

newsletter

EUROPEAN SOCIETY OF BIOMECHANICS

TABLE OF CONTENTS

Editorial.....	1
Executive notes	2
Forthcoming events.....	5
Scientific meeting reports.....	8
Who can measure what?.....	9
Preprint service.....	10
Advertisements.....	11

EDITORIAL

It appears to me that the rate of growth of Biomechanics as an autonomous discipline has increased a great deal in the last years. Medicine, prosthetics and orthotics, surgery, ergonomics, and sport sciences are getting more and more interested in the outcomes of Biomechanics research and in the possibility of using methodologies which are typical of this discipline for the solution of their applicative problems. This is demonstrated, for instance, by the increasing number of papers reporting biomechanical studies published in journals not explicitly devoted to Biomechanics. On the other hand, new journals are being produced which are entitled to Biomechanics. Another interesting consequence of the spreading of Biomechanics is the involvement of industry in the development of biomechanical instrumentation.

How much of this new impulse to biomechanical studies come from Europe? If the answer to this question is to be based on the number of relevant papers published in archive journals in recent years, one may conclude that the contribution to Biomechanics given by North American laboratories is quite more important than that given by their European counterparts.

European Biomechanics must therefore give itself a shake and get better organized and effective.

In this context the role of the European Society of Biomechanics is crucial; crucial to Biomechanics in Europe; crucial to the single individuals who are involved in biomechanical studies and applications.

Council:	Secretariat:	Treasury:	Editor:
F.Burny, President	R.Huiskes	D.H.van Campen	A.Cappozzo
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J.Wagner		Treasurer E.S.B.	

obtained and of the way they can get hold of them for their own use.

I invite all members interested in joining this project to write to me making all kinds of suggestions and mentioning what quantities concerning the biomechanics of normal walking they can measure and on what population groups.

Aurelio Cappozzo

PREPRINT SERVICE

Members are invited to submit the abstracts of ready-to-be-published papers for publication in the Newsletter.

Abstracts should be in English, of about 200 words describing the purpose, methods, results, and conclusions of the study. They should include the article title, authors' names and affiliations, and a mailing address.

LOCAL STRESSES AND BONE ADAPTATION AROUND ORTHOPAEDIC IMPLANTS

R.Huiskes and D.Nunamaker*

Lab. Experimental Orthopaedics, Biomechanics Section

University of Nijmegen, 6500 HB Nijmegen

The Netherlands

*Dept. Veterinary Medicine, University of Pennsylvania

Philadelphia

(Submitted for publication in Calcified Tissue International, September 1983)

The severest long-term complications of orthopedic joint-prostheses are associated with loosening of the implant-bone interface, due to adverse reactions in bone and subsequent weakening of the connection between the two materials. Mechanical stresses, caused by joint loading, play a key role in the adaptation of interface bone in the loosening process. In the present paper it is shown how local interface stress patterns can be evaluated, using advanced methods of computer-based, engineering stress analyses (the Finite Element Method, FEM). The stress patterns are compared to the local bone structure and bone resorption phenomena as found in animal experiments. The results indicate that loosening and bone resorption is associated with high peak stresses at the interface in the immediate post-operative stage. In addition, there appears to be similarity between the local stress patterns and the bone morphology at the interface, if resorption does not occur. Finally, it is found that implants of high local stiffness generate lower peak stresses in bone, as compared to low stiffness implants.

ADVERTISEMENTS

A NEW BOOK!

BIOMECHANICS OF NORMAL AND PATHOLOGICAL HUMAN ARTICULATING JOINTS

Edited by Berme, Engin and Correia da Silva

Proceedings of the NATO Advanced Study Institute held in Portugal - June 1983

This book provides the first comprehensive text on the advances in biomechanics of both normal and pathological human joints. Biomechanical properties of joint tissues, lubrication of joints and physiology and biomechanics of muscles are reviewed. Significance of mathematical modelling, various modelling techniques and experimental methods are discussed. The text also covers clinical aspects of normal and pathological joints, biomechanics of joint replacement, as well as design, manufacture, standards and testing of endoprostheses. Each chapter is authored by an expert in that field, including the following: Andriacchi, Berme, Cappozzo, Engin, Evans, Huiskes, Lawes, Mulier, Paul, Renaudeau, and Correia da Silva. The book will be published by Martinus Nijhoff Publishers BV, P.O. Box 566, 2501 CN The Hague, The Netherlands, and is expected to be available in March 1984.

