EUROPEAN SOCIETY OF BIOMECHANICS
NEWSLETTER DECEMBER 1990

LETTER FROM THE PRESIDENT

P.S. Walker

It is indeed a privilege to be the new President of this Society. There are many important tasks ahead, but fortunately each member of our Council brings unique experience and special skills and I am confident that with the enthusiastic support of the Council as well as our Membership we can make our Society reach even higher levels than before. But before we talk about the future let us see how we reached our present position. It would be difficult to name a single person who has contributed more to our Society than **Rik Huiskes**, our previous President. Rik was one of the early members and has been a Council member since 1975, finally standing down at the Aarhus meeting in July. At that meeting, Rik was presented with a plaque expressing the appreciation which I am sure we all feel. Rik is the first President of the newly formed Eruopean Orthopaedic Research Society and we wish him well in that position. At the same time he assures us that he will not disappear from the ESB!

Aurelio Cappozzo, Rainhard Kölbel and **Lance Lanyon** reached the end of their terms of office, and we are very grateful for their contributions. **Maurice Hinsenkamp** took over the Treasurer's position from Ivan Hvid, and we thank Ivan for carrying out this arduous task very efficiently and Maurice for taking it on. We must also thank **Wilmi Goosens** who looked after all of our office work for so many years, a considerable task! We wish Wilmi well in her new quest at the University. The new elected members of the Council were **Peter Niederer, Michel Jaffrin, Alain Meunier** and **Georg Bergmann**.

The numbers of different specialities represented on our Council has been broadened. One of the purposes of this was to try to expand the scope of our conferences to include other areas of biomechanics. This must be done carefully however. In meetings such as ours with parallel sessions, it often seems that two or three conferences are proceeding simultaneously. However, if a certain amount of overlap is deliberately planned, it is surprising how many new ideas can be gained, not to mention the added interest of learning more about another area! A further consideration is that each area itself must have a good representation to provide sufficient peer interaction.

Now to the topic of the meetings themselves. As you know, **the next meeting is in 1992 in Rome**. Aurelio Cappozzo is making excellent progress as Program Chairman and it promises to be an exciting meeting in a superb location. It may seem early to talk about 1994, but in that year a major event is being planned, the **Second World Congress of Biomechanics**. The first Congress took place in San Diego in September organised by an International Steering Committee chaired by Y.C. Fung.

Proposals for the second Congress had been solicited and Rik Huiskes, Colin Caro, and Michel Jaffrin successfully put forward a proposal to hold the meeting in **Amsterdam**. It felt like winning the Olympic Games of Biomechanics for Europe! The decision of our Council was to strongly support the World Congress and to merge our own meeting with it. I advanced this position

to the World Congress Steering Committee and it was warmly welcomed. Our Council is now strongly represented on the new Steering Committee. The Congress will enable us all to participate in the best of biomechanical research throughout the world. At the same time, the identity of our own Society will be preserved within the Congress by continuing our awards, banquet and of course the Business Meeting.

But what of the **intervening time between our biannual conferences**? There has been a growing feeling among many of our members that more opportunity than once every two years for presenting our work would be an advantage. The Council is giving careful thought to this problem. Up till now, the ESB has sponsored smaller meetings on specialised topics, but Lutz Claes points out that these meetings rely on the initiatives of members and their frequency cannot be predicted in advance. Our considerations have included simply holding annual meetings, to having combined meetings with other societies. Meanwhile, many of us will find it interesting to submit our work to the **ESBiomaterials meeting in 1991.** An analysis of the papers in the 1989 Heidelberg meeting showed that at least 25 percent of the papers were either on biomechanics alone or a combination of biomechanics and biomaterials, a good example of overlapping specialities.

Finally, a word about **funding our research**. The means of funding and advancing our research is a problem that faces us all. In an ideal world, funding should follow good ideas. Lack of success can be a signal that the ideas weren't as good as we thought, that other ideas were better, or that the idea wasn't presented at its best. Granting agencies should not think that smaller research groups should be put at a disadvantage compared with larger, because often there can be even more innovative ideas and the research can be carried out more efficiently. However, in cases where collaboration with different specialists is required the increasing opportunities to take a **European perspective can be an advantage**. Our society provides many opportunities for interfacing with researchers from many different countries. More funds are gradually beeing funnelled to Brussels, who fund projects with researchers from different countries. Our Council is currently investigating the situation and will report our findings to you, probably in the early part of 1991.

