

The final chapter deals with isotopic spin and its generalizations. It is in the theory of strong interactions that present-day elementary particle theory is faced with its greatest problems; hence, it is here that a textbook is hardest to write. The author has chosen to present many highly speculative ideas, some of which have already been made obsolete by newer developments, without making clear that the evidence for them is somewhat weaker than for Lorentz invariance, for instance. The inclusion of such material in a textbook is probably unwise. It will perhaps be impossible to write a really adequate text on the theory of elementary particles until more of the major problems of that theory have been solved.

G. FEINBERG

*Department of Physics,
Columbia University*

Atlantic Hurricanes. Gordon E. Dunn and Banner I. Miller. Louisiana State University Press, Baton Rouge, La., 1960. xx + 326 pp. Illus. \$10.

The large, rotary, tropical storm known regionally as the "hurricane," "typhoon," or "tropical cyclone" has a capacity for death and destruction well known to coastal and island inhabitants of the United States, Mexico and other Central American countries, Japan, China, the Philippines, and the South Pacific and Indian oceans. As many as 300,000 people have perished in a single storm, and two storms in the United States—Diane (1955) and Donna (1960)—have each caused damage that amounted to nearly \$1 billion. Their energy output borders on the fantastic: the conversion of one day's hurricane winds would supply the electrical power requirements of the United States for six months. An average hurricane produces 20 billion tons of fresh water a day, which someday may be used by thirsty and ingenious future generations.

This book, written by two members of the Weather Bureau's hurricane forecast center at Miami, Fla., contains background information and safety features which could well mean the difference between life and death for large numbers of Americans who, in recent years, have moved to ocean beaches or who have ventured forth in boats into areas vulnerable to hurricanes. Much recent progress has been made in hurricane detection, tracking, and prediction by use of weather reconnaissance

aircraft, radar, hurricane "beacons," and statistical and dynamical techniques involving use of electronic computers. These developments, combined with more effective dissemination of warnings, have brought the ratio of fatalities to property damage down by a factor of 60 in the past 30 years.

A glimpse into the potential contribution of weather satellites is given by a picture of the pinwheel clouds of a tropical cyclone observed near New Zealand on 10 April 1960 by the first weather satellite, Tiros I.

The book is given sharp focus by several fascinating eyewitness accounts made by survivors, some of them professional meteorologists, of outstandingly destructive hurricanes. A brief account of normal tropical weather patterns is followed by discussion of hurricane climatology, characteristics, energy, theories of forecasting, and destructive storm tides, surges, waves, rain floods, and winds. Sections of considerable practical value are devoted to the hurricane warning system, how to prepare for hurricanes, ways to improve zoning laws and building codes, and how to survive when the storm hits. The appendixes contain a listing of hurricanes that afflicted the United States from 1653 to 1958 and a useful glossary of meteorological terms.

Of particular interest are the sections devoted to the results of recent hurricane research, particularly those stemming from the extensive field activities of the National Hurricane Research Project; this project, the largest ever devoted to the study of a single meteorological phenomenon, owes its establishment to the increased federal support which was provided after the disastrous hurricanes of 1954 and 1955. In answer to the inevitable question of hurricane control, there is a brief account of several inconclusive hurricane seeding experiments as well as an account of the formidable problems involved in counteracting such energetic atmospheric phenomena.

For the more scientifically minded, the book will not serve as an adequate substitute for the chapter on tropical storms contained in Riehl's *Tropical Meteorology* (1954) or for the section on climatology and the record of storm movement and behavior found in Tannehill's *Hurricanes* (1944). Perhaps the book's greatest shortcoming is its failure to put in specific terms the principal unresolved problems concerning hurricane structure, behavior, and movement or to show how progress in the solution

of these problems could contribute to improved understanding and prediction. By and large, however, the book provides interesting reading for the layman and vital information to state and city officials, construction engineers, and others concerned with alleviating hurricane damage.

H. WEXLER

*204 South Lee Street,
Falls Church, Virginia*

The Search for Order. Cecil J. Schneer.

The development of the major ideas in the physical sciences from the earliest times to the present. Harper, New York, 1960. xvii + 398 pp. Illus. \$6.

This is one of many recent books designed to introduce science to the general reader. More than most, it succeeds in portraying science as an essential part of our cultural heritage and as a framework for modern ideas and beliefs.

Necessarily the author limits himself to a few topics, to "scientific ideas which in my opinion have had the greatest influence on the evolution of civilization." These ideas progress from the cosmology of the solar system to mechanics, thermodynamics, evolution, field theory, relativity, and quantum theory. Chemistry and geology are limited to brief chapters, biology appears only in the discussion of evolution, and stellar astronomy is hardly mentioned. No two scientists would agree completely about the wisdom of this distribution, but certainly the topics selected provide material for a coherent, colorful, many-faceted, and often exciting story. The story is told with great zest, good humor, and broad understanding. Scientific ideas are set against a background of history and philosophy which serves admirably to bring out their relevance to the development of Western civilization. The author should be commended especially for his vivid and unorthodox biographical sketches of eminent scientists—sketches accompanied by numerous apt quotations from their writings.

The major shortcoming of the book is the brevity of its treatment of the scientific ideas themselves. There is no escape from this, of course, if the historical and philosophical material is to be retained and if the book is to be held to a reasonable length. The relation of force to acceleration, the con-