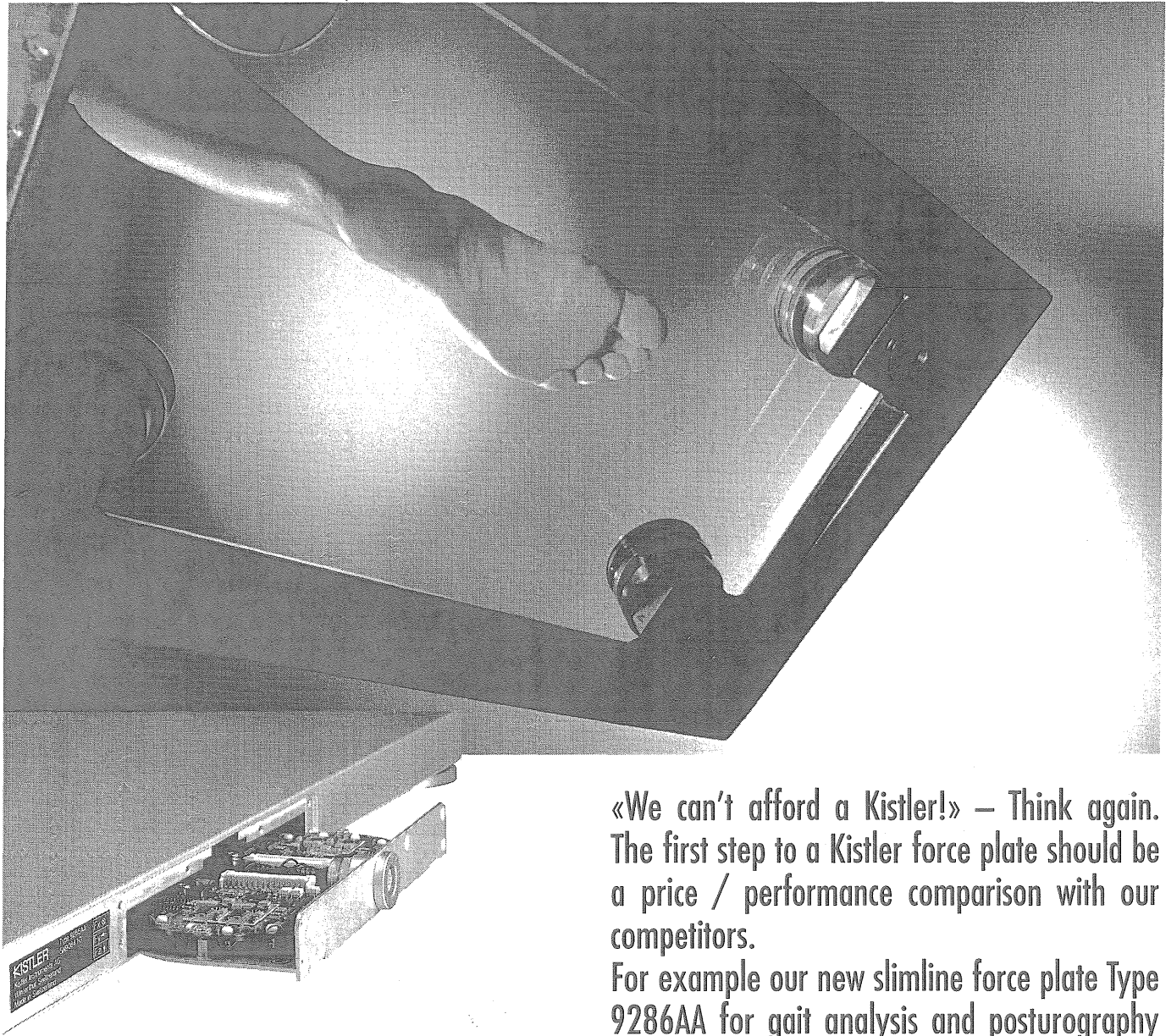
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