2nd October 1990

NEW NEWSLETTER-EDITOR

Georg Bergmann

Starting with this issue, I will edit the ESB-newsletter. All members of the society are encouraged to send information material about upcoming events, meetings organized by themselves, short summaries of meetings they attended, reports on own activities and other material suited to encourage the cooperation and communication within the membership. Why don't you ask for help and support, if needed? This might concern, for example, computer programs for specific purposes, equipment only needed once, or personal support for very specific problems. I myself will start the rubrik "Who can help?" at the end of this newsletter. Don't hesitate to send information, only because writing in perfect English takes you too much time! Those English speaking people in our society all have big advantages and therefore can take it if your writing style differs somewhat from that of Hemingway. We may also somewhat improve your writing if requested! All material should be send to:

Georg Bergmann
Oskar-Helene-Heim, Biomechanics-Laboratory
Clayallee 229, D-1000 Berlin 33, Germany

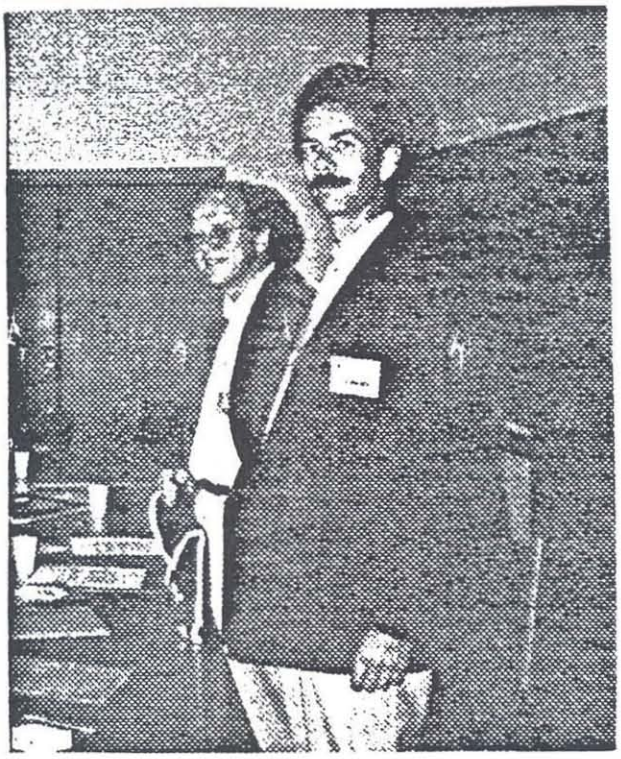
MARRY CHRISTMAS AND A HAPPY NEW YEAR!

IMPRESSIONS FROM THE AARHUS- MEETING

Right: Rik Huiskes was presented with a plaque in recognition of his services to the ESB. Rik is seen here with Peter Walker, the newly elected President and Aurelio Cappozzo, the organizer of the 1992 ESB-Conference in Rome.

Bottom left: Ivan Hvid (Vice- President) and Maurice Hinsenkamp (Treasurer).

Bottom right: Ivan Hvid with Erich Schneider (Secretary- General).



REPORT ON THE MEMBERSHIP IN THE EUROPEAN SOCIETY OF BIOMECHANICS.

by Leif Ryd, Sweden

The European Society of Biomechanics is thriving also regarding active members. The membership has thus risen and is today 274 with a rather heavy domination by central/western Europe. Germany, England, Switzerland, Italy, the Netherlands and the Scandinavia countries combined each has more than 20 members, which does also Czechoslovakia. All European countries except Albania, Romania and Hungary are represented in the society. There are a number of members from both the USSR and the USA and also rather remote countries like Australia, P.R. China, Singapore, Chile and Papua New Guinea (sic) are represented.

