



# 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 Editor-Mark Grabiner

## Happy Holidays!!



**From the Secretary-General: Brian L. Davis**

On October 23rd, the Past President of the ISB, Dr. Peter Cavanagh, sent a Biomch\_1 announcement describing five new initiatives for ISB student members. One of these initiatives was "The International Travel Grant Program" that is designed to allow student members to travel abroad to experience science in other cultures. Details regarding this and other initiatives are available on the ISB homepage.

In line with this announcement, the ISB would like to encourage any biomechanics students interested in attending the 1998 Summer Session of the International Space University (to be held in Cleveland, Ohio, U.S.A) to apply for \$2,000 travel assistance offered by ISB. Note that the actual costs of this Summer Session are in the region of \$12,000, therefore students would need to supplement any funds that may be obtained through the ISB Grant Program. Details of the Summer Session can be obtained from the ISB secretary (davis@bme.ri.ccf.org), or at <http://www.oai.org/ISU.html>

The International Space University (ISU) is dedicated to the development of space for peaceful purposes through its international and interdisciplinary programs. ISU is also a forum where space activities can be discussed internationally, unconstrained by national or political considerations and free from any particular bias. Summer Session Program (SSP) is an intensive 10-week program aimed at providing graduate students and professionals from around the world with a unique educational experience that provides an interdisciplinary, intercultural, and international perspective on the world's space activities. The program, conducted in English, has been offered

annually since 1988 and is held each year in a different educational or research institution around the world. At the last meeting there were over 100 students from countries that included France, U.K., Switzerland, Austria, Australia, Kenya, Nepal, Russia, USA, Ethiopia, Canada, Argentina, Kazakistan, Mexico, Japan, Belgium. While these students' fields of study included politics, law, engineering and life sciences, the ISB we would be interested in assisting a student whose interests lay in, for instance, the effects of weightlessness on muscles and bones.

**From the Council: Mary M. Rodgers  
ISB Student Grant Guidelines\***

Student members of ISB are eligible for the following three new 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, reference to key related literature, study design, methods, timetable for the measurements and budget; (b) CV (resume) 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 15, 1998. Notification to applicants will be by March 25, 1998. 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.

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 which is 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, 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 15, 1998. Notification to applicants will be by March 25, 1998. Recipients will submit a brief report to the committee which will be published in the Newsletter.

**The Congress Travel Grant Program:** This grant is offered only in the years of ISB Congress, therefore, this grant will be offered in 1999. ISB Congresses provide a wonderful opportunity for exchange of information and for meeting other scientists who can be influential in the development of new directions. By virtue of the need to move the congresses between different continents, it is often very difficult for students to afford to travel to the Congresses or to pay the registration fee if they can travel. Starting with the 1999 ISB Congress in Calgary, we will offer several travel grants of \$1000 to student members who will be presenting their research results at ISB Congresses. Applications should include the following: (a) the proposal should have a maximum length of 3-4 pages including the abstract and the info of its acceptance, the total budget for the travel 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 one page recommendation from the supervisor who must also be an ISB member at the time of application. Recipients will submit a brief report to the committee which will be published in the Newsletter. Deadlines for this grant will be announced in 1998.

Send applications to: M.M. Rodgers, PhD, PT, Department of Physical Therapy, University of

Maryland, 100 Penn Street, Baltimore, MD 21201 USA, Tel: (410) 706-0840, Fax: (410) 706-6387, Email: mrodgers@physio.ab.umd.edu

**Also from the Council: Ton van den Bogert  
ISB informatics officer**

If you are willing to host foreign students in your laboratory, with help of an ISB international travel grant, please send a short (<half page) description of the institution, the type of work you are doing, and a contact address to bogert@acs.ucalgary.ca. This will be posted on the ISB web site so that students who are interested can contact you.

See: <http://www.kin.ucalgary.ca/isb/student/hosts>

**From the ISB '99 Congress Organizers**

Calgary, Canada is pleased to invite you to the International Society of Biomechanics XVIIth Congress August 8 - 13, 1999. The Congress will concentrate on muscle, locomotion, sport, clinical/rehabilitation and orthopaedic biomechanics using the format of free communication and symposia. Following in the tradition of previous ISB Congresses, the 1999 Congress will be supplemented with various tutorials and satellite symposia of the ISB working groups. The Congress will be held in downtown Calgary at the Calgary Convention Centre. Calgary is located approximately 100 km east of Banff National Park and the Canadian Rocky Mountains.

The Wartenweiler Memorial Lecture will be delivered by Andrew Huxley, the Nobel Laureate from the UK. The Muybridge Lecture will be given by Paavo Komi, from Finland. Günter Rau, will give the Presidents Lecture. **Keynote speakers** include T. Andriacchi, S. Grillner, W. Hayes and J. de Koning. **Invited speakers** are R.McN. Alexander, R. Enoka, Y. Kawakami, R. Woledge, P. Cavanagh, F. Horak, J. O'Connor, A. Schultz, C. Vaughan, P. Brüggemann, J. Mester, M. Miyashita, M. Yeadon, F. Zajac, S. Arnoczky, J. Danserau, J. Engsborg, M. Gagnon, J. Yang, L. Blankevoort, P. Bösiger, C. Rubin, L. Setton, S. Woo

Other important information including the call for papers, awards, housing, and travel may be obtained at the Congress website: [www.kin.ucalgary.ca/isb99/](http://www.kin.ucalgary.ca/isb99/)



## Job Market

### Faculty Positions

- ◆ The Orthopaedic Research Laboratory of the Department of Orthopaedic Surgery at the University of Pennsylvania is seeking applicants for a junior faculty position in orthopaedic biomechanics or tissue engineering. Applicants should have a Ph.D. in Bioengineering, Mechanical Engineering, Mechanics, or a related field. Outstanding graduate students nearing degree completion, current postdoctoral fellows, or junior faculty members are welcome to apply. Send a letter of interest briefly outlining career plans, a resume or curriculum vitae, and names and addresses of five references to: L.J. Soslowsky, PhD, Director of Orthopaedic Research, University of Pennsylvania, Orthopaedic Research Laboratory, 424 Stemmler Hall, 36th and Hamilton Walk, Philadelphia, PA 19104-6081, Tel: (215) 898-8653, Fax: (215) 573-2133
- ◆ A faculty position is available in the Department of Biomedical Engineering in the area of biomedical imaging. Applicants must have a Ph.D. or equivalent in biomedical engineering, computer science or related discipline; a history of publications in his/her specialization area; and demonstrated ability to pursue and secure extramural research funding. Excellent verbal and written communication skills are required. Experience in the area of breast or cardiovascular image processing are especially desired. Send a CV, a brief statement detailing research interests, and three references to J. Fredrick Cornhill, D. Phil., Chairman, Department of Biomedical Engineering, Wb3, The Cleveland Clinic Foundation, 9500 Euclid Avenue, Cleveland, OH 44195. Fax: (216) 444-9198, <http://www.ccf.org/ri/bme>, <http://www.ccf.org/ri/bme/image>.
- ◆ The Dept. of Exercise Science, at the University of Georgia, Athens, in conjunction with the Gerontology Center & the Dept. of Foods & Nutrition, is seeking a candidate for a tenure-track position at the Asst Professor Level. Candidates should have a Ph.D. or equivalent w/specialization in an exercise science discipline and postdoc research experience. Individuals with a specialization in biomechanics and/or motor control and who are involved in gerontological research are especially encouraged to apply. Contact: K. Simpson, PhD, Tel: (706) 542-4385, Fax: (706) 542-3148, e-mail: [ksimpson@coe.uga.edu](mailto:ksimpson@coe.uga.edu)
- ◆ A tenure track position at the Assistant Professor level is available beginning September 1998 in the Department of Mechanical Engineering at Catholic University of America. Candidates with experience in mechanical design and mechanics of materials with applications in material behavior/processes, computational methods, dynamics, biomechanics, or biomaterials will be given highest priority. The successful candidate will be expected to teach undergraduate and graduate courses, develop research programs and advise/supervise both undergraduate and graduate students. Excellent communication and teach skills are required. Send a CV, a clear statement of teaching and research interests; and a list of at least five references to: M. Casarella, PhD, Dept. of Mechanical Engineering, Catholic University of America, Washington DC 20064, Tel: (202) 319-5170, Fax: 202-319-4499, Email: [casarella@cua.edu](mailto:casarella@cua.edu)
- ◆ The Brockton/West Roxbury VA Medical Center and the Partners HealthCare, Inc. seek well-qualified applicants with a background in orthopedic biomechanics for a research faculty position. Associated with this position is an academic appointment in Orthopedic Surgery (Biomechanics) at Harvard Medical School at the Assistant Professor level and an appointment as Co-Director of the Rehabilitation Engineering R&D Laboratory. The applicant should have the capability of directing an independent program in musculoskeletal research and an interest in collaborating in multidisciplinary projects with other laboratory investigators and orthopedic surgeon faculty. Send a CV, a statement of research interests, and the names of three references to: Myron Spector, PhD, Director of Orthopedic Research, Department of Orthopedic Surgery, Brigham and Women's Hospital, 75 Francis Street, Boston, MA 02115, Tel: (617) 732-6702, Fax: (617) 732-6705, Email: [spector@ortho.bwh.harvard.edu](mailto:spector@ortho.bwh.harvard.edu)
- ◆ The Department of Orthopaedic Surgery at Hannover Medical School is seeking qualified applicants for a minimum 2 year appointment as head of the joint kinematics research group at the biomechanics laboratory. Candidates should

have an earned doctorate in bioengineering, engineering, or a related field. Requirements include expertise in joint kinematics, robotics, tracking devices, mechanical testing, analytical and approximation methods as well as in vitro and in vivo experimental protocols. Experience in shoulder or foot biomechanics, in particular related to prostheses design/evaluation are desirable and German language skills are very welcome. Contact: H. Windhagen, MD, Tel: +49 177 2407682, Fax: +49 511 5354682, Email: 106025.356@compuserve.com

