tary astronomy (covering the planets, the sun, the moon, comets, asteroids, meteors, stars, and galaxies) and the structure of rockets to be launched into space. The simple approach to a quantitative concept of the vastness of the universe is of particular note. The entire book is simple, yet informative.

Frontiers of Science is truly a book about modern scientific development. The description of the use of the evaporograph as a means of taking pictures in the dark and the study of geobotany will be of interest to the scientifically minded person. The individual who is interested only in the sociological aspects of science will appreciate the chapters devoted to the theories of invention and diffusion in the discussion of human geography, the use of drugs in treating mental illness, and the treatment of organic diseases. In chapter 16 there is an excellent elementary discussion on the glow of the firefly.

It is difficult to describe these three books adequately in a short review. They present truth as it exists and should stimulate young people to study science. They all help to show the reader that the curtain of ignorance is being pushed ever farther open.

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American Agriculture: Geography, Resources, and Conservation. Edward Higbee. Wiley, New York; Chapman & Hall, London, 1958. x + 339 pp. Illus. $7.95.

This is a general book on the geography of American agriculture. Following three introductory chapters on broad land resources, climate, and soil, the author discusses the present agricultural patterns in the western states (13 chapters) and in the eastern states (11 chapters). The selected regions are discussed mainly in terms of the dominant physical features and present trends of land use. Maps and charts are used freely to illustrate the major regions. Diagrams of about 35 selected farms and several of communities, forest areas, and subregions are used to illustrate typical situations. Most of these are excellent but some of the large and complex ones of broad regions have been reduced too much.

In the regional chapters the author uses his case farms and such discussions as he feels will be helpful—sometimes he emphasizes soils, sometimes climate, and so on, depending on the area. Frequently he refers to significant historical, economic, and technological factors, and the effects of the agricultural programs for price supports, soil conservation, and the like. Since he does not do this consistently throughout, the basis for his selection of factors for discussion is not clear.

Orderly economic analyses of his sample farms would have helped the reader get a clear idea of the operating budgets of these farms.

Apparently the book is intended as a text for geography students who have had little or no previous training in agricultural science. It will help these students to get a conception of the variability and complexity of American agriculture and some general notion of the potentialities of our rural lands and of the problems of their use.

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Oil: From Prospect to Pipeline. Robert R. Wheeler and Maurine Whited. Gulf Publishing Company, Houston, 1958. ix + 115 pp. Illus. $2.95.

This very concise account of oil operations is intended for laymen and oil company personnel. Such a book has long been needed by the rather departmentalized professional and clerical staff of the oil companies and by countless mineral owners and investors in the oil business. It should be of great value to students contemplating a career in petroleum geology and other fields of oil technology.

In a clear and often entertaining fashion the authors have covered the technical, economic, legislative, and competitive aspects of finding and producing oil, using nontechnical language easily understood by laymen. A description of the first six chapters of the book follows:

"Oil is how you find it" considers the environment of oil accumulation and the techniques of evaluating prospects and exploring for production, all of which are within the province of the petroleum geologist.

"Drilling for oil" discusses the roles of the geologist and engineer in supervising drilling and testing operations.

"Getting the oil to market" discusses reservoir mechanics and the problems of securing oil production from the well bore.

"Who owns the oil" is a fascinating excursion into the legal problems of ownership, conservation, and legislation designed to promote the equitable sharing of this valuable natural resource.

"What's it worth" is an analysis of supply and demand, cost and profit, and unique tax legislation designed to encourage oil exploration—in general, a study of the economics of the domestic oil business.

"Pride, participate or promote" is an often amusing effort to compare the major and independent oil companies with regard to their philosophies of conducting oil operations, which run the gamut from pure prejudice to the most refined technology.

Following the main text of the book is chapter 7, an abridged oil dictionary designed to aid the secretarial-clerical staffs of the oil companies and conveying a good deal of the colorful language of the "oil patch."

The dictionary is followed by abbreviations used in oil reports, a tabulation of regional stratigraphic terminology for the important oil-producing regions in the United States, typical legal forms of mineral conveyance, and other useful tables concerning taxable income and fractional production equivalents.

Even to the experienced oil operator, this book will be of considerable interest and value because, as noted earlier, there is very little overlap between the professional departments in the oil companies. While it will not make experts of the geologists, geophysicists, reservoir engineers, landmen, and accountants in fields other than their own, it will give them some insight into and appreciation of the jobs of others.

