does not induce droplet freezing by virtue of any crystallographic similarity to ice (p. 89), but by cooling cloud drops below the threshold of homogeneous nucleation (near −40°C). Silver iodide does not act as an ice nucleant "on which super-cooled droplets readily fasten and turn to ice" (p. 90), but rather by that dissembling trick which the authors erroneously ascribe to dry ice.

Vaeth's book, *Weather Eyes in the Sky*, is a brief and businesslike summary of the history of the meteorological satellite program and a look ahead into the future of that program. It can be recommended to any readers who seek a concise account of weather satellites, and is an account that is well bolstered with quantitative data. It is pleasingly free of purple prose about the great new breakthroughs that are to be expected not much later than the next orbit, although the general reader may nonetheless be left with misimpressions about how useful these instruments now are to working meteorologists. In fact, the payoff from the satellite program still lies in the future, a point that might have been more heavily stressed by an author further removed from the satellite program.

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## Aspects of Engineering

**The World of Engineering**. John R. Whinnery, Ed. McGraw-Hill, New York, 1965. xii + 304 pp. Illus. Paper, $3.95; cloth, $5.95.

Many worlds make up the pursuit called engineering. This anthology, title aside, does a superlative job in conveying an understanding of these many worlds.

Credit for compiling the book goes to John R. Whinnery, dean of engineering at the University of California, Berkeley. Under his editorship, the anthology's ten contributors—all outstanding engineers—have struck a high level of technical content, surprisingly so, in view of the fact that the book is basically a career guidance work. Formulas, for example, are used liberally to drive home engineering's dependence on mathematics, especially the calculus, as in Leonardo Zeevaert's chapter "The engineering of large structures." Overall, the book seems perfect for the high school senior and the college freshman, as well as for the college sophomore who has an adequate background in mathematics and science but must soon choose between a major in engineering and a major in science.

The anthology also does an imaginative job in depicting the variety of challenges in the field of engineering and their interactions with science, economics, manufacturing, and management, and even suggests that some engineering work entails routine (a tidbit that career-guidance books always play down).

In contrast with other guidance books on engineering, this one emphasizes broad engineering functions—for example, there are chapters entitled "Energy sources and energy conversion," "Material science and engineering," "Computers, communication, and control," "Bioengineering," and "Space engineering." In departing from the traditional discipline orientations (mechanical, chemical, civil, and electrical engineering, for example), the text seems to have added zest. Apparently, this approach makes it easier for an author to capture the excitement of his technical field. The traditional disciplines, nevertheless, receive an airing, but in a more telling manner, namely, the role of each and their interrelationships in fashioning an Atlas missile or a TVA.

Basically, then, this book surveys the advancing frontiers of technological development which, we are reminded, is taking place not only in space exploration, but also, for example, in building design and construction as well. As such, it can be recommended to the technical specialist who is not familiar with the hubbub that is going on in technical worlds other than his own.

STANLEY KLEIN
*Engineers Joint Council, New York, New York*

## New Books

### Mathematics, Physical Sciences, and Engineering

**Advances in Analytical Chemistry and Instrumentation**. vol. 4. Charles N. Reilley, Ed. Interscience (Wiley), New York, 1965. 521 pp. Illus. $16. Seven papers: "Recent advances in precipitation from homogeneous solution" by F. H. Firsching; "Differential dialysis" by Lyman C. Craig; "The oxygen-flask method" by A. M. G. Macdonald; "Phase-solubility techniques" by T. Higuchi and K. Connors; "The electrochemistry of cation-sensitive glass electrodes" by G. Eisenman; "Recent advances in time-of-flight mass spectrometry" by Donald C. Damoth; and "Organic analysis with ultraviolet-visible absorption spectroscopy" by L. N. Ferguson.

**Advances in Chemical Engineering**. vol. 5. Thomas B. Drew, John W. Hoopes, Jr., and Theodore Vermeulen, Eds. Academic Press, New York, 1964. 327 pp. Illus. $14. Five papers: "Flame processes—Theoretical and experimental" by J. F. Wehner; "Bifunctional catalysts" by J. H. Sinfelt; "Heat conduction or diffusion with change of phase" by S. G. Bankoff; "The flow of liquids in thin films" by George D. Fulford; and "Segregation in liquid-liquid dispersions and its effect on chemical reactions" by K. Rietema.

