tively new and unsettled subject; this chapter is for nonspecialists. Of particular interest here, it seems, is the treatment of the effects of prolonged exposure to a severe noise and vibration environment for a pilot or astronaut.

W. W. KELLOGG
Planetary Sciences Department,
Rand Corporation,
Santa Monica, California

Atmospheric Motions

Jet-Stream Meteorology. Elmar R. Reiter. Translated from the German edition (1961). University of Chicago Press, Chicago, 1963. xiv + 515 pp. Illus. $17.50.

This English translation of Reiter's *Meteorologie der Strahlströme* (1961) is a monograph on many aspects of atmospheric motions; its extensive descriptive discussions are supplemented by brief summaries of certain related theoretical material. The total body of fact and interpretation collected here is impressive, but the wisdom of its organization and the significance of many points are open to serious question.

The book serves a useful purpose in that it incorporates in a single volume coherent summaries of a great many recent research papers. The bibliography is 74 pages in length, the text 433 pages; this ratio of one to six gives a fair impression of the exhaustive scope of the work and of the necessarily limited depth of the discussion. In contrast to the bibliography, the index is only seven pages, and this too gives a fair impression of my reaction to the book—the names of the authors stand out more strongly than the physical concepts with which they were concerned.

Reiter's account of the results of Project Jet Stream is well organized and clearly presented; for many readers it is probably the best part of the book. Other topics of which Reiter has made useful summaries include wind measurement, model experiments, and the influence of mountains.

In my opinion, "jet stream meteorology" no more exists than does "polar front meteorology" or "south wind meteorology," and the chief deficiency of Reiter's book is that this phantom deflects the author's real objective and confuses the reader. Reiter is concerned with the atmospheric field of motion, and he obviously knows that jet streams are descriptive abstractions of certain detectable features of the field. But the title leads to arbitrary choices: the inversion wind maximum passes the test, the convection cell does not, the monsoon is accepted, the sea breeze is not. And the title leads to distortions in emphasis and in interpretation—for example, "The second jet maximum . . . draws its energy from an anticyclone . . ." (p. 239)—so that it would be dangerous to recommend this book to readers not already fairly sophisticated in meteorology.

ROBERT G. FLEAGLE
Office of Science and Technology,
Washington, D.C.

Theoretical Models

Luminescence in Crystals. D. Curie. Translated from the French edition (1960) by G. F. J. Garlick. Methuen, London; Wiley, New York, 1963. xii + 332 pp. Illus. $8.50.

Scientists who desire to know more about luminescence in crystals are fortunate in having a book on the subject written by an expert, D. Curie, and translated by another expert, G. F. J. Garlick. The "treatment is mainly theoretical," and its chief emphasis is on theoretical models for explaining the many interesting and important phenomena that involve the emission of light from crystals. With a few brief exceptions at the end of the book, there are no descriptions of experimental apparatus and measurements or discussions of practical applications. There are careful definitions of terms and thorough descriptions and explanations of all the phenomena connected with luminescense in crystals. There is a comprehensive bibliography with about 1400 references. The book is clearly written. It is especially helpful in that it gives mechanisms and models to explain and predict the emission of light under widely varying types of stimulation.

The material covered includes spectra and probabilities of emission and absorption, configurational coordinate diagrams, optical transitions in photoconducting crystals, luminescence centers in phosphorescent sulfides, phosphorescence and thermoluminescence, activation of trapped electrons, energy transfer, sensitization and quenching, electroluminescence and electrophotoluminescence, and effects of high energy radiation.

FARRINGTON DANIELS
Department of Chemistry,
University of Wisconsin

New Books

Mathematics, Physical Sciences, and Engineering

Linear Regression. And its application to economics. Zdzislaw Hellwig. Translated from the Polish edition by J. Stadler. H. Infeld, Translation Ed. Pergamon, London; Macmillan, New York, 1963. 250 pp. Illus. $5.

Molecular Equilibrium. A programmed course in general chemistry. P. H. Carnell and R. N. Reusch. Saunders, Philadelphia, 1963. 226 pp. Illus. Paper, $2.25.

Networth Analysis and Synthesis. Louis Weinberg. McGraw-Hill, New York, 1962. 708 pp. Illus 19.50.

The New World of Physics. Arthur March and Ira M. Freeman. Random House, New York, 1962. 207 pp. Illus. Paper, $1.45.

Once-Forbidden Beta-Transitions. L. N. Zyryanova. Translated from the Russian edition (Moscow 1960) by Prasenjit Basu. Reginald W. Clarke, Ed. Macmillan, New York, 1963. 123 pp. Illus. $5.

Optimum Design of Digital Control Systems. Julius T. Tou. Academic Press, New York, 1963. 198 pp. Illus. $7.

Paramagnetic Resonance. vols. 1 and 2. Proceedings of the first international conference (Jerusalem), July 1962 (vol. 1, 414 pp., $16; vol. 2, 543 pp., $19). W. Low, Ed. Academic Press, New York, 1963. Illus. Set, $30.

Physical Chemistry of Petroleum Solvents. W. W. Reynolds. Reinhold, New York; Chapman and Hall, London, 1963. 221 pp. Illus. $10.

Principles of Bioastronautics. Siegfried J. Gerathewohl. Prentice-Hall, Englewood Cliffs, N.J., 1963. 575 pp. Illus. $16.

A Programmed Course in Basic Electricity. By the staff of the Electrical Technology Department, New York Institute of Technology, under the direction of Alexander Schure. McGraw-Hill, New York, 1963. 349 pp. Illus. Paper, $6.95.

Programmed Supplements for General Chemistry. vol. 1. Gordon M. Barrow, Malcolm E. Kennedy, Jean D. Lassila, Robert L. Litle, and Warren E. Thompson. Benjamin, New York, 1963. 139 pp. Illus. Paper, $3.95.

Thermal Physics. Philip M. Morse. Benjamin, New York, rev. ed., 1964. 469 pp. Illus. $10.50.

Les Volcans Tertiaires et Quaternaires du Tibesti Occidental et Central (Sahara du Tchad). Pierre M. Vincent. Editions B.R.G.M., Paris, 1963. 308 pp. Illus. Plates. Paper.

Wind-Driven Ocean Circulation. A collection of theoretical studies. Allan R. Robinson, Ed. Blaisdell, New York, 1963. 171 pp. Illus. $3.75.