American Society of Biomechanics Newsletter

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From the President

Bruce Martin

Our ASB abstracts have long since been submitted, and summer is bearing down on us. It is supposed to hit 80° outside my office today, and I plan to immerse myself in some of it on my way to the library this afternoon to dig for some references that I hope will save one of my manuscripts from reviewer mayhem. I hope you are enjoying similar good weather, good challenges, and anticipating glorious summertime adventures!

Looking beyond the summer, I also hope you are planning to attend the ASB's annual meeting in Pittsburgh, to be held October 20-23. Meeting Chair Savio Woo, Program Chair Tom Buchanan, and Education Committee Chair Suzanne Smith are hard at work preparing an exciting program of workshops, keynote speakers, symposia, paper/poster sessions, and all the other activities we look forward to each year. You will find plenty of information about this first-ever ASB meeting at the University of Pittsburgh elsewhere in this issue of the newsletter.

The Society is in a rather unusual position of having its annual meeting venues selected for several years in advance. Following this year's meeting in Pittsburgh, the 2000 meeting will be held in Chicago, on the University of Illinois campus; the Meeting Chairperson will be Raghu Natarajan. The dates have been set early - July 19-23 - so that our meeting will end as Chicago 2000: The Triennial World Congress on Medical Physics and Biomedical Engineering begins on Chicago's Navy Pier. This will be a huge meeting sponsored by half a dozen organizations, including the American Institute for Medical and Biological Engineers, of which ASB is a member organization. If you want to know more about this world congress, check out its web site at: *www.wc2000.org*. Then, in the year 2001, the ASB's annual meeting is slated to be held in southern California for the first time, at the University of California's San Diego campus. This campus has long been noted for its many achievements in biomechanics and biomedical engineering, and the weather down there isn't too bad, either! And finally, the Executive Board is considering an invitation to hold our 2002 meeting in conjunction with the World Congress of Biomechanics in Calgary, Alberta. This exciting schedule of future meetings has much to offer in terms of beautiful cities, interesting university campuses, and important collateral meetings.

I have received glowing compliments from several people who attended the Southern California Conference on Biomechanics that was held April 10-11 on the campus of California State Polytechnic University in Pomona. This regional biomechanics conference was partially funded by the ASB with a $2000 grant. The concept of sponsoring such regional mini-conferences originated with my predecessors on the Executive Board, and if the first one is any indication, this is an extremely useful means of furthering the purpose of our Society: to "stimulate and foster research, discussion, and the exchange of ideas among Society members working in the various areas of biomechanics." Of course, these meetings, like our annual meeting, are not at all limited to our members; in fact, they should serve to draw new members into the ASB, especially because the regional meetings seek to nurture biomechanics students even more than our national meetings do. I extend my heartiest congratulations to Michael Feltner, of Pepperdine University, and Michele LeBlanc, of Cal Poly Pomona, who organized the conference, and everyone

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else who worked to make it such a success. You can read more about it elsewhere in this newsletter, and I hope we will have more applicants for such a grant next year!

Our sponsorship of the Southern California Conference apparently led at least one group of students to believe that the ASB sponsors student chapters of the Society on university campuses, and campus meetings that they might organize. By way of clarification, the ASB, unlike some societies, does not sponsor student chapters; instead, we try to involve students more on a par with all the other members. The recent regional meeting was organized by faculty members, with a lot of help from students. However, I see no reason why, in the future, students at a university could not initiate such a regional meeting and apply to the ASB for help with funding. In considering such applications, I think the ASB Executive Board would like to see some faculty members involved, and ASB members among both the student and faculty organizers, but presently there are no rigid rules about these regional meetings. They are an experiment, and the board would like to see how they develop without undue restrictions.

In last fall's column, I wrote at some length about an issue that has concerned me for some time: the diminishment of interdisciplinary diversity within the ASB over the course of its history. I pointed out that over half our members are in the engineering and physical sciences category, and the biological sciences, health sciences, and ergonomics memberships have long been too small to maintain the kind of "presence" that many of us would like to see at the annual meetings. I suggested that this evolution of the membership was driven by group dynamics and that the provisions in the bylaws designed to maintain interdisciplinary balance within the society were obviously not working. I went on to propose that we consider changing the bylaws to try to fix the problem in some other way. Specifically, I suggested that we do away with bylaws requiring that various membership categories be represented on the nominating committee and in the presidency, because they have not worked, and add a bylaw that requires the program committee to insure diversity in the program at the annual meeting.

More than anything else, I wanted to stir some debate on this issue by proposing some perhaps disproportionate changes. However, I completely failed in that goal, receiving only one response from the membership. I had no illusions that very many members are diligent enough to actually read into the second half of this column, but either this is not the right place to start a debate, my suggestions turned off rather than provoked discussion, or few members are concerned about the issue. In any event, you will be receiving a ballot concerning changes to the bylaws, but these are "housekeeping" changes that have nothing to do with the suggestions that I made last time. If you do want to express yourself on the issue of balance among the membership categories, by all means call or send me an e-mail, but in the meantime, I'll move on to other matters...

Periodically, the *Journal of Biomechanics* selects a new editorial board. This board is composed of two representatives each from the ASB and the European and International Societies of Biomechanics, plus two other members selected entirely by the Journal's editors, Dick Brand and Rik Huiskes. The ASB Executive Board submitted several nominees for the ASB's representatives, and from these, the editors selected Joan Bechtold and Rick Lieber. I am sure that Joan and Rick will serve us all extremely well at the Journal, and I congratulate them on being selected for this honor!

In his column a year ago, Past-President Mark Grabiner mentioned several transitions in the ASB and the field of biomechanics: retirements, changes in leadership, and the death of a prominent biomechanician. In this same vein you will find notice elsewhere in this newsletter of the unexpected death of an ASB member whose contributions to science and our annual meetings I have always felt were second to none: Prof. Thomas McMahon from Harvard University. How I enjoyed his talks, his Groucho walks, his bed-rock scientific approach, and his quiet sense of imagination and fun in biomechanics! Over a Mexican dinner after our mid-year Executive Board meeting in February, some of us were reminiscing about these things, and about Tom's novels that some of us had read. And then, a month later, he was gone. You are right, Mark, some transitions really make us pause and consider what we have accomplished and where we are going. And how fortunate we are to find inspiration for our work in this Society through unique and unforgettable contributions like Tom McMahon's.

From the Secretary/Treasurer

Rob Shapiro

Membership and Elsevier update: As of May 1, 1999 574 members have paid 1999 dues. We are still receiving dues. We recently e-mailed a reminder to all members who had not paid and received a number of positive replies. The main problem with late payment of dues is getting journal subscriptions restarted. We have continued to work closely with Elsevier and appear to have most if not all of subscription problems worked out. In order to avoid problems in the future, we will need to move the deadline for submitting dues up one month. Dues will now be due on January 31. Active members will receive the January issue of the journal from Elsevier and we will forward the active list to them prior to the mailing of the next issue. If you are still having problems with your journal subscription please contact me or my assistant Jill Carson (jscars0@pop.uky.edu). Please be advised that as part of our negotiated three year agreement with Elsevier the subscription rate for the Journal of Biomechanics will be $66 next year.

Elections – New Officers and Bylaws Change: The nominating committee for President–Elect and Program Chair-Elect was chaired by Mark Grabiner (Past-President) with John Yack(Health Sciences), Rodger Kram(Biological Sciences), Ian Stokes (Engineering and Applied Physics) and Bill Marras (Ergonomics and Human Factors) serving as committee members. The nominees for President-Elect are Kenton Kaufman and James Ashton-Miller. The nominees for Program Chair-Elect are Mark Redfern and Walter Herzog. The biographical sketches for the outstanding candidates nominated by the committee can be found on page 7 in this newsletter.

The Executive Board is also requesting two changes to the Bylaws (complete wording listed on ballot):

1. Article 6, Section2. The requested change will allow the society to hold our annual conference in conjunction with another society's meeting. As we do this on a regular basis with NACOB and the Canadian Society of Biomechanics, the Executive Board feels our Bylaws should reflect our practice.

2. Article 10. This section refers to the document as the "constitution", not the bylaws and is the only reference to "constitution" in the entire document. To be consistent, the Executive Board is recommending that the word "constitution" in Article 10 be replaced with "bylaws."

It is essential to the cooperation of the society that members take an active role. Please read the biographical sketches and the requested changes in the bylaws and then **VOTE and Mail** your ballots. In an attempt to make this as easy as possible, we have included addressed envelopes for your convenience. Place your ballot in the envelope, apply the necessary postage and please mail your ballot. We will announce the results at the annual meeting in Pittsburgh.

Directory: Included in this mailing will be the 1999-2000 ASB membership directory. Only current members will be receiving the directory.

Reminder: If you have any questions or concerns about your membership, journal subscriptions or other society related business please contact me (rshap01@pop.uky.edu) or Jill Carson (jscars0@pop.uky.edu).

Membership Committee

Trey Crisco

Applications for new membership in 1998 totaled 86. This was a decrease of 17% compared with the same four review cycles in 1997. The distribution of these applications by membership category and discipline was somewhat less stable than usual, ranging within 3% - 19% of the 1997 distribution in each category for this same period. Typical of past years, most of the applications were in Engineering/Applied Physics (45%), but this reflected a decrease in this area. This change resulted in small increases in the areas of Exercise/Sport Sciences (25%) and Ergonomics/Human Factors (13%). Biological Sciences and Health Sciences received the least number of applications at 8.5% each. Student applications in 1998 have comprised 56% of the total submissions and compromise 66% of the acceptances. In this period, 14 applications for Regular Membership (16%) were not approved. This rejection rate was a 5% increase in rejections from 1997 and a 14% increase from 1996. Rejection was based upon the Committee's vote that an applicant had not sufficiently contributed to the Society nor demonstrated an expertise in the field of biomechanics.