**Applied Optics and Optical Engineering**. vol. 1, *Light: Its Generation and Modification*. Rudolf Kingslake, Ed. Academic Press, New York, 1965. 437 pp. Illus. $15. Eleven papers contributed by P. Baumeister, F. E. Carlson, C. N. Clark, Ralph D. Geiser, Robert F. Hopfield, R. E. Jacobson, Rudolf Kingslake, Norbert J. Kreidl, Robert J. Meltzer, Joseph L. Rood, Philip T. Scharf, Harold S. Stewart, Ray P. Teele, and Adriaan Walther.

**Atomic Energy Review**. vol. 3, No. 1. A. A. Jonke, I. Lovas, and Z. Zámori. International Atomic Energy Agency, Vienna, 1965 (order from Natl. Agency for International Publications, New York). 147 pp. Illus. Paper, $3.

**Basic Facts of College Chemistry**. Alfred Vogel. Macmillan, New York, 1965. 59 pp. Paper, 95¢.

**Basic Facts of College Mathematics**. John Papay. Macmillan, New York, 1965. 64 pp. Illus. Paper, 95¢.

**Basic Facts of Trigonometry**. Louis F. Roethel. Macmillan, New York, 1965. 64 pp. Illus. Paper, 95¢.

**Chemical Physics of Semiconductors**. J. P. Suchet. Enlarged and revised translation of the French edition (Paris, 1962) by E. Heasell. Van Nostrand, Princeton, N.J., 1965. 209 pp. Illus. $8.50. Van Nostrand Series in Physical Chemistry, edited by T. M. Sugden.

**Classical Electromagnetic Radiation**. Jerry B. Marion. Academic Press, New York, 1965. 495 pp. Illus. $10.75.

**College Physics**. Robert L. Weber, Kenneth V. Manning, and Marsh W. White. McGraw-Hill, New York, ed. 4, 1965. 718 pp. Illus. $9.75.

**Colloque sur le Dévonien Inférieur et ses Limites, Rennes, September 1964**. *Mém. Bur. Rech. Geol. et Min. No. 33*. Bureau de Recherches Géologiques et Minières, Paris, 1965. 86 pp. Paper, F. 20. Résumés of 34 communications.

**Concepts in Physical Science**. Sidney Rosen, Robert Siegfried, and John M. Dennison. Harper and Row, New York, 1965. 593 pp. Illus. $9.95.

**Concepts of Engineering System Design**. Warren E. Wilson. McGraw-Hill, New York, 1965. 267 pp. Illus. $7.50.

**Einleitung in die Algebra und die**

(*Continued on page 780*)

## NEW BOOKS

*(Continued from page 740)*

**Theorie der Algebraischen Gleichungen.** F. Nevanlinna. Birkhäuser, Basel, Switzerland, 1965. 218 pp. F. 34.50.

**Electromagnetic Clutches and Couplings.** T. M. Vorob'yeva. Translated from the Russian edition (Moscow, 1960) by O. M. Blunn. A. D. Booth, Translation Ed. Pergamon, New York, 1965. 232 pp. Illus. $9.

**Electronic Information Handling.** Allen Kent and Orrin E. Taulbee, Eds. Spartan Books, Washington, D.C., 1965. 363 pp. Illus. $11. Twenty-five papers given at a national conference (Pittsburgh, Pa.), October 1964; the conference was sponsored by University of Pittsburgh, Goodyear Aerospace Corporation, and Western Michigan University.

**Elementary Contemporary Algebra.** Merlin M. Ohmer, Clayton V. Aucoin, and Marion J. Cortez. Blaisdell (Ginn), New York, 1965. 254 pp. Illus. $6.50. A Blaisdell Book in the Pure and Applied Sciences, John Kemeny, Consulting Ed.

**Elements of Inorganic Chemistry.** Robert A. Plane and Ronald E. Hester. Benjamin, New York, 1965. 204 pp. Illus. Paper, $3.95; cloth, $8. The Physical Inorganic Chemistry Series, edited by Robert A. Plane and Mitchell J. Sienko.

**Encyclopedia of Polymer Science and Technology: Plastics, Resins, Rubbers, Fibers.** vol. 2, *Amino Resins to Casein.* Herman F. Mark, Norman G. Gaylord, and Norbert M. Bikales, Eds. Interscience (Wiley), New York, 1965. 885 pp. Illus. $50.

