



Biological and Artificial Membranes and Desalination of Water



Programme

I. Water Needs and the Importance of Desalination

1. *Balancing Needs and Resources in the Use of Water* (M. Batisse)
2. *Nuclear Energy and Water Desalination* (L. Leprince-Ringuet)

II. Structure of Biological Membranes and Methods of Membrane Study

3. *Enzymatic Properties of Rat-liver cytomembranes* (C. De Duve)
4. *Structure of Biological Membranes; Bacteriorhodopsin and the Purple Membrane* (W. Stoeckenius)
5. *Interactions among Cellular Membranes. Problems and Perspectives* (G.E. Palade)

III. Methods of Membrane Study

6. *Electrical Methods in the Study of Biological Membranes* (R.D. Keynes)
7. *A Preliminary Report on the Effect of Curare and Curare like Agents on the Diffraction of a Coherent Beam of Visible Light by the isolated Electroplate* (C. Chagas)
8. *Phase-Plane Analysis of Propagated Electrical Activity in Muscle Cells* (A.P. De Carvalho)
9. *Cell Coupling in Cardiac Muscle* (S. Weidmann)

IV. Ionic Permeability and Transport in Biological and Artificial Membranes. I

10. *Thermodynamic Aspects of Nonelectrolyte Permeation of Lipid Bilayers* (A.K. Solomon)
11. *Kinetics and Energetics of Calcium Transport Squid Giant Axons* (P.F. Baker)
12. *Electrical Behaviour of "Excitable" Artificial Membranes* (A.M. Monnier)

V. Ionic Permeability and Transport in Biological and Artificial Membranes. II

13. *Calcium Transport by Muscle Microsomes* (W. Basselbach)
14. *Control of ATP Hydrolysis, ATP=P_i Exchange and Membrane Phosphorylation by the Ca²⁺ Concentration Gradient in Sarcoplasmic Reticulum Vesicles* (L. De Meis)
15. *Synthesis of Adenosine Triphosphate by Way of Potassium-Sensitive Phosphoenzyme of Sodium, Potassium Adenosine Triphosphatase* (R.L. Post)
16. *Electrolyte Fluxes and Energy Coupling in Plant Cells* (E.A.C. MacRobbie)
17. *Electrophysiological Aspects of Energy Transfer in the Plasma Membrane of Neurospora* (C.L. Slayman)

VI. Membrane Thermodynamics and Transport

18. *Energy Transductions in Biological Systems* (P.D. Boyer)

19. *Electrical Excitation in Lipid Bilayers and Cell Membranes* (P. Mueller)

20. *Thermodynamics of Nervous Conduction* (J.M. Ritchie)

VII. Artificial Membranes: Thermodynamics and Transport

21. *Interpretation and Prediction of the Transport Properties of Charged Membranes using Irreversible Thermodynamics* (R. Paterson)

22. *Computer Prediction of Stationary States of Membranes from Differential Permeabilities* (P. Meares)

23. *Inorganic Ion Exchange Membranes* (G. Alberti)

24. *Chemical Engineering Problems Regarding Reverse Osmosis Process Operation* (G. Astarita)

VIII. Artificial Membranes: Thermodynamics and Transport. I

25. *Function and Structure of Membranes* (A.J. Staverman)

26. *Polarization at Membrane/Solution Interfaces* (K.S. Spiegler)

27. *Equilibria at Membrane/Solution Interfaces* (O. Kedem)

28. *Membrane/Solution Polarization in Dynamic Conditions* (R. Passino)

IX. General Aspects of Membranes Phenomena

29. *The Use of Models in the Study of Complex Effects at Mosaic Membranes* (K. Sollner)

30. *The Feed-Back between Biology and Membrane Technology* (T. Teorell)

Participants

Prof. Giulio Alberri

Prof. Gianni Astarita

Prof. P.F. Baker

Prof. Michel Bâtisse

Prof. Paul D. Boyer

Prof. Carlos Chagas

Prof. Antonio Paes De Carvalho

Prof. Christian De Duve

Prof. Leopoldo De Meis

Prof. Wilhelm Hasselbach

Prof. Ora Kedem

Prof. Richard K. Keynes

Prof. Louis Leprince-Ringuet

Prof. Alfonso Maria Liquori

Prof. E.A.C. Maonnier

Prof. Patrick Meares

Prof. A. M. Monnler

Prof. Paul Mueller

Prof. George E. Palade

Prof. Rodolfo Paoletti

Prof. Roberto Passino

Prof. Russell Paterson

Prof. Robert L. Post

Prof. T. Murdoch Ritchie

Prof. Clifford L. Slayman

Prof. Karl Sollner

Prof. Arthur K. Solomon

Editeur des Actes

Prof. Roberto Passino

L'academie a tenu sa Séance Plénière, à laquelle ont participé les Académiciens pontificaux suivants:

Carlos Chagas, Georges Chaudron, Antonio De Almeilla, Christian De Duve, Paul A. Dirac, Percy C. Garnham, Wolfgang Gentner, Rev. Martino Giusti, Gerhard Herzberg, Sven Hörstadius, Rev. Josef Junkes, Thomas A. Lambo, Jean Lecomte, Jérôme Lejeune, Louis Leprince-Ringuet, Manuel Lora-Tamayo, Giovanni Battista Marini-Bettòlo, Sanichiro Mizushima, Severo Ochoa, Rev. Daniel P. O'Connell, Jan H. Oort, Mauro Picone, George Porter, Marcel Roche, Manuel Sandoval-Vallarta, Rev. Alfons Stickler, Rev. Patrick Treanor, Hans Tuppy, Alfred R. Ubbelohde.

Medaille d'or Pie XI

Dr. Stephen William Hawking