NEW MEMBERSHIP CHAIR

Scott Delp, Ph.D. is now the new Chair of the Membership Committee. Scott was appointed back in the fall of 1998, but his taking of the office was delayed for his journey west. Now that he is settled, his position is effective immediately and he can be reached at the address listed on page 4.

As a final note, I would sincerely like to thank the members of the Membership Committee - Gregory Rash, representing Exercise/ Sport Sciences; Claire Farley, representing Biological Sciences; Irene McClay, representing Health Sciences; and Mark Redfern representing Ergonomics/Human Factors - for all of their help these past three years.

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Thomas McMahon, 55, Scientist-Author, Dies

By Robert McG. Thomas Jr.

Thomas A. McMahon, a whimsical American synthesizer who fused sciences in a pioneering academic career in biomechanics even as he blended science and literature, died on Sunday on the way to a hospital near his home in Wellesley, Mass. He was 55, and was both the Gordon McKay Professor of Applied Mechanics and professor of biology at Harvard University, as well as the author of three well-received novels.

His family said he died after abdominal surgery last week.

If it is an open question whether Dr. McMahon was a novelist who did science or a scientist who wrote novels, he had only himself to blame. Not only did he do acclaimed work in both fields, but he also clouded the issue from the beginning.

His first book, completed while he was studying for his doctorate in fluid mechanics at the Massachusetts Institute of Technology, was ambiguously — if ultimately, helpfully — entitled "Principles of American Nuclear Chemistry: A Novel." Published by Little, Brown in 1971, the book is a coming-of-age story focused on the prosaic off-duty lives of the scientists who worked on the atomic bomb.

A man who was fascinated by the process of invention, Dr. McMahon, to satisfy his own scientific interests, helped invent a new science, biomechanics, which applies the principles of mechanics to the study of locomotion in humans and other animals.

It was a reflection both of the blended field's novelty and Dr. McMahon's academic standing that to accommodate his research interests, Harvard had to give him dual appointments in applied mechanics and biology.

Although he had recently helped invent a hip-padding system to protect the elderly from fractures because of falls, perhaps the most significant application of his science came in the 1970's when he and a colleague, Peter R. Greene, designed a tuned indoor track for Harvard.

By optimizing the spring, or returned energy, when a foot pounds into the boards, the largely plywood track, which had been designed to reduce runners' shinsplint injuries, improved running times by an average of 3 percent, an accomplishment that might have made Dr. McMahon more a hero at Harvard if he had not helped install a similar track at Yale, as well as others at Madison Square Garden and the Meadowlands.

As a literary scientist or scientific novelist, Dr. McMahon came by his bifurcated vision naturally. His mother, Lucille, had a literary flair, while his father, Howard O. McMahon, did some scientific fusing of his own as a physical chemist who worked on low temperature science and became president of Arthur D. Little, the management and technology consulting company.

He was born in Dayton, Ohio, in 1943, grew up in Lexington, Mass., and studied physics at Cornell University before going to M.I.T. and then to Harvard, first as a postdoctoral research fellow.

Dr. McMahon, who once published a paper complete with detailed computer projections and complicated graphs promoting what he called ''Groucho running,'' based on the comedian Groucho Marx's signature bent-knee gait, as a low-impact, high-energy form of exercise, was equally whimsical as a novelist.

His tongue was firmly in his cheek with his second novel, "McKay's Bees" (Harper & Row, 1979). Published two years after Dr. McMahon took the Gordon McKay chair, the book raised eyebrows at Harvard because the main character is a wealthy Bostonian named Gordon McKay who goes to Kansas during the bloody struggles over slavery in the 1850's to make money by raising bees, a purely imaginary endeavor pursued by neither the real McKay nor any other real person.

Like his third novel, "Loving Little Egypt" (Viking Penguin, 1987), in which a technician subverts the phone company to develop a toll-free network for the blind, ''McKay's Bees'' was a widely praised comic novel that won a cult following and became the basis for a play.

Dr. McMahon also won praise for his scientific books, "On Size and Life", a 1983 collaboration with John Tyler Bonner that analyzed for general readers the effects of size on animals of various dimensions, and the more specialized "Muscles, Reflexes and Locomotion" (1984), which *Science* magazine called an instant classic.

Known as an especially nurturing teacher who always had time to advise his students on their careers, Dr. McMahon, a master at securing research grants, could not quite hide his playful side.

A man who for many years pedaled a bicycle the 14 miles from his Victorian home in Wellesley to his office, he had recently taken to driving to work, an apparent concession to his constant companion, Tess, a golden retriever that became a student petting favorite and an excuse (dogs need exercise) for Dr. McMahon to take outdoors "fetch breaks."

Dr. McMahon, who made headlines with research showing how the basilisk, or so-called Jesus Christ lizard, could run on water — a cinch if you weigh three ounces and have fringes on your feet to keep the water from flooding the air pocket created by the downstroke before the lift — was never one to rest on his laurels. Before his death, he was rubbing his hands over his next project: determining how ants are able to walk on glass ceilings.

Dr. McMahon is survived by his wife, Carol; a son, James, of Atlanta; a daughter, Elizabeth Kirsten of Portland, Me.; two sisters, Jean Humez of Somerville, Mass., and Nancy Swanborn of Duxbury, Mass., and a granddaughter.

Note: National Public Radio's All Things Considered aired a segment on Dr. McMahon that can be heard at: www.npr.org/ramfiles/atc/19990219.atc.05.ram.

Guest Columnist

Joseph Price & Ellen Rosenberg

JUNK SCIENCE IN THE COURTS

The issue of junk science in the courts is of interest to anyone who may be involved in the area of forensic medicine or accident reconstruction. Biomechanists testifying in medical litigation will encounter the issue of the soundness of scientific principles being introduced to support allegations of product defect or negligence. For many years, virtually all that was needed for a so-called expert witness to be permitted to enter the witness box and testify were the initials M.D. or Ph.D. after his or her name. Courts tended to place minimal requirements on the qualifications of expert witnesses or the soundness of their testimony, rather leaving the inadequacies of their opinions to be explored by the opposing side through cross-examination.

Unfortunately, juries are oftentimes unable to separate good science from bad science and are not persuaded that questionable scientific arguments are incorrect when highly technical issues are pitted against a sympathetic and often badly injured plaintiff. Frequently, opinions are rendered by highly paid expert witnesses who tender questionable theories outside the mainstream of scientific or medical knowledge for large financial reward. These so-called "junk scientists" are recruited by plaintiff lawyers who have an extremely large vested interest in seeing that plaintiffs recover regardless of the soundness of their cause. These lawyers' approach is to bring as many lawsuits as possible and use the threat of bankruptcy and financial ruin to force mass settlements. Manufacturers know that the expense of defending multiple cases in multiple jurisdictions is enormous and oftentimes settlements ensue regardless of the scientific merits of the case.

In 1993, the United States Supreme Court decided the case of *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, requiring trial judges to become "gatekeepers" performing a gatekeeping function to "insure that any and all scientific testimony or evidence admitted is not only relevant but reliable." Judges were required to do preliminary assessments of the reasoning and methodology underlying the experts' testimony to determine whether it was valid and could properly be applied to the issues in the case. The court laid out standards for what would be admissible scientific evidence. This was a step in the right direction, although many judges felt that they were no more qualified than lay juries to determine the validity of the science.

The silicone gel breast implant litigation has become, in a sense, a barometer for the rise and fall of junk science. Claims of autoimmune disease and connective tissue disease associated with silicone breast implants have been made since approximately 1984, although the recent avalanche of cases occurred around 1992. Early cases resulted in huge verdicts for plaintiffs, notwithstanding the dearth of sound scientific basis for claims predicated on testimony of spurious scientific "experts." This situation became increasingly untenable to both the judicial and medical-scientific communities and judges turned to the scientific community to assist them with the scientific issues posited in the breast implant case.

Starting around 1994, a number of epidemiologic studies were published refuting any association, let alone causal relationship, between breast implants and autoimmune disease. Based on the evolving science, judges in New York, Oregon and the judge in Birmingham, Alabama, responsible for co-ordination of all federal silicone gel breast implant cases invoked procedures to enlist the aid of knowledgeable neutral scientists to elucidate the evolving science as it relates to the breast implant case.

Perhaps the best known of the science panels was the panel assembled by Judge Sam Pointer, Chief Judge of the Northern District of Alabama and the judge to whom all federal breast implant cases were assigned for co-ordination. His panel, comprised of an epidemiologist, rheumatologist, toxicologist and immunologist, deliberated for two years reviewing thousands of scientific articles and interviewing expert witnesses on both sides of the issue. In November, 1998, they issued a 300+ -page report discussing the results of their review and concluding individually and collectively that the scientific evidence did not support the contention that silicone gel breast implants were in any way connected with autoimmune or connective tissue disease. As of the writing of this column, Judge Pointer's scientists are in the process of giving testimonial depositions which will be used in cases throughout the country to strike claims by plaintiffs under the Supreme Court's *Daubert* ruling. These experts may also testify by deposition in those cases, should the courts not strike plaintiffs' experts' opinions.

The use of science panels is a major step forward in eliminating "junk science" in the courtroom. No longer will unsound opinions which inordinately stretch the limits of scientific principle and statistical significance be permitted in the courtroom. The use of science panels will eliminate the unevenness of the playing field between sympathetic plaintiffs and large, "deep-pocket" corporations. Although the cost and complexity of science panels limit their use to huge complex litigation, the use of an independent scientist or technical advisor to the court is permitted by most jurisdictions and may now become a much more common practice with respect to scientifically disputed issues. To quote Dr. Marcia Angell, executive editor of the *New England Journal of Medicine*, "Courts trying technical cases have become a hotbed of junk science, and the inconsistent and capricious jury verdicts that result often have more to do with the theatrical talents of the lawyers and expert witnesses than with the facts... Appointment of a dispassionate panel of experts to evaluate the strength of the scientific evidence is a model more courts should follow."

