sandstone, siltstone, mudstone, claystone, gypsum, and gray limestone; the latter lithic type characterizes the Fort Apache Member and contains the rich molluscan fauna. The Supai was interpreted as having accumulated marginal to and in a shallow epeiric sea under warm dry conditions; the cyclicity of sedimentation indicates eustatic fluctuations and a periodic encroachment of a Permian sea from the south.

In this memoir Winters provides geologists with details of the stratigraphy in 13 well-located surface sections in addition to detailed systematic description and illustration of their fauna. Three new genera were among the 22 genera of gastropods collected, and 12 new species are described; the 15 genera of pelecypods contain 20 forms. And of the two brachiopods recognized, one is a new productid genus. The fauna is superbly illustrated.

Winters has done a commendable job in providing objective data and subjective interpretation for these Early and Medial Permian sedimentary rocks. The systematic paleontology by itself is an outstanding contribution, because it provides information necessary for biostratigraphic studies in this and contiguous areas. This memoir should prove of inestimable value to stratigraphers and the paleontologists who wish to make documented correlation with the standard West Texas sections. It is self-evident that its value will be enhanced as its utility is applied in such areas as the eastern Great Basin and the Colorado Plateau. The author is to be highly complimented.

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Space Age Aerodynamics

Aerodynamics. A space-age survey. John E. Allen. Harper and Row, New York, 1963. 128 pp. Illus. $2.95.

Readers of this engagingly written little book should begin in the middle of the volume with the author's account of natural aerodynamic phenomena, for that is a fascinating story, spiced with anecdotes of men lifted by tornadoes, of wind-tunnel tests of the Rock of Gibraltar, of galloping bridges, cables, and circus tents and with accounts of other caprices of the earth's atmosphere.

Equally interesting are the subsequent chapters devoted to the streamlining of cars and trains, to the industrial use of moving air, and, of course, to the airplane. Here the narrative follows the historical acceleration from low speeds through subsonic, transonic, and supersonic to hypersonic flight. It culminates in the aerodynamics of space, including not only guided missiles and re-entry vehicles but also the small molten marbles called tektites whose extraterrestrial origin is being so hotly disputed by the experts. Treatment of such fashionable subjects as radiation and magnetohydrodynamics makes this a thoroughly modern survey of the science of air in motion.

The author is less successful in his first four chapters, where he attempts a brief summary, in simple terms, of all of aerodynamic theory. The specialist would quibble with many details: for example, Figure 5 is almost a "what's wrong with this picture?" puzzle. The nonspecialist—to whom the book is addressed—will be discouraged by a proliferation of mathematical formulas which call for a knowledge of partial differentiation and vector analysis and which could have been avoided with a bit more ingenuity.

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Note

Electronic Spectra

Volume 4 of *Organic Electronic Spectral Data* [Interscience (Wiley), New York, 1963. 1189 pp. $20], edited by J. B. Phillips and F. C. Nachod, covers spectral data published during 1958 and 1959. The text, which is similar to that of the earlier volumes in the series, is a comprehensive compilation of the data on electronic spectra of organic compounds reported in some 90 journals. Metallic salts and complexes are included. The data consist of listings of the wavelengths of all reported absorption maxima, together with logarithms of molar absorptivities at these maxima for each compound listed. Compounds are cataloged by molecular formula in a manner similar to that used in *Chemical Abstracts*. Solvents or phases used are given, as are references to the sources of the data. Volume 4, which is similar in size and format to the previous volumes, includes about 18,000 listings. The printing is satisfactory. This series continues to be the most comprehensive available listing of electronic spectra.

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New Books

Mathematics, Physical Sciences, and Engineering

The Adiabatic Motion of Charged Particles. Theodore G. Northrop. Interscience (Wiley), New York, 1963. 123 pp. Illus. $5.95.

Advances in Glass Technology. pt 2. History papers and discussions of the technical papers of the sixth International Congress (Washington, D.C.), July 1962. Frederick R. Matson and Guy E. Rindone, Eds. Plenum Press, New York, 1963. 428 pp. Illus. $15.

Advances in Heterocyclic Chemistry. vol. 2. A. R. Katritzky, A. J. Boulton, and J. M. Lagowski, Eds. Academic Press, New York, 1963. 472 pp. Illus. $14.

Advances in Photochemistry. vol. 1. W. Albert Noyes, Jr., George S. Hammond, and J. N. Pitts, Jr., Eds. Interscience (Wiley), New York, 1963. 453 pp. Illus. $16.50.

Analytical Chemistry of the Actinide Elements. Alfred J. Moses. Pergamon, London; Macmillan, New York, 1963. 147 pp. Illus. $6.75.

Astrophysics. The atmospheres of the sun and stars. Lawrence H. Aller. Ronald, New York, ed. 2, 1963. 662 pp. Illus. $15.

Atlas of Electron Spin Resonance Spectra. Theoretically calculated multicomponent symmetrical spectra. Ya. S. Lebedev, D. M. Chernikova, N. N. Tikhomirova, and V. V. Voevodskii. Translated from the Russian edition. Consultants Bureau, New York, 1963. 233 pp. Illus. $15.

Atomic Structure Calculations. Frank Herman and Sherwood Skillman. Prentice-Hall, Englewood Cliffs, N.J., 1963. Unpaged. Illus. Paper, $13.

Automatic Data Processing. Frederick P. Brooks, Jr., and Kenneth E. Iverson. Wiley, New York, 1963. 520 pp. Illus. $10.75.

Basic Topics in Mathematics. John Riner. Prentice-Hall, Englewood Cliffs, N.J., 1963. 293 pp. Illus. $6.95.

Biochemistry of Industrial Micro-organisms. C. Rainbow and A. H. Rose. Academic Press, New York, 1963. 728 pp. Illus. $22.

Boron Hydrides. William N. Lipscomb. Benjamin, New York, 1963. 285 pp. Illus. $14.

Breakthroughs in Mathematics. Peter Wolff. New American Library, New York, 1963. 285 pp. Illus. Paper, 75¢.

The Changing Concept of the Universe. Directorate of General Education Reading Material Project, Aligarh Muslim University. Asia Publishing House, New York, 1963. 120 pp. $4.75.

Chemical Analysis by Flame Photom-