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and detailed descriptions of gadgets, concentrating instead on physical principles. Figures are simple and clear. A long list of reading references is provided and there are many quotations, including one from Bertrand Russell (page 269) on "what electricity is" that should be helpful in dealing with one's children.

Advances in Geophysics. Vol. 3. Edited by H. E. Landsberg. 378 pp. Academic Press Inc., New York, 1956. \$8.80. Reviewed by Arthur Beiser, New York University.

Once more the editors of *Advances in Geophysics* have compiled a useful, informative, and, in the bargain, highly interesting volume whose subjects range from the interior of the earth to interplanetary space.

In the first article we learn from A. P. Crary about arctic ice islands and some unique studies made from them. The most striking conclusion: "The evidence [is] that the present period is one of long-term warming, which may lead to an open polar sea in the not too distant future." Next, Zdenek Sekera comprehensively discusses the polarization of sky light with reference to recent developments in the theory, mostly a consequence of Chandrasekhar's work on radiative transfer, and in experimental techniques, mostly a consequence of improved photomultiplier tubes which permit the detection of as little as 0.001 polarization.

Turning our gaze inward, as it were, we then examine subcontinental structure and in particular the Mohorovičić discontinuity with the help of Perry Byerly. "It appears increasingly clear that difficulties in interpreting earth crustal structure from seismic data lie primarily in the irregularities within the earth's crust and not in mistakes made by early workers or even in the meagerness of the observations available." Following this paper is a related one on heat flow through the deep sea floor by Bullard, Maxwell, and Revelle. They find that the oceanic and continental heat flows are approximately equal: "The simplest explanation would be that the radioactivity originally in the upper part of the mantle has been concentrated in the crust, allowing the continental heat to escape by conduction, while beneath the oceans the same amount of radioactivity is still distributed through the mantle and the heat is brought to the surface by convection or by unexpectedly high thermal conductivity." Completing our tour of the nether regions, J. A. Jacobs takes us to the interior of the earth with a lucid description of its composition and constitution, its thermal history, and its puzzling magnetic field.

The sixth article in *Advances in Geophysics* is devoted to subsurface geophysical methods in ground-water hydrology. In their account of scientific dowsing, P. H. Jones and H. F. Skibitzke consider electric, radiation, temperature, bore hole diameter, flow meter, and fluid conductivity logging. Last, S. F. Singer relates the variety of experimental possibilities offered by artificial satellites; there is evidently little danger of running out of things for sputniks (and our own spātniks) to do,

"leading eventually to the stage when man himself will be able to explore the environment of the planet Earth".

L'Univers Aléatoire. By Philippe Wehrlé. 459 pp. Editions du Griffon, Neuchatel, Switzerland, 1956. Fr. 38.00. *Reviewed by R. B. Lindsay, Brown University.*

This volume is one of the latest in the publishers' "Bibliothèque Scientifique". The author is a physicist who has given much attention to the turbulent motion of fluids, particularly with reference to meteorological problems. The present work, however, is an endeavor to present what may be called a philosophical reconstruction of physics in the endeavor to escape from what the author considers the unfortunate dichotomy of deterministic physics on the one hand and the probability interpretation of quantum mechanics on the other. The author refuses to take sides in this controversy, is not satisfied with any half-way measures on compromises and presents what he considers to be a completely new philosophical synthesis. Taking his cue from the physics of the atmosphere he insists on making every conceptual element at the basis of physical theorizing aleatory in character, i.e., ultimately based on contingency or probability. Thus in his view space and time themselves must have a contingent foundation and all probability distributions descriptive of physical situations become random functions of time.

What all this means has been rather difficult for the reviewer to grasp, partly because of the all-embracing character of the synthesis, which is more typically philosophical than physical, and partly because of the almost complete absence of analytical treatment of special cases, by which alone the physicist usually feels he gets an understanding of any theory. Physicists are in general suspicious of any point of view which pretends to subsume all physical experience. It is unlikely that they will show enthusiasm for the world picture presented by the author of this work until he produces results of more concrete nature.

Mysteries of Science: A Study of the Limitations of the Scientific Method. By John Rowland. 214 pp. Philosophical Library, Inc., New York, 1957. \$6.00. *Reviewed by J. C. Polkinghorne, University of Edinburgh.*

The purpose of this book is to show that there are more things in heaven and on earth than are discussed in scientific journals and that a religious view of life is possible. All this I firmly believe but I found myself exasperated by the arguments presented here.

The author surveys, in successive chapters, physics, biology, psychology, sociology, and a curious unclassifiable collection ranging over the sublime and the ridiculous, from mysticism to flying saucers. Everywhere he is in search for what he considers to be mysteries. In physics, the uncertainty principle apparently furnishes one example. Another example is the nature of electricity. Mr. Rowland will have no answer to this question in terms of charges and fields. One is reminded of the

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NUCLEAR REACTOR EXPERIMENTS

*by the Staff of the Argonne
National Laboratory;*

J. BARTON HOAG,
Editor and Contributor

To help scientists meet the dynamic challenge that nuclear reactors present, this new book describes forty-four experiments ranging over the whole reactor field. For the most part, sections are written by ANL staff members who created, or helped create, the work they describe. *Published March 1958*

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