Joseph Price and Ellen Rosenberg are trial lawyers with the Minneapolis-based law firm of Faegre & Benson. Mr. Price has published and lectured extensively nationally and internationally on medical device and pharmaceutical litigation, as well as scientific testimony in the courtroom issues. He is a graduate of the University of Minnesota Law School. Ms. Rosenberg received her law degree from the University of Pennsylvania. She has published widely on the issue of admissibility of scientific testimony in the courtroom.

PRESIDENT-ELECT CANDIDATES

James A. Ashton-Miller, Ph.D.

James A. Ashton-Miller is Director of the Biomechanics Research Laboratories, Department of Mechanical Engineering & Applied Mechanics, University of Michigan (U-M) in Ann Arbor. He is a Research Scientist in the Departments of Mechanical Engineering & Applied Mechanics and Biomedical Engineering and a Senior Research Scientist at the Institute of Gerontology. He received his bachelor's degree in mechanical engineering from the University of Newcastle-upon-Tyne, England, his master of science degree in mechanical engineering from the Massachusetts Instititute of Technology, and his Ph.D. from the University of Oslo where he was a Norwegian Research Council for Science and the Humanities Fellow. He moved to the U-M in 1983 and was promoted to Associate Professor in 1991. Dr. Ashton-Miller has co-authored over 80 papers and 10 book chapters with colleagues in fields as diverse as anesthesiology, dentistry, geriatrics, nursing, obstetrics and gynecology, orthopaedics, physiology, physical medicine and rehabilitation, and neuropsychology.

Dr. Ashton-Miller's early research focussed on the biomechanics of the human spine, including the pathomechanics of adolescent idiopathic scoliosis and low back pain. In 1988, he joined forces with Albert B. Schultz to explore issues in geriatric biomechanics. Together with their students they sought to develop insights to help reduce fall-related injuries and mobility-related problems in the burgeoning elderly population. In recent years he and his students have also been studying mechanisms underlying the development of female urinary incontinence.

Dr. Ashton-Miller was presented with the U-M Research Scientist Award, the U-M College of Engineering Research Scientist Award, the International Continence Society Dantek Award, the German Gynecological Society Award, and the American Urogynecological Society Award. He has served on NIH study sections, the Executive Committee of the Bioengineering Division of ASME, and the Executive Committee of the U-M Department of Biomedical Engineering. He has served on the Board of Editors for *J. Orthopaedic Research*, *Spine*, and *Clinical Biomechanics*, and reviews manuscripts for many other technical journals. Over the past year he has served as a consultant to the U.S. National Research Council on work-related musculoskeletal disorders, the National Collegiate Athletic Association, and the Swedish Foundation for Strategic Research.

Kenton R. Kaufman, Ph.D., P.E.

Kenton Kaufman received his Ph.D. degree in biomechanical engineering from North Dakota State University in 1988. He was employed as an Assistant Professor at North Dakota State University from 1976 to 1986. From 1986 to 1989, he worked as a Visiting Scientist and then as a Research Fellow in the Biomechanics Laboratory at the Mayo Clinic. From 1989 to 1996, he served as the Director of Orthopedic Research in the Motion Analysis Laboratory at Children's Hospital, San Diego, and as an Adjunct Associate Professor at the University of California, San Diego. Currently, he is the Co-Director of the Biomechanics Laboratory, Associate Professor of Bioengineering, and Senior Associate Consultant in the Department of Orthopedics at the Mayo Clinic.

Dr. Kaufman's research focuses on the biomechanics of human movement. He currently holds several grants from NIH, with projects aimed at improving the mobility of disabled individuals. He has also conducted research to decrease overuse injuries in military recruits. He has won several awards for his research efforts. His awards include the American Society of Biomechanics Young Investigator Award in 1989, the Excellence in Research Award in 1989 and the O'Donoghue Sports Injury Research Award in 1993 from the American Orthopedic Society for Sports Medicine, the Clinical Research Award from the American Academy of Orthopedic Surgeons in 1996, and the Best Scientific Paper Award from the Gait and Clinical Movement Analysis Society in 1999.

Dr. Kaufman has served the biomechanics research community in several forms. He is a member of the American Society of Biomechanics Graduate Student Grant-In-Aid Committee. He has served as an *ad hoc* grant reviewer for NIH since 1993 and for the National Institute on Disability and Rehabilitation Research in 1998. He was on the Working Group on Injury Prevention of the Armed Forces Epidemiological Board from 1994-95. He is currently the Conference Chairperson and serves on the Accreditation Committee for the Gait and Clinical Movement Analysis Society. He also serves on the Commission for Motion Laboratory Accreditation.

PROGRAM CHAIR-ELECT CANDIDATES

Walter Herzog, Ph.D.

Walter Herzog did his undergraduate training in Kinesiology at the Federal Technical Institute in Zurich, Switzerland (1978), received a Ph.D. in Biomechanics from the University of Iowa, USA (1985) and did postdoctoral training in Biomechanics and Neuroscience at the University of Calgary, Canada (1985-1987).

Presently, he is a full professor in Kinesiology, Engineering, and Medicine and the Associate Dean for Research in Kinesiology at the University of Calgary. His research interests center around the biomechanics of the musculoskeletal system. Experimentally, Dr. Herzog is dealing with animal models of movement control and joint injuries and diseases, as well as the determination of mechanical properties of musculoskeletal tissues, primarily skeletal muscle and articular cartilage. Theoretically, he is working on models of optimal movement control, on mechanisms of skeletal muscle contraction, on growth models of biological tissues, and on the contact mechanics in diarthrodial joints using continuum mechanics and multi-phase systems.

Mark S. Redfern, Ph.D.

Mark S. Redfern obtained his Ph.D. in Bioengineering from the University of Michigan in 1988. His graduate work focussed on occupational biomechanics and electromyographic modeling. Previous to his graduate education he trained and worked as a certified prosthetist, with clinical responsibilities for upper and lower extremity amputee care. Currently, Mark is an Associate Professor at the University of Pittsburgh with appointments in the School of Medicine and the School of Engineering.. He is Director of the Human Movement & Balance Laboratory and is also the Vice-Chairman for undergraduate education in the Department of Bioengineering. His current research interests are in postural control, fall prevention in the elderly, and occupational injury prevention. He has 35 peer review publications, 10 book chapters, and over 50 proceedings and meeting abstracts. He has been a reviewer for numerous biomechanics and movement related journals including the *J. Biomechanics*, *J. Biomechanical Engineering*, *Posture & Gait*, and *J. Applied Biomechanics*. Mark has been active in the ASB since joining as a student member over 12 years ago and currently serves on the Membership and GIA committees. He is also active in the Human Factors and Ergonomics Society and IEEE.

Between the Lakes

Joseph Hale

Y2K: Compliant or Complacent?

Have you started making your plans for New Year's Eve 1999? Times Square? Australia's Great Barrier Reef (*www.millenniumparty1999.com*)? Maybe a Caribbean cruise on the Queen Elizabeth II (*www.ineedavacation.com/CunardQE2000.html*)? Despite it's incorrect billing as the start of the new millennium, it will doubtless be occasion enough for many people to engage in high-spirited celebration. For many others, however, it will be the source of much angst and concern in the months before and after; some of whom plan to mark the occasion by escaping to the wilderness with ample supplies of food and water to avoid the anticipated meltdown of society.

Given the extent of media coverage to date, it is difficult to believe that anyone has not heard about the Y2K incompatibility problem that afflicts some computer systems and the potential havoc it will wreak with computer systems, elevators, air traffic control systems, HVAC, ancillary patient care equipment, etc. Peoples' responses to this issue (guided in part by the nontechnical and often sensationalized nature of the media coverage) range from complacency to adopting survivalist tactics.

The roots of the Y2K problem (also referred to as the 'millennium bug' despite the fact that the new millennium actually begins in 2001) can be traced to the 1960's, when many computer systems began using a two-digit date format (mm/dd/yy). This convention may cause computers to interpret 00 as 1900 instead of the year 2000, resulting in erroneous comparisons and calculations. For example, a phone call that begins just before midnight on December 31, 1999 and ends moments later on January 1, 2000 could be billed as a conversation that lasted 99 years!

In addition, some systems may not recognize that the Year 2000 is a leap year. If a year is evenly divisible by 4, it is a leap year *unless* it is also evenly divisible by 100. But, if a year is also evenly divisible by 400, it is a leap year. So 1900 was not a leap year, but 2000 is.

As early as 1974, the Y2K problem was recognized by Bill Schoen, a computer programmer. Unfortunately, his crusade in the early 1980's to alert U.S. companies and halt perpetuation of the error was largely ignored. The proliferation of computers into all aspects of our daily lives in the ensuing years has significantly compounded the problem. More recently, Peter de Jaeger, a Canadian consultant, drew attention to the problem in his September 6, 1993 article in *Computer World* titled "Doomsday" in which he compares the problem to realizing that you are suddenly in an unavoidable car crash.

The source of the Y2K problem can include hardware, operating systems and software applications and utilities which are unable to hold, recognize or process dates beyond 1999. Although older systems are clearly suspect, even relatively new technology is not necessary immune to this issue. One study found that 81 percent of commercial software products are not Y2K-ready.

"If we built houses the way we build software, the first woodpecker to come along would destroy civilization."
-Deputy Defense Secretary John Hamre
(Boston Globe, 6/21/98. Military on Year 2000 Alert)

Although most people anticipate Y2K problems will occur on December 31, 1999 at midnight, many 'experts' predict that some problems may actually be encountered before that time and others will persist over the next few years, rather than being a single event. According to a study released by the Gartner Group (*www.gartner.com*), about 25% of glitches related to Y2K will show up during 1999, while only 8 to 10% will occur during the first two weeks of 2000.

