



# International Society of Biomechanics Newsletter

SPRING ISSUE 1987 N° 26

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# Editorial

The day-to-day work of the International Society of Biomechanics is carried out by a relatively small group of people... Officers and Council members (elected each two years by the membership). My first purpose in writing this editorial is to advise you (the members and affiliate members of the Society) of some of the results of their efforts over the past eighteen months.

Others who work very diligently on behalf of I.S.B. are the organizers of the various Congresses and Symposia conducted in the name of the Society. My second purpose is to acknowledge their achievements and to advise you of their progress.

## Executive Council Meetings.

The constitution of ISB requires that the Council "meet at least once a year" and it has become the practice to hold the meeting between ISB Congresses in conjunction with some other major international biomechanics conference. In accord with this practice, the Executive Council of ISB met in Montreal for two days in August, immediately prior to the North American Congress on Biomechanics, conducted jointly by the American and Canadian Societies of Biomechanics. Our meetings in Montreal were very well attended and a large volume of business was conducted. Although a synopsis of the minutes of these meetings appears elsewhere in this issue of the *Newsletter*, there are some issues on which I would like to elaborate here.

## Administrative Procedures.

*Ad hoc* committees have been working over the last 18 months to develop improved procedures for the conduct of the Society's affairs. Among these was one, chaired by Richard Wells, that was charged with the responsibility of clarifying the role of exhibitors and other commercial interests at our Congresses. The work of this committee is mentioned here because it is an example of a newly-instituted practice of involving non-Council members in the policy-making activities of the Society. In the past, participation on such *ad hoc* committees was limited exclusively, or almost exclusively, to Council members. Because the work to be done far exceeds what the Council members. Because the work to be done far exceeds what the Council alone can be expected to handle and because the Council does not have a monopoly on wisdom (in spite of the member's obvious brilliance!), more and more non-Council members are likely to be invited to serve on such committees in the future. Incidentally, the other two members of Richard's committee were Klaus Nicol and Rients Rozendal, neither of whom are Council members.

## Affiliate Members and Affiliate Membership.

Considerable efforts have been made over the past 18 months to develop formal relationships between ISB and other national and international societies of biomechanics. Such relationships are seen as a way to strengthen the activities of both ISB and the societies with whom ISB is affiliated. A new affiliate membership policy was approved in 1985 (see the *ISB Newsletter*, Autumn 1985, p. 10). This policy was modified at our meeting in 1986 to eliminate the requirement that affiliate societies pay an annual fee to ISB. In some cases, the payment of this fee created an unwelcome

financial burden; in others, it conveyed the impression that an affiliate society was somehow subservient to ISB. Both of these were very undesirable effects of the requirement that a fee be paid. With regard to the latter, it cannot be too strongly emphasized that our affiliate membership policy is intended to encourage the development of relationships in which the societies involved are equal partners. We surely cannot expect another society to be interested in some subservient role when we ourselves would surely not be interested in such a thing.

## World Congress of Biomechanics.

Mention was made in my last editorial (*ISB Newsletter*, Autumn, 1985) of the World Congress on Biomechanics proposed by the United States National Committee on Biomechanics. Some time ago, I attended a meeting of the U.S.N.C.B. for the express purpose of presenting the I.S.B. proposal to host this 1st World Congress on Biomechanics in conjunction with our own 12th International Congress of Biomechanics at the University of California, Los Angeles in 1989. While the strength of the arguments presented was acknowledged, strong sentiment was expressed at the meeting against having this World Congress conducted in association with another meeting or conducted by a single society. This was seen as bestowing an unfair advantage on one society compared to all others. It was also stated that there were several other conferences in 1989 with which a World Congress would conflict. There were, of course, many other points raised in the discussion. In the end, the U.S.N.C.B. voted to hold the 1st World Congress on Biomechanics in New York in 1990 and appointed Professor Y.C. Fung to chair an International Steering Committee. Although no contact has been made on this matter since that time, I expect that ISB will be invited to participate in the organization of the World Congress in due course.

## A.S.M.E. - E.S.B. - I.S.B. Biomechanics Symposium.

Biomechanics symposia have been sponsored and conducted for many years by the Applied Mechanics, Bioengineering and Fluids Engineering Division of the American Society of Mechanical Engineers (A.S.M.E.). This year's symposium is jointly sponsored by this Division of A.S.M.E., the European Society of Biomechanics (E.S.B.) and I.S.B. Our involvement in this meeting -- to be held in Cincinnati, Ohio, June 14-17, 1987 -- is a further example of I.S.B.'s continuing efforts to develop strong cooperative relationships with other biomechanics societies. The symposium will feature two forums -- "Microstructure Related to Tissue Mechanics and Function" and "Biomechanics of Locomotion and Motor Control" -- and a number of general biomechanics sessions. I sincerely hope that I.S.B. members with an interest in the topics of the forums or in simply being a part of this cooperative venture will make every effort to attend this meeting.

## American Society of Biomechanics

We have been trying for some time to establish a formal relationship between I.S.B. and the American Society of Biomechanics (A.S.B.). I am now pleased to announce that the Executive Board of A.S.B. recently made a decision to "promote cooperative activities between the American

Society of Biomechanics and the International Society of Biomechanics". This means, among other things, that A.S.B. and I.S.B. will become mutually affiliated.

#### Polish Society of Biomechanics

I have also been advised recently that one of the aims of the Polish Conference of Biomechanics to be held in Gdansk, June 23-25, 1987 is "organization of the founding meeting of the Polish Society of Biomechanics". We wish our Polish colleagues well in this endeavor and hope that before long the newly-created Polish Society of Biomechanics will become an Affiliate Member of I.S.B.

