latest industrial gear, which is certain to go out of date quickly), to give college preparatory students a new sense of concreteness in their study of history (building, mining, blacksmithing, time measurement, and so on), and to create the area of common activity needed to get some collaboration between students whose work centers in the shop and those whose work centers in the library. The present book is an attractive first step toward implementation of this notion. Its appeal, however, is not limited to educators and secondary school students: any scientist with an interest in history or in ingenuity will be fascinated by the drawings and brief accounts of the wide range of machines collected: the classical steam engine and classical slot machine, the oliver (a medieval blacksmith's aid), the Cornish man-engine (a weird anticipation of modern mine elevators), the Chinese south-pointing chariot, and 30-odd more. The format—a page of text facing a full-page drawing of each device—is as attractive as any such layout can possibly be. One defect of the book so far as its ostensible purpose is concerned, but a virtue for a wider audience than potential model-builders, is its preference for the mechanically unorthodox or amusing to more routine, simpler items.

As reading for a humanist or scientist, and as a step toward a new set of programs in education, the book is excellent. As an actual guide to building the attractive models it presents, it is not as good. The author keeps forgetting at crucial points that the potential model-builder can't telephone the machine shop of the school of engineering to send him a pair of balanced fine-jet nozzles of equal weight or a 30-tooth wheel for the verge-and-foliot model (the suggestion that this can be made by the student with saw and file seems to me to make sense only if the student is in prison, with nothing else to do with his time), and so on. Advice ranges from the insultingly trivial (a pulley can be whittled out of wood) to the impossible (correct adjustment of the planetary shaft of the differential box of the south-pointing chariot is essential). The compression of the text precludes more than brief allusions to historically interesting material, and every so often leads to omission of essential details. (The text and drawing of the verge-and-foliot model really give no clue to the way the pallets work; the screw-cutting machine comes out a model of obscurity; and so on.) The author talks about using standard materials, but never mentions Tinker Toy, Erector, or Meccano parts where these would be exactly what is needed.

Maybe this book is just the right first step: an exotic, if somewhat arbitrarily selected, set of plans that will interest a wide audience in its central idea. But it needs as a second step a complete redesign—perhaps four pages rather than two for each machine—in collaboration with someone who actually teaches or works in a modestly equipped shop, but who is able to get needed parts from local toy, grocery, and hardware stores. A bibliography would also help—the credits for photographs and plans are totally inadequate for this purpose. Any young model-builder should be told about Heron's *Pneumatica*, Britten's *Old Clocks and Watches*, Vitruvius' *On Architecture*, and a dozen or so more works.

ROBERT S. BRUMBAUGH
Department of Philosophy,
Yale University,
New Haven, Connecticut

Working Oceanographers

The New World of the Oceans. Men and Oceanography. DANIEL BEHRMAN. Little, Brown, Boston, 1969. xii + 436 pp., illus. $8.95.

This book is a pleasant surprise. Reading it on board a hot, cramped vessel in the Atlantic, I was prepared for another wide-eyed, slack-jawed account of oceanography in the manner of the glossy magazines, and prepared to dislike it.

Behrman's book is definitely journalistic, but in a respectable tradition. He writes in a Sunday supplement style, with a sense of humor and some degree of irreverence. Behrman is able to communicate what oceanographers do, how they do it, and, to some extent, why they do it. Everyone working in or at the sea likes to call himself an "oceanographer"; this book is a good guide to the most important scientific areas covered by that now almost meaningless term.

The book is built around the large American oceanographic institutions and the men who work in them. Behrman is able to capture the personalities and conversational styles of the people he interviews. In a way, the book is like a gossip column; working oceanographers will enjoy reading between the lines, and seeing how an outsider reacts to some of the strong personalities that abound. The book is vaguely reminiscent of a recent volume by Rex Reed entitled *Do You Sleep in the Nude?*, which does for movie stars what Behrman has tried to do for oceanography.

There is solid science in the book, generally well explained. Some of the more technical matters are accompanied by accounts that are a bit muddled and don't explain. But these are small slips and detract little from the value of the book.

The point where I do take issue with it is in the lack of distinction between good science and bad or even pseudo science. *The New World of the Oceans* is a potpourri of the profound with a sprinkling of the humbug and silly. Perhaps it takes a working scientist to appreciate the difference, or to appreciate that not all scientists are particularly bright. The author is not enough of a skeptic.

On the whole, however, this book makes good reading, either on a long oceanographic cruise or as a general source on what people try to do on oceanographic cruises.

CARL WUNSCH
Department of Earth and
Planetary Sciences, Massachusetts
Institute of Technology, Cambridge

Processes in Plants

Perspectives in Phytochemistry. Proceedings of the Phytochemical Society Symposium, Cambridge, England, April 1968. J. B. HARBORNE and T. SWAIN, Eds. Academic Press, New York, 1969. xii + 236 pp., illus. $9.