- ◆ The Department of Biomedical Engineering at Tulane University invites applications for two tenure-track faculty positions that will be open beginning July 1, 1998. One position is at the rank of an Associate Professor or higher the focus of which includes computational cell and tissue biomechanics research. The second position, with rank commensurate with the applicant's experience, is intended to strengthen our experimental activities in biomechanics/biomaterials or tissue engineering. Send CV, brief description of research and teaching interests, and names and addresses of three references to: R.T. Hart, PhD, Department of Biomedical Engineering, Boggs Center, Suite 500, Tulane University, New Orleans, LA 70118-5674, [www.bmen.tulane.edu](http://www.bmen.tulane.edu)

#### *Postdoctoral Positions*

- ◆ A post-doctoral fellow/research associate position is available immediately in the Human Performance Laboratory at The University of Calgary is seeking an individual with experience and/or an interest in biomechanical modeling and simulation. The applicant must possess a Ph.D. in biomechanics, engineering or a related discipline. Projects include 3-D simulation of various human movements. Priority will be given to Canadian citizens and permanent residents. Send a CV to B. Nigg, Dr.sc.nat., Director, Human Performance Laboratory, Faculty of Kinesiology, The University of Calgary, 2500 University Drive N.W., Calgary, Alberta, T2N 1N4, Tel: (403) 220-3436, Fax: (403) 284-3553, Email: [croberts@kin.ucalgary.ca](mailto:croberts@kin.ucalgary.ca)
- ◆ Post-doctoral positions are available with starting date September 1, 1998 in a research program in "Applied Mathematics for Systems of Oscillators in Biology & Engineering" within the Department of Mathematics at Boston University. This is a

collaborative interdisciplinary research training with faculty in Mathematics, Aerospace & Mechanical Engineering, Biomedical Engineering, and Health Sciences). The problems to be addressed using this approach fall into three broad classes: dynamics of networks of neurons, systems of coupled mechanical oscillators, and interactions of neural and mechanical systems. Send a 1-page statement that includes your career goals, how this position satisfies those goals, and why you think you are a good candidate; your C.V.; and three letters of recommendation to: Ariella Rebbi, GIG Postdoctoral Search, Department of Mathematics, Boston University 111 Cummington Street, Boston, MA 02215, <http://eng.bu.edu/INTERDISC/Oscillation/>

- ◆ The Bioengineering Laboratory of the Department of Orthopaedics, Rhode Island Hospital and Brown University, Providence, Rhode Island is seeking an individual with interest and expertise in musculoskeletal soft tissues. The lab's primary focus in soft tissue research is on impact mechanics and injury mechanisms, but a candidate with a strong interest in any bioengineering area of soft tissues will be considered. A Ph.D. in Bioengineering or related field is required. Email replies will be logged but must be duplicated by printed copies (*Editor's note: ah, another tricky instruction set*) Send a C.V., three references and a statement of research interests to J.J. Crisco, PhD, Director Bioengineering Laboratory, Department of Orthopaedics, RIH, Orthopaedic Research, SWP-3, Rhode Island Hospital, 593 Eddy Street, Providence, RI 02903, Tel: (401) 444-4231, Fax: (401) 444-4559, Email: [joseph\\_crisco\\_iii@brown.edu](mailto:joseph_crisco_iii@brown.edu)
- ◆ The Department of Biomedical Engineering at Tulane University invites applications for a Post-Doctoral Scholar with a specialization in computational cell and tissue biomechanics research. Send CV, brief description of research and teaching interests, and names and addresses of three references to: D.P. Gaver, PhD, Department of Biomedical Engineering, Boggs Center, Suite 500, Tulane University, New Orleans, LA 70118-5674, [www.bmen.tulane.edu](http://www.bmen.tulane.edu)

#### *Graduate Assistantships*

- ◆ Doctoral studentships are available at the University of Calgary in the Department of Kinesiology for students having a background in

math, physics, or engineering who are interested in skeletal muscle mechanics and joint contact or spinal mechanics. First class honours degrees, or the equivalent, are required. Contact: W. Herzog, PhD, faculty of Kinesiology, University of Calgary, Calgary, AB, T2N 1N4, Canada, Tel: (403) 220-8525, fax: (403) 284-3553, Email: walter@kin.ucalgary.ca.

◆ The Orthopaedic Research Laboratory at the University of Pennsylvania is seeking applicants for graduate student research assistantships in Bioengineering or Mechanical Engineering. Research areas include orthopaedic biomechanics or tissue engineering. Applicants should have a BS or MS in Bioengineering, Mechanical Engineering, Mechanics, or a related field. Send a letter of interest, and a CV, to: L.J. Soslowsky, PhD, Director of Orthopaedic Research, University of Pennsylvania, Orthopaedic Research Laboratory, 424 Stemmler Hall, 36th and Hamilton Walk, Philadelphia, PA 19104-6081, Tel: (215) 898-8653, Fax: (215) 573-2133

◆ The Biomechanics Laboratory at The Pennsylvania State University is offering two graduate assistantships for the 1998-1999 school year. Areas of research currently being conducted are: hand biomechanics and finger control in multi-digit tasks, biomechanics of 'natural' standing posture, the response of lumbar intervertebral discs to axial spine compression loads studied in vivo with MRI technique, maximal power production in human movement, wavelet analysis of EMG recording, and impact biomechanics. A continuing focus for many of the research projects will be the biomechanical aspects of motor control problems. Send a letter of interest to: V.M. Zatsiorsky, PhD, Director, Biomechanics Laboratory, 39 Recreation Hall, University Park, PA 16802, Phone: (814) 865-3445, Fax: (814) 865-2440, E-mail: vxz1@psu.edu Assistantships are available for doctoral students in the Program of Rehabilitation Science at SUNY/Buffalo. Students interested in human motor control with a background in physical therapy, occupational therapy, exercise science, and other areas of clinical rehabilitation are encouraged to apply. Students with backgrounds in engineering with interests in rehabilitation research are also encouraged to apply. Contact: W.J. Gavin, PhD, Director of Graduate Studies, University at Buffalo, Department of Occupational Therapy, 515 Kimball

Tower, Buffalo, NY 14214, Tel: (716) 829-3141, Email: Gavin@shaman.socsci.buffalo.edu

◆ A full time, two year graduate assistantship, MS level, is available in biomechanics at St. Cloud State University beginning in the Fall of 1998. Applications are encouraged from individuals with backgrounds in math, physics or mechanical engineering. Most of the lab's research focuses on sports performance and sport equipment design. Contact D. Bacharach, PhD, Human Performance Lab, S102 Halenbeck Hall, St. Cloud State University, St. Cloud, MN 56301, Tel: (320) 255-3105. Email: bacharach@stcloudstate.edu

◆ Three graduate research positions are available in the Orthopaedic Research Laboratory Center for Biomedical Engineering at Columbia University. Research areas include characterization of mechano-electrochemical properties of biological soft tissues, computational biomechanics, constitutive modeling, orthopaedic engineering, bio-instrumentation, cellular/tissue engineering, signal transduction and transport. Applicants should have BS and/or MS in Applied Physics, Biomedical Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Engineering Mechanics, or Mechanical Engineering. Send a CV, GRE scores, and 3 letters of recommendation to: V.C. Mow, PhD, Director, Center for Biomedical Engineering, and Orthopaedic Research Laboratory, Department of Orthopaedic Surgery, Columbia University, 650 W. 168th Street, BB 1412, New York, NY 10032, USA

◆ There is a graduate position available at St. Francis Xavier University to do a M.Sc. in the comparative biomechanics laboratory, working on integrated studies of muscle function. For Canadian students, sponsorship of NSERC postgraduate scholarships is available. Contact: M.E DeMont, PhD, Biology Department, P.O. Box 5000, St. Francis Xavier University, Antigonish, N.S., Canada B2G 2W5, email: edemont@stfx.ca, <http://juliet.stfx.ca/~edemont/biomechanics-lab.html>

