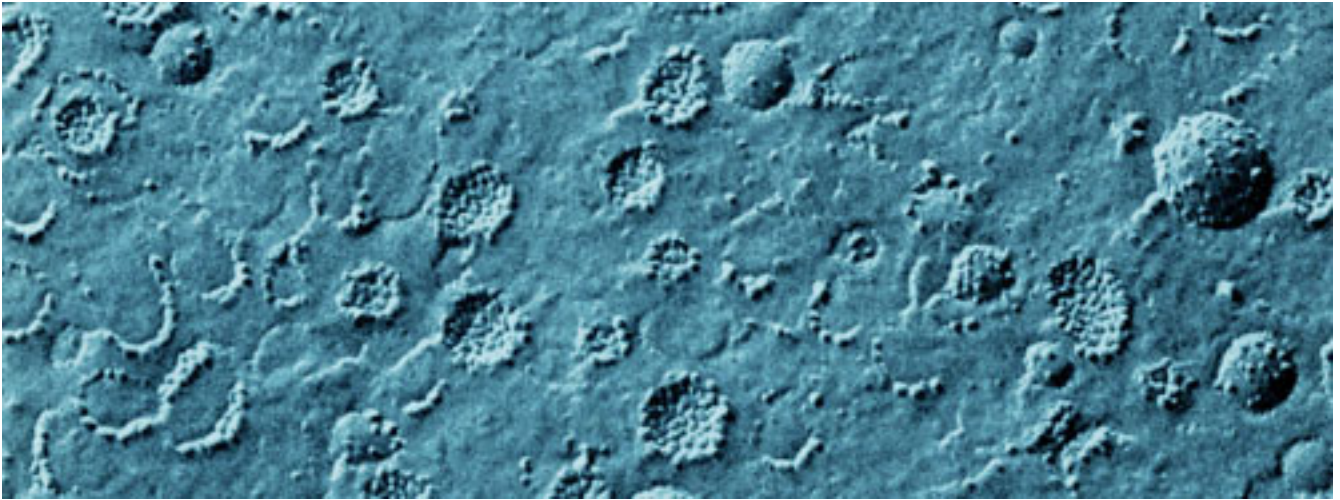




Biological and Artificial Membranes and Desalination of Water



The Council of the Pontifical Academy of Sciences decided that it would be interesting to invite the main experts of natural and artificial membranes to a Study Week to exchange ideas and scientific data to improve water desalination methods on the one hand, and on the other to give those who study the properties of biological membranes some new prospects and techniques that might have otherwise gone unnoticed.

The interest shown by all the participants, the quality of the papers presented, the debates that followed, the welcoming atmosphere which lasted for the five days of the Study Week undoubtedly testified to the success of the event.

On behalf of the Academy I wish to express once more my profound gratitude to the participants in the Study Week for their zeal and commitment to their work. I would also like to thank Professor Roberto Passino for his help in the organization of the Study Week and related book of Proceedings.

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)