#### Journal of Biomechanics.

The American and European of Biomechanics have for some years had affiliate status with the *Journal of Biomechanics*. This status affords them a number of benefits including reduced subscription rates for their members -- all of whom pay a subscription to the *Journal* as part of their membership fee; representation on the Editorial Board -- and thus a voice in the conduct of *Journal* affairs; representation on the panel of Editorial Consultants; publication of the abstracts of papers presented at their annual or biennial meetings; and, finally, a greatly increased visibility for their respective societies. I.S.B. has been attempting to make similar arrangements with the *Journal of Biomechanics* for some time and it is my hope that a proposal can be put before the membership before long. Given the highly diverse interests of the members of I.S.B., this proposal will probably include the option to subscribe to either the *Journal of Biomechanics* or to one or two other journals, with whom similar affiliate status might be negotiated.

#### 5th International Symposium on the Biomechanics of Swimming Medicine.

This symposium was held in Bielefeld, Federal Republic of Germany from July 27-31, 1986 and was a resounding success. The conference was attended by scientists from more than 24 countries and some 65 scientific papers were presented. One of the highlights of the symposium was a pool session at which various items of research equipment were demonstrated, discussed and, in some instances, tried out by participants in the symposium. The success of this symposium was due in very large measure to the fine organizational work of Congress Chairman, Bodo Ungerechts. Those of us who were fortunate enough to participate are truly indebted to him for his efforts on our behalf. Thank you Bodo for a job well done.

#### XI International Congress of Biomechanics

Plans for our next Congress in Amsterdam, June 29-July 3, 1987 are well advanced and by now all members will have received announcements concerning the Congress. Rients Rozendal, who heads a strong organizing team in Amsterdam, presented a thorough and impressive report of preparations for the Congress at the Council meeting in Montreal. The impressive array of invited speakers is, in itself, sufficient to guarantee that attendance at the Congress will be well worthwhile for anyone working in our field. And there will, of course, be much, much more. We look forward to seeing you all there!

1st International Symposium on the Science of Archery  
Organized in conjunction with the 3rd International

Archery Seminar, under the auspices of Olympic Solidarity, this symposium will be held in Brussels, July 6-10, 1987. This symposium, in the capable hands of our *Newsletter* editor, Jan Clarys and his colleagues, will be the first conducted under the umbrella of the newly-created World Commission of Sport Biomechanics (formerly the Working Group, Biomechanics of Sport). For those with interests in this highly-specialized area of sports biomechanics, this satellite meeting should be a valuable bonus to their attendance at the Congress in Amsterdam.

Finally, I would like to extend thanks to all the many people who have worked so hard and effectively on behalf of I.S.B. over the past 18 months; and to wish all the members and affiliate members of the Society every success in 1987.

James G. Hay  
(President, I.S.B.)

29 June - 3 July 1987



under the auspices of the  
International Society  
of Biomechanics

#### SIX PHASES OF A PROJECT

1. ENTHUSIASM
2. DISILLUSIONMENT
3. PANIC
4. SEARCH FOR THE GUILTY
5. PUNISHMENT OF THE INNOCENT
6. PRAISE & HONORS  
for the  
NON-PARTICIPANTS



# Special article

## SPORT BIOMECHANICS AT THE OLYMPIC GAMES

Robert J. Gregor  
*University of California, Los Angeles*

Quantification of high-level performance has been a goal of sport scientists for many years. In an effort to achieve this objective, noninvasive high-speed filming conducted during the Olympic Games would provide unique biomechanical information on the performance of world-class athletes from many countries. A broad spectrum of events could be studied with results applied to the better understanding of training methods, loads imposed on the body during elite competition, and injury prevention. While local, national, and selected world championship competitions have been studied in some sports (e.g., weightlifting) no organized investigation has been achieved during the Olympic Games. Track and field competition was filmed during the 1976 Summer Games but, due to the large quantities of data, results have been limited. Additionally, efforts were made to film during the 1980 Olympic Games in Moscow but international political tensions forced cancellation of the project. In short, there is need for a well organized, scientific study of athletes with cooperation at the highest level (i.e., international federations) during elite, international competitions.

Following the 13th Winter Games at Lake Placid and the Games of the 22nd Olympiad at Moscow on the initiative of the Chairman of the IOC Medical Commission, Prince Alexandre de Merode, the medical commission was restructured and considerably enlarged. Fully aware of the efforts and interests in the sports science community, Prince de Merode wished to expand the role of the medical commission to study the more positive aspects of sports training and competition. As a result, three subcommissions were established, each with specific objectives. These subcommissions were: Doping and Biochemistry of Sport, Biomechanics and Sport Physiology, and Sports Medicine and Orthopedics.

The need for these subcommissions arose from the rapid expansion of sports medicine throughout the world. Many national Olympic committees and international sports federations were setting up medical commissions in line with the directives of the IOC. Additionally, it was felt that the fight against doping must go beyond the stage of repression. Aid should be based on scientific fact and go hand in hand with the development of scientific training programs to enhance performance and minimize injury. In fact, several international federations have indicated an interest in collaborating with the IOC and other international sports science groups to conduct scientific research during world and Olympic championships and to discuss sports medicine problems specific to their sport. Certainly, the stage is set for a broad spectrum of efforts designed to enhance performance in international sport.