◆ The Bone Bioengineering Laboratory at the Center for Biomedical Engineering at Columbia is seeking an applicant for graduate research assistant position in the area of bone tissue bioengineering. This individual will pursue a Ph.D. degree in

biomedical engineering/mechanical engineering and perform graduate research in cellular adaptation of bone by mechanical stimulation. The candidate should have B.S. in mechanical or biomedical engineering. A M.S. in mechanical or biomedical engineering will be preferred but not required. Previous research experience in biomedical engineering will be a plus. Send a CV, GRE scores, and three letters of recommendation to: X.E Guo, PhD, Center for Biomedical Engineering, 238 S.W. Mudd MC4703, Columbia University, New York, NY 10027, Tel: (212) 854-6196, Fax: (212) 854-3304, Email: [exg1@columbia.edu](mailto:exg1@columbia.edu), <http://www.columbia.edu/~exg1>

*Industry, Health Care, et al.*

- ◆ The Orthopedic Biomechanics Laboratory, Mayo Foundation, Rochester, Minnesota has an opening for a full-time material testing engineer. This position involves all aspects of the research services provided by the lab, including project planning, equipment design, data collection and analysis, grant writing, and manuscript preparation. The position requires training in mechanical or biomedical engineering. Candidates should have a master's degree, or a bachelor's degree with significant research experience. The position requires advanced experience with material testing equipment and procedures, and knowledge of structural mechanics, orthopedics/anatomy, and instrumentation and advanced software. Send a cover letter, CV, and a list of 3 professional and 2 personal references to: K.A. Kerkhoff, Mayo Medical Center, Human Resources-OE 1, Rochester, Minnesota 55905, Fax: (507) 284-1445, Email: [kerkhoff.kaine@mayo.edu](mailto:kerkhoff.kaine@mayo.edu)
- ◆ Peak Performance Technologies, Inc., Denver, Colorado, has immediate employment opportunities available. Peak offers a variety of state-of-the-art kinematic and kinetic measurement tools for researchers in sports, biology, ergonomics and industrial applications, clinical gait analysis, as well as animation tools for the entertainment market. Systems Engineer II: Responsibilities include worldwide training at customer sites, developing exciting new technologies, and supporting our user base. Candidate must have BS or above in biomechanics, engineering or computer science. Experience with MS Windows, PC hardware and Peak Motus preferred. Systems

Engineer I: An individual who enjoys technical problem solving will be responsible for WindowsNT TCP/IP network installation and maintenance, in-house training, applications support, and system integration. Candidate must have Microsoft WindowsNT certification or equivalent training. Experience with Microsoft Windows95, Microsoft Office97, and PC hardware is required. Technical Sales Representative. Responsibilities include selling video and real-time motion measurement systems and peripheral equipment such as A/D systems, high-speed video systems, force platforms, and EMG systems to a variety of markets. A B.S. or higher in biomechanics, PT, engineering, or related field and four to seven years of technical sales experience is required Contact: Peak Performance Technologies, Inc. Attention: Human Resources, 7388 South Revere Parkway, Suite 603, Englewood, CO 80112 USA, Fax: 303-799-8690, Email: [peaktech@peakperform.com](mailto:peaktech@peakperform.com), Please, no phone calls (*Editor's Note: Who will be the first to fail this test?*)

- ◆ A full-time research position is immediately available at the Orthopedic Biomechanics Laboratory, Beth Israel Deaconess Medical Center (Boston, MA). An individual with good analytical and technical skills involved in material testing is sought. Applicants should have a BS in mechanical engineering, biomedical engineering, or equivalent, previous research experience and proven ability to work semi-independently. Send a letter of application, a resume, and the names and addresses of three references to: S.D. Kwak, PhD, Orthopedic Biomechanics Laboratory, Beth Israel Deaconess Medical Center, 330 Brookline Ave, RN 115, Boston, MA 02115, [sdk@obl.bidmc.harvard.edu](mailto:sdk@obl.bidmc.harvard.edu), Tel: (617) 667-8512, Fax: (617) 667-4561, <http://rncc.bidmc.harvard.edu/labs/obl/obl.html>
- ◆ A Research Assistant is available to work at the R.S. Dow Neurological Sciences Institute in Portland, Oregon. The research is directed at the control of balance in normal and zero-gravity environments and development of new clinical tests to diagnose balance disorders. Applicant must have at least a B.S. in Science or Engineering discipline and possess good communication skills. Experience with physiological testing and computers is highly desirable. Contact R.J. Peterka, PhD, Email: [peterka@nsi.lhs.org](mailto:peterka@nsi.lhs.org)

◆ A position is available for a biomechanics engineer to work with our group to assist with research on skates and skating in a university/industry research program. Applicants should possess a degree in mechanical and/or electrical engineering or a related subject. In particular, we are interested in a candidate who is conversant with electronics design, computer software and hardware, as well as analog and digital circuitry. Contact: Mario Lamontagne, PhD, School of Human Kinetics, University of Ottawa, 125 University Street (MNT 339), Ottawa, Ontario, Canada K1N 6N5, Tel: (613) 562-5800 ext. 4258, Fax: (613) 562-5149, Email: mlamon@uottawa.ca

◆ BTS, based in Milan, Italy, purveyors of motion measurement technologies for clinical gait analysis, biomechanics and industrial applications, is seeking a highly motivated individual to reinforce the Customer Service and Support Department. Responsibilities include worldwide system installation and training at customer sites, supporting our user base, running system demonstrations. Candidates must have a BS or above in biomechanics and/or engineering. Experience with MS Windows 95/NT, PC hardware a must, experience with motion analysis preferred, Italian, French and German languages a plus. Contact: F. Rotelli, BTS Bioengineering Technology & Systems, Via Cristoforo Colombo 1-A, I-20094 Corsico MILAN, ITALY, Tel: +39-2-45875.1, Fax:+39-2-45867074, Email: fabio.rotelli@bts.it, <http://www.bts.it/bts>

### Upcoming Meetings, Workshops, Etc.

1998

#### January

**2nd Australasian Biomechanics Conference**, 28-30 Jan 1998, The University of Auckland, Auckland, New Zealand, Contact: R.N. Marshall, PhD, Tel: 64 9 373 7599 ext 6630, Fax 64 9 373 7043, Email: r.marshall@auckland.ac.nz

#### March

**10th International Conference on Mechanics in Medicine and Biology**, 2-5 Mar 1998, Honolulu, Hawaii. Contact: L. Jones, Dept. Biomedical Engineering, 3304 G.G. Brown Building, university of Michigan, Ann Arbor, Michigan. Tel: (313)764-9588, Fax: (313) 936-1905.

**Neuronal mechanisms for generating locomotor activity**, 20-23 Mar, 1998, New York, New York, Contact: Science and Technology Meetings, New York Academy of Sciences. Tel: (800) 843.6927 or (212) 838.0230, ext 324. Email:

[conference@nyas.org](mailto:conference@nyas.org), <http://www.nyas.org>

**4th International Conference on Sports Medicine and Science in Tennis**, Coral Gables Florida.

Contact: K. Jennigs-Crooms, USTA, 7310 Crandon Blvd, Key Biscayne, Florida, 33149, Tel: (305) 365-8711, Email: [karenc@playdev.usta.com](mailto:karenc@playdev.usta.com)

#### April

**3rd Annual Gait and Clinical Movement Analysis Meeting**, 15-18 April, 1998. San Diego, California. Contact: 1998 GCMA Meeting Program Chair, Children's Hospital San Diego, Motion Analysis Laboratory MC 5054, 3020 Children's Way, San Diego, California 92123-4282.

**The International Sport Science and Sport Ergonomics Seminar of the Savoie**, 24-30 Apr, 1998, Val d'Isere, Haute Savoie, France, Contact: M. Verlinden, PhD, (Seminar Secretary), Dept. Experimental Anatomy, Vrije Universiteit Brussel, Laarbeeklaan 103, 1090 Brussel, Belgium.

#### May

**6th European Congress on Research in Rehabilitation**, 31 May-4 June, 1998, Berlin, Germany, Contact: Congress Secretary ECRR-98, H. Kirsten, c/o BAR, Walter-Kolb Str. 9-11, D-60594 Frankfurt/M, Germany, Tel: + +49-69-605018, Fax: + +49-69-605018-37.