Although most of the chapters could have been treated in considerably more detail, it was quite evidently the authors' object to treat each subject as concisely and consistently as possible. The simplicity and clarity of statement that characterize this presentation undoubtedly derive from the facts that Wheeler and his secretary, Maurine Whited, manage the operations of the Pyramid Oil & Gas Corp., and that the idea of the book was to help simplify each phase of oil operations for their directors and coinvestors.

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The Chemical Industry during the Nineteenth Century. A study of the economic aspects of applied chemistry in Europe and North America. L. F. Haber. Clarendon Press, Oxford, England, 1958 (order from Oxford University Press, New York). viii + 292 pp. $7.20.

This book defines its object as the filling of a gap in economic history, a gap that encompasses the chemical industry during its period of greatest growth. Without exhausting the subject, Haber accomplishes remarkably well the organization of this complex and obscure subject into a coherent and readable narrative. He proceeds through the jungle of sprouting and decaying business structures of the late 19th-century chemical industry with a facility which has

not, to my knowledge, been demonstrated heretofore. To a considerable extent he owes this facility to his unusual familiarity with both British and German sources. To this he adds an ability to correlate the scientific and the technical with the economic. This will come as no surprise to those who recognize him as the son of Fritz Haber, whose name is associated with ammonia synthesis.

The sulfuric acid, soda ash, caustic soda, bleaching powder, and coal-tar dye industries are described in detail—an obvious core around which revolved other chemical industries which are only briefly touched upon here. Of particular interest is the account of the struggle for survival of the Leblanc soda industry. Although the author refrains from emphasizing the point unduly, scientists will be interested to note the scientific weakness of the great British soda combine which, in its declining days, employed 50 chemists in 45 works—a ratio of 1 to each 240 employees.

The account of the German dye industry comprises the most penetrating and original part of the book, at least from the point of view of the English reader, and is especially useful in view of our tendency to regard the growth of this industry as something of a devious plot. Since the book ends with the 19th century, it leaves much of this story untold. The account of American development is competently handled, but serves as a reminder that the 19th century was not a period of great chemical enterprise in this country.

The book is well documented and indexed and is attractively printed.

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New Books

Computability & Unsolvability. Martin Davis. McGraw-Hill, New York, 1958. 235 pp. $7.50.

Correlation between Physical Constants and Chemical Structure. Graphical statistical methods of identification of mineral and fatty oils, glass, silicones, and catalysts. H. I. Waterman in collaboration with C. Boelhouwer and J. Cornelissen. Elsevier, Amsterdam, 1958 (order from Van Nostrand, Princeton, N.J.). 127 pp. $5.25.

The Eternal Search. The story of man and his drugs. Richard R. Mathison. Putnam's, New York, 1958. 381 pp. $5.95.

Electric Conduction in Semiconductors and Metals. W. Ehrenberg. Oxford Univ. Press, New York, 1958. 399 pp. $10.10.

Handbuch der Physik. vol. VI, *Elasticity and Plasticity.* S. Flügge, Ed. Springer, Berlin, 1958. 649 pp. DM. 145.

Die Infektionskrankheiten des Menschen und ihre Erreger. vols. 1 and 2. A. Grumbach and W. Kikuth. Thieme, Stuttgart, Germany, 1958. 1742 pp. $47.15.

International Review of Cytology. vol. VII. G. H. Bourne and J. F. Danielli, Eds. Academic Press, New York, 1958. 692 pp. $16.

Introductory Horticulture. E. P. Christopher. McGraw-Hill, New York, 1958. 490 pp. $7.50.

Medical Terminology Simplified. Louis L. Perkel. Thomas, Springfield, Ill., 1958. 115 pp. $3.85.

Modern Chemical Processes. A series of articles describing chemical manufacturing plants. vol. 5. Editors of *Industrial and Engineering Chemistry* in conjunction with the technical staffs of the cooperating organizations. Reinhold, New York; Chapman & Hall, London, 1958. 154 pp. $5.

Nuclear Scattering. K. B. Mather and P. Swan. Cambridge Univ. Press, New York, 1958. 477 pp. $14.50.

The Physiology and Pathology of the Cerebellum. Robert Stone Down and Giuseppe Moruzzi. Univ. of Minnesota Press, Minneapolis, 1958. 682 pp. $12.50.

Science Students' Guide to the German Language. A. F. Cunningham. Oxford Univ. Press, London, 1958. 199 pp. $2.

The Principles of Biological Control. Interrelation of hosts and pests and utilization in regulation of animal and plant populations. Harvey L. Sweetman. Brown, Dubuque, Iowa, 1958. 572 pp. $8.75.