Organizations with fiscal years that begin prior to December 31, 1999 could be among the first to encounter problems. Others have speculated that the erstwhile use of a series of nines to indicate termination of computer programs could incorrectly terminate programs on dates such as April 9, 1999, the 99th day of the year, or 9/9/99. Some problems have already been noted: centenarians, born in the late 1800's, have received letters welcoming them to first grade or have been inadvertently admitted to pediatric wards because the hospital computer determined their age by subtracting 93, instead of 1893, from the current year, 99, to get 6 instead of 106.

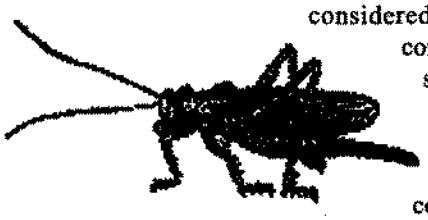
Another ramification of Y2K that is already being felt is the cost of trying to avert impending problems. According to *Information Week*, the cost for Y2K updates, based on lines of computer code that needed to be reviewed, will hit $600 billion. This estimate also takes into account the cost of hiring additional programmers and of lost opportunities because of resources committed to this problem instead of new initiatives. Costs associated with Y2K litigation have been estimated at $3 trillion. Nearly 800 Y2K-related suits have been filed thus far; most of these cases comprise companies suing their software suppliers.

Because computer programs use and store dates for many different reasons, the extent and effects of the Y2K problem are

difficult to predict, but continue to be hotly debated. Depending on your point of view, the arrival of January 1, 2000 will cause computers to create anything from minor inconveniences to worldwide catastrophe. Opinion polls from a variety of sources suggest that while most people know about the Y2K issue, they don't believe society will be greatly affected by it. A December 1998 Gallup poll conducted for USA Today and the National Science Foundation indicated that 34% of those surveyed believed that Y2K-related computer mistakes would cause major problems while 51% foresaw only minor problems. Ten percent expected no problems at all.

Among the most vulnerable to Y2K problems in this country may be nonprofit social service agencies that lack the necessary resources to address problems. Because Y2K does not pose an immediate threat, many nonprofit agencies continue to focus on their mission and take the chance that something may go wrong later. Ironically, Y2K problems could create additional demand for the services such agencies provide. On a global scale, a lack of money and technicians is also expected to hinder efforts by less developed nations to address Y2K issues. According to Senator Robert Bennett (R-UT), "The world as a whole is almost doomed to have major problems because other countries are way behind... It is entirely possible that every organization in America could get its own computers fixed ... and still have major problems." (From WorldNetDaily, June 18, 1998. Presidential Decision Directive 63)

Although most, if not all, of our institutions are actively engaged in efforts to avert Y2K-related problems in the workplace, the susceptibility of systems in our homes should also be considered. In addition to home computers and software, other systems that may potentially be effected include automobiles, automatic thermostats on heating/cooling systems, smoke/gas/CO detectors, telephones, VCR's, televisions, and security devices. Interruptions in these systems could range from inconvenient to life-threatening.



Here are a few things you can do to make sure that your home is prepared:

- Contact product manufacturers and service providers to find out about their Y2K readiness.
- Keep paper copies of current statements of all important financial data (e.g., credit cards, bank accounts, investment accounts, etc.)
- Check your insurance policy. Most do not specifically exclude Y2K-related damage. Although failure of a particular device due to Y2K issues is not likely to be covered by insurance, related damage should be. For example, a thermostat that fails would not be covered, but water damage from pipes that froze and burst as a consequence should be.
- Test compliance of computer hardware and software.

Compliance tests for PC's can be found at the following sites:

www.zdnet.com/vlabs/y2k/testy2k.html
nstl.com/html/nstl_y2k.html
www.agoodpc.com
www.millenniumquest.com

Alternately, you can set your computer's clock ahead to 11:59 pm, December 31, 1999 and wait a few minutes to see what happens.

Being a Macintosh advocate, I can't help pointing out that Macintosh computers have had the ability to make the transition to the year 2000 since their introduction in 1984. In fact, the Mac OS and most Mac applications can handle internally generated dates correctly all the way to the year 29,940. To check the compliance of Apple products, visit *www.apple.com/about/year2000/.*

Since the Web is a readily available forum for anybody with an opinion about anything, it is not surprising that there are literally hundreds of sites devoted to Y2K issues. Although misinformation, exaggeration and rumors abound, a lot of useful information can be found. Here are a few sites to get you started:

PC Y2K Alliance	*www.pcy2000.org*
U.S. Senate Special Committee on Year 2000 Technology Problem	*www.senate.gov/~y2k/*
The Utne Reader	*www.utne.com/y2k/*
President's Council on Year 2000 Conversion	*www.y2k.gov*
Money Magazine	*www.pathfinder.com/money/2k*
The Year 2000 Institute	*www.year2000.com*
The Y2K Links Database	*www.y2links.com*
The Year 2000 Journal	*www.y2kjournal.com*
The Year 2000 National Bulletin Board	*it2000.com*
2000AD, Inc.	*www.tickticktick.com*
Rx2000 Institute	*www.rx2000.com*
American Medical Assoc.	*www.ama-assn.org/not-mo/y2k/index.htm*
ZDNet Y2K Home	*www.zdnet.com/zdy2k/*
American Red Cross	*www.redcross.org/disaster/safety/y2k.html*
Consumer Information Center	*www.pueblo.gsa.gov*

We Need Your Contribution

Members are encouraged to contribute to the newsletter. A note, a letter to the editor, a lead on an interesting story, information about a scientific meeting, in fact anything of interest to the ASB membership would be most welcome. Send information scrawled in longhand, via e-mail, or on computer diskette for PC or Macintosh. If you have any other ideas, please get in touch. The next newsletter will be published in December 1999. **Deadline for submission of materials is 15 October 1999!**

Job Opportunities

Kathy Browder

FACULTY POSITIONS

Exercise physiology: Lecturer position in The Scottish School of Sport Studies at University of Strathclyde. Responsibilities: Participate in teaching and consultancy work of the department; play a significant role in research, which presently focuses on 2 areas - thermoregulation and the elderly. Qualifications: Higher degree in exercise physiology or a related area. For an application form and further information, contact the personnel office, Jordanhill Campus, Southbrae Drive Glasgow G13 1PP. 0141 950 3260.

Exercise Science/Sports Medicine: Assistant professor tenure-track position at The University of Akron. Responsibilities: Teach at the undergraduate and graduate levels; conduct scholarly research; advise master's and undergraduate students in exercise physiology and athletic training; place and coordinate master's clinical/field experiences in exercise physiology/adult fitness; participate in university/community service, professional organizations on local, state, and national levels. Requirements: Doctorate and successful college teaching in exercise physiology and/or kinesiology, lab supervision and grant writing experience; demonstrated ability to conduct scholarly research, write grants, and obtain external funding. Experience with athletic training students preferred. ACSM certification and/or ATC desirable. For more information, contact Dr. Mary J. MacCracken, Search Chair, at (330) 972-6485.

OTHER POSITIONS

Director, Institutional Review Boards: Responsibilities: Provide oversight and management of and administrative support for the operations of the 9 university committees reviewing research subject to compliance in human subjects and vertebrate animal care and use. Qualifications: BA/BS, Master's preferred, biomedical science discipline preferred (or equivalent experience). 5 years experience in regulatory oversight: previous IRB/IACUC experience highly desirable. Send letter of application and resume to: Vice Provost for Research, University of Pennsylvania, 212 College Hall, Philadelphia, PA 19104-6303.

Recruiting and Advising: Faculty Associate Position for Recruiting and Advising in The William States Lee College of Engineering. Objectives of position are to: (1) increase the number and diversity of qualified students ultimately enrolled in the College of Engineering; (2) advise students with undecided majors; and (3) assess and continuously improve the recruiting and advising processes. Requirements: MS degree in counseling, adult or developmental education, psychology, human services, or a BS degree in technical areas represented by the College of Engineering. Should possess excellent leadership, teamwork, interpersonal, and communication skills; be able to multi-task in a high-energy, fast-paced environment while interacting with a diverse student population, university administrators, faculty, alumni, and local professionals. Experience with college-age students preferred. Forward letters of nomination and application to: Patricia A. Tolley, The William States Lee College of Engineering, University of North Carolina at Charlotte, 9201 University City Boulevard, Charlotte, North Carolina 28223-0001.

Experiential Learning: Faculty Associate Position for Experiential Learning in The William States Lee College of Engineering. Objectives of position are to provide a variety of out-of-classroom experiential learning opportunities designed to complement academic curriculum and facilitate successful transition of students into the workplace and/or graduate school. Will provide leadership for the College's various experiential learning programs, serve as a liaison for the College's Alumni Group, and work closely with the University Career Center and University International Programs to promote, assess, and continuously improve experiential learning opportunities for our students. Qualifications: BS degree in business, marketing, science, math, or a technical field represented by the College of Engineering. 5 years professional work experience, preferably in building viable clientele and new program development. MS degree or registration as a professional engineer desired. Forward letters of nomination and application to: Patricia A. Tolley, The William States Lee College of Engineering, University of North Carolina at Charlotte, 9201 University City Boulevard, Charlotte, North Carolina 28223-0001.