#### June

**International Society of Electrophysiology and Kinesiology (ISEK)**, 27-20 Jun 1998 Montreal, Canada. Contact: ISEK Secretariat, Conference Office, McGill University, 550 Sherbrooke St. West, West Tower, Suite 490, Montreal, QC, Canada H3A 1B9, Tel: (514) 398-3770, Fax: (514) 398-4854, Email: [isek@UMS1.Lan.McGill.CA](mailto:isek@UMS1.Lan.McGill.CA), [www.mcgill.ca/mco/isek](http://www.mcgill.ca/mco/isek)

**International Research Society of Spinal Deformities**, 28 Jun - 1 Jul 1998, Burlington, Vermont, Contact: I.A. Stokes, PhD, University of Vermont, Department of Orthopaedics and Rehabilitation, Burlington, VT 05405-0084, USA, e-mail: [irssd@med.uvm.edu](mailto:irssd@med.uvm.edu), <http://salus.med.uvm.edu/~irssd/1998.htm>



**8th International Symposium of Biomechanics and Medicine in Swimming**, 28 Jun-2 Jul, 1998, Jyvaskyla, Finland, Contact the Symposium secretariat, Email: [pitkanen@jyu.fi](mailto:pitkanen@jyu.fi). to get  
**International Society of Electrophysiology and Kinesiology (ISEK)**, Montreal, Canada, 27 - 30 June, 1998. Contact: ISEK Secretariat, Conference Office, McGill University, 550 Sherbrooke St. West, West Tower, Suite 490, Montreal, QC, Canada H3A 1B9, Tel: (514) 398-3770, Fax: (514) 398-4854, Email: [isek@UMS1.Lan.McGill.CA](mailto:isek@UMS1.Lan.McGill.CA), <http://www.mcgill.ca/mco/isek>

#### July

**Fifth International Symposium on the 3-D analysis of Human Motion**, 2-5 Jul 1998, Chattanooga, Tennessee, Contact: M. Whittle, PhD, The University of Tennessee at Chattanooga, Michael-Whittle@utc.edu, <http://www.utc.edu/Human-Movement>

**11th Conference of the European Society of Biomechanics**, 8-11 July 1998, Toulouse, France, Contact: ESB'98, BP 3103, 31026 Toulouse, Cedex, France, Tel: 33 5 61 77 82 84/ 33 5 62 74 83 59, Fax: 33 5 61 31 97 52, Email: [ESB98.@purpan.inserm.fr](mailto:ESB98.@purpan.inserm.fr), <http://esb.purpan.inserm.fr>

**Symposium of the International Society of Biomechanics in Sports**. 21-25 July, 1998. University of Konstanz (Germany). Contact ISBS'98 Secretariat, Department of Sports Science, Lehrstuhl Riehle, P.O.Box 5560 D30, 78434 Konstanz / Germany, Tel:+49-7531-883565, Fax: +49-7531-884221, Email: [isbs98@uni-konstanz.de](mailto:isbs98@uni-konstanz.de),  
**2nd International Conference on The Engineering of Sport**, 13-17 July 1998, The University of Sheffield, Contact: Miss A. Staley, Conference Secretariat, 2nd International Conference on the Engineering of Sport, Department of Mechanical Engineering, The University of Sheffield, Mappin Street, Sheffield S1 3JD, UK. Tel. (+ 44 114) 222 7801, Fax. (+44 114) 275 3671, email: [a.staley@sheffield.ac.uk](mailto:a.staley@sheffield.ac.uk), <http://www.shef.ac.uk/uni/academic/I-M/mpe/sportseng/>

**International Research Society of Spinal Deformities**, 28 Jun - 1 Jul, 1998, Burlington, Vermont. Contact: I.A. Stokes, PhD, Department of Orthopaedics and Rehabilitation, University of Vermont, Burlington, Vermont, 05405-0084,

Email:[irssd@med.uvm.edu](mailto:irssd@med.uvm.edu),  
<http://salus.med.uvm.edu/~irssd/1998.htm>

#### August

**The Third World Congress of Biomechanics: 2-8 Aug 1998**, Hokkaido University, Sapporo, Japan; Contact K. Hayashi, PhD, Biomechanics Laboratory, Department of Mechanical Engineering, Faculty of Engineering Science, Osaka University, Toyonaka, Osaka 560, Japan; Tel: +81-8-850-6170, Fax:+81-8-850-6171

**VI Emed Scientific Meeting**, 8-12 Aug, 1988, Brisbane, Australia, Contact: C. Jordan, Medical Engineering & Physics, King's College Hospital, East Dulwich Grove, London, SE22 8PT, UK, Tel & Fax: + 44 (0) 181 693 2345

**The Third North American Congress on Biomechanics: 14-18 Aug 1998**, University of Waterloo, Waterloo, Ontario, Canada. Contact: S. McGill, Ph.D., host chair, <http://www.ahs.uwaterloo.ca/nacob98>

#### September

**Global Ergonomics Conference**, 9-11 Sep 1998, Cape Town, South Africa, Contact: D. McTeer, Postgraduate Conference Centre, University of Cape Town Medical School, Observatory 7925, Cape Town, South Africa, [deborah@medicine.uct.ac.za](mailto:deborah@medicine.uct.ac.za)

**The International IMEKO Conference on Measurement in Clinical Medicine: "Biomedical Measurement and Instrumentation" & 12th International Symposium on Biomedical Engineering**, 16-19 Sep, 1998, Dubrovnik - Croatia, Contact: KoREMA, P.O. Box 473, HR-10001 Zagreb, CROATIA, Tel.: +385 1 61 29 869/938, Fax.: +385 1 61 29 870, Email: [imeko.bmi98@zesoi.fer.hr](mailto:imeko.bmi98@zesoi.fer.hr), <http://www.imeko-bmi98.hr>

**3rd Combined Meeting of Orthopaedic Research Societies of USA, Canada, Europe and Japan**, 28-30 Sep 1998, Contact: Hayato Hirotsu, MD, Shigetomi Health Care Group, 1-1521, Shikenyu, Moriyamaku, Nagoya, Japan 463. Tel: +81-52 -776-2501, Fax: +81-52-776-2508.

#### November

**International Conference on Weightlifting and Strength Training (in conjunction with the World Weightlifting Championships)**, November 10-12, 1998, Lahti, Finland, Contact: Ms Pirjo-Leena

Pitkanen, Conference Coordinator, ConFinnia Ltd, P.O. Box 35, FIN-40351 Jyvaskyla, Finland, Tel: +358-14-603662, Fax +358-14-603727, Email: pitkanen@jyu.fi, <http://www.jyu.fi/wlconference/>  
**3rd Interdisciplinary World Congress on Low Back- and Pelvic Pain**, 19-21 Nov, 1998, Vienna, Austria, Contact: in Europe: European Conference Organizers, P.O.Box 4334, 3006 AH Rotterdam, The Netherlands. Phone +31 - 10- 4133287. Telefax + 31 - 10 - 4148059. Email: SJCECO@WorldAccess.NL; in the U.S.: University of California, San Diego, Office of Continuing Medical Education, 9500 Gilman Drive, 0617, La Jolla, California 92093-0617, U.S.A. Tel:(619)534 3940. Fax:(619)534 7672

1999

**World Congress of Science of Football**, 22-26 February 1999 University of Technology Sydney, Australia. Contact: World Congress of Science of Football, PO Box 236, ROSEVILLE NSW AUSTRALIA 2069, Tel: 61 2 9411 4666, Fax: 61 2 9411 4243, Email: Nick@hotelnetwork.com.au  
**First World Congress of Science and Medicine in Cricket**, 14-17 Jun 1999, Newport, Shropshire, Contact: N. Stockill, PhD, Tel: 01952 670185, Fax: 01952 820924, Email: nigelstockill@lsihpc.demon.co.uk  
**17th International Symposium of Bioemchanics in Sports**. 30 Jun - 6 July, Perth Western Australia. Contact: R. Sanders, PhD, School of Biomedical and Sportss Sciences, Edith Cowan University, Joondalup, Western Australia, 6027. Tel: 61 8 9400 5860, Fax: 61 8 9400 5717, Email: r.sanders@cowan.edu.au, [Http://weaver.fste.ac.cowan.edu.au/~blaw/sports/isbs\\_invitation.html](http://weaver.fste.ac.cowan.edu.au/~blaw/sports/isbs_invitation.html).  
**ISB99** The University of Calgary, 8-13 Aug, 1999, Contact: M. Stroh, Conference Mgmt. Services, 1833 Crowchild Trail N.W., Calgary, AB, CANADA T2M 4S7, Tel: (403) 220-6229, Fax: (403) 284-4184, Email: mastroh@acs.ucalgary.ca

#### Czech this out

Editor's Note: The following represents a more interpretable version of something that may have resembled this in the previous issue of the NL.

The Executive Council of Czech Society of Biomechanics (CSB) was restored. On the plenary session (in March 1997) was voted the new

executive team work: Stanislav OTAHAL (President -Charles University Prag), Premysl JANICEK (Vice President - Technical University Brno), Ottmar KITTNAR (Vice President - Charles University Prag), Miroslav SOCHOR (Scientific Secretary - Czech Technical University Prag), Monika CHALUPOVA ( treasurer - Charles University Prag) Contact Address: Czech Society of Biomechanics J.Martiho 31 162 52 Prag 6 (CZ), Email: otahal@ftvs.cuni.cz, Tel/fax: + +42 2 20610219, csb@ftvs.cuni.cz, sochor@fsid.cvut.cz, CSB homepage (czech version, in the meantime it is in construction), <http://www.ftvs.cuni.cz/csb/>

#### News from the Technical Group Computer Simulation

Ton van den Bogert - TGCS chairperson

The Technical Group Computer Simulation (TGCS) of the ISB has held their 6th International Symposium in Tokyo, Japan (August 21-23) as a satellite event to the XVIth ISB congress. The symposium, hosted by Dr. Michiyoshi Ae (University of Tsukuba), had about 60 participants with 23 presentations. Almost every presentation was accompanied by an informal software demonstration in separate sessions, which allowed for many stimulating discussions and much echange of ideas.

