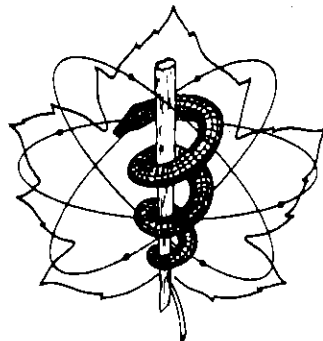


**1972**

WINNIPEG, MANITOBA, SEPTEMBER 7-9



**Digest  
of  
Papers**

**4<sup>th</sup> -**

**CANADIAN MEDICAL AND  
BIOLOGICAL ENGINEERING  
CONFERENCE**

CANADIAN MEDICAL AND BIOLOGICAL

ENGINEERING SOCIETY

The Canadian Medical and Biological Engineering Society is a non-profit organization, the Canadian affiliate of the International Federation for Medical and Biological Engineering. The present executive is:

President: Dr. D. A. Winter  
Shriners Hospital  
633 Wellington Cresc.  
Winnipeg, Man.

Vice-Pres: Dr. R. C. Cobbold  
Inst. of Biomedical Electronics  
University of Toronto  
Toronto, Ont.

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The committee in charge of the organization of this 4th C.M.B.E.S. Conference was selected from various Winnipeg Agencies:

M.B. Raber .....Chairman  
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J.A. Townsend .....Publicity  
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J.F. Greenberg .....Secretary

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FPE-Pioneer Electric Ltd.  
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Computer Department for Health Sciences,  
University of Manitoba.

**PROGRAM**  
**CMBEC 1972**  
**Wednesday, September 6 th.**

0900 Opening Ceremonies  
0910 Address: Dr. D. Winter  
0920 Address: Mr. J. Hopps  
0935 Key-Note Address: Dr. D. Hill  
1020 COFFEE

**CARDIOVASCULAR - ECG**  
Chairman: Dr. D. Mymin

1040 Bioelectrode Voltage Offset Time Profiles and Their Impact on ECG Measurement Standards.  
Almasi, Hart, Schmitt and Watanabe.

1058 Computer Detection and Interpretation of Electrocardiographic Arrhythmias.  
Roberge, Leblanc and Nadeau.

1116 A New System for Large Volume Electro-Cardiography.  
Roy, Berkman, Berger, Landis, and Wehnert.

1134 A PDP System for Collecting Vector Electrocardiograms.  
O'Beirne and Fowler.

1152 Formal Discussion

1215 LUNCH

**GAMMA IMAGING**  
Chairman: Dr. I. Sutherland

1040 The University of Toronto Gamma Ray Camera.  
Moody, Joy and Paul.

1058 The Multi-Wire Proportional Chamber as a Gamma-Imaging Device.  
Price, Perez, Mendez, Kaufman and Powell.

1116 Computer Assisted Regional Pulmonary Function Study.  
Wartak, Overton, Friedenbergl and Sproule.

1134 General Discussion

1215 LUNCH

Wednesday, September 6th.

CARDIOVASCULAR-FLUID DYNAMICS

GASTRO-INTESTINAL

Chairman: Dr. J. Milsum

- 1400 A Four Channel Pulsed-Field Electro-magnetic Blood Flowmeter System. Moody, Morrison, de Kat, Henderson, Rappaport and Lipton.
- 1418 Flow and Frequency Dependence of Blood and Blood-Dextran Mixtures. Singh, Scearce and Coulter Jr.
- 1436 Head Impedance, Plethysmographic Pulse Wave Velocity and Cerebral Blood Flow. Kryspin.
- 1454 Quantities of Ultrasonic Doppler Shift Blood Velocity Measurements. Duck, Durdle, Hodson.
- 1512 General Discussion

- 1400 A Mathematical Model of Glyco-Energizing Regulation. Parmentier.
- 1418 Mathematical Analysis of the Gluco-regulatory System. Norwich, Hetenyi Jr. and Zelin.
- 1436 Characterization of the Bladder Control System of the Dog. Drolet, Kunov, Reddy and Robson.
- 1454 General Discussion.

