Magnetic fields in the universe are assuming an ever-growing importance both as dynamical agencies and for diagnostic purposes. The great virtue of this book lies in the fact that it covers almost all the aspects of cosmic magnetism (the prime exception being galactic magnetic fields, probably the most important dynamically). With a total of 39 papers, it becomes impossible to give a detailed account of the book's content, author by author. Although there have been monographs of various types on the earth's magnetism, there has not to my knowledge been a systematic collation of our knowledge relating to the magnetic fields of the sun, the stars, and the planets. Gratifyingly, most of the papers in sections 2 through 5 deal with analysis of empirical data rather than with theoretical speculations. Alfvén's *Cosmic Electrodynamics* introduced the subject in a pioneering fashion many years ago. The material has since grown so rapidly that in the absence of a new monograph we can be happy to have this exhaustive coverage of the field by a large number of competent specialists. The organizer of the symposium, S. K. Runcorn, has done the next best thing to devoting a lifetime to the writing of a monograph. Whoever wishes to work in the field of cosmic magnetism or to get acquainted with it will certainly have to have an acquaintance with this work of unusual breadth and coherence.

It is regrettable that by some legalistic quirk the sponsors of such symposia find it often difficult to contribute to the printing costs. The extravagant price is then unloaded on librarians and it becomes difficult for the active specialist who wants such a book here and now to buy it.

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## Man and His Beliefs

**The Biology of Ultimate Concern.** THEODOSIUS DOBZHANSKY. New American Library, New York, 1967. 172 pp. $5.

This is the second of a series of books to appear under the general title Perspectives in Humanism. The introduction to the series seems to dedicate it to the idea that humanity has emanated from a fixed pattern, rather than having evolved for a million years or so as part of a more general pattern that has been evolving for very much longer. The present volume is founded on evolutionary theory and evidence, which give no support to the idea of a true discontinuity at the advent of man or of humanity; thus the author's approach would seem opposed generally to the dogma of the series.

In early chapters Dobzhansky stresses the "opportunistic" character of natural selection, which takes advantage of favorable mutations but does not create them to meet the exigencies of the environment. He also disposes of fallacies of vitalistic and orthogenic reasoning with regard to evolution, which though long abandoned by most biologists may linger tacitly in other areas. All this goes with modern Darwinism, understanding of which is essential to any approach to the problems taken up in this book.

Culture, however, is transmitted by a looser mechanism than genetic inheritance, and this confers greater freedom from the environment. Chance thus has a larger role in the evolution of culture than in biological evolution, and environment correspondingly less. Although Dobzhansky recognizes this, it would seem that he might have given the point greater emphasis because of its bearing on the evolution of our "ultimate concern." Can we expect to find a really close correlation of human customs and beliefs with biological adaptations?

In discussing awareness of life and death, and matters akin, Dobzhansky is on less certain ground than in his biological argument; but he has the company of all those who tread in this area, where both evidence and theory may be inadequate for the testing of hypotheses and opinions. The relationship of such concerns to biological evolution thus becomes the more vague. Here we may sympathize with much of the author's criticism of the concepts of others without necessarily subscribing to his.

Many readers may find that the "Teilhardian synthesis" receives overmuch praise. Teilhard de Chardin asked many cogent questions, but did he really make a synthesis in other than mystical terms?

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## Theory of Wave Phenomena

**Collective Oscillations in a Plasma.** A. I. AKHIEZER, I. A. AKHIEZER, R. V. POLOVIN, A. G. SITENKO, and K. N. STEPANOV. Translated from the Russian edition (Moscow, 1964) by H. S. H. Massey. R. J. Tayler, Translation Ed. M.I.T. Press, Cambridge, Mass., 1967. 200 pp., illus. $8.50.

The study of wave phenomena in infinite homogeneous plasmas is the best-developed aspect of the recently crystallized discipline of plasma physics. Clearly the simplest situation to analyze, it has spawned a bewildering variety of phenomena: hosts of oscillations, novel collisionless damping, nonequilibrium fluctuation theory, and so on. Today the interest of investigators seems to be shifting to consideration of bounded systems and turbulent systems. Thus a summary of prior work is clearly in order, and this slender monograph is a useful effort in that direction.

The book is the joint venture of a number of Russian workers who have been major contributors to the field, and its style is clearly that of the Russian school. It is by no means an introductory work. Indeed, the reader would do well to approach it with good knowledge of the celebrated set of volumes by Landau and Lifshitz on theoretical physics, and the rudiments of plasma physics as they are supplied, for example, in Spitzer's *Physics of Fully Ionized Gases.* For someone with this background it is a very useful book.

The work would be somewhat more useful if it were not devoted to theory alone but made some effort to relate the results to experiment, and if the physical explanations of phenomena such as Landau damping were more extensive. Also, the characterization in the book of the contributions of various terms in the inversion by residues of the Laplace-transform solution as "eigen oscillations" is not in keeping with the usual mathematical usage, since they do not simply satisfy the system of homogeneous equations resulting from the *Ansatz* that all quantities vary like $e^{i(k\cdot v-\omega t)}$. Finally, the absence of a description of the integration of the linearized Vlasov equation in terms of its characteristics, the particle trajectories, is regrettable.

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