RECAL

Rehabilitation Engineering Current Awareness List

Produced by

The National Centre for Training and Education in Prosthetics and Orthotics

University of Strathclyde - Curran Building - 131 St James' Road

Glasgow - Scotland

Current Awareness and Information Service

The National Centre for training and Education in Prosthetics and Orthotics maintains a library and information service which is now being offered to rehabilitation professionals outwith Glasgow through a fortnightly Current Awareness List.

The service consists of:

- a) bibliographic details of papers from over one hundred journals taken at the National Centre. The papers are listed under broad subject headings for ease of finding. A list of journals covered presently is shown overleaf - new titles are added as appropriate.
- b) literature searches. A notice of any searches carried out in the preceding fortnight is given with the number of references found. Sources used include Index Medicus, Excerpta Medica and the Centre's own material. Copies of these searches are available for £ 3.00. The original request is charged at £ 5.00.
- c) acquisitions. Details are provided of all new books, conference proceedings, standards etc acquired by the Centre library. These items are available on loan within the UK, although there may be a waiting list.

Subscription rates:

Individual £10 UK, £20 Overseas

Library/Institution/Company £15 UK, £25 Overseas

Cheques should be payable to University of Strathclyde and sent to the above address.

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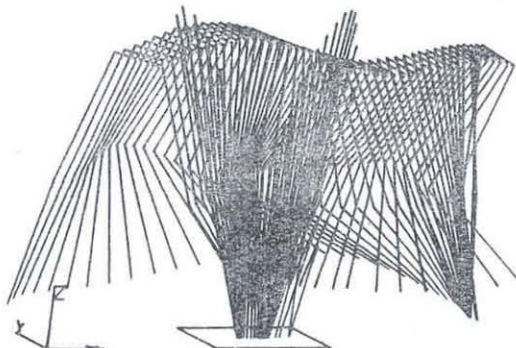
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To learn more about VICON contact: OXFORD DYNAMICS LTD

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A MEMBER OF THE OXFORD INSTRUMENTS GROUP

**OXFORD
DYNAMICS**



We shall see in ten months time in Davos at the ESB Fourth Meeting who we are and what we intend to do in the future. In Davos the ESB should make a selfcriticism and set up plans for renewing its image and its capacity of penetration into the european scientific community. Thus, get ready for that event with new ideas and renewed enthusiasm!

A very Merry Christmas and Happy New Year!

EXECUTIVE NOTES

From the Secretary

We are gratefully looking back on a succesfull Conference in Leuven in collaboration with the ESB'mat. An encouraging number of Biomechanics papers were presented, and many members of the ESB'mech were present. We thank the ESB'mat committees for their efforts.

The General Assemble of our Society in Leuven did not take place, due to an emergency operation which had to be performed by our President. A Council Meeting, however, did take place. Topics discussed included the following.

Problems of J.Biomechanics subscriptions were solved by the Treasurer and Pergamon Press. Anyone still having problems with receiving the Journal issues should call the Treasurer immediately. All members will shortly receive a notice for their 1984 fees. Appr. 100 members paid their fees for both 1982 and 1983. A total of 20 new applicants were voted to membership.

J.Merchx has resigned from the Council. F.Burny and D.van Campen plan to resign in 1984, at the Davos Meeting. Rules for Council membership terms were discussed and will be finalized at the next Council Meeting, March 24th in Rome.

The serving terms of the representatives of the J.Biomechanics Editorial Board and Consultants Panel end this year. New proposals were made by the Corresponding Members and by the Council. The present representatives will be considered for a new term as well. All proposals have been sent to the Journal for final selections.

The USSR Society of Biomechanics have proposed a combined Meeting with our Society in 1985, in Riga (Latvian SSR). R.Huiskes and A.Cappozzo will look into possibilities of organizing this.

Further topics discussed included the 4th General Meeting in Davos, the organization of which is well underway, proposals for the 5th Meeting in 1986 and a research award to be installed in our Society.

Finally, it was decided that members who have not paid their subscription fees for three consecutive years will be expelled from the Society. The Treasurer will start procedures to that effect. The persons concerned will first receive a final notice.

On behalf of the Society Council, I wish you all a Merry Christmas and a Happy New Year. We are looking forward to meeting you again in Davos. If you have any matters that you wish to communicate to the Council, do not hesitate to contact me or your national corresponding member.

Membership Administration.

The following applicants were voted to membership on August 30, 1983:

Belgium:

M.Domb (Brussels)

Denmark:

I.Hvid (Arhus).