1520

COFFEE BREAK

CARDIOVASCULAR-PROSTHESIS

Chairman: Dr. E. Cuddy

RESPIRATORY

Chairman: Mr. D. Lywood

- 1540 Limiting Factors of the Total Replacement Artificial Heart. Morris, Nishizawa and Couves
- 1558 Consideration of Suture Line Stresses in the Selection of Synthetic Grafts for Implantation. Raasche, Gozna, Kinley, Marble and Dolan.
- 1616 On the Generation of Membranes by Fission Fragment Bombardment. Taraschuk, Cobbold and Joy.
- 1634 Photo-Analysis of Implanted Cardiac Pacemakers. Cameron.
- 1652 General Discussion.

- 1540 A Two Compartment Linear Dynamic Model of the Lungs, Including Collateral Ventilation and Tissue Interdependence. Holland, Macklem and Milsum.
- 1558 A Computer Assisted System for Evaluation of Airway Resistance. Horny, Tripp and Kruger.
- 1616 Evaluation of Artificial Lungs by "In Vitro" Experimentations. Proulx.
- 1634 Some Preliminary Experiments in Pulsatile Flow. Miller and Ferguson.
- 1652 General Discussion.

Thursday, September 7th.

HOSPITAL COMPUTER SYSTEMS

Chairman: Dr. M.G. Saunders

- 0900 System Analysis and Data Organization  
in a Computerized Pathology Information  
System.  
Hercz, Laszlo and Reesal.
- 0918 Admission to Hospital--On-Line.  
Shepley and O'Conner
- 0936 On-Line, Real Time Computer Support  
in an Intensive Care Unit.  
Horny, Bassett and Shepley.
- 0954 Medics--An Effort to Model the Health  
Care Delivery System of Quebec.  
Belanger, Hurtubise, Laszlo, Levine  
and Milsum.
- 1012 Formal Discussion

1020

COFFEE BREAK

IMAGE PROCESSING

Chairman: Dr. K. Taylor

- 1040 A Computer Visualization to Aid the  
Neurosurgeon During Stereotaxic  
Surgery on Deep Cerebral Structures.  
Thompson and Bertrand.
- 1058 Left Ventricular Volume Using Video-  
densitometry.  
Trenholm, Mymin, Lansdown and Winter.
- 1116 Truncation Error in Processing  
Digitized Video Signals.  
Reimer, Winter and Trenholm
- 1134 A Biomedical Pictorial Data Acquisition  
and Procession System.  
Badal, Pollak and Federoff.
- 1152 Formal Discussion.

BIOLOGICAL SYSTEMS

Chairman: Dr. B.W. Hyndman

- 0900 Biofeedback Training.  
Katz.
- 0918 Electrosleep Technique--Some  
Observations.  
Krishna Murthy.
- 0936 Biological Systems Identification by  
Hybrid Computer.  
Kearney and Milsum.
- 0954 General Discussion.

CARDIAC NEUROLOGY

Chairman: Dr. H. Wolfe

- 1040 Spectral Analysis of the Beat by Beat  
Fluctuation in Heart Period in the Cat  
Under Different Conditions of Neural  
Control of the Heart.  
Chess, LaBelle and Calaresu.
- 1058 Automatic Binary Detectors for Cardiac  
Interbeat Interval Data Generated in  
Psycho-physiological Experiments.  
Bernstein, Corson and Milsum.
- 1116 A New Method for Analyzing Cardiac  
Intervals.  
Gregory, Mohn and Hyndman.
- 1134 Quantitative Description and Simulation  
of the Autonomic Control of Heart Rate.  
Mohn and Hyndman.
- 1152 Formal Discussion.

Thursday, September 7 th.

DATA TRANSMISSION

Chairman: Dr. G.O. Martens

NEUROLOGICAL

Chairman: Mr. R. Jell

- |      |  |      |  |
|------|--|------|--|
| 1400 | Digital Electrocardiogram Transmission Over the Switched Telephone Network. Forbes, Miskey and Pollak.   | 1400 | Simulation Study of a Spinal Motoneuron Pool with Renshaw Inhibition. Varano and Lee.                                  |
| 1418 | Digital Transmission of Electrocardiograms--A New Approach. Wolf, Sherwood and Rautaharju.   | 1418 | Instrumentation Associated with the Node of Ranvier Voltage Clamp. Ryan.   |
| 1436 | Acquisition by Telemetry and Computer Analysis of 4 Channel Long Term EEG Recordings from Patients Subject to 'Petit-Mal' Absence Attacks. Ives, Thompson and Woods. | 1436 | Stochastic Properties of Motor Unit Firing Intervals During Constant Force Isometric Contractions. DeLuca.             |
| 1454 | An Implantable Seven-Channel Bio-Telemetry System for Use in Infant Monkeys. Pauley and Reite.   | 1454 | COFFEE   |
| 1512 | Formal Discussion.   | 1512 | A System for Applying Spectral Analysis Techniques to the Study of Motor Unit Properties in Skeletal Muscle. Blinston. |
| 1530 | COFFEE   | 1530 | Statistics of the Myo-Electric Signal From Monopolar and Bipolar Electrodes. Parker and Scott.                         |
|      |  | 1548 | Formal Discussion.   |