The council has decided to make a concerted effort to identify individuals or groups from eastern Europe and working in the field of biomechanics and encourage them towards future activity within the Society. Within the frame of this process, any reader of this newsletter who is familiar with such research activity, clinical or experimental, is encouraged to acknowledge this/these scientists to the ESB council.

REPORT ON THE FIRST WORLD CONGRESS OF BIOMECHANICS

by M.Y. Jaffrin

The First World Congress of Biomechanics was held on the beautiful campus of the University of California, San Diego at LA JOLLA, from August 30 through September 4, 1990. Approximately 770 papers were presented orally in 130 sessions together with 420 posters. Among these sessions were 30 symposia with sollicited papers for a total of 90 sessions. Symposia with most sessions were Biomechanics of diarthrodial joints (8 sessions), multiple muscle movement organization and systems (15 sessions). There were three excellent plenary lectures: Vascular fluid mechanics (R. NEREM), Biomechanics of bone and implants (R. HUISKES) and Sport Biomechanics (J. G. HAY). This Congress war really a success in bringing together most of the world wide Biomechanicsl community. Generous coffee breaks and the barbecue party gave plenty of opportunity for informal discussions. It was therefore not a surprise that the International Steering Committee of the First World Congress, in his September 1st meeting proposed unanimously that future World Congresses of Biomechanics be arranged at intervals ranging from 3 to 5 years. The Steering Committee also appointed C. CARO from Imperial College, London, R. HUISKES from Nijmegen University, Holland and M.Y. JAFFRIN from Compiègne University, France to organize a new Steering Committee chaired by Colin CARO for the 2nd World Congress. The organisation of this **second World Congress** will be a truly European initiative and this Congress **will take place at the RAI Congress Center in Amsterdam**, Holland from July 10 to July 14, 1994. The European Society of Biomechanics and probably the International Society of Biorheology and the International Society of Biomechanics will be expected to play a role in the organisation of 2nd World Congress. The local arrangement Committee will be chaired by **R. HUISKES** and the Program Committee by **M.Y. JAFFRIN** with **P.S. WALKER** (London) as Cochairman representing ESB.

WORKSHOP OF THE EUROPEAN SOCIETY OF BIOMECHANICS ABOUT BIOMECHANICS OF FRACTURE HEALING HELD ON REISENBURG CASTLE AND UNIVERSITY OF ULM/GERMANY JULY 12 - 14, 1990

ORGANIZING COMMITTEE: L. CLAES AND L. DÜRSELEN

It is well known and accepted that mechanical conditions influence healing of bone. Interfragmentary movement can lead to bone resorption and nonunion or can stimulate callus formation and bone remodelling.

For the further development of the operative treatment of fractures it is important to determine the optimal biomechanical conditions.

The goal of this ESB workshop on methodology and problems in biomechanics was to exchange and discuss the state of research about this specific topic.

This workshop was devided in five sessions.

Basic aspect of bone remodelling

Animal experiments for stimulation of bone remodelling by overloads and their histomorphological results were reported (R.A. Brand and R. Seibold). An analytical model to explore the bone remodelling (R.A. Brand) was discussed. Basic aspects of structural changes and revascularisation processes in healing bone were shown (S.M. Perren, H.-J. Wilke, L. Claes, F. Eitel) and a hypothesis for the biomechanical related bone healing process defined (S.M. Perren) and discussed.

Influence of interfragmentary strain on bone healing

Different animal experiments were presented and discussed to study the influence of interfragmentary movement and gap size on bone healing (L. Claes, K.M. Stürmer) and the modulation of repair processes in bone by mechanical stimulation (A.E. Goodship, R. Hente). A stimulation of bone healing could be shown for special conditions but the optimal parameters are still not known.

Monitoring of fracture healing

Beside the computertomography (J. Cordey) all the other groups used instrumented external fixators for monitoring of the fracture healing process (F. Burny, P. Kay, Keller, H. Gerngroß). Compared to x-rays these mechanical measurements give much better information about the course of fracture healing. Particularly when the measuring principle is easy to handle this method is an advantage in clinical recording of the fracture healing.

Segmental movement and bone lengthening

Segmental movement of osteomized bones is used for closing large bone defects by callus distruction. This method was applied using external fixators (R. Brutscher, M. Janovec) or intramedullary nails (A. Betz)

in animal experiments as well as in patients. The reported results are good and seem to open up new methods for the repair of large bone defects and infected cases.