Emphasis in this symposium is on secondary metabolism, with particular reference to biosynthesis and chemotaxonomy. T. J. Mabry has contributed an interesting discussion on the establishment of structures of flavonoids by ultraviolet and nuclear magnetic resonance spectroscopy. The occurrence of secondary metabolites in relation to classification of plant taxa is discussed generally by R. Hegnauer and by H. Erdtman. V. Herout and F. Sorm consider sesquiterpenoids in relation to classification of the Compositae. E. C. Bate-Smith has written a thought-provoking paper on the occurrence of flavonoids in relation to

classification of the monocotyledons. The papers on biosynthesis cover work on the cyanogenic glucosides and mustard oil glucosides (E. E. Conn and G. W. Butler), carotenoids and triterpenes (T. Goodwin), and fatty acids (A. T. James). G. H. N. Towers gives an interesting account of phenylpropanoid metabolism in Basidiomycetes, and A. W. Galston reviews his recent studies on flavonoids in relation to photomorphogenesis in peas.

As is indicated by the title, this book is not a comprehensive review of the field. It is a series of papers reflecting the personal views of the authors on subjects they have actively researched. The chapters are well documented and have been edited to a uniformly high standard. The scientist already involved in phytochemical research will find this book helpful in keeping up with recent advances in areas related to his own particular interest. It offers an interesting entry into the literature of phytochemistry for students, particularly for those reviewing the chemotaxonomy of higher plants.

A. C. NEISH

Atlantic Regional Laboratory, National Research Council of Canada, Halifax, Nova Scotia

Books Received

Adult Psychology. Ledford J. Bischof. Harper and Row, New York, 1969. x + 310 pp. Paper, $5.

Advances in Microbial Physiology. Vol. 3. A. H. Rose and J. F. Wilkinson, Eds. Academic Press, New York, 1969. xii + 252 pp., illus. $11.50.

Antibodies and Immunity. G. J. V. Nossal. Basic Books, New York, 1969. x + 238 pp., illus. $5.95.

Apollo on the Moon. Henry S. F. Cooper, Jr. Dial, New York, 1969. xii + 148 pp. $4.50. Reprinted from *The New Yorker*.

Biomaterials. Proceedings of a Workshop on the Status of Research and Training in Biomaterials, Chicago, 1968. Lawrence Stark and Gyan Agarwal, Eds. Plenum, New York, 1969. xviii + 286 pp., illus. $12.50.

Birds of North America. A Guide to Field Identification. Chandler S. Robbins, Bertel Bruun, and Herbert S. Zim. Illustrated by Arthur Singer. Golden Press, New York, 1969. 340 pp. $5.95. Golden Field Guide.

The Cell. Carl P. Swanson. Prentice-Hall, Englewood Cliffs, N.J., ed. 3, 1969. x + 150 pp., illus. Cloth, $5.95; paper, $2.50. Prentice-Hall Foundations of Modern Biology Series.

Comparative Vertebrate Histology. Donald I. Patt and Gail R. Patt. Harper and Row, New York, 1969. x + 438 pp., illus. $14.95.

Compiling Techniques. F. R. A. Hopgood. Elsevier, New York, 1969. x + 126 pp., illus. $6. Computer Monograph Series, vol. 8.

Documentation Standards. Max Gray and Keith London. Brandon/Systems, Princeton, N.J., 1969. 176 pp., illus. $8.

Domestic Animals of China. H. Epstein. Commonwealth Agricultural Bureaux, Farnham Royal, Bucks., England, 1969. xviii + 166 pp. + plates. 80 s.

The Ecology of Reproduction in Wild and Domestic Mammals. R. M. F. S. Sadleir. Methuen, London, 1969 (U.S. distributor, Barnes and Noble, New York). xii + 324 pp., illus. $12.

Economic Policy-Making and Development in Brazil, 1947–1964. Nathaniel H. Leff. Wiley, New York, 1968. xvi + 208 pp. $7.95.

Edmond Halley. Genius in Eclipse. Colin A. Ronan. Doubleday, Garden City, N.Y., 1969. xii + 252 pp. + plates. $5.95.

Electron Optics. B. Paszkowski. Translated from the Polish edition (Warsaw, 1968) by George Lepa. R. C. G. Leckey, Transl. Ed. Iliffe, London; Elsevier, New York, 1969. 308 pp., illus. $13.

Electronic Data Processing. Glyn Emery. Elsevier, New York, 1969. xii + 344 pp., illus. $8.75.

Electronic Spectra of Transition Metal Complexes. An Introductory Text. D. Sutton. McGraw-Hill, New York, 1968. x + 208 pp., illus. $8.50. European Chemistry Series.

Electronics. A General Introduction for the Non-Specialist. G. H. Olsen. Plenum, New York; Butterworths, London, 1968. 496 pp., illus. $17.50.