1900

RECEPTION AND BANQUET

Friday, September 8th.

BIOLOGICAL PROPERTIES I

Chairman: Dr. R.C. Cobbold

- 0900 Nonthermal Effects of Microwaves on Algae.  
Hamid and Badour.
- 0918 Bird Feathers as Microwaves Sensors.  
Bigu Del Blanco, Tanner and Romero Sierra.
- 0936 Resistivity and Dielectric Constant of Liver, Spleen and Kidney in the Dog.  
Berson.
- 0954 General Discussion.

NEUROMUSCULAR

Chairman: Dr. H. Kunov.

- 0900 Neuromuscular Control of Human Forearm Torque.  
Milsum and Kwee.
- 0918 The Sensory Dynamics of a Muscle Spindle.  
Koles.
- 0936 Improved Myo-Telemetry Implants.  
Nelson.
- 0954 An Interactive Mathematical Model of the Frog Muscle Spindle System.  
Johnson and Murphy.
- 1012 Formal Discussion.

1020

COFFEE BREAK

- 1040 Patient Monitoring at the Hospital for Sick Children, Toronto. -- Albisser.
- 1058 Recent Developments in Ground Integrity Monitoring. -- Sircom.
- 1116 How Much Electrical Hazard Exists in Today's Hospitals. -- Pask and Albisser.
- 1134 Grounding in Patient Care Areas. -- Raber.
- 1152 General Discussion.

BIOLOGICAL PROPERTIES II

Chairman: Mr. E. Mazerall

- 1040 A Low Cost Apparatus for Research in Organ Preservation.  
Durie.
- 1058 The Performance of Specific Electrodes for Biological Fuel Cells in Vitro and In Vivo.  
Won and Tseung.
- 1116 Technical Aspects of the Freeze-Fracture Technique for Surface Ultrastructure Examination.  
Iles, Cobbold and Seeman.
- 1134 A Study of the Changes in the Ovine Blood Placed in an Electrical Field "In Vitro" Experiments.  
Guidoin.
- 1152 General Discussion.

LOCOMOTION STUDIES

Chairman: Dr. P.J. Lowe

- 1040 Some Results from a Computer Aided Study of Human Locomotion.  
Quanbury and Kasvand.
- 1058 Kinematics of Human Gait.  
Winter, Hobson and Greenlaw.
- 1116 Computer Simulation of Human Locomotion.  
Daher, Thornton and Trump.
- 1134 Formal Discussion.

Friday, September 8th.

BIOMECHANICS

Chairman: Dr. F. Gunston

1400 PANEL:  
Electro-Medical Equipment Evaluation.

1400 Kinematics of the Hip Joint.  
Walker and Graham.

1418 An In Vivo Analysis of Medio-Lateral  
Bending in the Normal Human Knee.  
Lowe and Angenent.

1436 Comparative Study of Biomechanical  
Properties of Muscle.  
Vachon, Kunov and Ambasta.

1454 Graphite Reinforced Polyethylene  
Bone Plate.  
Osborne.

1512 Formal Discussion.

1530

COFFEE BREAK

SURGICAL/THERAPY

Chairman: Dr. F.R. Tucker

1550 PANEL:  
Electro-Medical Equipment Evaluation.

1550 The Role of the Therapist in the  
Development of Technical Devices for  
Handicapped Children.  
Trefler, Parsons, Walder and Stein.

1608 A Typing Aid for the Severely  
Handicapped.  
Vasa and Lywood.

1626 Is Symes Amputation Worthwhile?  
A Review of Symes Amputation after  
Industrial Accident.  
Harris and Hornby.

1644 General Discussion.