Influence of dynamization and stability on bone healing

The main point of discussion was the best time for the dynamization, that means the higher loading of a healing fracture. Following dynamization 3-8 weeks p.o., the increase of fracture stiffness showed often a delay (R. Hente, P. Kay) of about two weeks followed by an increased healing stiffness.

Early dynamization seem to be better than later (Goodship). A comparative study (Heitemeyer) on comminuted fractures of sheep tibiae which were fixed by osteosyntheses of different stabilities led to be better results for the more flexible fixations under dynamic loads (external fixator, interlocking nail, bridging plate) than for stiff internal fixations (plate and lag screw).

This workshop was a very competent and fruitful exchange of the experiences concerning different methods for improving the fracture healing process. It proved to the participants that still much effort has to be put into quantifying and studying the healing process to obtain more information about optimal conditions for fracture treatment.

Address: Prof. Dr. L. Claes and Dipl.-Ing. L. Dürselen
Universität Ulm, Abtlg. für Unfallchirurgie, Forschung und Biomechanik,
Helmholtzstr. 14, W-7900 Ulm

CAMARC (COMPUTER AIDED MOVEMENT ANALYSIS IN A MOTOR REHABILITATION CONTEXT) CONGRESS "PRESENT AND FUTURE" NOVEMBER 29 - 30, 1990, ROME/ITALY

Aim of the Congress

CAMARC is the AIM (Advanced Informatics in Medicine) exploratory action project in the area of motor rehabilitation. It studies movement analysis (MA), trying to integrate existing instruments, in order to build a knowledge base on movement analysis, and to define protocols for data capturing and processing in different clinical situations. The aim of the project is to produce specifications, technical and normative reports, and hardware/software prototypes.

The consortium, led by the Università die Ancona, Dipartimento di Elettronica ed Automatica, Ancona, I, includes the following research centres:

- Strathclyde University, Bioengineering Unit, Wolfson Centre, Glasgow, U.K.
- Consortium of Research and Rehabilitation Laboratories, Eindhoven, NL.
- Università die Pisa, Dipartimento di Informatica, Pisa, I.
- Istituto Superiore di Sanità, Laboratorio die Ingegneria Biomedica, Roma, I.
- Istituto die Fisiologia Clinica CNR, Dipartimento LAD, Pisa, I.
- Log. In. S. r. I., Roma, I.
- INSERM U 103, Montpellier, F.
- Oxford Metrics Ltd., Oxford, U.K.

The scope of this Congress is to learn about the expectations clinical people have from MA, and to investigate the possibility of establishing a European network of research and rehabilitation laboratories promoting and/or applying, or willing to apply, MA to rehabilitation.

Programme

Thursday, November 29, 1990

1) CAMARC presentation: achievements and open issues.
2) Orthopaedic Surgery and Sports Medicine (Prosthetic and orthotic implants)
3) Neurology and Neurosurgery (Neurological diagnosis through MA)
4) Othorinolaryngology and Posture (Diagnosis through MA)

Friday, November 30, 1990

1) Geriatrics (Quantitative assessment of the degradation of the human machine, management of the rehabilitation programme)
2) Technical and Engineering issues (protocol standardisation, equipment testing, data format, networking)
3) Engineering session (continued)

Scientific Secretaries:

V. Macellari / M. Torre
Laboratorio di Ingegneria Biomedica, Istituto Superiore di Sanità
Viale Regina Elena 299, I-00161 Rome (Tel +39 6 4990/864; Fax +39 6 4040071)

BOOK ANNOUNCEMENT

In April 1990, an "ESB-Workshop in lantable Telemetry in Orthopaedics" in Berlin brought together most research groups which have ever been involved in telemetric measurements in vivo on the skeletal system. The primary goal of this meeting was to describe problems and their possible solutions rather than to present results.