The Andzrej Komor new investigator award of the ISB was awarded to Naomichi Ogihara, for his paper "A Bio-mimetic neuro-musculo-skeletal model for synthesis of autonomous human bipedal locomotion". I was personally very impressed by this paper and several other Japanese contributions on control of bipedal locomotion which showed a strong background in robotics and control theory. The TGCS thanks Dr. Ae for organising an excellent symposium.

TGCS membership is free and open to all ISB members. If you are not sure that you are registered, check the list of members on our web page: <http://www.kin.ucalgary.ca/isb/tgcs> . You can also request an update of information included in the database. TGCS members are automatically included in the mailing list TGCS-L, which we hope will become an active means of communication between members. If you wish to become a member, please register through the web site.

Symposia remain the main focus of the group. For activities between symposia, there are plans for

further developments of the web site. There is already a considerable amount of simulation software available, that can be downloaded from <http://www.kin.ucalgary.ca/isb/software>. Future plans include: a Web-based encyclopaedia for simulation and modeling (coordinated by Lutz Bauer), group projects such as benchmarking of simulation software, and student exchange programs.

#### News from Sweden

- The 10th International Biomechanics Seminar was held in Gothenburg September 12-13 on the theme "Internal forces". Key-note speakers were Walter Herzog, Calgary, and Marek Dietrich, Warsaw. For the first time the seminar was arranged in cooperation with the Academy of Physical Education, Wroclaw, who will also host the seminar Sept 18-19, 1998.
- A new Biomedical Engineering program (MSc program) has been launched at the School of Mechanical Engineering, Chalmers University of Technology. This is the first program of this kind in Sweden.
- A PhD thesis entitled "Towards an Optimized Denta Implant and Implant Bridge Design; A Biomechanical Approach" by Stig Hansson was successfully defended in April -97. The impact of the thesis was such that by now 2000 copies of the thesis have been distributed.

*Thanks to Christian Hoegfors, Chalmers University of Technology, Gothenburg, Sweden for these items*

#### Free Stuff: a perfect stocking stuffer

Just in time for the holidays, a NEW improved version of spacelib is now available at:

<http://www.kin.ucalgary.ca/isb/tgcs/software>  
SPACELIB is a software library written in c-language useful for the realization of programs for the kinematic and dynamic analysis of systems of rigid bodies.

The functions contained in the library are devoted to:

- \* basic operations on matrices
- \* basic operation on points, lines and planes
- \* basic operation on vectors
- \* transformation matrices (rototranslations)
- \* velocity and acceleration matrices
- \* Cardan/Euler angles
- \* linear systems

The library is offered with:

- \* full c code
- \* a full reference manual
- \* commented application examples
- \* papers describing the mathematic theory which is at the base of spacelib

The file listfile.txt contained in the zip file lists of all the files of the library, of the examples and of the documentation. The library is free for non-profit activities. Be sure to read the "disclaimer warranties" statment in the manual.

#### Places to "Go"

- ♦ NACOB 98  
<http://www.ahs.uwaterloo.ca/nacob98>
- ♦ Perception and Motor Systems Laboratory  
Dept Human Movement Studies  
University of Queensland.  
<http://www.uq.edu.au/hms/motor.html>
- ♦ Journal of Neurophysiology on-line  
Free!! Until, February, 1998,  
<http://www.jn.org>
- ♦ ISB '99  
[www.kin.ucalgary.ca/isb99/](http://www.kin.ucalgary.ca/isb99/)

#### How to annoy people

- \* Leave the copy machine set to reduce 200%, extra dark, 17 inch paper, 99 copies.
- \* Specify that your drive-through order is "to take away."
- \* If you have a glass eye, tap on it occasionally with your pen while talking to others.
- \* Insist on keeping your car windshield wipers running in all weather conditions "to keep them tuned up."
- \* Reply to everything someone says with "that's what YOU think."
- \* Practice making fax and modem noises.
- \* Highlight irrelevant information in scientific papers and "cc." them to your boss.
- \* Make beeping noises when a large person backs up.
- \* Finish all your sentences with the words "in accordance with the prophesy."
- \* Signal that a conversation is over by clamping your hands over your ears.
- \* Adjust the tint on your TV so that all the people are green, and insist to others that you "like it that way."

- \* Staple papers in the middle of the page.
- \* Publicly investigate just how slowly you can make a "croaking" noise.
- \* Decline to be seated at a restaurant, and simply eat their complimentary mints by the cash register.
- \* TYPE ONLY IN UPPERCASE.
- \* type only in lowercase.
- \* dont use any punctuation either
- \* donotuseaspaceattimeswhenwritinglongletters
- \* Buy a large quantity of orange traffic cones and reroute whole streets.
- \* Repeat the following conversation a dozen times: "Do you hear that?" "What?" "Never mind, it's gone now."
- \* Try playing the William Tell Overture by tapping on the bottom of your chin. When nearly done, announce, "no, wait, I messed it up," and repeat.
- \* Ask people what gender they are.
- \* While making presentations, occasionally bob your head like a parakeet.
- \* Sit in your front yard pointing a hair dryer at passing cars to see if they slow down.
- \* Sing along at the opera.

*Thanks to Suneel Apte, PhD, Cleveland Clinic, for this submission*

#### Interpreting Engineering Terminology

A NUMBER OF DIFFERENT APPROACHES ARE BEING TRIED  
 We're still guessing.  
 AN EXTENSIVE REPORT IS BEING PREPARED FOR A FRESH APPROACH TO THE PROBLEM  
 We just hired three kids right out of college.  
 CLOSE PROJECT COORDINATION  
 We know who to blame.  
 A MAJOR TECHNOLOGICAL BREAKTHROUGH  
 It works okay, but looks very high tech.  
 CUSTOMER SATISFACTION IS ASSURED ON DELIVERY  
 We are so far behind schedule the customer will be happy to get it at all.  
 PRELIMINARY OPERATIONAL TESTS WERE INCONCLUSIVE  
 The damn thing blew up when we turned it on.  
 TEST RESULTS WERE EXTREMELY GRATIFYING  
 We're surprised the stupid thing works.

THE ENTIRE CONCEPT WILL HAVE TO BE ABANDONED  
 The only person who understood the thing quit.  
 IT'S STILL IN PROCESS  
 It's so wrapped up in red tape that the situation is hopeless.  
 WE'LL LOOK INTO IT  
 Forget it! We have enough problems for now.  
 PLEASE READ AND INITIAL  
 Let's spread responsibility around for the screw up.  
 GIVE US THE BENEFIT OF YOUR THINKING  
 We'll listen to what you have to say as long as it doesn't interfere with what we've already done.  
 GIVE US YOUR INTERPRETATION  
 I can't wait to hear this BS  
 SEE ME, LET'S DISCUSS IT  
 Come into my office, I'm lonely.  
 ALL NEW  
 Parts not interchangeable with the previous design.  
 RUGGED  
 Too damn heavy to lift!  
 LIGHTWEIGHT  
 Lighter than RUGGED.  
 YEARS OF DEVELOPMENT  
 One finally worked.  
 ENERGY SAVING  
 Savings are achieved when the power switch is off.  
 LOW MAINTENANCE  
 Impossible to fix if broken.

*Thanks to Rachel Skoss, galactic distributor of overnight emails, for this submission*

#### The Changing Face of health Care in the United States

In the United States, there are various forms of Health Insurance. One form is the Health maintenance Organization, the HMO, the physicians of which you must see for your healthcare. Here are a number of Frequently Asked Questions pertaining to HMO Plans  
 Q. What does HMO stand for?  
 A. This is actually a variation of the phrase, "Hey, Moe!" Its roots go back to a concept pioneered by Doctor Moe Howard, who discovered that a patient could be made to forget about the pain in his foot if he was poked hard enough in the eyes. Modern practice replaces the physical finger poke with hi-tech equivalents such as voice mail and referral slips, but the result remains the same.



Q. Do all diagnostic procedures require pre-certification?

A. No. Only those you need.

Q. I just joined a new HMO. How difficult will it be to choose the doctor I want?

A. Just slightly more difficult than choosing your parents. Your insurer will provide you with a book listing all the doctors who were participating in the plan at the time the information was gathered. These doctors basically fall into two categories -- those who are no longer accepting new patients, and those who will see you but are no longer part of the plan. But don't worry -- the remaining doctor who is still in the plan and accepting new patients has an office just a half day's drive away!

Q. What are pre-existing conditions?

A. This is a phrase used by the grammatically challenged when they want to talk about existing conditions. Unfortunately, we appear to be pre-stuck with it.

Q. Well, can I get coverage for my pre-existing conditions?

A. Certainly, as long as they don't require any treatment.

Q. What happens if I want to try alternative forms of medicine?

A. You'll need to find alternative forms of payment.

Q. My pharmacy plan only covers generic drugs, but I need the name brand. I tried the generic medication, but it gave me a stomach ache. What should I do?

A. Poke yourself in the eye.

Q. I have an 80/20 plan with a \$200 deductible and a \$2,000 yearly cap. My insurer reimbursed the doctor for my outpatient surgery, but I'd already paid my bill. What should I do?

A. You have two choices. Your doctor can sign the reimbursement check over to you, or you can ask him to invest the money for you in one of those great offers that only doctors and dentists hear about, like windmill farms or frog hatcheries.