Proceedings of the Congress on Modern Analytical Chemistry in Industry. Held at the University of St. Andrews, 24–28 June 1957. Organised by the Scottish Section of the Society for Analytical Chemistry. Heffer, Cambridge, England, 1958. 231 pp.

The Properties of Gases and Liquids. Their estimation and correlation. Robert C. Reid and Thomas K. Sherwood. McGraw-Hill, New York, 1958. 398 pp. $10.

Readings in Medical Care. Edited by the Committee on Medical Care Teaching of the Association of Teachers of Preventive Medicine. Univ. of North Carolina Press, Chapel Hill, 1958. 729 pp. $6.50.

Roaming Britain. 8000 miles through England, Scotland and Wales. Willard Price. Day, New York, 1958. 318 pp. $5.75.

Solid State Physics. Advances in research and application. vol. 6. Frederick Seitz and David Turnbull, Eds. Academic Press, New York, 1958. 443 pp. $12.

Sound Pulses. F. G. Friedlander. Cambridge Univ. Press, New York, 1958. 213 pp. $7.50.

Subsurface Geology in Petroleum Exploration. A symposium. John D. Haun and L. W. LeRoy, Eds. Colorado School of Mines, Golden, 1958. 893 pp. $10.

The Tarantula. William J. Baerg. University of Kansas Press, Lawrence, 1958. 97 pp. $3.

A Treasury of Science. Harlow Shapley, Samuel Rapport, Helen Wright, Eds. Harper, New York, ed. 4, 1958. 789 pp. $6.95.

Voice across the Sea. Arthur C. Clarke. Harper, New York, 1958. 221 pp. $3.75.

Electric Machinery. A coordinated presentation of A-C and D-C machines. Clifford C. Carr. Wiley, New York; Chapman & Hall, London, 1958. 547 pp. $9.25.

The World's Nations. An economic and regional geography. George F. Deasy, Phyllis R. Griess, E. Willard Miller, Earl C. Case. Lippincott, Philadelphia, Pa., 1958. 991 pp. $10.

Handbuch der Physik. vol. VII, *Crystal Physics II,* 273 pp., DM. 60.80; vol. XXVI, *Light and Matter II,* 972 pp., DM. 134.40. S. Flügge, Ed. Springer, Berlin, 1958.

Miscellaneous Publications

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

Cost Estimation Methods in Unemployment Insurance, 1909–1957. Harry Malisoff. New York State Department of Labor, Bureau of Research and Statistics, New York 18, 1958. 167 pp.

Serial Publications of the Soviet Union, 1939–1957. A bibliographic checklist. Compiled by Rudolf Smits. Cyrillic Bibliographic Project, Library of Congress, Washington, 1958 (order from Supt. of Documents, GPO, Washington). 459 pp. $2.75.

Educators Guide to Free Films. Compiled and edited by Mary Foley Horkheimer and John W. Diffor. Educators Progress Service, Randolph, Wis., ed. 18, 1958. 616 pp. $7.

Human Blood in New York City. A study of its procurement, distribution and utilization. Conducted by the Committee on Public Health, New York Academy of Medicine. H. D. Kruse, General Director of Study. New York Acad. of Medicine, New York, 1958. 147 pp.

The Training Program of the National Institute of Mental Health, 1947–1957. U.S. Department of Health, Education, and Welfare, Public Health Service, Washington, 1958. 65 pp.

Sanitary Engineering Education in Peru. A report of the School of Public Health of the University of North Carolina, Chapel Hill. A project for technical assistance to the National University of Engineering of Peru. Sponsored by the International Cooperation Administration–Institute of Inter-American Affairs, September 1954–May 1958. Univ. of North Carolina, Chapel Hill, 1958 (order from Dr. Daniel A. Okun, Department of Sanitary Engineering, Univ. of North Carolina, Chapel Hill). 51 pp. Free.

Some East African Pleistocene Suidae. Fossil Mammals of Africa, No. 14. L. S. B. Leakey. British Museum (Natural History), London, 1958. 133 pp. 4d 10s.

Joint FAO/WHO Expert Committee on Brucellosis. Third report. WHO Tech. Rept. Ser., No. 148. World Health Organization, Geneva, 1958 (order from Columbia University Press, New York 27). 51 pp. $0.60.

Automation and Remote Control (Soviet journal *Avtomatika i Telemekhanika* in English translation). Instruments Society of America, 313 Sixth Ave., Pittsburgh 22, Pa. General subscription, $30; libraries of academic and other non-profit institutions, in U.S. and Canada, $15; 12 issues per year.