A book, edited by G. BERGMANN, F. GRAICHEN and A. ROHLMANN, contains all contributions made at the meeting and several papers from additional authors which did not attend. It therefore not only represents the current state of the art in this field of research, but also its history and possible future developments. The papers and their references will allow other researchers easy access to the literature and to the results obtained to date. The work presented in this publication may help to prevent them from running into the difficulties which have already been encountered and overcome (or bypassed) by the authors. In this way it y hasten the future developments in this area of research.

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June 2-5

WORKSHOP ON OSTEOBIOLOGY: CELL MATRIC INTERACTIONS IN HEALTH AND DISEASE. Grant Hotel Rosa Marina, Ostuni (Brindisi) Italy. Contact: Secretariat Workshop on Osteobiology, Institute of human Anatomy, University of Bari, Policlinico, I-70124 Bari/Italy.

June 2-6

CANADIAN ORTHOPAEDIC ASSOCIATION ANNUAL MEETING 1991, Calgary/Canada. Contact: Canadian Orthopaedic Association, 1440 O. Ste. Catherine W., Suite 421, Montreal, Quebec, H3G 1R8/Canada.

June 3-6

AMERICAN ORTHOPAEDIC ASSOCIATION ANNUAL MEETING 1991, Palm Beach, Florida, USA. Contact: American Orthopaedic Association, 222 South Prospect Avenue, Park Ridge, Illinois 60068/USA.

June 9-13

SUMMER ANNUAL MEETING, ASME, Houston/Texas. Contact: ASME (212) 705-7037

June 20-22

2nd BRITISH COURSE ON REVISION SURGERY, Stratford upon Avon. Contact: MetaPhor Conferences and Meetings, 21 Kirklees Close, Farsley, Pudsey, West Yorkshire, LS28 5TF/U.K.

June 26-29

THIRD COMMON MEETING OF THE CERVICAL SPINE RESEARCH SOCIETY (Amercian and European Sections), Athens, Greece. Contact: 3rd Common Meeting of the C.S.R.S., c/o Prof. Dem. St. Korres, 10 Heyden Str., 10434 Athens/Greece.

July 2-4

EUROTECH DIRECT '91 (IMechE), International Convention Centre, Birmingham, U.K. Contact: Ms. Jackie Moorhouse, Eurotech. Direct. '91 Office, Institution of Mechanical Engineers, 1 Bidcage Walk, London, SW1H 9JJ/ U.K.

July 28 - August 2

WORLD CONFEDERATION FOR PHYSICAL THERAPY 11th INTERNATIONAL CONGRESS, Barbican Centre, London/U.K. Contact: Conference Associates WCPT, Congress House, 55 New Cavendish Street, London W1M 7RE/U.K.

Aug 6-8

INTERNATIONAL CONFERENCE ON FRACTURE OF ENGINEERING MATERIALS AND STRUCTURES, Singapore. Contact: Dr. S.H. Teoh, Coordinator, Fracture Group, Department of Mechanical & Production Engineering, National University of Singapore, 10 Kent Ridge Crescent, Singapore 0511.

Aug 18-23

COMBINED AUSTRALIAN AND NEW ZEALAND ORTHOPAEDIC ASSOCIATION MEETING, Christchurch, New Zealand. Contact: New Zealand Orthopaedic Association, 9 Remuera Road, Auckland 5/New Zealand.

Aug 29-31

V. INTERNATIONAL CONFERENCE ON TRAUMATOLOGY - HUNGARY, Medical University, Debrecen, Hungary. Contact: Prof. Dr. Zaborsky Zoltan, Magyar Traumatologus Trasasag Nemzetkozi traumatologus kongresszus, sczervezobizottsaga, Debrecen, Bartok B. ut 4-26., H-4043, Hungary.

Sep 3-6

SOUTH AFRICAN ORTHOPAEDIC ASSOCIATION ANNUAL MEETING 1991, Johannesburg, South Africa. Contact: South African Orthopaedic Association, 1203B Durdoc Centre, 460 Smith Street, Durban 4001/SOUTH AFRICAN.

Sep 7-8

2nd CONSENSUS CONFERENCE ON DEFINITION IN BIOMATERIALS, Chesterl, U.K. Contact: Conference Secretariat, Institute of Medical and Dental Bioengineering, University of Liverpool, P.O. Box 147, Liverpool/U.K.