**The Environment in Modern Physics.** A study in relativistic mechanics. C. W. Kilmister. Elsevier, New York, 1965. 142 pp. Illus. $5.

**Exploring the Physical Sciences.** Willard J. Poppy and Leland L. Wilson. Prentice-Hall, Englewood Cliffs, N.J., 1965. 384 pp. Illus. $6.95.

**Foundations of Plasma Dynamics.** E. H. Holt and R. E. Haskell. Macmillan, New York, 1965. 528 pp. Illus. $12.95.

**General Chemistry.** W. F. Luder, Robert A. Shepard, Arthur A. Vernon, and Saverio Zuffanti. Saunders, Philadelphia, ed. 3, 1965. 583 pp. Illus. $8.75.

**General Chemistry Workbook: How to Solve Chemistry Problems.** Conway Pierce and R. Nelson Smith. Freeman, San Francisco, ed. 3, 1965. 270 pp. Illus. Paper, $2.

**The General Theory of Sorption Dynamics and Chromatography.** Vladimir Vatslavovich Rachinskii. Translated from the Russian edition (Moscow, 1964). Consultants Bureau, New York, 1965. 98 pp. Illus. Paper, $15.

**Heat Transfer in Structures.** H. Schuh. Pergamon, New York, 1965. 358 pp. Illus. $10. International Series of Monographs in Aeronautics and Astronautics, Solid and Structural Mechanics Division, vol. 7.

**Humidity and Moisture: Measurement and Control in Science and Industry.** Based on papers presented at the International Symposium (Washington, D.C.), May 1963, Arnold Wexler, Ed. vol. 3, *Fundamental Standards* (576 pp., $25), edited by Arnold Wexler and William A. Wildhack; vol. 4, *Principles and Methods*

*of Measuring Moisture in Liquids and Solids* (347 pp., $20), edited by Paul N. Winn, Jr. Reinhold, New York; Chapman and Hall, London, 1965. Illus.

**An Introduction to Analysis**. Daniel Saltz. Prentice-Hall, Englewood Cliffs, N.J., 1965. 288 pp. Illus. $8.95.

**An Introduction to the Principles of Metalworking**. Geoffrey W. Rowe. St. Martin's Press, New York, 1965. 320 pp. Illus. $7.

**Ionic Aliphatic Reactions**. William H. Saunders, Jr. Prentice-Hall, Englewood Cliffs, N.J., 1965. 127 pp. Illus. Paper, $1.95; cloth, $4.50. Foundations of Modern Organic Chemistry Series, edited by Kenneth L. Rinehart, Jr.

**Ionospheric Radio Propagation**. Kenneth Davies. U.S. Department of Commerce, Washington, D.C., 1965 (order from Superintendent of Documents, Washington, D.C.). 484 pp. Illus. $2.75. National Bureau of Standards Monograph 80.

**Laboratory Approach to the Physical Sciences**. A project manual. Conrad E. Ronneberg. Houghton Mifflin, Boston, 1965. 165 pp. Illus. Paper, $2.95.

**Lunar and Planetary Surface Conditions**. Nicholas A. Weil. Academic Press, New York, 1965. 234 pp. Illus. $10. Advances in Space Science and Technology, supplement 2, edited by Frederick I. Ordway, III.

**Mathematical Analysis of Observations**. B. M. Shchigolev. Translated from the Russian edition (1960) by Scripta Technica. H. Eagle, Ed. Iliffe, London; Elsevier, New York, 1965. 366 pp. Illus. $12.50.

**Meson and Baryon Spectroscopy**. D. B. Lichtenberg. Springer-Verlag, New York, 1965. 159 pp. Illus. Paper, $2.80. Revised edition of the article published in volume 36 of *Ergebnisse der exakten Naturwissenschaften* (Berlin, 1964).

**Nuclear Chemistry**. Bernard G. Harvey. Prentice-Hall, Englewood Cliffs, N.J., 1965. 128 pp. Illus. Paper, $1.95; cloth, $3.95. Foundations of Modern Chemistry Series, edited by Robert W. Parry and Henry Taube.

**Numbers and Ideals**. An introduction to some basic concepts of algebra and number theory. Abraham Robinson. Holden-Day, San Francisco, 1965. 116 pp. Illus. $5.95.

