

This conference was convened and the proceedings published because it had been more than a decade since an in-depth conference had been devoted exclusively to biomagnetic research in the United States. In addition, a workshop was held related to the DOE process of generating magnetic field exposure guidelines. Finally, the fact that interest in magnetobiology as an independent scientific discipline was rapidly intensifying because of the large number of developing technologies that utilize high magnetic fields.

The book is divided into six major sections as follows: Magnetic Effects on Lower Organisms; Magnetic Field Exposure Guidelines; Magnetic Effects on Mammals; Magnetic Effects in Cellular and Molecular Systems; Long-Range Electromagnetic Field Interactions at Brain Cell Surfaces; and Theoretical Aspects of Magnetic Field Interactions with Biological Systems. The major objective of this work was to review the current state of knowledge in the field of biomagnetics, and this goal was accomplished reasonably well. One of the major points of the book is the difficulty to make generalizations regarding the sensitivity of lower organisms to very weak magnetic and electromagnetic fields. Observations made today suggest that a diversity of sensory mechanisms may have evolved independently for a wide variety of phylogenetically unrelated organisms. In mammals, a large number of alterations in the mammalian physiology and behavior has been reported to occur following the exposure to stationary, low-frequency magnetic fields. In cellular and molecular systems the influence of magnetic fields on cell metabolism is a specialized function that depends upon the respiratory chain and will be an important subject for future biomagnetic studies. There is need for further theoretical development because few biomagnetic phenomena have been interpreted in well-defined theoretical terms.

Medical applications discussed included a new technique for modifying the depth-dose profile of fast electron beams using radiotherapy. In this approach, a transverse magnetic field application was utilized to enhance the dose delivered in the treatment zone near the end of the electron range relative to the entrance dose. The resulting dose relative to depth characteristics resemble those for negative pions and heavy ions, and may prove advantageous in the therapy of deep-seated tumors.

This book is a useful overview of magnetic field effects in biological systems but is limited because it was written in 1978, hence is somewhat dated, and does not include current areas of investigation that involve NMR imaging and diagnostic chemistry. On

the other hand it is useful for identifying those areas that will profit from intensive research in future biomagnetic studies, including the detection of nanogauss level fields associated with brain (magnetoencephalography) and cardiac activity (magnetocardiography).

C. LEON PATFAIN
Vanderbilt University
Nashville, Tennessee

PHYSICS AND THE CIRCULATION. (Medical Physics Handbooks 9). J. O. Rowan. London and Philadelphia, Heyden and Son, Inc., 1981, 125 pp, \$28.00

In reviewing this text, *Physics and the Circulation*, I questioned whether it should be approached from the standpoint of a physiologist and student of the circulation or from that of a nuclear medicine physician primarily interested in cardiovascular procedures. Chapter one discusses the blood and circulation at an elementary level, describing nucleated white cells as "playing some role in the protection of the body from disease," the circulation of the blood being "difficult" to understand if it were not for the fact that hemoglobin functioned inside rather than outside red cells, and that the arterial orifices of the ventricles were "protected" by semilunar valves. The complex autoregulatory mechanisms of the coronary circulation are dismissed in a cursory fashion as resulting from anoxic fibers liberating a vasodilator substance.

Next is a short thesis on international units. Then follow chapters on electromagnetic flowmeters, ultrasound techniques, impedance plethysmography, and lastly tracer techniques. The biophysics of the flowmetering techniques are described in a fine scientific manner, but once again the physiologic implications are quite inadequate. The description of the tracer techniques would be unacceptable for any nuclear medicine physician to apply in his practice.

It is difficult to understand why this book was written or for whom it was intended. For the physician interested in the cardiovascular system it is at best a primer; for a physicist, it is too elementary. This "little" book does not seem to serve a purpose for the medical or biological scientist and unfortunately I cannot recommend it.

JOSEPH R. LOGIC
University of Alabama Medical Center
Birmingham, Alabama

BOOKS RECEIVED

Dictionary of Radiologic Terminology. Alphons Jacob, Herbert L. Jackson, St. Louis, MO, Warren H. Green, Inc., 1982, 107 pp, \$27.50

Atlas of Total Body Radionuclide, Vol. I & II. Ernest W. Fordham, Amjad Ali, David A. Turner, John Charters, Philadelphia, PA, J.B. Lippincott Company, Harper & Row, Inc. 1982, 1000 pp, \$175

Radionuclide Section Scanning. An Atlas of Clinical Practice. P.J. Ell, P.H. Jarritt, I.D. Cullum, London, Chapman and Hall Ltd., 1982, 285 pp, \$75.00

X-ray Measurements and Protection 1913-1964. Lauriston S. Taylor, U.S. Government Printing Office, Washington, D.C., 1981, 386 pp, \$9.00

Cardiac Imaging in Infants and Children. Michael J. Kelley, C. Carl Jaffe, Charles S. Kleinman, Philadelphia, PA, W.B. Saunders Company, 1982, 464 pp, \$49.50

Nuclear Medicine in Clinical: Selective Correlation with Ultrasound and Computerized Tomography. Larry D. Greenfield and J. Michael Uszler, Eds. Deerfield Beach, FL, Verlag Chemie International Inc., 1982, 410 pp, \$47.50

Selected Techniques in Interventional Radiology, (SMCR series Volume 19). Saadoon Kadir, Stephen L. Kaufman, Klemens H. Barth, Robert I. White, Jr., Philadelphia, PA, W.B. Saunders Company, 1982, 240 pp, \$39.00