

Contents

Part I Diamagnetic Orientation of Macromolecules and Membranes

Magnetic Birefringence in Polymers and Polyelectrolytes By G. Weill	2
Propagation and Generation of High-Frequency Ultrasonic Waves in Magnetically Oriented Lyotropic Liquid Crystals By K. Dransfeld, Zeng-Ming Sun, and V. Uhlendorf (With 4 Figures)	7
Liquid Crystals and Virus Solutions in Strong Magnetic Fields By G. Maret	17
Magnetic Damping of Orientational Fluctuations in Nematics with Negative Diamagnetic Anisotropy. By A. Seppen, G. Maret, A.G.M. Jansen, P. Wyder, J.J.M. Janssen, and W.H. de Jeu (With 3 Figures)	18
Magnetic Birefringence Study of Fibrin Formation and Chylomicron Behaviour in Human Blood Plasma. By J. Torbet (With 3 Figures)	23
Diamagnetic Anisotropy of Proteins and Magnetic Orientation of Biological Membranes and Protein Assemblies By M. Chabre	28
Superdiamagnetism in Lipid Monolayers By H. Colbeck, B.H. Blott, D.P. Fraser, R.W. Chantrell, and D. Melville (With 6 Figures)	34
Magnetic Field Effect on the Gel-Liquid Crystal Phase Transition of Phospholipid Membranes. By R.H. Dean, B.H. Blott, A.S. Monem, M.M. Eleiwa, and D. Melville (With 4 Figures)	39
Membrane Responses to Magnetic and Electromagnetic Fields By R.P. Liburdy and T.S. Tenforde (With 5 Figures)	44

Part II Ferrofluids

Wetting of Solids by Ferrofluids. By P. Pincus (With 4 Figures)	54
---	----

Ionic Ferrofluids: Physico-Chemical Aspects By J.C. Bacri, R. Perzynski, D. Salin, V. Cabuil, R. Massart, J.-N. Pons, and J. Roger (With 6 Figures)	59
Ferrofluids in Lyotropic Nematic Liquid Crystals By L. Liébert, A.M. Figueiredo Neto, and Y. Galerne (With 9 Figures)	65
<hr/>	
Part III Biological and Chemical Photoreactions	
Magnetic Field Effect on Photosynthetic Reactions By A.J. Hoff and E.J. Lous (With 10 Figures)	74
Polymethylene-Linked Radical Ion Pairs in Magnetic Fields By H. Staerk, R. Treichel, and A. Weller (With 4 Figures)	85
Study of Polymer Dynamics by Magnetic Field-Dependent Biradical Reactions. By R. Bittl and K. Schulten (With 6 Figures)	90
Model for a Physiological Magnetic Compass By K. Schulten and A. Windemuth (With 4 Figures)	99
Retinal Response to Variations of the Earth's Magnetic Field By G. Cremer-Bartels and K. Krause (With 3 Figures)	107
Influence of Geomagnetic Field Alterations on Electric Retinal Potentials and Dark Adaptation in Humans By K. Krause, G. Cremer-Bartels, and R. Hennekes (With 2 Figures)	113
Effects of Earth-Strength Magnetic Stimuli on the Pineal Gland and Central Nervous Neurons. A Short Review By P. Semm and C. Demaine	117
<hr/>	
Part IV Physiological Effects and Animal Development	
Static Magnetic Fields Influence the Evoked Potentials of Man By L. von Klitzing (With 4 Figures)	122
The Influence of Static Magnetic Fields on Skin Temperature and Blood Flow in Man. By F. Wunsch-Binder	125
Magnetic Field-Induced Blood Flow Changes in Frogs and Red-Green Vision of Man After NMR-Tomography. By H. Wendhausen	129
Magnetic Field Driven Thermal Convection in Air: A Mechanism for Field-Induced Skin Temperature Changes in Animals By J. Ecochard and G. Maret (With 5 Figures)	132
Embryonic Development of the Quail in Strong Magnetic Fields By J. Bouvet and G. Maret (With 4 Figures)	138

Part V Animal Orientation and Magnetoreception

A Review of Magnetic Effects on Homing Pigeon Orientation By C. Walcott	146
A Further Analysis of the Orientation Behavior of Homing Pigeons Released Within Magnetic Anomalies By J. Kiepenheuer (With 4 Figures)	148
Pigeon Homing: The Use of Magnetic Information in Position Finding. By W. Wiltschko, D. Nohr, E. Füller, and R. Wiltschko (With 3 Figures)	154
Homing Experiments with Pigeons at the Magnetic Equator By R. Ranvaud, K. Schmidt-Koenig, J. Kiepenheuer, O.C. Gasparotto, and L.R. Britto (With 2 Figures)	163
Magnetic Orientation and Magnetically Sensitive Material in Migratory Birds. By R.C. Beason (With 4 Figures)	167
Magnetite and Magnetotaxis in Bacteria and Algae By R.B. Frankel (With 3 Figures)	173
Biogenic Magnetite in Higher Organisms and the Current Status of the Hypothesis of Ferrimagnetic Magnetoreception By L. Kirschvink and M.M. Walker (With 5 Figures)	180
The Effect of Ultrahigh Magnetic Fields on the Initial Orientation of Homing Pigeons By J. Kiepenheuer, R. Ranvaud, and G. Maret (With 2 Figures)	189
Experimental and Correlational Studies of Responses to Magnetic Field Stimuli by Different Species. By M.M. Walker, M.E. Bitterman, and J.L. Kirschvink (With 5 Figures)	194
The Cetacean Geomagnetic Travel Strategy. By M. Klinowska	206
A Mathematical Model for Magnetic Navigation by Animals By M.M. Walker, J.L. Kirschvink, and A. Kobayashi-Kirschvink (With 2 Figures)	207

Part VI Applications in NMR and Medicine

Magnets for NMR Imaging and Spectroscopy. By G. Aubert	214
In Vivo NMR Spectroscopy of Mammalian Nervous Systems By A.L. Benabid, M. Decorpis, C. Remy, J.P. Albrand, M. von Kienlin, J.F. Lebas, P. Blondet, and H. Reutenauer (With 5 Figures)	215

The Cytoplasmic pH of the Green Alga <i>Chlorella fusca</i>, Measured by 31-P-NMR Spectroscopy. By J. Sianoudis, A.C. Küsel, D. Leibfritz, L.H. Grimme, and A. Mayer (With 4 Figures)	221
Magnetic Mapping of the Human Thorax Using a SQUID Magnetometer By S. Khenia, D. Melville, and D. Rassi (With 4 Figures)	226
Index of Contributors.....	231