Part of these efforts, and specifically the purpose of this review, concerns the objectives and accomplishments of the subcommission on biomechanics and sport physiology. In May of 1982, the subcommission held its first meeting in Rome. The five members who attended were Professor

Wolfgang Baumann of the Biomechanics Laboratory, German College of Physical Education and Sports, Cologne, West Germany; Professor Heinz Liesen of the Institute of Cardiovascular Physiology and Sports Medicine, German College of Physical Education and Sports, Cologne, West Germany; Professor Vladimir Zatziorsky of the Biomechanics Laboratory, Central, Institute of Physical Culture, Moscow, USSR; Professor Paavo Komi of the Department of Biology of Physical Activity, University of Jyväskylä, Jyväskylä, Finland; and Professor Robert Gregor of the Biomechanics Laboratory, Department of Kinesiology, UCLA, Los Angeles, CA. The general objectives set forth at that meeting focused on the development of programs designed to enhance the biomechanical and physiological basis for training and competition. Long-term goals for research and development included the following aspects:

- Promotion of sport through objective biomechanical and physiological research;
- Descriptive analyses (kinematic and kinetic) of competitive sports performance;
- Explanatory analyses of competitive sports performance (i.e., underlying mechanisms behind the bodily response to exercise, optimal control of training, and the influence of training on different bodily responses);
- Standardization of different competitive conditions (e.g., altitude, temperature, etc.);
- Technical specifications of sports equipment and facilities as related to biomechanics and physiology;
- Performance evaluation with special emphasis on safety (e.g., impact tolerances and avoidance of harmful conditions);
- Development of educational programs regarding the biomechanical and physiological aspects of training and performance.

Although these goals were ambitious, it was agreed that much collaboration with scientists, coaches, and athletes throughout the world would be needed and that future efforts should emphasize facilitation of this collaboration.

While long-term plans are necessary for direction, short-term goals are essential for continued progress. In light of the need to establish some immediate objectives, the short-term goals outlined in Rome focused on conducting research projects during the 1984 Winter and Summer Olympic Games. It was concluded that high-speed film and force plate measurements could be made in selected sports during the Games. In order to formalize research efforts, three subcommission meetings were held during the next 18 months. In November 1982, the subcommission met in Cologne and discussed plans for research projects during the Winter Games in Sarajevo. It was proposed that high-speed films be taken during the ski jumping competition, selected portions of cross-country skiing, and certain speed skating events. Professors Bauman, Komi, and Zatziorsky were assigned the initial responsibility for specific methods to be used in each event.

In February 1983, the subcommission met in Sarajevo, Yugoslavia, to discuss research plans with the local organizing committee. Several competition sites were visited and preparations for actual camera positions were discussed. The local organizing committee cooperated wholeheartedly.

A fourth subcommission meeting was held in Los Angeles in November 1983; major agenda items concerned final plans for Sarajevo and discussion of proposed research projects with the Los Angeles Olympic Organizing Committee (LAOOC) for the Summer Games. Members of the IOC Medical Commission, Biomechanics and Sport Physiology Subcommission, and representatives of the LAOOC visited four competition sites. While research interests in eight sports were discussed, final plans were made for weightlifting (both force plate and film), track and field (high speed film of several events), and gymnastics (high speed film of vaulting). Again, the local organizing committee (LAOOC) cooperated very well.

In January 1984, some major problems were discovered regarding the plans for filming in Sarajevo and, unfortunately, the project had to be cancelled. While it was difficult to isolate any specific reasons for this disappointment, much was learned from these initial efforts. Currently the Biomechanics and Sport Physiology Subcommission is in close contact with the Calgary Olympic Organizing Committee, and Dr. Beno Nigg of the University of Calgary has consented to be a liaison between the subcommission and the local organizers.

In April 1984, the subcommission held its final meeting in Cologne prior to the Summer Games. As liaison to the LAOOC, I was responsible for the final plans and reported to the other members of the subcommission regarding my progress. Discussion at this time focused on the following issues.

1. The Redlake Corporation agreed to loan the IOC eight LoCam cameras and all peripheral devices needed to conduct the filming project. It was further agreed that Dan Irvin would serve as technical advisor during the USOC track and field trials in June and during the entire period of the Olympic Games.

2. Kistler Corporation agreed to construct and install two very sophisticated force platforms in the weightlifting arena for measurement of ground reaction forces during the Olympic competition. Unfortunately, due to problems with construction in the weightlifting venue in Los Angeles, the platform could not be used. But, upon agreement with the International Weightlifting Federation, this equipment is proposed for future international competition.

3. Eastman Kodak agreed to supply 120 roles (400') of color negative film to be used during the Olympic Games. They further agreed to process the film and supply the first print for analysis.

4. Three camera locations (two side and one front) were agreed upon for gymnastics. Two camera locations were agreed upon in weightlifting (one side and one front) and eight locations were established in the Coliseum for track and field. Aside from the five subcommission members and Irvin of Redlakes, several other scientists volunteered their time for this project: biomechanists Dick Nelson of The Pennsylvania State University, Chuck Dillman of the USOC Training Center, James Hay of the University of Iowa, William Whiting of UCLA, and John Garhammer of St. Mary's Hospital, Long Beach, CA, as well as Ralph Mann of Ocala, FL. The group was divided into research teams, each responsible for collecting data in the assigned venues.

5. Excellent cooperation was obtained from each international federation involved, as well as from the LAOOC. The LAOOC assured easy access to the playing field in each venue.

Films were taken of 6 weight divisions in weightlifting, some optional and all compulsory men's and women's vaulting, and 6 field events and 13 running events for both men and women. This project was the largest scientific investigation ever performed during international competition. With data collected, the major objective became analysis and dissemination of results. Plans regarding this aspect of the subcommission's function contain the following elements.

1. Seven model analyses are currently in progress. Focusing on the top five competitors in each event, films have been distributed to the following scientists for exemplary analysis and manuscript presentation.