Q. What should I do if I get sick while traveling?

A. Try sitting in a different part of the bus.

Q. No, I mean what if I'm away from home and I get sick?

A. You really shouldn't do that. You'll have a hard time seeing your primary care physician. It's best to wait until you return, and then get sick.

Q. I think I need to see a specialist, but my doctor insists he can handle my problem. Can a general practitioner really perform a heart transplant right in his office?

A. Hard to say, but considering that the \$10 Co-payment is all you're risking, there's no harm in giving him a shot at it.

Q. What accounts for the largest portion of health care costs?

A. Doctors trying to recoup their investment losses.

Q. Will health care be any different in the next century?

A. No, but if you call right now, you might get an appointment by then.

*Thanks to Alan Litsky, The Ohio State University (new area code of 1-8-1, Wolverine sports fans!) for this submission*

**How to Write a Ph.D. Dissertation**  
*E. Robert Schulman and C. Virginia Cox*  
Charlottesville, Virginia

*Editor's Note: It is with great pleasure that the ISB Newsletter presents this outstanding scholarly article for the consumption of the readership. On behalf of all of the students and mentors alike who stand to benefit from its wisdom, I want to offer our deepest gratitude to Marc Abrahams, from Harvard University, Co-founder of the Annals of Improbable Research for permission to reprint the article that originally appeared in AIR 3:5, 1997. The AIR website is definitely worth a visit... <http://www.improb.com>*

In this paper, we demonstrate that writing a Ph.D. dissertation can have many benefits. Not only do you obtain extensive typesetting experience, but afterwards you can have your frequent-flyer literature addressed to "Dr. Your Name".

**Chapter I: Introduction**

Ph.D. dissertations (e.g., Schulman 1995a; Cox 1995) are commonly believed to be comprehensive compendiums of the original research done by a graduate student in partial fulfillment of the requirements for the degree of Doctor of Philosophy.<sup>1</sup> In reality, the Ph.D. thesis is usually a number of disparate chapters whose most important feature is not the thoroughness of the experimental description, but rather the width of the margins. In this paper, the second article in a series on scientific writing that began with Schulman (1996a), we will discuss the phenomenon of the Ph.D. thesis.

**Chapter II: Preparing to Write**

There comes a time in the life of every graduate student when she or he realizes that another two years of graduate school cannot be endured. Even though a year spent writing your thesis will be filled with frustration and angst, it will end up being worth it in order to escape school forever. Remember the following phrase: "No one will ever read your

thesis". You will hear this phrase a number of times as you finish up, and it is vitally important that you believe it to be true. The phrase is important because without it you would be tempted to work on your thesis until everything is perfect, and you would never finish. Say "It's good enough for the thesis" to yourself several times a day. Tell yourself that you'll correct all the mistakes when you turn the various chapters into independent scientific papers, even though this won't happen (see Schulman 1996a and references therein).

### Chapter III: Your Thesis Committee

Your thesis committee should consist of between four and nine researchers in and outside of your field. Each committee member has a specific duty. Your thesis advisor has the most important job: to reassure you that you don't have to do many of the things you're positive you should do. She or he will likely say, "It's good enough for the thesis" fairly often. You also need one committee member who will insist on more mathematical rigor, one who will demand that the thesis be made more concise by getting rid of all that irrelevant math, and two or three to say that you should do all the things your thesis advisor told you didn't need to be done. There should also be at least one committee member who will never read the thesis, and who will therefore ask only general questions at your thesis defense. Try to set a defense date early so as to give your committee ample time to schedule conferences, vacations, and/or elective surgery for that day.

### Chapter IV: Producing the Thesis

Legend has it that doctoral students in ancient times used to produce their dissertations using a device called a "typewriter". While there is some archeological evidence for typewriter use in the past, many researchers doubt the plausibility of such claims (e.g. Schulman 1995a). These days, dissertations are produced using word processing programs such as Word<sup>TM</sup> or Word Perfect<sup>TM</sup>, or computer typesetting systems such as TeX or LaTeX. The former will give you practice in drawing by hand all the symbols that aren't supported, while with the latter you have the opportunity to craft new typesetting definitions to satisfy your university's dissertations policies. For example,

```
\long\def\printfrontnonchapter{\vfil\ejct\rightpage\null\vskip1in\centerline{{\bf\Uppercase{\frontnonchapterheader}}}\vskip22pt plus 73pt
```

```
\relax\bigskip\setwidesspacing\frontnonchaptertext\par}
```

(Jerius 1992).

Be sure not to choose the wrong method of producing your thesis.

### Chapter V: Writing the Thesis

The Ph.D. thesis usually begins with a pithy quote, after which there will sometimes be a dedication to one's parents, life partner, and/or pet tapir. Following this is probably the most important part of the dissertation: the acknowledgments section. This is the only section that everyone who picks up your thesis will read. They will happen upon your dissertation in the library and flip through the first few pages, looking for a juicy acknowledgments section. This is your chance to make obscure references to secret loves, damn various faculty members with faint praise, or be very mysterious by having no acknowledgments section at all so that everyone wonders what you're hiding. After this section should be the various tables of contents, denoting the page numbers on which the reader may find every section, subsection, subsubsection, figure, table, appendix, footnote, and semicolon in the thesis.

Next comes the first thesis chapter, the introduction, which is judged on the basis of how far back in the past you start. Although the introduction is supposed to enable someone with no knowledge of your field to read and understand your thesis, this is an impossible goal. Instead, simply reference sources such as Rontgen (1896), Galileo (1610), Aristotle (-350), or other similarly ancient researchers. The idea to get across is that your work, being based on the work of great scientists of the past, must be truly worthwhile. Even though these works have little to do with your research, your committee isn't going to look up the references.

After the introduction come chapters that describe what you did, where you did it, when you did it, why you did it, and how much work has to be done before you can obtain definitive results. This last point is usually discussed in the concluding chapter.

### Chapter VI: The Thesis Defense

Remember those dreams you used to have about going to class and finding out that there was a big test that day for which you hadn't studied? The thesis defense is worse, because you find out that although you studied very hard, you didn't study the right things. Your committee members aren't going

to spend their time asking you about your research, because you know more about that than anyone else in the world. Instead, they will ask questions that are really about their research or, if they are in a particularly punchy mood, about fundamental mathematics. The fun part is that at most universities the first part of your defense is open to the public, so that your parents will probably want to come and videotape the event.

#### Chapter VII: Rewriting

Your thesis defense was tough, but you survived. Your committee members have signed a piece of paper saying that they are satisfied with your dissertation as long as your thesis advisor is happy with the revisions you make. Don't fall into the trap of trying to make everything perfect! Remember the phrase from Chapter II, "No one will ever read your thesis". Once your advisor is happy with the revisions, take one unbound, unperforated, paginated copy of your dissertation, two copies of your abstract, one extra copy of your title page, the signed evaluation forms from your committee members in a sealed, notarized envelope, the receipt proving your payment of the Thesis Publication Fee, your diploma application, and proof of your doctoral candidacy enrollment to the Bureaucratic Office of Records, Education, and Dissertations (your requirements may vary; void where prohibited). The folks at BORED will take a ruler to every page in your thesis, making sure that all the margins are correct and insisting that you go back and redo them if even one page is wrong.

#### Chapter VIII: Distributing Your Thesis

You've passed the format check, and it's time to make a hundred copies of your thesis and distribute them to departmental libraries all over the world so that everyone in your field can read it. Your advisor should pay for the photocopying and postage (see Schulman & Cox 1997 for a detailed justification). Try not to think of all the errors lurking in your thesis as you address the envelope to Prof. Famous or Dr. Influential. You want to publicize your dissertation as much as possible so that prospective employers will at least have heard your name. Some journals will publish brief summaries of your dissertation (e.g. Schulman 1995b; Schulman 1996b), but be warned that these journals may want you to format your summary quite specifically. The requirements for the *mini-Annals of Improbable Research* are particularly restrictive; it can be difficult to summarize five years of work in five lines of text.

#### Chapter IX: Conclusion

Congratulations, Doctor! You've escaped from graduate school and can now have your frequent-flyer literature addressed to Dr. Your Name, complain when forms only list Mr/Ms/Mrs, and smirk when surgeons whine about all the people with academic doctorates who are making the title meaningless for medical doctors. Go out and make the world a better place.

#### Bibliography

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#### Note

1. One does not actually need to include any philosophy in the thesis unless one is getting a Doctorate of Philosophy in philosophy, and even in that case the philosophical component can be minimized (e.g., Kaplan 1996).

*The Editor wants to personally thank Tammy Owings who personally took on the responsibility of finding someone to type this article by hand when a recent software upgrade rendered our scanner useless. Tammy and I both wish to thank Julie Perry for doing the typing. None of us cares to thank Microsoft.*

#### Contest Winners

The May-June '97 ISB Newsletter included another contest, the winners of which are listed below. The puzzle was to solve the expressions given in the parentheses. The response to the contest was, as expected, overwhelming although most of the responses were pathetic. I have learned that there are a number of sick minds out there and I personally want to thank them for their entries. However, the cream always rises to the

top (C always R T T T) and therefore, it is with pleasure that the following people can be duly recognized for their fine efforts. Now they can go back to work.