The Environment of Change. Proceedings of two conferences, Sterling Forest, N.Y., Warrenton, Va., 1966. Aaron W. Warner, Dean Morse, and Thomas E. Cooney, Eds. Columbia University Press, New York, 1969. xx + 188 pp. $7.50.

A First Check List of the Herbaceous Flora of Malawi. Blodwen Binns. Government Printer, Zomba, Malawi, 1968. ii + 116 pp. 25 s.

Indian Civilization: The Formative Period. A Study of Archaeology as Anthropology. S. C. Malik. Indian Institute of Advanced Study, Simla, 1968. xii + 204 pp., illus. $8.

Induction Machines. B. V. Jayawant. McGraw-Hill, New York, 1968. xiv + 314 pp., illus. $14. European Electrical and Electronic Engineering Series.

Infrared Analysis of Polymers, Resins and Additives. An Atlas. Vol. 1, Plastics, Elastomers, Fibers and Resins. Dieter O. Hummel. Part 2, Spectra, Tables, Index. Wiley-Interscience, New York, 1969. 616 pp., illus. $72.50; by subscription, $65.

Integrated Models in Geography. Richard J. Chorley and Peter Haggett, Eds. Methuen, London, 1969 (U.S. distributor, Barnes and Noble, New York). Approx. 400 pp., illus. Paper, $2.50. University Paperbacks. Reprint of parts 1 and 4 of *Models in Geography*, 1967.

Interaction Cross Sections of Elementary Particles. V. S. Barashenkov. Translated from the Russian edition (Moscow, 1966) by Y. Oren. Israel Program for Scientific Translation, Jerusalem; Davey, Hartford, Conn., 1968. viii + 416 pp., illus. $21.50.

Introduction to Acid-Base and Electrolyte Balance. Gösta Rooth. Barnes and Noble, New York, ed. 5, 1969. 80 pp., illus. Paper, $3.50.

Introduction to Control Theory for Engineers. Allan Sensicle. Hart, New York, 1969. viii + 248 pp., illus. $10.

Statistical Analysis in Geography. Leslie J. King. Prentice-Hall, Englewood Cliffs, N.J., 1969. xiv + 290 pp., illus. $6.95.

The Structure and Properties of Water. D. Eisenberg and W. Kauzmann. Oxford University Press, New York, 1969. xiv + 300 pp., illus. Cloth, $10; paper, $4.50.

Superconductivity. E. A. Lynton. Methuen, London, ed. 3, 1969 (U.S. distributor, Barnes and Noble, New York). x + 222 pp., illus. $5. Methuen's Monographs on Physical Subjects.

A Symposium on Support and Testing of Large Astronomical Mirrors. Tucson, Ariz., 1966. D. L. Crawford, A. B. Meinel, and Martha W. Stockton, Eds. Kitt Peak National Observatory and University of Arizona, Tucson, 1968. vi + 252 pp., illus. Paper. Optical Sciences Center Technical Report No. 30.

Synchrotron Radiation. A. A. Sokolov and I. M. Ternov. Translated from the Russian by M. August and H.-R. Kissener. E. Schmutzer, Transl. Ed. Akademie-Verlag, Berlin; Pergamon, New York, 1968. viii + 204 pp., illus. $16.

Systematics, Biogeography, and Evolution of Cynorca and Dyseohyus (Tayassuidae). Michael O. Woodburne. American Museum of Natural History, New York, 1969. Paper, $3. Bulletin of the American Museum of Natural History, vol. 141, article 2, 273–356, illus. + 11 plates.

Time, Experience and Behaviour. J. E. Orme. Iliffe, London; Elsevier, New York, 1969. x + 190 pp., illus. $6.75. Behavioural Sciences Series.

To Walk the Streets Safely. The Role of Modern Science and Technology in Our Criminal Justice System. James H. Scheuer. Doubleday, Garden City, N.Y., 1969. xxiv + 240 pp. $5.95.

Traité de Zoologie. Anatomie, Systématique, Biologie. Pierre-P. Grassé. Vol. 16, Fasc. 6, Mamelles, Appareil Génital Gamétogenèse, Fécondation, Gestation. R. Courrier, R. Matthey, A. Raynaud, and C. Thibault. Masson, Paris, 1969. xii + 1028 pp., illus. 280 F.

Twentieth Century Discovery. Isaac Asimov. Doubleday, Garden City, N.Y., 1969. xiv + 178 pp. $4.95.

The Two Cultures: and a Second Look. An Expanded Version of the Two Cultures and the Scientific Revolution. C. P. Snow. Cambridge University Press, New York, 1969. iv + 108 pp. Paper, $1.25. Reprint of the 1964 edition.

World Urbanization 1950–1970. Vol. 1, Basic Data for Cities, Countries, and Regions. Kingsley Davis. Institute of International Studies, University of California, Berkeley, 1969. viii + 320 pp. Paper, $3. Population Monograph Series, No. 4.