Biotechnology Engineer: Two positions with Bristol-Myers Squibb Company in Warsaw, IN. Responsibilities: Design and development of custom and specialty implant products to meet individual customer needs; engineer instrument modifications to accommodate surgeon preferences; interpret clinical issues and define implant designs that solve patients' needs; manage design process through modeling, processing engineering, manufacturing and delivery to customer. Requirements: Bachelor's degree in biomedical engineering, mechanical engineering, other engineering science, or combination of education and experience. 3-5 years experience designing/developing orthopaedic implants with special emphasis in at least one product category of hip, knee, or trauma. To apply, email resume and cover letter to CBJB750_500000@bms.careerbuilder.com (Engineer position) or CBJB748_500000@bms.careerbuilder.com (Senior Engineer position). Reference job: Engineer 99-0000734 or Senior Engineer 99-0000733.

Human Factors Engineer with IBM in Richmond, VA. Responsibilities: Consult with clients to provide Usability Engineering consulting solutions to meet clients' objectives and achieve high client satisfaction; perform user interface requirements analysis, design, development, prototyping, and

testing. Most contracts with Fortune 500 clients. Must be willing to travel to perform majority of the work. Qualifications: Master's Degree in Human Factors, Industrial, Experimental, Cognitive Psychology, or Computer Science; 3-5+ years experience; Ph.D. in Human Factors, prior consulting experience, professional Ergonomics or Human Factors certification (CPE or CHFP) preferred. To apply, email CBJB462_510006@five.tbojobs.com with resume and cover letter in the body of the e-mail or as attachments [use HTML , Word (Mac or Windows), RTF, Works, Write or Excel, WordPerfect (Mac or Windows), Lotus Word Pro, AMI Pro or 1-2-3, OR ASCII or Unicode text (plain text) format]. Compressed documents not recommended. Reference job: 462.

Medical Assistant for orthopaedic surgeon in Houston, TX. Assist physician with patients in clinic, release of medical records, compile test (lab and diagnostic) and physical therapy reports/progress notes, general filing and reconciliation list, assembling new charts. To apply, email CBJB11_121302@teambuilder.adp.com with resumÈ and cover letter in the body of the e-mail or as attachments [use HTML , Word (Mac or Windows), RTF, Works, Write or Excel, WordPerfect (Mac or Windows), Lotus Word Pro, AMI Pro or 1-2-3, OR ASCII or Unicode text (plain text) format]. Compressed documents not recommended. Reference job: 11.

Mechanical Engineer with Veridian in Dayton, OH. Requirements: M.S. mechanical or structural engineering, engineering mechanics or equivalent; Working knowledge of multibody dynamics, numerical methods and scientific programming; understanding of biomechanics, occupant safety and injury, assessment, vehicle crashworthiness; experience in using biodynamic modeling software; finite element modeling; computer programming experience. Ability to use silicon graphics unix workstation and PC-related software. Send resume and cover letter as one message, resume first, via e-mail to personnel@veridian.com using a flat ASCII text only file without attachments or enclosures. Scannable resume and cover letter, original copy only, may be sent to Human Resources/MB; Veridian; 2001 North Beauregard Street; Suite 1200; Alexandria, VA 22311-1732. Include PR # 08-051MB in cover letter.

Curriculum Development Coordinator with Human Kinetics Publishers in Champaign, IL. Responsibilities: Coordinate the development of educational publications and videos for coaches, administrators, and officials; develop distance education courses for delivery over the Internet. Qualifications: Advanced degree in education or sport sciences, extensive experience in sports, and 5 years experience in developing educational resources. Send cover letter and resume to Human Resources, Human Kinetics, P.O. Box 5076, Champaign, IL 61825-5076, fax 217-351-2674, or e-mail angelam@hkusa.com. For more info, visit *www.humankinetics.com*.

Crash Analyst in Dearborn, MI. Responsibilities: Perform crash CAE analyses of automotive components and full vehicle structures for front, side, and rear impact conditions to develop robust design, regulatory, and corporate design objectives. Qualifications: Master's degree in Mechanical Engineering, Engineering Mechanics, or Structural Engineering; knowledgeable in the use of crash analysis codes; knowledge and experience in the use of preprocessors; ability to use Silicon Graphics/ Hewlett-Packard Unix workstations. Knowledge of automotive crash regulations, understanding of crash safety and biomechanics preferred. Send your resume via e-mail to DAGUABW@kellyservices.com. Reference job ID: F1090/ F1091-KW.

Biomechanical Engineer & Physical Therapist to work in state of the art seat comfort research laboratory in Detroit, MI. Qualifications: A strong background or educational knowledge of ergonomic and or biomechanical engineering; strong knowledge of biomechanics related to the back. For more information, contact Bob Millman at (248) 967-0700; fax (248) 978-0788; or e-mail autopro@rust.net.

Sr. Assoc. Scientist/Scientist with The Mullings Group in NJ. Responsibilities: Design, develop, and validate new innovative test methods for characterizing medical devices and biomaterials; develop test protocols, carry out laboratory experiments, analyze test results, and prepare technical completion report; work with project teams to provide characterization strategies aimed at supporting product development and regulatory submission; collaborate with associates of diverse technical backgrounds (chemistry, physiology, materials science, engineering veterinary) to achieve desired project outcomes. Qualifications: M.S. or Ph.D. in Biomedical Engineering, Mechanical Engineering, Material Science & Engineering, or closely related field; 2-4 years work experience in characterization and testing of medical devices in biomedical R&D environment. Extensive knowledge of/experience in development and use of clinically relevant mechanical (non-animal) models for assessment of Medical Devices and Biomaterials is required. Fax resume to Jim at 561-243-1622 or Email: jim@mrimed.com.

Senior Human Factors Engineer with Gateway Computers in San Diego, CA. Responsibilities: Take lead role considering ergonomics and usability considerations for the design of world-class PC products; perform related prototyping, evaluation and usability testing. Requirements: M.A. or Ph.D. in Human Factors, Cognitive Psychology, IE, CS, or related field; 5+ years experience in HCI, usability information gathering & evaluation, product ergonomics, software prototyping, industrial design, web and/or multimedia design, or applied knowledge of user-centered design of hardware and software. Computer industry experience preferred. To apply, email JOB10_1319@careers.gateway.com with resume and cover letter in text (*.txt) or any word processing format, except RTF. Reference job: 10.

Bone Scientists with Procter & Gamble in Cincinnati, OH. (1) Ph.D. level Bone Biologist/Molecular Biologist will work as a polyfunctional team aimed at identifying and utilizing new molecular targets for the treatment of osteoporosis. Desired qualifications include a technical and practical background in molecular biology, experience in bone biological systems, and the ability to initiate, organize, and conduct independent research efforts in this area. (2) BS/MS Level - Skills must include molecular biology techniques with emphasis on analysis of gene expression and function in mammalian cells, as well as good techniques for mammalian cell culture. Background in bone biology is preferred, and skills in receptor and enzyme assay are strongly desired. (3) BS/MS Level - Skills must include a strong background with in vitro cell and molecular biology techniques, such as mammalian cell culture and analysis of gene expression and function, with a preference for a bone biology background. Additional skills in receptor and enzyme assay are strongly desired, as are familiarity with histological techniques. Send a letter of introduction, resume, and list of publications to: Dr. D. R. Webb; The Procter & Gamble Company; U.S. Recruiting-R&D, Dept. TD-DA; P. O. Box 599; Cincinnati, OH 45202. Or email to: deaton.tl@pg.com.

NOTE: *Applicants are stongly encouraged to contact the listing individual/institution directly to determine the current statusof a position and to obtain additional information.*

Additional opportunities can be found on the ISB home page (http://isb.ri.ccf.org/jobs/index.html) and on the Biomechanics World Wide home page (http://www.per.ualberta.ca/biomechanics) under the Career Opportunities category.

Don't forget to

VOTE

Return the enclosed ballot today!

See page 7 for candidate biosketches.

Calendar of Events

Don Anderson

20-23 May 1999 18th Southern Biomedical Engineering Conference & 2nd International Conference on Ethical Issues in Biomedical Engineering, Clemson University, Clemson, SC. Subrata Saha, Ph.D., Director, Bioengineering Alliance of South Carolina, 313 Rhodes Research Center, Clemson University, Clemson, SC 29634-0906. Tel: 864/656-7603; Fax: 864/656-4466; e-mail: amarand@clemson.edu; *sbec.abe.msstate.edu.*

2-5 June 1999 Annual Meeting of the American College of Sports Medicine, Seattle, WA. Michael Feltner, Dept. of Sports Medicine & Physical Ed., Pepperdine University, Malibu, CA 90263. Tel: 310/456-4312; Fax: 310/317-7270; e-mail: mfeltner@pepperdine.edu; *www.acsm.org/sportsmed.*

11 June 1999 Measurements and Simulations in Musculoskeletal Biomechanics Meeting, London, UK. IPEM Meetings, Fairmount House, 230 Tadcaster Road, York YO24 1ES, England. Tel: +44 (0)1904 610821; Fax: +44 (0)1904 612279; e-mail: gill.kennedy@ipem.org.uk.