**First place:** Karen E. Warden, Orthopaedic Engineering Lab, Case Western Reserve University, Cleveland, Ohio (30 out of 30)

**Second Place:** Students in the Biomedical Engineering Department at the University of Akron, Akron, Ohio (fewer)

**Third place:** Maaïke Langelaan from somewhere in The Netherlands (fewer still)

- 26 = Letters of the Alphabet (L of the A)
- 7 = Wonders of the Ancient World (W of the A W)
- 1001 = Arabian Nights (A N)
- 12 = Signs of the Zodiac (S of the Z)
- 54 = Cards in a Deck (with the Joker) (C in a D (with the J))
- 9 = Planets in the Solar System (P in the S S)
- 88 = Piano Keys (P K)
- 13 = Stripes on the American Flag (S on the A F)
- 18 = Holes on a Golf Course (H on a G C)
- 32 = Degrees Fahrenheit at which Water Freezes (D F at which W F)
- 8 = Sides on a Stop Sign (S on a S S)
- 200 = Dollars for Passing Go in Monopoly (D for P G in M)
- 3 = Blind Mice (See How They Run) [B M (S H T R)]
- 90 = Degrees in a Right Angle (D in a R A)
- 4 = Quarters in a Game or Quarts in a Gallon (Q in a G)
- 24 = Hours in a Day (H in a D)
- 1 = Wheel on a Unicycle (W on a U)
- 5 = Digits in a Zip Code (D in a Z C)
- 57 = Heinz Varieties (H V)
- 11 = Players on a Football Team (P on a F T)
- 1000 = Words that a Picture is Worth (W that a P is W)
- 29 = Days in February in a Leap Year (D in F in a L Y)
- 64 = Squares on a Checkerboard (S on a C)
- 40 = Days and Nights of the Great Flood (D and N of G F)
- 80 = Days to Go Around the World (D to G A the W)
- 2 = number it takes to tango (# it T to T)
- 6 = Points on the Star of David (P on the S of D)
- 50 = Ways to Leave Your Lover (W to L your L)
- 31 = Flavors of Baskins Robbins (F of B R)
- 40 = Hours in a Work Week (H in a W W)

## Treasurer's Entreatment

Well, Mark tried to bury me in this issue by hiding me behind the Jokes columns (is he trying to tell me something?). As I'm sure you know, Mark Grabiner prepares all the Newsletter copy, but I still do the printing and mailing from Australia (Qantas airline's got a good safety record!). This gives me the last say in what is published, which is probably why you have never read anything really derogatory about me (apart from references to my A-V problems in Tokyo). Of course, I have to correct Mark's spelling ("labratory"?), as well as to add a bit of humour to his text (!). But seriously, it's a team I'm delighted to still be a part of, and a special "Thank You" to Mark for carrying us through another year as Newsletter Editor.

This issue brings with it an "invoice" for your 1998 ISB Membership and Journal Subscription(s). Please return this form to me as quickly as possible so as to avoid disruption to your Journal and Newsletter mailings. Payment must be in Australian dollars (\$AUS) - otherwise your Society incurs significant expense in renegotiating foreign currency amounts. Credit card payments are our preferred method, but any cheque drawn on an Australian bank (preferably Westpac-Challenge bank) is quite acceptable.

Could you also take a moment to check the accuracy of your mailing address, and that of your telephone and e-mail details. Apart from ensuring that your Newsletters and Journals reach you directly, this information can now be accessed through the ISB web site, and it's accuracy and completeness is of benefit to all of us.

*Thanks,*

*Graeme*



## The Thesis Exchange

Editor's note: This newsletter component provides a vehicle through which graduate students can disseminate, reasonably rapidly, the results of their Masters and Doctoral studies to the biomechanics community. These abstracts are intended also to provide impetus for interactive discussions on these topics among members and, thus, may provide valuable feedback to the author. Comments may be directed to the newsletter Editor for inclusion in future issues. The Newsletter Editor assumes no responsibility for being unilingual. Since no one seems to follow the previously published instructions anyway, submissions are received at the Editorial Office in many different forms, some of these forms are acceptable. The Editorial Office is particularly pleased to receive Thesis Abstracts that include data.

### THE EFFECTS OF DIABETES ON THE MAGNETIC RESONANCE, MECHANICAL, AND HISTOLOGICAL PROPERTIES OF THE CALCANEAL FATPAD

Patricia Kao, M.S.  
The Ohio State University, 1997  
Adviser: Brian L. Davis, PhD

Foot ulceration leading to amputation persists as one of the most debilitating consequences of diabetes. A major reason for this is that the etiology of diabetic foot ulceration is not well understood. The purpose of the current study was to use MRI, mechanical testing, and histology methods to investigate differences between the internal composition of diabetic and non-diabetic heel fatpads, and to determine if these differences are reflected in the mechanical stiffness of the tissue. The theory that soft tissue changes are initiating factors in diabetic foot ulceration was then evaluated.

For the MR study, cadaver and live calcaneal fatpads were investigated using four image acquisitions: Septa Visualization, T1, T2, and Magnetization Transfer (MT). For the mechanical tests, heel cores were removed from the cadaver specimens and then compressed in a materials testing device. Subsequently, the cores were sectioned and subjected to a histological analysis of fat composition.

The results of this study showed that MRI is a useful, noninvasive technique for differentiating between diabetic and non-diabetic fatpads. Diabetic heel fatpads were found to have significantly greater T1 and T2 relaxation times, and significantly lower average MT ratios than non-diabetic specimens. Furthermore, mechanical stiffness was found to be significantly higher for diabetic cores under loads of 9N, and the percent composition of fat in the diabetic fatpad was determined to be lower than in the non-diabetic fatpad. In addition, the percent composition of fat, the T1 relaxation time, and the average MT ratio of a cadaveric calcaneal fatpad specimen were all found to be significantly related to its stiffness at different points along its loading and unloading curve. Since these same variables were shown to be different for diabetic and non-diabetic cadaveric fatpads, the implication is that compositional changes occur in the heel fatpads of diabetic feet that affect the behavior of the tissue under compressive loads, and that these changes may be responsible for the development of diabetic foot ulcers.

EFFECTS OF SHOE MASS DISTRIBUTION ON PHYSIOLOGICAL  
AND MECHANICAL RESPONSES DURING DISTANCE RUNNING

Kristopher P. Hartner, MS  
St. Cloud State University  
Advisor: Glenn Street, Ph.D.

While the effects of many running shoe design parameters are routinely evaluated, the effects of shoe mass distribution have never been reported. Therefore, the purpose of the present study was to determine the effects of shoe mass distribution on the physiological and mechanical responses to distance running. To examine these effects, ten highly skilled male distance runners participated in a single testing session. The testing session consisted of four 8 min treadmill runs, separated by 5 min rest periods, at a speed of 3.8 m.s<sup>-1</sup>. VO<sub>2</sub>, HR, resultant joint moments (RJMs), and mechanical work done by the RJMs were calculated for each of the following loading conditions: no load, 200 g added at the heel of each shoe and 200 g added at the toe of each shoe. Repeated measures ANOVA and a Tukey HSD post-hoc test were used to test for significant differences between means. Significance was set at the 0.05 level. VO<sub>2</sub> and HR were significantly different for all testing conditions (Table A). The greatest values were obtained when load was added at the toe. The respective increases over baseline and heel load conditions for the toe load condition were: 4.25% and 1.82% for VO<sub>2</sub> and 2.39% and 0.72% for HR. The only significant increases in average RJM or total mechanical work during the swing phase were found for the two loaded conditions as compared to the baseline (Table A). Increases in average RJM, over baseline, were 5.71% and 7.18% for the heel and toe load conditions. Total mechanical work increases, over baseline, were 7.97% and 12.01% for the heel and toe load conditions.

TABLE A. Physiological and mechanical data for each testing condition (mean (SE)).

<u>Variable</u>	<u>No Load</u>	<u>Heel Load</u>	<u>Toe Load</u>
VO <sub>2</sub> (ml.kg <sup>-1</sup> .min <sup>-1</sup> )	44.66 (0.633)	45.67 (0.637)	46.50 (0.627)
HR (beats.min <sup>-1</sup> )	150.4 (3.38)	152.9 (3.37)	154.0 (3.30)
Average RJM (Nm)	54.3 (2.52)	57.4 (2.53)	58.2 (2.50)
Total work (joules)	96.6 (5.49)	104.3 (5.61)	108.2 (5.70)

All differences are significant ( $P < 0.05$ ) except between heel and toe load RJM and work. The findings of this study showed that shoe mass distribution has measurable effects on physiological responses during distance running. Increase in aerobic demand nearly doubled when the 200 g added load was moved from the heel to the toe. These findings indicate that shoe design modifications, aimed at reducing the distal mass of a running shoe, can have a positive effect on a runner's economy.