France:

J.C.Le Flohic (Le Puy), J.M.Crolet (Dijon), A.P.Mackenzie (Paris).

Nigeria:

L.M.Srivastava (Zaria).

Portugal:

K.M.Correia da Silva (Deiras)(Corresponding member).

Spain:

J.Dolz Ripollés (Barcelona).

Switzerland:

M.Gschwend (Zurich), M.A.Gunst (Bellinzona), R.Frigg (Davos), E.Morscher (Basel), A.Schreiber (Zurich), R.Mathys jr. (Bettlach), F.Straumann (Waldenburg), U.Schlegel (Bern), A.R.Schaer (Basel).

The Netherlands:

H.van Mameren (Maastrich), J.M.G.Kauer (Nijmegen).

Yugoslavia:

D.Popovic (Belgrad).

From the Treasurer

Approximately 100 ESB members paid their fee for 1982 and 1983.

At the ESB Council Meeting of Leuven, Belgium (30 August 1983) it has been decided that those members who did not pay their fees for a period of 3 years must be expelled from the Society. In view of this all ESB members who did not yet fulfill their financial duties over 1983 and 1982 are asked to pay urgently.

There are serious problems with tracing the names of some ESB members for whom fees are paid by cheque or by bank transfer without their names mentioned on the cheque or the transfer order. Please contact the treasurer urgently if you are aware of being in such a position.

It seems that the supply of the J.Biomechanics from Pergamon has been improved. Those paying members who still have supply problems are asked to contact the treasurer and Pergamon simultaneously.

<u>Cash balance August 1983:</u>	Dfl.	US\$
Total amount on Dfl. account	11,471.91	4,329.--
Total amount on US\$ account	6,118.--	2,309.--
<u>Incomes:</u>		
Membership fees on Dfl. account	1,435.18	500.--
Interest	67.60	23.--
Conference book Nijmegen-meeting	220.--	77.--
Membership fees on US\$ account	2,227.12	776.--
<u>Expenses:</u>		
Transfer costs bank account	156.23	54.--
Secretarial costs: treasurer	PM	
secretary	PM	
Invoices Pergamon fees J.Biomechanics		
for: 1982	502.25	175.--
for: 1983	6,529.25	2,275.--
<u>Cash Balance August 1983:</u>		
Total amount on Dfl. account	13,038.46	4,543.--
Total amount on US\$ account	1,822.45	635.--

From the Membership Committee

The membership statistics are (August 1983) as follows:

Austria	1	Ireland	1	Switzerland	20
Belgium	25	Italy	35	The Netherlands	30
Brazil	1	Nigeria	1	United Kingdom	13
Canada	2	Portugal	1	U.S.A.	4
Denmark	8	Spain	9	West Germany	8
France	24	Sweden	2	Yugoslavia	2
Greece	11				

Total: 198 Members.

The recruiting campaign continues!

From the Meeting Committee

The functions of the Meeting Committee were outlined in the Newsletter of May 1982.

We strongly encourage members to let us have the details of any local or international Scientific Meeting or Instructional Course which they are organizing on Biomechanics or related topics so that the Awareness Service may operate efficiently.

The existence of a vast demand for Instructional Courses on specific topics related to Biomechanics calls for an effort in this direction. The ESB has an important role to play in the promotion and organization of these educational activities. It has therefore been decided to include Instructional Courses in the programme of our Fourth Meeting to be held in Davos. Relevant details may be found elsewhere in this Newsletter. We also invite all members to make a contribution to this effort by organizing either local or international courses. The ESB Council is willing to give all possible support in this area.

Organization of the Fifth Meeting of the European Society of Biomechanics

The Fifth Meeting of our Society is due in 1986. Members willing to organize this Meeting should send their proposal to the Meeting Committee Chairman no later than 24 June 1984, that is, three months prior to the Fourth Meeting which is to be held in Davos from 24 to 26 September 1984.

Proposal should be accompanied by a detailed description of the hosting Institution, other sponsorships, funding, conference and accomodation arrangements, and transport services. An estimate of subsistence expenses and Conference fees should also be included. Applicants may enclose suggestions concerning the scientific programme.

The proposals will be assessed by the Council and presented in a report to the ESB General Assembly at its meeting in Davos, where the final decision will be mase.

Announcements on the Journal of Biomechanics

Pergamon Press has given a one page space to the ESB for Announcements.

These may concern:

- ESB Affairs.
- Scientific Meetings.
- Instructional Courses.
- Vacant positions in Biomechanics.
- Other important notice.