16-20 Jun 1999 ASME Summer Bioengineering Conference, Big Sky, Montana. Program Chair, Vijay K. Goel, Ph.D., Iowa Spine Research Center, Department of Biomedical Engineering, 1410 EB, College of Engineering, University of Iowa, Iowa City, IA 52242. Tel: 319/335-5638; Fax: 319/335-5631; e-mail: Vijay-Goel@uiowa.edu; *www.asme.org/divisions/bed/summer99.html*

17-19 Jun 1999 3rd Annual North American Program on Computer Assisted Orthopaedic Surgery (CAOS/USA '99), Pittsburgh, PA. Center for Orthopaedic Research, UPMC Shadyside, 5200 Centre Avenue, Suite 309, Pittsburgh, PA 15232. Tel: 412/623-2673; Fax: 412/623-1108; e-mail: caos@cor.ssh.edu; *www.cor.ssh.edu.*

30 Jun - 6 Jul 1999 XVII International Symposium on Biomechanics in Sports, Hillary's Resort and Underwater World, Perth, Western Australia. Ross Sanders PhD, Chair ISBS99 Organising Committee, Senior Lecturer in Biomechanics, Edith Cowan University. Tel: 61 8 94005860; Fax: 61 8 94005717; e-mail: r.sanders@cowan.edu.au; *isb.ri.ccf.org/confannounce.html.*

10-15 July 1999 14th Symposium of the International Society for Posture and Gait Research, University of Waterloo, Waterloo, Ontario, Canada. Aftab Patla, Ph.D and James S. Frank, Ph.D. Chairs, Department of Kinesiology, University of Waterloo, Waterloo, Ontario, Canada, N2L 3G1. Tel: 519/888-4567, x 6884; Fax: 519/885-2694; e-mail: ispg@healthy.uwaterloo.ca; *www.ahs.uwaterloo.ca/ispg.*

5 - 7 Aug 1999 Fourth Symposium of the ISB Technical Group on Footwear Biomechanics, Greenwood Inn, Canmore, Alberta, Canada. Darren Stefanyshyn. e-mail: darren@KIN.UCALGARY.CA; *www.uni-essen.de/~qpd800/FWISB/Canmore99.html.*

5-7 Aug 1999 VIIth International Symposium on Computer Simulation in Biomechanics (ISCSB-VII), Calgary, Alberta, Canada. A.J. (Ton) van den Bogert, PhD, Department of Biomedical Engineering, Cleveland Clinic Foundation, 9500 Euclid Avenue (Wb-3), Cleveland, OH 44195, USA. Tel: 216/444-5566; Fax: 216/444-9198; *isb.ri.ccf.org/tgcs/iscsb7.*

6-7 Aug 1999 ISB Satellite Symposium on Skeletal Muscle Mechanics, Canmore, Alberta, Canada. Ms. Holly Hanna, Conference Secretariat, University of Calgary, PEB205, 2500 University Dr. N.W., Calgary, Alberta, Canada T2N 1N4. Tel: 403/220-8525; Fax: 403/284-3553; email: hhanna@ucalgary.ca. Abstracts due: May 28, 1999.

8-13 Aug 1999 XVIIth Congress of the International Society of Biomechanics; Calgary, Alberta, Canada. ISB99, Attention: Margaret-Anne Stroh, The University of Calgary, Conference Mgmt. Services, 1833 Crowchild Trail N.W., Calgary, Alberta, Canada T2M 4S7. Tel: 403/2206229, Fax: 403/284-4184, e-mail: mastroh@acs.ucalgary.ca. *www.kin.ucalgary.ca/isb99/.*

15 -16 Aug 1999 2nd Conference of the International Shoulder Group, Calgary, Alberta, Canada. Michelle Richards, Conference Management Services, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4. Tel.: 403/220-7103; Fax: 403/284-4184; e-mail: richardm@ucalgary.ca.

19 - 22 Aug 1999 Progress in Motor Control - II: Structure-Function Relations in Voluntary Movements, State College, PA. Conferences and Institutes, The Pennsylvania State University, Box 10850, State College PA 16805-0850. Tel: 800/778-8632; Fax: 814/863-5175.

13-16 Oct 1999 Fourth International Symposium on Computer Methods is Biomechanics and Biomedical Engineering, Lisbon Portugal. John Middleton, Biomechanics Research Unit, Cardiff Medicentre Heath Park, Cardiff CF4 4UJ, Wales, UK. Tel/Fax: + 44 (0) 1222 682161; e-mail: MiddletonJ2@Cardiff.ac.uk; *www.uwcm.ac.uk/uwcm/bd/biolisboa.html.* Abstracts due June 30th 1999.

13-16 Oct 1999 Joint Meeting of the Biomedical Engineering Society (BMES) and the Engineering in Medicine and Biology Society (EMBS), Atlanta, GA. BMES/EMBS 99 Conference Office, 1518 Brookhollow Drive, Suite 23, Santa Ana, CA 92705. Tel.: 714/957-9100; Fax: 714/957-9114; email: PrestigACC@aol.com; *bmes-embs99.gatech.edu.*

14-17 Oct 1999 Annual Meeting of The American Congress of Rehabilitation Medicine, Orlando, Florida, USA. American Congress of Rehabilitation Medicine, 4700 W. Lake Avenue, Glenview, IL 60025. Tel: 847/375-4725; Fax: 847/375-4777; e-mail: acrm@amctec.com. *www.acrm.org.*

20-23 Oct 1999 23rd Annual Meeting of the American Society of Biomechanics, Pittsburgh, PA. Savio L-Y. Woo, PhD, University of Pittsburgh, Tel. 412/648-2000; e-mail: cphil+@pitt.edu; *asb-biomech.org/conference.html*

4-8 Nov 1999 European Medical & Biological Engineering Conference (EMBEC'99), Vienna, Austria. Heinz-Bodo SCHMIEDMAYER, Technische Universitaet Wien, Wiedner Hauptstrasse 8-10/325, Institut fuer Mechanik, A-1040 WIEN / AUSTRIA / EUROPE, Tel.: (+43 1) 58 801 x 5524, Fax: (+43 1) 587 58 63; e-mail: Heinz-Bodo.Schmiedmayer@tuwien.ac.at, *www.univie.ac.at/EMBEC99/.*

14-19 Nov 1999 1999 International Mechanical Engineering Congress & Exposition, Nashville, TN. Jennifer S. Wayne, Ph.D., Department of Biomedical Engineering, 220 McGuire Annex, 1112 E. Clay Street, Virginia Commonwealth University, Richmond, Virginia 23298-0694. Fax: 804/827-0290. *www.asme.org/conf.*

12-15 Mar 2000 46th Annual Meeting of the Orthopaedic Research Society, Orlando, Florida. *www.ors.org*

27-30 Aug 2000 12th Conference of the European Society of Biomechanics, Dublin, Ireland. Patrick J. Prendergast, PhD, Chair: ESB 2000, Incentive Conference Ireland, 1 Pembroke Place, Ballsbridge, Dublin 2, Ireland. e-mail: esb2000@tcd.ie; *www.mme.tcd.ie/esb2000.*

3-8 Aug 2002 4th World Congress on Biomechanics, University of Calgary. Dr. Benno Nigg and Dr. Ronald Zernicke.

NOTE: For a more exhaustive international listing, visit ISB's website at http://isb.ri.ccf.org/confannounce.html.

Students' Corner

Fadric Bressel

I have good news for those students attending the annual meeting in Pittsburgh, Pennsylvania. Along with the potential for defraying costs by applying for a student travel award (more on this in a moment), students who are first authors or co-authors of an accepted abstract will have their registration fees paid for by the Asian-American Institute for Research and Education. To receive the paid registration fees, you must submit a copy of the accepted abstract and acceptance letter with your registration form. Nice huh?

With regard to the student travel award, all students regardless of whether your name is on an abstract or not may apply for one of eight $250 awards to decrease costs associated with travel to the meeting in Pittsburgh. To apply for the travel award, student members must submit: (a) "Letter of Purpose" (approximately one page) which states the need for funding, reasons for attending the annual meeting, and an overview of his/her area of study; and (b) a letter from the student's advisor stating the lack of other (travel) funding sources. Preference will be given to students who are an author of an abstract; accordingly, you may strengthen your proposal by submitting a copy of your abstract and the abstract acceptance notification. All applications should be sent to the Awards Committee Chair, Mark D. Grabiner, Ph.D. Those students receiving the award will be notified during the student luncheon at the annual meeting.

As expected, this year's meeting in Pittsburgh will be a rewarding experience, so please plan to attend! For instance, on Wednesday, October 20th, Dr. Tom Andriacchi and Dr. Debra Hurwitz will speak at a tutorial addressing the calculation of joint moments for clinical and research applications. Don't forget tutorials are free for students! Additionally, during the student luncheon on Saturday, October 23rd, there will be an opportunity to interact with industry representatives regarding potential jobs. You may want to bring a resume to the luncheon.

If the expense of lodging is a concern at the meeting, I was told the Holiday Inn has reasonable rates and will accept four people to a room. If you need a roommate, to decrease the cost, email me and I will do my best to match you up with another student.

In other news, the student representative's position will be available beginning in October for the 1999-2000 term. The successful candidate will be chosen during the student luncheon at Pittsburgh. The major responsibility of the position is to act as a messenger between students and the Executive Board. This position provides the student a great opportunity to interact with the biomechanics community and to experience service work, which is a critical component of a successful faculty or research member. If you are interested in this position, please contact me via email (ebresse@blue.unco.edu) prior to the meeting for more details.

Finally, if you have not heard from me over email, please contact me so I can add your address to my list. If you are interested in receiving a monthly listing of job opportunities, I can also add your name to the job resource list. Additionally, I would like your input regarding new ideas to benefit students, so please email me with your suggestions. And by the way, have great summer and please consider the student representative position. See you in Pittsburgh!

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ASB Regional Student Meeting

Michael Feltner & Michele LeBlanc

The first Southern California Conference on Biomechanics (SCCB) was held April 9-10 at California Polytechnic University at Pomona and was a great success. Over 70 individuals attended and heard excellent presentations by our two keynote speakers. Dr. William Whiting of California State University, Northridge gave the SCCB keynote address entitled, "If it ain't broke, just wait!: A biomechanical perspective of musculo-skeletal injury." The ASB keynote address, "Biomechanical analysis of the high jumping and discus throwing techniques", was presented by Dr. Jesus Dapena of Indiana University. In addition, there were 13 outstanding presentations from undergraduate and graduate students representing seven area colleges and universities. Abstracts of the student presentations can be reviewed at the conference web site: *www.csupomona.edu/~mkleblanc/sccb/*

Two students received awards for their presentations. Chris Hamerski, an undergraduate student working with Dr. Roger Kram at UC Berkeley, received an award for his presentation entitled, "Running downhill on Mars: applied horizontal forces increase impact peaks." The second presentation award was given to Philip Requejo, a graduate student working with Dr. Jill McNitt-Gray at USC. Philip's presentation was entitled, "Validation of a model to simulate joint control prior to landing."