John Garhammer - weightlifting  
 Roger Gregor - discus throw (men and women)  
 James Hay - long and triple jump  
 Ralph Mann - hurdles (men and women)  
 Chuck Dillman - men's gymnastics  
 Dick Nelson - women's gymnastics  
 Paavo Komi - javelin throw (men and women)

Publication through the IOC is planned for the Summer of 1985.

2. All films will be documented and made ready for further scientific analysis. The films will be stored in an archives in Lausanne, Switzerland, and made available to scientific groups throughout the world.

3. In support of the IOC's new research efforts, an International Olympic Association for Research in Sports Medicine (IOARSM) was established in December 1982. The basic function of this organization is to support the medical commission's research efforts and to provide an avenue for collection of resources necessary to the projects outlined.

The initial efforts were a success and plans are already underway for Calgary, Canada, and Seoul, S. Korea. The most promising aspect, however, is the interest and cooperation currently being developed between international sport federations and sports science groups (e.g., ISB). If maintained, the scientific study of elite competition should expand to the benefit of sportsmen and sportswomen throughout the world.

The international Journal of Sport Biomechanics published a special issue on Olympic Filming and the IOC-Medical Commissions' Biomechanical Studies during the L.A. Olympic Games I.J.S.B., Vol 1, N° 2, 1985

## SCIENTIFIC ADVERTISEMENTS

On request of ISB members and on condition that there is no relation with a commercial circuit, all scientific advertisements will be published free of charge.

## COMMERCIAL ADVERTISEMENTS

The Newsletter is open for commercial publicity at 250 US dollar per full page  
 150 US dollar per half page  
 90 US dollar per quarter page  
 All publicity will be advertised in the 4 issues.

# Calender of scientific events

## CALENDER OF WORLDWIDE INTERNATIONAL SCIENTIFIC EVENTS FROM 1987 UNTIL 1990

**April 2-5, 1987**

Sorrento, Italy, 2nd Intern. Conference on Sports Cardiology (c/o Organizing Secretariat MP Italia, Via Rodolfo Benini 7, 00191 Roma, Italia, Tel.: 06/3288150)

**April 13-17, 1987**

Liverpool, England, First World Congress of Science and Football (c/o Congress Secretariat Science and Football, Department of Sport and Recreation Studies, Liverpool Polytechnic, Byrom Street, Liverpool L3 3AF, England)

**April 27-May 01, 1987**

Sydney, Australia, First World Congress on "Heat Stress"; Theme: "Heat Stress - Physical Exertion and Environment" (c/o, Heat Stress 1987, The Menzies Foundation, 310/84 Pacific Highway, North Sidney 2060, Australia)

**May 08-10, 1987**

Munich, FRG, II. International Congress on Sport Therapy; Theme: "Tendopathia" (c/o DSB/BA-L, M. Löcken, Otto-Fleck-Schneise 12, 6000 Frankfurt 71, FRG, Tel. 069/6700238; Telex: 416595 DSBF D)

**May 24-29, 1987**

Sorrento, Italy, VIII th International Congress of EMG and related Clinical Neurophysiology. (c/o Jean Gilder, Università di Napoli, Cattedra di Neurofisiopatologia, Il facoltà di Medicina e Chirurgia. Via S. Lansini, 5, 80131 Napoli, Italy).

**May 27-June 01, 1987**

Gubbio, Italy, Hith International HISPA Congress Themes: "Sport and Celebration", "The History of Sport Science" (c/o HISPA, Secretariat, Tervuursevest 101, 3030 Heverlee, Leuven, Belgium; Tel. 16/22.04.45)

**May 27-30, 1987**

Las Vegas, USA, Congress of the American College of Sports Medicine (c/o ACSM P.O. Box 1440, Indianapolis, IN 46206-1440, tel. 317-637-9200, USA)

**June 08-12, 1987**

Stockholm, Sweden, IAP 10th World Conference, Theme: "Creativity Through Play" (c/o IPA 1987, Conference Secretariat, RESO Congress Service, 11392 Stockholm, Sweden; Tel. 08/7283200, telex 10057 reso s)

**June 09-13, 1987**

Vancouver, Canada, 30th Anniversary ICHPER World Congress, Theme: "Toward the 21st Century" (c/o ICHPER Congress Secretariat, School of Physical Education and Recreation, University of British Columbia, Vancouver, BC V6T 1W5, Canada)

**June 14-18, 1987**

Trois-Rivières, Canada, AIESEP World Convention (c/o Congrès mondial AIESEP-1987, Département des sciences de l'activité physique, Univ. du Québec à Trois-Rivières, C.P. 500, Trois-Rivières, Canada/69A 5H7)

**June 20-24, 1987**

Brisbane, Australia, 1987 IFAPA World Congress (c/o J.C. De Potter, IFAPA Secr. Gen., Univ. Libre de Bruxelles, ISEP, Laboratoire de l'Effort, Av. Paul Héger 28, 1050 Brussels, Belgium)

**June 26-28, 1987**

Warsaw, Poland, 1st International Symposium on Computer Simulation in Biomechanics (c/o 1st International Symposium on Computer Simulation in Biomechanics, Politechnika Warszawska, ITLIMS, ul. Nowowiejska 22/24, 00-665 Warszawa, Poland)

**June 29-July 3, 1987**

Amsterdam, The Netherlands, Hith Intern. Congress of Biomechanics (c/o Organizing Committee Hith I.S.B. Congress, Interfaculty of Phys. Educ., Free University. P.O. Box 7161, 1007 MC Amsterdam, The Netherlands)

**July 06-10, 1987**

Brussels, Belgium, 1st Intern. Symposium on the Science of Archery (c/o Prof. Dr. J.P. Clarys, Dept. Experimental Anatomy, Vrije Universiteit Brussel, Laarbeeklaan 103, B-1090 Brussels, Belgium, Telex 61.051 VUBCO-B)