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### EDITOR'S NOTE

The ISB Newsletter is published quarterly: February-March (Spring); May-June (Summer); August-September (Autumn), and November-December (Winter). There may be alternative printing schedules that coincide with unbelievable errors. Deadlines for material and articles are the first day of each first named month, except in the alternative schedule in which 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 just about anything they would like to relate to the 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. Naturally, serious items such as *Letters*, *Special Articles*, *Affiliate Society News*, *Laboratory Features*, *Reports*, or *Announcements of Meetings, Conferences*, and *Jobs Available*, *Reviews* of relevant conferences and other serious biomechanics-related information is desirable. *Thesis Abstracts* can be published. Thesis abstracts should provide an Introduction that includes the rationale and hypotheses of the study, description of the methods, the key results, and important conclusions. 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 one actually does 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.

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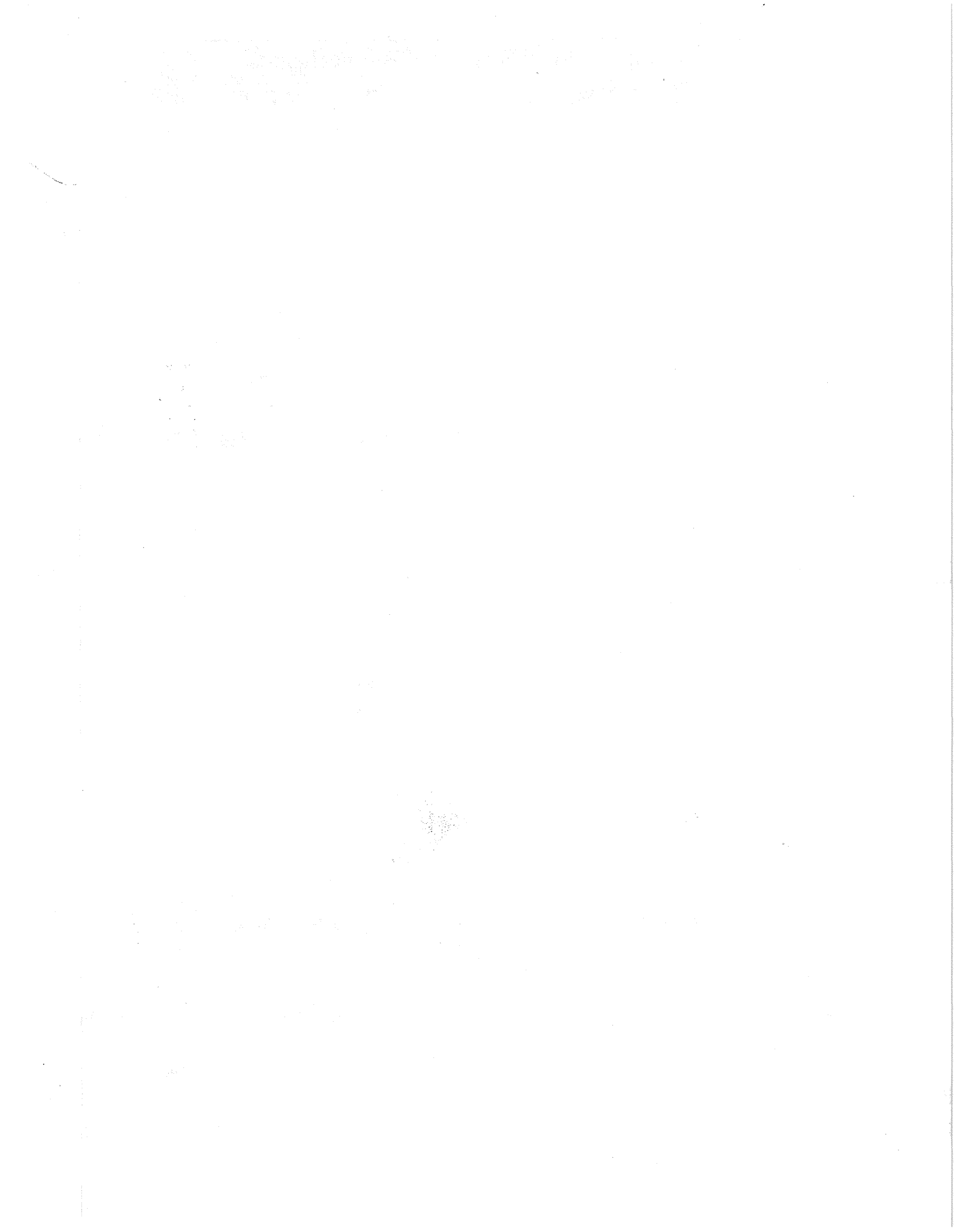
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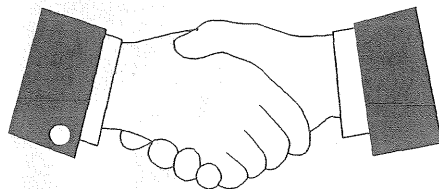
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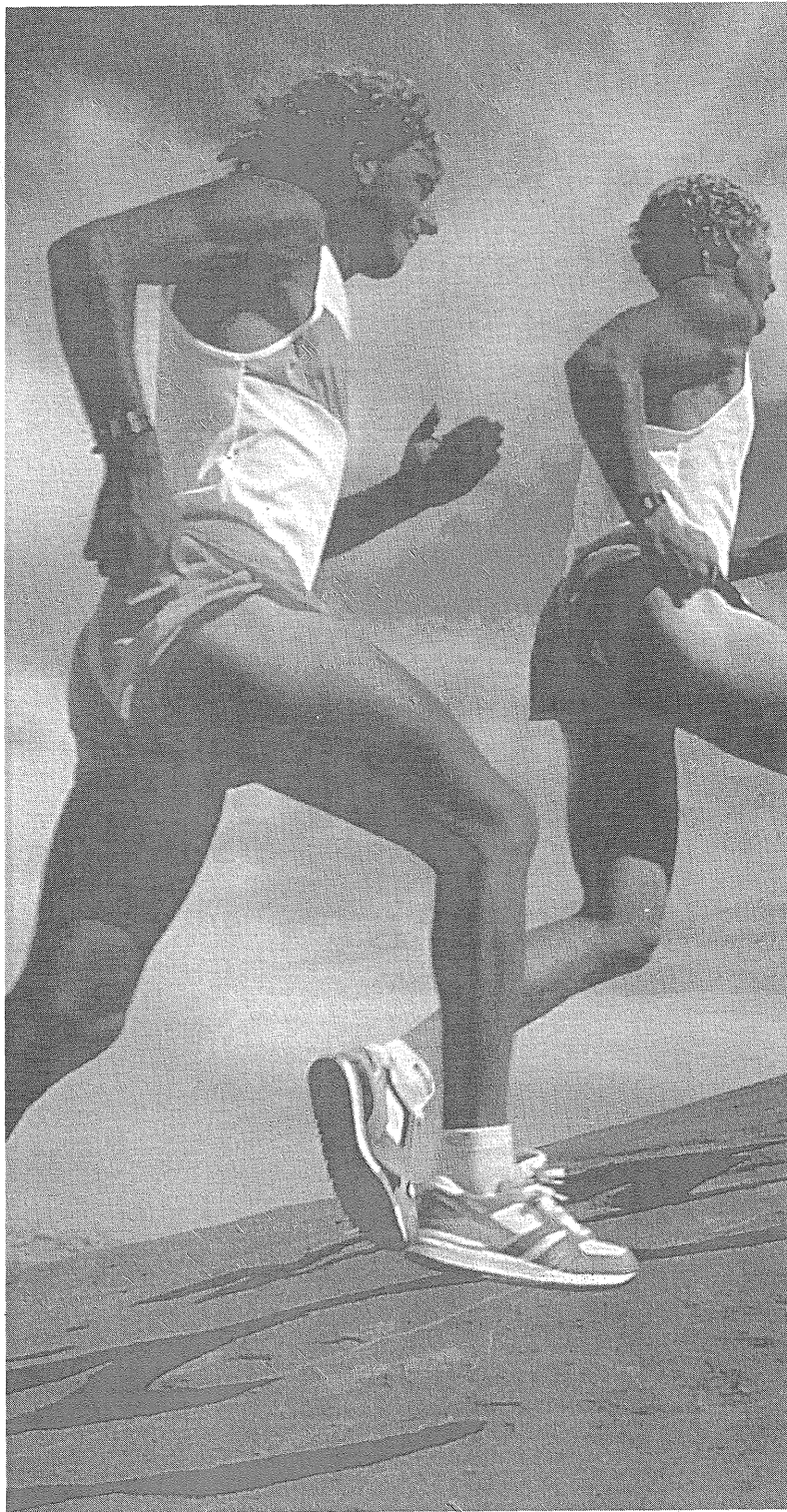
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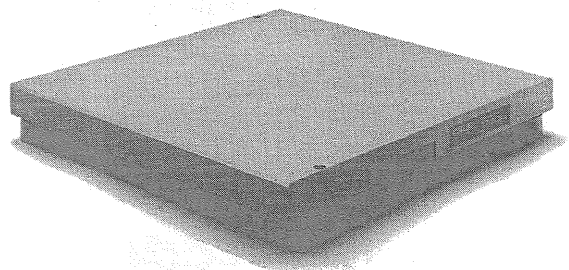
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