**Optical Model of the Atomic Nucleus**. Ivan Úlehla, Ladislav Gomolčák, and Zdeněk Pluhař. Czechoslovak Acad. Sciences, Prague, 1964; Academic Press, New York, 1965. 147 pp. Illus. $7.75.

**Organometallic Syntheses**, vol. 1, *Transition-Metal Compounds*. R. Bruce King. Academic Press, New York, 1965. 198 pp. Illus. $6.50.

**Orthogonal Families of Analytic Functions**. Bernard Epstein. MacMillan, New York, 1965. 90 pp. Paper. $2.50.

**Photon Interactions in the Bev-Energy Range**. Proceedings of an international conference (Cambridge, Mass.), January 1963. Bernard T. Feld, Ed. M.I.T. Press, Cambridge, Mass., 1965. Unpaged. Illus. $5. Papers presented at a conference sponsored by the International Union for Pure and Applied Physics, the U.S. Atomic Energy Commission, the U.S. National Science Foundation, and the U.S. Office of Naval Research.

**Physical Acoustics: Principles and**

**Methods**. vol. 2, pt. B, *Properties of Polymers and Nonlinear Acoustics*. Warren P. Mason, Ed. Academic Press, New York, 1965. 403 pp. Illus. $14. Six papers: "Relaxations in polymer solutions, liquids, and gels" by W. Philippoff; "Relaxation spectra and relaxation processes in solid polymers and glasses" by I. L. Hopkins and C. R. Kurkjian; "Volume relaxations in amorphous polymers" by Robert S. Marvin and John E. McKinney; "Nonlinear acoustics" by Robert T. Beyer; "Acoustic streaming" by Wesley Le Mars Nyborg; and "Use of light diffraction in measuring the parameter of nonlinearity of liquids and the photoelastic constants of solids" by L. E. Hargrove and K. Achyuthan.

**Polyesters**. V. V. Korshak and S. V. Vinogradova. Translated from the Russian edition (Moscow) by B. J. Hazzard. J. Burdon, Translation Ed. Pergamon, New York, 1965. 564 pp. Illus. $30.

**Principles of Structural Glaciology**. The petrography of fresh-water ice as a method of glaciological investigation. P. A. Shumskii. Translated from the Russian by David Kraus. Dover, New York, 1965. 511 pp. Illus. Paper, $3. A revised version based on translations made in 1957–1958 and 1960–1961.

**Probability, Random Variables, and Stochastic Processes**. Athansios Papoulis. McGraw-Hill, New York, 1965. 595 pp. Illus. $19.50. McGraw-Hill Series in Systems Science.

**Problems in Higher Algebra**. D. K. Faddeev and I. S. Sominskii. Translated by J. L. Brenner. Freeman, San Francisco, 1965. 508 pp. Paper, $3.95.

**Proceedings of the 1965 Heat Transfer and Fluid Mechanics Institute, Los Angeles, Calif., June 1965**. Andrew F. Charwat, Ed. Published for the Heat Transfer and Fluid Mechanics Institute by Stanford Univ. Press, Stanford, Calif., 1965. 384 pp. Illus. $10. Twenty-two papers.

**The Quaternary**. vol. 1. Kalervo Rankama, Ed. Interscience (Wiley), New York, 1965. 322 pp. Illus. $15. Four papers: "The Quaternary of Denmark" by Sigurd Hansen; "The Quaternary of Norway" by Björn G. Andersen; "The Quaternary of Sweden" by Jan Lundqvist; and "The Quaternary of Finland" by J. J. Donner.

**Quick Calculus**. A short manual of self instruction. Daniel Kleppner and Norman Ramsey. Wiley, New York, 1965. 302 pp. Illus. Paper, $2.25.

**Radiative Heat Exchange in the Atmosphere**. K. Ya. Kondrat'yev. Translated from the second Russian edition by O. Tedder. C. D. Walshaw, Translation Ed. Pergamon, New York, 1965. 421 pp. Illus. $15.

## Miscellaneous Publications

*(Inquiries concerning these publications should be addressed to the publisher or agency sponsoring the publication, not to* Science.)

**Abstracts for 1964** (*Geol. Soc. Am. Spec. Pap. No. 82*). Geological Soc. America, New York, 1965. 400 pp. Paper, $3. Abstracts of papers submitted for meetings in Miami Beach, Fla.; Seattle, Wash.; Baton Rouge, La.; Moscow, Idaho; College, Alaska; and Montreal, Quebec, Canada.