**July 12-17, 1987**

Caracas, Venezuela, Hith Panamerican Congress on Phys. Educ. (c/o Dr. Carlos V. Guarchia, CPEF, Apartado 10079, Maracaibo, Venezuela)

**July 13-17, 1987**

Athens, Greece, Fifth International Symposium of Biomechanics in Sports (c/o Secretariat of Fifth Int. Symposium of Biomechanics in Sports, Hellenic Sports Research Inst., Olympic Sports Center of Athens, 37 Kifissias Ave. Maroussi, 151 53 Athens, Greece)

**Aug. 03-05, 1987**

Indianapolis, USA, The Panamerican Sports Medicine Congress

**Aug. 17-21, 1987**

Jyväskylä, Finland, Jyväskylä Congress on Movement and Sport in Women's Life (c/o Jyväskylä Congress - on Movement and Sport in Women's Life, Fac. of Sport and Health Sciences, Univ. of Jyväskylä, 40100 Jyväskylä, Finland)

**Sept. 07-10, 1987**

Prague, Czechoslovakia, 2nd Symposium on Methods of Functional Anthropology (c/o Symposium Secretariate: Salmovská 5, CS 120 00 Praha 2, Czechoslovakia)

Sept. 8-11, 1987

Amsterdam, Holland. Second announcement and call for paper of the 7th European Conference on Biomaterials. Dr. C. de Putter, Department of Oral Implantology ACTA - Free University P.O. Box 7161 1007 MC Amsterdam, The Netherlands.

Sept. 14-18, 1987

Hurdal, Norway, Pediatric Work Physiology HIII (c/o Professor Svein Oseid, The Norwegian College of Physical Education and Sport, P.O. Box 40, Kringsjaa, 0807 Oslo 8, Norway)

Sept. 16-17, 1987

Leeds, England, European Conference on Biomechanics in Sport (c/o Paul Wright, Conference Dept. C349, The Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster, London SW1H 9JJ)

Oct. 3-4, 1987

Brussels, IIIrd International Congress of LASERTHERAPY, (with a special session on cycloid vibration therapy) in collaboration with the "European Medical Laser Association". Information: Prof. P. LIEVENS, University of Brussels Laarbeeklaan, 103, 1090 Brussels, tel. 02/478.48.90 extension 1528.

Sept. 28-Oct. 02, 1987

Athens, Greece, "Int. Seminar on Ergometry" (c/o Prof. Dr. V. Klissouras, Univ. of Athens, Dept. of Phys. Educ. & Sports Science, 41 Olgas Street, Dafne 17237, Athens, Greece)

Oct. 06-10, 1987

Calgary, Canada, Pre-Olympic Conference "Science in Winter Sport" and Annual Meeting of the Canadian Assoc. of Sp. Sc. (c/o "Science in Winter Sport" Fac. of Phys. Educ., U. o. Calgary, 2500 Univ. Drive N.W., Calgary, Alberta, Canada T2N 1N4)

Oct. 12-15, 1987

Berlin, FRG, Seminar on "Sport-Management in Europe" (c/o Führungs- und Verwaltungs-Akademie Berlin des Deutschen Sportbundes e.V., Priesterweg 6, 1000 Berlin 62, Schöneberg)

Nov. 3-6, 1987

Brussels, IVth International Congress on Sport Psychology. Université Libre de Bruxelles, Unité de Recherche de Psychologie Appliquée à l'Education Motrice. Madame P. PLASCH-TOUBEAU, Université Libre de Bruxelles I.S.E.P.K. (CP 168) Avenue Paul Héger, 28, B-1050 Bruxelles, Tel. 02/642.21.80.

Nov. 26-27, 1987

Conference on Sport, Leisure and Ergonomics at Burton Manor College, Burton, Wirral, Cheshire. Dr. Thomas Reilly, Ergonomics Conference, Department of Sport & Recreation Studies, Liverpool Polytechnic, Byrom Street, Liverpool. L3 3AF.

Dec., 1987

Lisbon, Portugal, AIESEP 25th - World Conference Human Kinetics (c/o Prof. Dr. Henrique Barreiros, Lisbon Technical University - ISEF, Estrada da Costa, Cruz Quebrada, 1499 Lisboa Codex, Portugal)

Sept. 11-15, 1988

Seoul, Korea, "1988 Olympic Scientific Congress" Theme: "Human Movement Science Toward 2000" (c/o Dr. Keung Seh-Lee, Director, Org. Comm. of the 1988 Olympic Scientific Congress, Korea Sports Science Inst., C.P.O. Box, 1106 Seoul, Korea)

May 27-June 01, 1988

Amsterdam, The Netherlands, HHIVth FIMS World Congress of Sports Medicine (c/o Organisatie Bureau Amsterdam b.v., Europaplein 12, 1078 GZ Amsterdam, The Netherlands, Tel.: 31/20440807; Telex 13499 raico nl)

May 29-June 03, 1988

Toronto, Ontario, Canada, The International Conference on Exercise, Fitness and Health (c/o The International Conference on Exercise, Fitness and Health, c/o Ontario Group Fitness Office, 1220 Sheppard Avenue East, Toronto, Ontario, Canada M2K 2H1)

June 01-04, 1988

London, Ontario, Canada, 7th Int. Symp. on Biochemistry of Exercise, Theme: "Biochemical Strategies in Response to Altered Functional Demands" (c/o Dr. A.W. Taylor, Fac. of Phys. Ed., Univ. of Western Ontario, Thames Hall, London, Ontario N6A 3K7, Canada)