We would like to thank R. Bruce Martin, Mark Grabiner, the Executive Committee, and the entire membership of the ASB for their generous support of this meeting. All present felt that the meeting was a success and it significantly enhanced the local biomechanics community. Most importantly, the conference was a positive educational experience for all student attendees. The response to the meeting was so favorable, Dr. George Salem of the USC Department of Biokinesiology and Physical Therapy has agreed to host the event in the year 2000.

Again, we thank all involved in the ASB for their support of this event.

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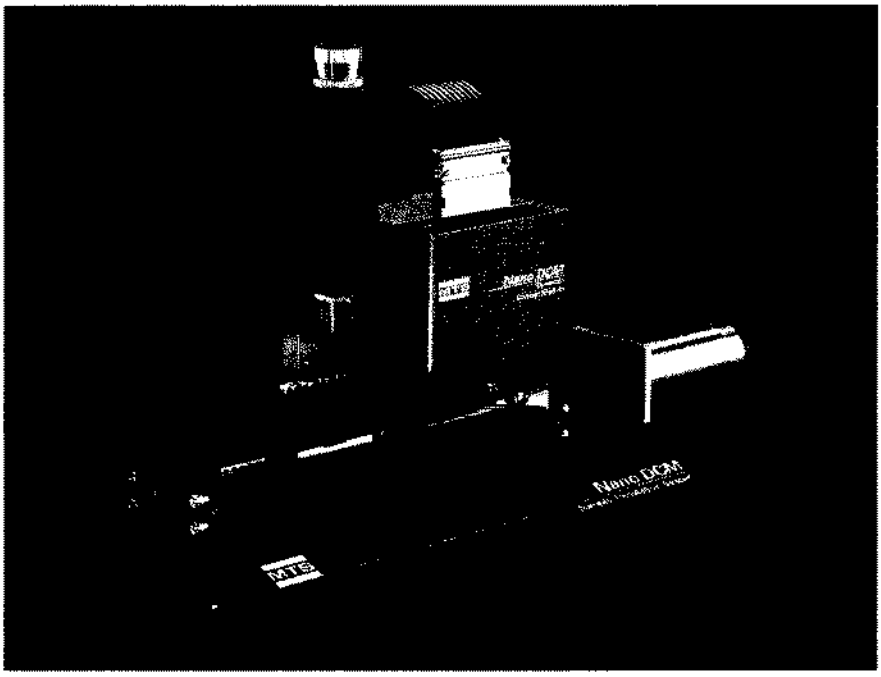
MTS TESTING NEWS

Special Bionix Testing Edition

Vol. XVI, No. 6

The World of Biomaterials Testing Has Just Gotten Smaller

MTS Introduces Microprobe Technology for Evaluating Small Volumes of Material



You'll be able to explore a new level of mechanical properties research capabilities. MTS has introduced new mechanical properties microprobe systems to biomaterial researchers and manufacturers.

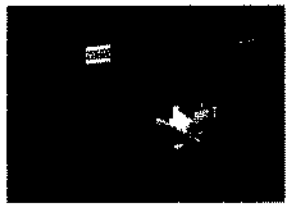
With this new technology, MTS offers researchers three systems employing the most advanced mechanical microprobe technologies available. Manufacturers of medical electronics, devices, materials, coatings, and optical devices can benefit by being able to obtain fast, accurate, and repeatable characterization of surfaces down to a few nanometers. At this scale, as small as tens of atoms, MTS now offers you the capability of determining how properties such as hardness and modulus of elasticity can affect the performance of products and materials.

One key to this capability is the MTS Dynamic Contact Module (DCM), which extends the range of load-displacement research down to the surface contact level. It allows researchers to study the first nanometers of indentation into the surface of a material, and even the pre contact mechanics. Because it is truly a dynamic system, it offers information well beyond that available with traditional static and quasi-static systems.

The MTS Dynamic Contact Module is available as a stand-alone unit, or as a key component in two basic test systems – The Nano Indenter® II Series and the Nano Indenter XP series.

Nano Indenter II Series for advanced research

An unequaled range of power, flexibility, and capability makes the Nano Indenter II Series the most advanced indentation technology available in the world. This modular system features open architecture that allows you to customize your system to meet your specific information needs. It includes the most powerful and flexible software ever developed for indentation technology.



MTS Nano Indenter XP for quality control testing, routine research

For both quality control and research applications, the Nano Indenter XP Series gives you high-quality information in a system focused on ease of use, simplicity, reliability, and speed. With minimal training, your assistants and technicians will quickly be testing with this system, thanks to a point-and-click location selection, and to automated control and reporting.

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Education Committee Chair

Suzanne Smith

Great news about the 1999 ASB tutorials – they will be ***free*** to all registered attendees!! In the past, the tutorials were free to students but cost a fee to regular members and nonmembers. This year's topics and presenters were selected based on recommendations made in past meeting evaluations. The topics promise the appeal of a wide audience from the biomechanics community. Both tutorials will be given by multiple presenters of various backgrounds and skills which should offer interesting perspectives on both topics. Tutorial 1 is scheduled on Wednesday, October 20, from 3 – 5 pm. Tutorial 2 is scheduled the same day from 7 – 9 pm. Please try to attend the opening acts for what should be a great annual meeting! The following are summaries of the two tutorials:

TUTORIAL #1

CLINICAL AND RESEARCH APPLICATIONS OF KINEMATIC/KINETIC MEASURES OF GAIT

Debra Hurwitz, Ph.D.
Department of Orthopedic Surgery
Rush-Presbyterian St. Luke's Medical Center
Chicago, IL

Erez Morag
Nike Sport Research Laboratory
Beaverton, OR

Tom Andriacchi
Department of Mechanical Engineering
Department of Functional Restoration
Stanford University
Palo Alto, CA

As modalities for treatment of injury and disease of the musculoskeletal system advance, there is increasing need to understanding *in vivo* function. The information obtained from *in vivo* functional testing, such as gait analysis, provide unique and important information about musculoskeletal function. This type of information cannot be obtained from other testing modalities, since the salient characteristics of most musculoskeletal pathology become apparent under dynamic conditions.

Fundamental research is needed to provide the basis for appropriate application of clinical functional testing. This course will present specific topics related to the formulations of research questions, protocol design and the selection of appropriate variables to be studied using kinematic and kinetic measures of gait. Specific examples related to osteoarthritis and sports medicine will be provided. In addition, examples of the clinical use of kinematic and kinetic measurements of gait will be presented. The establishment of appropriate clinical protocols, the identification of clinical questions and the selection of variables will be illustrated through use of case studies. Finally, the selection of appropriate methodology and models for research and clinical applications will be discussed. The sensitivity of specific variables to specific disease conditions and the implications of inter-subject and intra-test variability to research and clinical studies will be examined.

TUTORIAL #2

WRITING GRANT PROPOSALS: THE GOOD, THE BAD, AND THE UGLY

R. Bruce Martin, Ph.D.
Orthopaedic Research Laboratories
UC Davis Medical Center
Sacramento, CA

Thomas Buchanan, Ph.D.
Mechanical Engineering Dept.
University of Delaware
Newark, DE

"Successful grant proposals are based on good writing and good science."

The focus of this tutorial is the writing of NIH grant proposals, but its lessons would be applicable to proposals written for any scientific granting agency. The tutorial will be organized using the following agenda:

1. Understanding the grant application review process:
   - -how applications are ranked, scored, and funded
   - -what goes on at an NIH study section meeting
   - -the roles of ethics, etiquette, and politics

2. Writing a successful proposal:
   - -specific aims and hypotheses
   - -background and significance
   - -preliminary studies/progress report
   - -research plan

3. What you can control and what you can't:
   - -ten steps to writing a bad proposal
   - -when and how to revise your unfunded proposal

4. Mock study section meeting:
   - -review of an example of a poor proposal
   - -review of an example of a good proposal

5. Q & A session

Funding Opportunities

Peter Vint

Hello again from the land of NASCAR! In previous columns, I have compiled lists of grant writing and funding resources. A number of these resources may be accessed through Internet links. If you have not yet done so, you may wish to bookmark this page at:

asb-biomech.org/funding.html

In this column, I will describe briefly two programs designed to automatically alert researchers to new and upcoming funding opportunities.

Community of Science (COS) Funding Alert

The Community of Science (COS) is a consortium of universities and research institutions that publishes funding information for all disciplines on the World Wide Web. If your institution belongs to the COS, you will have access to the COS Funding Alert. If you are uncertain about your institution's affiliation with the COS, contact your office of research services.

The COS Funding Alert is a weekly alert that notifies you of available grants that match your research interests. Once you establish a new COS Expertise Profile, which contains a statement of your research interests and expertise, COS creates an initial search for your Funding Alert account. The COS will automatically complete a new search every time you update your Expertise Profile.

The COS Funding Alert will run every week, and you will only receive an alert when new or updated information is available. The alert will arrive by e-mail. You can access your results on the Web at any time. You may also turn off the e-mail feature of Funding Alert, create and modify several search topics, and establish default options that will affect each of your searches. The COS and the COS Funding Alert may be accessed at: *www.cos.com*.

GrantsNet Funding Alert

The American Association for the Advancement of Science (AAAS) and the Howard Hughes Medical Institute (HHMI) have created GrantsNet, a searchable database of biomedical funding options from non-profit organizations and federal agencies. They are also building a collection of interviews with application reviewers, program officers, and recent award recipients. The GrantsNet funding directory includes an alphabetized directory of 667 programs with contact information.

GrantsNet also has available an automatic e-mail alerting program. Registration for this free service may be accessed at: *www.grantsnet.org*.