Sep 9-11

9th EUROPEAN CONFERENCE ON BIOMATERIALS, Chester, U.K. Contact: Conferencde Secretariat, Institute of Medical and Dental Bioengineering, University of Liverpool, P.O. Box 147, Liverpool/U.K.

Sep 12-15

AMERICAN SOCIETY FOR BONE AND MINERAL RESEARCH, Phoenix, Arizona. Contact: Shirley Hohl, ASBMR Business Office, P.O. Box 739, Kelseyville, CA 95451/USA.

Sep 16-18

THE 4th READING SHOULDER SURGERY COURSE, The Royal Berkshire Hospital, Reading, Berkshire. Contact: Mrs. P. Austin, Administrator, Postgraduate Medical Education Centre, Royal Berkshire Hospital, London Road, Reading, Berkshire RG1 5AN/U.K.

Sep 17-18

IV. INTERNATIONAL SYMPOSIUM ON MEDICAL AND BIOLOGICAL ENGINEERING, Peniscola, Spain. Contact: VI. International Symposium on Biomedical Engineering, Universidad Politecnica de Valencia, Laboratorio Integrado de Bioingenieria, P.O. Box 22012, 46071 Valencia/Spain.

Sep 24-27

BIOMED 91 - 1st INTERNATIONAL CONFERENCE ON COMPUTERS IN BIOMEDICINE, Southampton, U.K. Contact: Biomed Conference Secretariat, Computational Mechanics Institute, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton, SO4 2AA/U.K.

Sep 25-27

BRITISH ORTHOPAEDIC ASSOCIATION AUTUMN MEETING 1991, Cambridge, U.K. Contact: British Orthopaedic Association, Secretariat, Royal College of Surgeons, 35-43 Lincoln's Inn Fields, London WC2A 3PN/U.K.

Sep 28 - Oct 2

ASSOCIATION OF ORTHOPAEDIC TECHNICIANS, York, U.K. Contact: Mr. Ray Chilvers, Association of Orthopaedic Technicians, c/o Queen Mary's Hospital, Sidcup, Kent, DA14 6LT/U.K.

Oct 21-23

COMBINED MEETING OF THE ORTHOPAEDIC RESEARCH SOCIETIES OF USA, JAPAN AND CANADA, Banff, Alberta, Canada. Contact: Mrs. Madeleine Aldridge, Conference Office, The University of Calgary, 2500 University Drive N.W., Calgary, Alberta T2N 1N4/Canada

Nov 5-7

THE INTERNATIONAL SYMPOSIUM ON OSTEOPOROSIS, Kobe, Japan. Contact: Takuo Fujita, Chairman, Local Organizing Committee, Phone (078) 341 7451, FAX (078) 371 6468.

Nov 19-24

ACR - NATIONAL AMERICAN COLLEGE OF RHEUMATOLOGY MEETING, Boston, Ma/U.S.A.

Dec 8-13

9th INTERNATIONAL WORKSHOP ON CALCIFIED TISSUES: PROSPECTIVE TRENDS IN CALCIFIED TISSUE RESEARCH. Jerusalem, Israel. Contact: Dr. Itai Bab, Bone Laboratory, Hebrew University Hadassah, Faculty of Dental Medicine, P.O. Box 1172, Jerusalem 91010/Israel.

Dec 9-13

XIIIth INTERNATIONAL CONGRESS ON BIOMECHANICS, Perth, Western Australia. Contact: Ms. Rosemary Ingham, XIIIth ISB Congress Secretariat, Department of Human Movement, The University of Western Australia, Nedlands, WA 6009/Australia.

WHO CAN HELP ?

SOFTWARE FOR ANALOG DATA ACQUISITION AND DISPLAY: For measuring low frequency, multichannel analog data with an IBM-PC, performing mathematical operations on them, displaying the results in real time, storing and reading back selected diagrams, we look for an appropriate program. It should preferably been written in Quick-Basic. The source code is needed for adapting the program. We could pay a small fee! Please contact: Georg Bergmann, Oskar-Helene-Heim, Biomechanics-Lab., Clayallee 229, D-1000 Berlin 33, Germany