July 18-22, 1988

Paris, France, 12th IMACS World Congress on Scientific Computation (c/o The Secretary 12th IMACS World Congress, IDN, BP 48, 59651 Villeneuve D'ASCQ CEDEH, France)

July 24-31, 1988

Zagreb, Yugoslavia, 12th International Congress of Anthropology and Ethnological Sciences (c/o Laboratory of Anthropology, Institute for Medical Research and Occupational Health, Mose Pijade 158, P.O. Box 291, 41000 Zagreb, Yugoslavia, tel. 041/432-186 of 432-286)

Jan. 28-Febr. 02, 1989

Auckland, New Zealand, The IH Commonwealth and International Conference (c/o Conference Convenor 1990, Ms. Rosalie King, Auckland College of Education, Private Bage, Symonds St., Auckland, New Zealand)

1989, (date to be fixed)

International ISAK-Congress "Kinanthropometry IV"

# Society news

## MINUTES OF THE ISB EXECUTIVE COUNCIL MEETING

Montreal, Saturday August 23 and Sunday August 24

Present: Cappozzo, Grieve, Hay, Huiskes, Morehouse, Nigg, Norman, Paul, Schneider, Wood.

Apologies: Balsevich, Chaffin (absent on Saturday), Miyashita, Clarys.

### 1. Approval of Agenda:

The agenda is approved.

### 2. Minutes of Previous Council Meeting (June 19 in Umea, Sweden, 1985):

The minutes are approved.

## OFFICER'S REPORTS

### 3. Report of President (Hay):

The President briefly reports on the highlights of this busy year. Contacts with other societies and the upcoming First World Congress on Biomechanics have been important topics. The President asks the Council members to attend the cooperative Symposium in Cincinnati in 1987. The ASB conditionally agrees to affiliation with the ISB. The conditions for affiliation with the *Journal of Biomechanics* are to be finalized soon.

Sponsorships were given to meetings on Computer Simulation in Warsaw, and the Biomechanics in Sport meeting of the Institute of Mechanical Engineers. The Muybridge Medal procedure is finalized. The appointed committees spread the load of the Society business.

### 4. Report of Past-president (Nigg):

Nigg informs about the procedure for the elections in 1987. The three Presidents will make a list of potential Council members. This list will be finalized and voted upon and the results announced in Amsterdam. Criteria will be: 1. Internationality; 2. Field of interest; 3. Scientific quality. Huiskes suggests an additional criterion: Organizational and/or administrative abilities. Paul finds that the Society must decide what the fields of interest of the Council members are. Hay will put this on the agenda of the next Council meeting.

Three Council members will retire, suggestions for nominees must be given to Nigg.

### 5. Report of Treasurer (Morehouse):

Paul suggests that payment to Officers would be appropriate. Some payments were made, individually approved by Executive Committee. Hay asks whether his telephone, postage and Xerox expenses can be reimbursed; they amount to \$ 527.03. This is approved. It is decided, as a general rule, that all administrative costs of Council members can be reimbursed. If expenses will be more than \$ 100, prior approval by the Treasurer is necessary.

The Treasurer informs that there are 55 new members and 8 resignations. The membership report is attached as an appendix to these minutes.

### 6. Report from the Newsletter Editor (Clarys pp. Hay):

Hay informs that Clarys was asked to edit a Newsletter for the International Society for the Advancement of Kinesiology. The Newsletter would be exchanged at no cost and sent in the same envelope as the *ISB Newsletter*. Following a discussion on this point, it is decided that a combined mailing is not approved for the reason that this society is not affiliated at the present time. The membership list of the ISB can be sold to this society according to the normal procedure.

## COMMITTEE REPORTS

### 7. Constitution and Operating Codes (Morehouse):

The constitution must be changed to include affiliated and collective membership. In addition, the topics and goals of the Society must be better defined. It is decided to make these changes after a discussion at the meeting in Amsterdam. A constitution committee will be appointed. The question comes up whether the Society is registered. Nobody seems to know about that. It is concluded that the Society has no legal basis at this time. Hay will appoint a committee for that problem. He will get information about possibilities for incorporation in the U.S.

Proposals for operating codes were made by Morehouse, based on information from Nelson. The Secretary General will keep these on file, to be given to new Council members.

### 8. Terms of Office (Paul):

Paul explains a proposal to increase the term of the President from the present two years to three years. The consequence of this proposal would be that only two Presidents serve at the same time. Nigg suggests that the President should serve longer than two years. This question is discussed and finally put to a nonbinding vote. It turns out that three are in favor of the *status quo*, seven want to extend the term of the Presidency. The Terms of Office committee will develop proposals to accomplish the term extension. The committee will be enlarged by additional committee members from North America. The President will make appointments.

The Working Group of Biomechanics of Sports is discussed. This committee wants to change its name to World Commission of Sports Biomechanics (W.C.S.B.) and this change is approved.

It was requested whether the ISB Council can provide contact between this World Commission and the International Olympic Committee. It was decided that first the subcommittee will be asked why they want contact, and based on their reasons a decision will be made at the next Council meeting.

The question arises whether the Council has any power over this committee. It was decided that this committee is considered as a Council-appointed subcommittee. The question now arises as to the formal operating code of this subcommittee in particular, and other subcommittees in general. This question will be addressed the next day.



The meeting is adjourned until Sunday 9:00 a.m.

The meeting reconvenes at 9:20 on Sunday. Following a power breakdown, the same Council members as the day before are present, now including Chaffin. After the candles are lit, the President reopens the meeting and reflects that prior to this year most of the Council topics concerned technical matters. Administrative and legal matters have not been emphasized. It is now necessary to deal with them. The subject is now subcommittees within ISB in general.