Members are required to submit the relevant material to the Newsletter Editor.

FORTHCOMING EVENTS

FOURTH MEETING OF THE EUROPEAN SOCIETY OF BIOMECHANICS

In Collaboration with the European Society for Biomaterials

Davos, Switzerland, 24-26 September 1984

General information

The official conference language is English. The scientific program will cover all areas of research, such as,

- Orthopaedic Biomechanics
- Cardiovascular and Respiratory Biomechanics
- Dental Biomechanics
- Sports Biomechanics
- Impact Biomechanics
- Dynamics of the Musculoskeletal System
- Rehabilitation Biomechanics
- Biomaterials
- Biomechanics of Hard and Soft Tissues
- Methodology in Biomechanical Research
- General Topics

as well as the special topics

- Mechano-Biology at Interfaces
- Implant Related Bone Porosis
- Image Analysis

Authors wishing to present an original scientific report must submit an abstract prior to 15 February 1984. Information and authors' kits can be obtained from the Conference Secretariat. Exhibitions of "Work in Progress" and demonstrations of equipment can be submitted as well. Exhibitions of hard-and software in computer applications in particular are welcome.

The Conference will be preceded by an Educational Program including courses in Basic Biomechanics, Biomechanics applied to Fracture Treatment, Biomechanics applied to Prosthetic Joint Replacement, Cardiovascular Mechanics and Ultrasonic Measurements. In addition to the general contributions by conference participants, specific topics of Fundamental, Cardiovascular, Orthopaedic, Dental and Sports Biomechanics will be reviewed by nine "Keynote" Speakers from various countries in the World.

Abstracts of accepted papers will be published in the Journal of Biomechanics. Invited and selected contributions will be published in full length by Martinus

Nijhoff Publishers after the Conference as Volume 2 of the series Developments in Biomechanics.

Conference secretariat

Miss Vreni Geret
Laboratory for Experimental Surgery
Ch-7270 Davos-Platz
Switzerland
Tel.(083) 3 32 55
Telex. 74796 lecd ch

X INTERNATIONAL CONGRESS OF BIOMECHANICS

Research Department of the Swedish National Board of Occupational Safety and Health
Umea, Sweden, 15-20 June 1985

Topics

The aim of the Congress is to report research in the area of biomechanics of human movement. The Congress will include invited lectures and free communications (oral and poster).

Papers are invited in the following areas:

- Basic Research in Biomechanics
- Occupational Biomechanics
- Orthopaedic Biomechanics
- Rehabilitation Biomechanics
- Sports Biomechanics
- Electromyography and Neuromuscular Control
- Instrumentation and Methodology

The official language of the Congress is English.

Organizing Committee

Bengt Jonsson, Congress Chairman
Mats Hagberg, Congress Vice Chairman
Gudrun Hedberg, Congress Vice Chairman
Inga-Marit Hagner, Congress Vice Chiarmman
Kjell Niemi, Congress Secretary

Congress secretariat

X International Congress of Biomechanics
Work Physiology Division
National Board of Occupational Safety and Health
Box 6104
S-900 06 Umea
Sweden
Telephone: (46-90) 165060

THE EIGHTH INTERNATIONAL SYMPOSIUM ON EXTERNAL CONTROL
OF HUMAN EXTREMITIES

Dubrovnik, Yugoslavia, 3-7 September 1984

Organized by
Yugoslav Committee for
Electronics
and Automation
P.O. Box 356
11001 Beograd
YUGOSLAVIA

Purpose

The Symposium is organized to promote the exchange of new knowledge and technology in the field of rehabilitation engineering. It will take place in Yugoslavia, Dubrovnik, September 3-September 7, 1984. By now, it has become an established practice for the Symposium to bring together prominent specialists in order to stimulate exchange of opinions and achievements. Traditionally the Symposium is concerned with the state of the art, the assessment of recent advances and perspectives of development of active and passive orthotic and prosthetic aids. The Symposium shall emphasize the multidisciplinary and systems approach, clinical applications and the functional pay-off of assistive devices in terms of the quality of life and the social participation of the disabled. At this Symposium, special attention will be given to the technology transfer to developing countries. The Symposium will be run in a flexible way in order to leave enough free time for direct contacts and discussions as to keep up with the established traditions of the Dubrovnik Symposium. Afternoons will be left free for other activities: round table discussions and special sessions.