National Institute of Health (NIH) Table of Contents Listserve

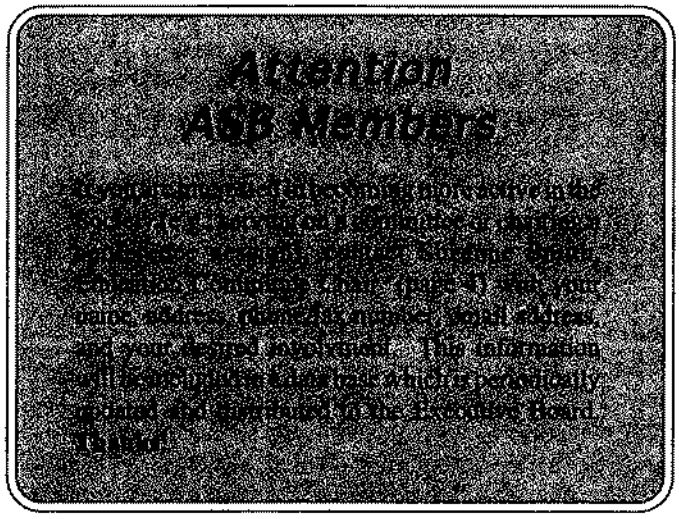
NIHTOC-L is an electronic mailing list that sends out a weekly table of contents for new NIH grants, contracts, and other information. If you do not subscribe to this free service yet, you can do so by sending email to:

LISTSERV@list.nih.gov

with the following text in the body of the message:

SUBSCRIBE NIHTOC-L firstname lastname.

As always, please help me help you by sending me your suggestions for future topics for the Funding Opportunities column. In addition, if you have any useful resources that you would like to share with the Society, I would be happy to announce them in upcoming issues. Until then ... Happy hunting!



Advertising in the ASB Newsletter

The Editorial Board invites various businesses and corporations that have products or services of interest to members of the Society to advertise in the ASB Newsletter. Advertising space may also be purchased for job postings or other special announcements.

The current advertising rates are as follows:

1/4 page	$75
1/2 page	$150
full page	$250
back page	$500
separate insert	$500 per insertion

If you are interested in placing an advertisement or have any information concerning potential advertisers, please contact Gary Heise (gdheise@bentley.univnorthco.edu).

News from AIMBE

Kai-nan An & Joan Bechtold

The Council of Societies of The American Institute for Medical and Biological Engineering (AIMBE) currently has eighteen professional and scientific societies, and includes ASB. The annual council meeting was held in March in Washington, D.C. during the annual AIMBE meeting. In addition, a council summit meeting was held in November of 1998 in Minneapolis. AIMBE encourages the solicitation of public policy and other issues from Societies. Last year, AIMBE spearheaded lobbying for the passage of the Biomaterials Access Assurance act. With the Medical Technology Leadership Forum, AIMBE prepared two White papers - on 1) Medicare Reimbursement of cutting-edge technologies, and 2) assessing evidence of value in regulatory and reimbursement decisions. AIMBE co-sponsored (with 6 other engineering societies) a Congressional Briefing "Engineered for Life: New Frontiers in Bioengineering". AIMBE was also a co-sponsor of the NIH symposium "Bioengineering: Building the Future of Biology and Medicine". AIMBE is involved in the NIH Bioengineering Consortium, advocates for a permanent home for Bioengineering at NIH, and monitors SBIR and funding trends.

AIMBE has been facilitating response to the NIH Center for Scientific Review (CSR). Last fall, Dr. Ellie Ehrenfeld, Director of the NIH CSR, appointed the Working Group on Review of Bioengineering and Technology and Instrumentation Development Research (for roster, see *www.csr.nih.gov/btidr/workgroup.htm*). The Working Group's charge was to identify obstacles to fair, high-quality, rigorous review and to develop a set of principles to guide CSR in establishing a review structure friendly to bioengineering and technology. While the charge to the Working Group was relatively narrow, the members believed the issues to be broad. Therefore, the draft report they have now produced speaks generally to ways in which NIH might promote agility in responding to emerging opportunities. Before preparing their final recommendations, the Working Group welcomes further input from the scientific community. The report is posted for comment at *www.csr.nih.gov/events/wg.htm* and an open forum will be held at the Experimental Biology 99 meeting on Sunday, April 18 (5:00-6:30 p.m., Washington Convention Center, Washington, D.C.).

The World Congress on Medical Physics and Biomedical Engineering will be held on July 23 - 28, 2000 in Chicago. The theme for the Chicago 2000 World Congress is "Global Information Networking for the Twenty-First Century." ASB is planning to organize its 2000 meeting in Chicago, to facilitate attendance of ASB members (and other AIMBE members) at each meeting. On November 1, 1999, the Web site will be activated to receive electronic abstract submissions and meeting registration begins. January 14, 2000, is the deadline for receipt of contributed (proffered) abstracts. Details can be found at: *www.wc2000.org*

Commercial Members

Commercial membership categories are aimed at encouraging affiliation by commercial organizations that market products which are used by the biomechanics research community, or companies that are otherwise engaged in activities that fall within the Society's general interest areas. The benefits and fees for Commercial Members of the Society have been reorganized. Based on level of support, commercial membership categories in decreasing order are Sustaining Member, Supporting Member, Contributing Member, and Corporate Member. Companies wishing to become a Commercial Member are encouraged to contact either Scott Delp or Bruce Martin (page 4) for details.

The ASB Executive Board is pleased to recognize:

SUSTAINING MEMBERS

Peak Performance Technologies, Inc.

CONTRIBUTING MEMBERS

Motion Analysis Corporation

CORPORATE MEMBERS

Aircast

DePuy

Orthofix, S.R.L.

Tekscan

We are also happy to acknowledge and thank the following companies for their past support:

Howmedica

Kistler Instrument

MTS Systems

Noraxon U.S.A

All members of the Society are invited to suggest names of potential commercial members. Please send your suggestions to Scott Delp, Membership Committee Chairperson, at the address indicated on page 4 of this newsletter. If you have a particular contact person at the company, please make sure to include his/her name.

23rd Annual Meeting of the
AMERICAN SOCIETY OF BIOMECHANICS

University of Pittsburgh
Pittsburgh, Pennsylvania

October 20-23, 1999

"Human engineering . . . on the Horizon of the New Millennium" is the theme for the Twenty-Third Annual Meeting of the American Society of Biomechanics. The meeting will be held at the University of Pittsburgh in Pittsburgh, Pennsylvania on October 20 – 23, 1999. The Musculoskeletal Research Center (MSRC), the Department of Orthopaedic Surgery and the School of Engineering are pleased to host this conference.

This exciting and educational program will begin on Wednesday, October 20th with ***lab tours*** of modern bioengineering/orthopaedics research facilities, followed by featured ***tutorials*** on "Writing a Successful Grant Proposal" and "Calculating Joint Moments for Clinical and Research Applications." Be sure to check the ASB web site for more details!

Our two ***keynote speakers*** will be Drs. Y. C. Fung and Demetri Terzopoulos. Dr. Fung, often described as the "Father of Modern Biomechanics", has authored over 300 papers in archival journals and a series of outstanding textbooks on the biomechanics of living tissues. He has been bestowed with many honors, including election to the National Academy of Engineering, Institute of Medicine, and National Academy of Science. Dr. Terzopoulos directs the Visual Modeling Group at the University of Toronto. A dynamic speaker and the author of over 200 papers, his work on biomechanics focuses on medical imaging and artificial life.

In addition to our two exciting keynote speakers, we are also planning four ***symposia*** for this year's meeting. The first symposium is on Sports Biomechanics and will be chaired by Dr. Savio Woo. Second, we will have a symposium on Neural Control chaired by Dr. Zev Rymer that will address the topic "What the Nervous System Knows About Biomechanics." The third symposium will be on Cardiovascular Biomechanics and will be chaired by Drs. David Vorp and Michael Sacks from the University of Pittsburgh. Finally, Dr. Art Kuo will chair a symposium in honor of our departed colleague, Tom McMahon, that will feature speakers highlighting some of the many areas of Dr. McMahon's research interests.

Throughout the three-day conference, eleven ***Podium Sessions***, two ***Poster Sessions***, (including the Clinical Biomechanics Award), two stimulating ***debates*** and the Borelli Award Lecture will give insight into the present and future goals of bioengineering. In support of these goals, the Asian-American Institute for Research and Education (ASIAM) will support any student planning on attending the meeting who is an author or co-author of an accepted paper.

In addition to the scientific program, the local planning committee will offer a variety of ***special events*** to encourage you to visit us in October.

Thursday evening will be "An Evening to Remember" at the Carnegie Museum Music Hall with an ***opening reception*** unlike any other. Come journey with us through the history of bioengineering and hear the "Father of Modern Biomechanics", Prof. Y.C. Fung, take us into the new millennium. After the program, stay and enjoy a scrumptious buffet and music in the breath-taking Carnegie Museum Music Hall Foyer.

Friday evening is sure to be the "best night you've spent in Pittsburgh." We will begin with trolley service from Oakland to downtown by the scenic route, and drop you off on the "gang plank" of the Gateway Clipper Fleet's "Partyliner Steamship." As we cruise the three rivers, we will hold our ***Awards Banquet*** and feast on a delectable buffet dinner, with live entertainment for dancing, a strolling magician and Monte Carlo night for those who feel lucky! There is no better way to view the "night lights" of our city.

On Saturday, there will be a student luncheon and job fair to motivate and challenge each student and give them incentive towards their future. There is so much more, so please visit our web site: ***msrc.ortho.pitt.edu***. Come and join us for this remarkable meeting.

For more information, please contact the Meeting Chair, Savio L-Y. Woo or the Program Chair, Tom Buchanan (see page 4). We hope to welcome you to Pittsburgh in October.