At this point in time, the subcommittees are the Force Platform Group and the W.C.S.B. In addition, there are the Council committees. Paul suggests that one member of a subcommittee should be a Council member. Huiskes suggests the following requirements for a subcommittee: 1. Its goal must fit the goal of the Society; 2. the subcommittee must have an operating code. The operating code should include a Council member or liaison officer in the committee; the subcommittee should report once every two years; external contacts can only be made via or with approval of the President; and the committee must have an approved budget. Hay will install a committee to develop formal proposals on this point.

#### 9. Awards (Grieve):

The New investigator Award is discussed. A problem is that the judges must work throughout the Congress. The manuscripts should be ready before the Congress. Nigg is of the opinion that members of institutions where candidates are affiliated must not sit in the committee. The purpose of the New Investigator Award should be well defined. The committee must be broad to cover all fields. The Awards committee will make new proposals to be discussed by the Council at the next meeting.

The question arises whether institutions or persons can sponsor additional awards. One of these sponsors is Mrs. Wartenweiler. It is agreed that the Society has one award for a New Investigator. This award can be sponsored by Mrs. Wartenweiler. Other institutions or persons could sponsor other awards, which then have to be defined. Relative to the New Investigators Award and the problems with the judges, Hay proposes that initial selections are based on a manuscript, not on an abstract.

The Muybridge Medal is then discussed. The design of the medal is approved. Hay proposes that the requirements that the candidate is a member of ISB is dropped. This is approved, but will only be put into effect for future nominees.

Paul proposes to drop the requirement that the candidate applies for the medal. This is not agreed.

#### 10. Standards and Terminology (Wood):

A document "Terms and Units of Measurements in Biomechanics" is ready. This document will be sent to Society members. Additional copies can be obtained from Clarys. They are free in principle.

The document on the normalization of terminology in gait is discussed next. A draft is proposed by Winter. The plans are to publish it as a separate booklet. The Council suggests that Winter work with Grieve, Paul, and Wood to revise the draft.

#### 11. New Projects (Cappozzo):

Three proposals (education, guest studentships, and scholarships) are presented.

After a discussion on the education project, it is agreed that this should be taken up. The committee is asked to provide options and suggestions.

The proposal for guest studentship is like an award or Young Investigator Award. It is decided not to pursue this avenue. The proposal on scholarships is accepted by the Council. The committee will provide a constitution for ISB-sponsored Scholarships. The idea is that limited amounts of money should be given to as many individuals as possible. Expenses should preferably be paid from interest, on the order of \$ 1,00 - \$ 1,500 per year.

#### 12. Congress Guidelines (Schneider):

A draft of the proposed guidelines is presented by Schneider. A final draft will be sent to Council members.

#### 13. Proceedings (Norman):

A proposal on revisions in the ISB Congress proceedings was accepted in principle. It was agreed that Part 2 of the proposal be modified in the light of Council's preference that invited papers be published as a journal supplement (special issue), rather than as a hard-bound monograph. A final statement would be prepared for implementation at the UCLA Congress in 1989.

It was also pleasingly noted that the *Journal of Biomechanics* would most likely publish ISB abstracts if the Society entered into a group subscription arrangement with Pergamon Press.

#### 14. Amsterdam Congress (Rozendal):

Rozendal joined the meeting to give a report on the organization of the 11th Congress in Amsterdam. The report is discussed and approved by the Council. A discussion evolves about the possibility of New Investigator Award selections from posters, instead of oral presentation. The Council is not in favor of this. Nigg suggests to increase the time for the General Assembly.

#### 15. Affiliation with the Journal of Biomechanics:

The arrangement of the affiliation is explained by Hay. An important point is the obligatory subscription. The suggestion is to offer the membership the option to select the *Journal of Biomechanics*, the *International Journal of Sports Biomechanics*, or both. The Council feels that there should also be the option of taking none of the journals. However, 150 subscriptions should be provided, at least the money for these subscriptions. Hay suggests to have a trial period of two years on a voluntary basis possibly with a reduced minimum number of subscriptions required in the first year. The proposal for the journal affiliation is finally accepted. Morehouse suggests that somebody is appointed to handle the additional administrative work.

#### 16. Affiliate Membership Fees:

It was agreed that no affiliation fee would be required of affiliate societies in that such affiliation was of mutual benefit.

It was further agreed that a list of affiliated societies would be drawn up, and that this listing would become a permanent feature of the *Newsletter* be exchanged with affiliate societies.

The meeting was closed at 4:35 p.m.

## MEMBERSHIP REPORT

6June, 1985 to August, 1986)

As of June 1, 1985, there were 584 active members of ISB. A total of 55 new members have been accepted between June 1, 1985 and August 1, 1986. During this period a total of 8 members have resigned, been dropped for non-payment of dues or contact with them has been lost as a result of unreported changes in address. The difference in these numbers represents a net gain of 47 active members, for a total of 631 active members as of August 1, 1986. This is a percentage increase in membership of 8.0 percent.