Topics

Papers dealing with the advances and indications for devices, evaluation problems and procedures, measurement methods, clinical practice and pay-off in the following areas are invited:

1. Rehabilitation Engineering Technologies enhancing the full participation of the disabled
2. Technology transfer of rehabilitation engineering to the developing countries: problems, ways, promotions
3. Functional electrical stimulation as a rehabilitation method
4. Gait and posture pathology
5. Prosthesis (prothesis) & Orthosis
6. Rehabilitation of gait and posture pathology
7. The use of physiological and reflex mechanisms in external control of extremities
8. The use of clinical measurement methodology
9. Implants and biomaterials
10. Sensors and actuators
11. Assistive devices for geriatric purposes
12. External control applied in sport.

Special Sessions

- Neuro Muscular Control Mechanisms (Chairman: L.Vodovnik)
- Movement Measurement (Chairman: D.Winter)
- Artificial Intelligence Elements in External Control (Chairman: R.Tomovic)

Symposium Activities

Participants are encouraged to demonstrate new devices and prototypes.

Call for Papers

Authors willing to submit papers are kindly requested to send papers not later than February 1, 1984. Papers will be accepted by the Scientific Committee by March 1, 1984.

Secretary

Mjriana Jovanic
Yugoslav Committee for ETAN
P.O. Box 356
11001 Belgrad
Yugoslavia

SCIENTIFIC MEETING REPORTS

R.Huiskes Reports
Conference on "Functional Adaptation in Bone Tissue"
Sponsored by the MROC-Foundation
Santa Inez - California
July 11-15, 1983

The Conference was held by 22 invited specialists on functional bone adaptation from several background, including biochemistry, cell-biology and physiology, biomechanics, physics, orthodontics and orthopaedics. Most of them from the USA, and one from Canada, USSR, Israel, UK and Netherland each. Each speaker presented one or more 40 minute lectures. There was abundant time for discussions, during and between lectures.

The topics discussed included functional requirements and strains in bones, geometry and elastic properties, the cellular basis of bone-remodelling, normal and strain-induced bone remodelling, fluid-flow related effects, electric potentials, biochemical signals, mathematical modelling of strain-induced bone adaptation, bone-remodelling around implants, skeletal growth factors, and osteoporosis in patients and astronauts.

The interdisciplinary concepts proved to be very fruitful. Full manuscripts of the lectures will be published shortly in "Calcified Tissue International". They will certainly be of interest to those working in the Orthopaedic Biomechanics area.

R.Huiskes Reports

Workshop on the Implant Interface

Sponsored by the Musculoskeletal Diseases Program, NIA, and
the Academy of Orthopaedic Surgeons

Chicago - Illinois

September 14-16, 1983

The workshop was attended by approximately 60 invited specialists on implant fixation, implant-bone interfaces, and bone remodelling, of which approximately 30 presented 15 minutes lectures on subjects such as Biomechanical and Clinical Overviews, Bone/Cement interfaces, Metal/Cement interfaces, Cementless interfaces, ingrowth and non-ingrowth. Sub-topics in the sessions included critical state of the interfaces, nature of replaced tissues, evolution of the interface, mechanical failure, general clinical experience, toxicity, bone remodelling, and new techniques.

All papers and discussions will be published shortly in a bound volume which will be of interest for those working in the Dental and Orthopedic fields.

R.Huiskes Reports

Seventh Annual Meeting, American Society of Biomechanics

Rochester - Minnesota

September 28-30, 1983

The Seventh Annual Meeting of the ASB was attended by about 70 people. Four keynote lectures, two instructional courses and 45 papers were presented; the latter in two parallel sessions. The session included Ergonomics, Bone Mechanics, Orthopaedic Biomechanics, Spine Mechanics, Soft Tissue Mechanics, Human Function and Performance, Locomotion, Biofluid/Biosolid Mechanics. Abstracts of the papers will be published shortly in the Journal of Biomechanics.

WHO CAN MEASURE WHAT?

A proposal!

Anyone who deals with clinical applications of gait analysis knows the importance of having a normative data base. This should be relative to homogeneous normal population groups and given mean speed of progression ranges. In this context Chao et al., J.Biomech. 16 (1983): 219-233, is interesting reading. An effective description of a variable associated with the mechanics of walking that have a statistical significance requires a great deal of experiments to be performed. This to the point that it is unlikely that one single laboratory can carry out such an investigation in a thorough fashion and in a reasonable lapse of time.

It is thus imperative that a number of gait labs join their efforts to this aim.

The ESB can play an important role in this respect. It can represent the reference point for the organization of this collaboration. The Newsletter can represent the medium through which all members are made aware of the results