The 55 individuals who became new members of ISB during the period from June 1, 1985 to August 1, 1986 are from 17 different countries. A list of these countries and the number of new members from each country are as follows:

Austria	1	Ireland	(Northern)
Belgium	1	Italy	4
Canada	4	Japan	5
Denmark	1	Netherlands	2
England	2	Norway	1
Finland	2	Sweden	7
France	1	Switzerland	1
Germany		United States	19
Fed. Rep.)	2	Yugoslavia	1

## Membership News

### CHANGE OF ADDRESS

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BARRY D. WILSON  
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Box 56 Dunedin New Zealand  
Kinesiology Section  
Faculty of Physical Education

### NEW MEMBER LIST:

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## Thesis Abstract Corner

### THE MECHANICS OF TWO-JOINT MUSCLES DURING GAIT

BY

H. John Yack

A thesis  
presented to the University of Waterloo  
in fulfillment of the  
thesis requirement for the degree of  
Doctor of Philosophy  
in  
Kinesiology

Waterloo, Ontario, 1986

(c) H. John Yack, 1986

Supervisor: Dave Winter

#### ABSTRACT

An EMG driven muscle model, based on the Hill equation, was used to estimate the force produced by the hamstrings, rectus femoris and gastrocnemius muscles in two subjects. Input parameters of length/tension and force/EMG were determined experimentally for each muscle. Muscle kinematics were determined from a three-dimensional musculo-skeletal model. The ability of the modelling to predict muscle moments was assessed in two ways: 1) the predicted moments generated by the knee flexors were compared to the measured knee flexors were compared to the measured knee flexor moment during isokinetic concentric and eccentric contraction; 2) the predicted muscle moments were compared to the calculated net joint moments of force during walking trials at a natural and fast cadence and for one jogging trial.

In general the predictions of the model were assessed as being reasonable when compared to the net joint moments at the hip, knee and ankle along with the LE EMG of representative one-joint muscles. The two-joint muscles produced both "appropriate" and "inappropriate" moments as related to the net joint moments. It was shown, however, that these "inappropriate" moments may actually be beneficial in terms of power transfers and that transfers between all three muscles was possible at certain times in the gait cycle. The transfer of power also points to the efficacy of two-joint muscles in terms of mechanical energy savings. During the slow-jogging trial power savings were between 11 % and 42 % depending on the muscle and how it was calculated. Gait speed did not have an effect on the percentage of power transferred except for the gastrocnemius in one subject where a direct relationship was apparent.

### THE VOLVO AWARDS FOR LOW BACK PAIN RESEARCH 1988

In order to encourage research in low back pain, the Volvo Company of Göteborg, Sweden, also this year has sponsored three prizes of US \$ 7.000 each. Awards will be made competitively on the basis of scientific merit in the following three areas:

1. Clinical studies
2. Bioengineering studies
3. Studies in other basic science areas

Papers submitted for the contest must contain **original** material, not previously published or submitted for publication. A multiple authorship is acceptable. The manuscripts should be in the form of a complete report, including original illustrations, not exceeding 30 typewritten pages, double-spaced, and in a form suitable for submission to a scientific journal. Six copies of each paper submitted in full should **reach the address given below not later than November 15, 1987.**

One of the authors should be prepared, at his own expenses, to come to Miami, Florida, USA, at the time of the meeting of the International Society for the Study of the Lumbar Spine, April 12-16, 1988, to present the paper and to receive the award.

The board of referees will be chaired by the undersigned and will contain members from the fields of clinical medicine, bioengineering and biochemistry.

Please direct all correspondence to:

Professor Alf Nachemson  
Department of Orthopaedics  
Sahlgren Hospital  
S-413 Göteborg, Sweden

### APPLICATIONS TO ORGANISE XIII INTERNATIONAL CONGRESS OF BIOMECHANICS IN 1991.

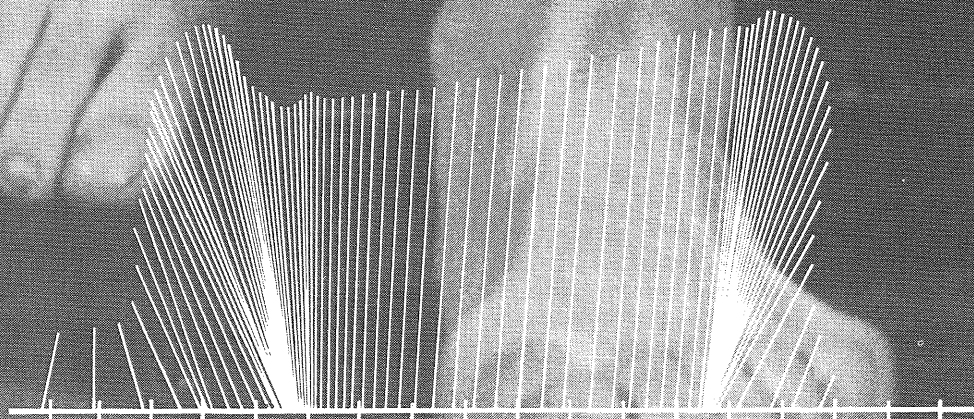
The XIth and the XIIth International Congresses will be held in Amsterdam, The Netherlands (1987) and Los Angeles, USA (1989) respectively. In order to allow sufficient time for preparation of the XIIIth Congress, a search for potential candidates to organize such a conference has been initiated.

**The official deadline to submit the application is June 15th, 1987.** The applications should be prepared according to the ISB guidelines and sent to Dr. J.P. Paul

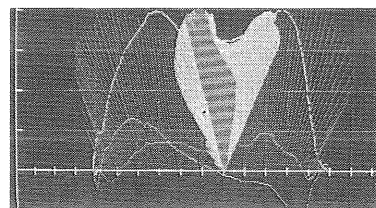
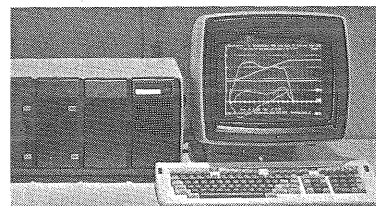
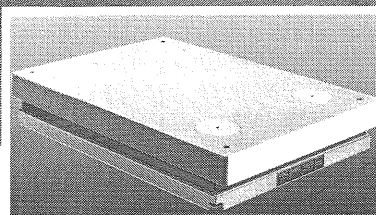
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