"The existence of powerful armaments constitutes for their possessors a standing temptation to resort to violence .... And so long as governments and manufacturers continue to subsidize research into the science and technology of armaments, these temptations will remain...."

Even the fascination of power over the inanimate forces of Nature has, in Mr. Huxley's opinion, contributed to the world's trouble, by leading people to mistake for final reality the restricted aspects of experience, by the study of which scientists have shown how to attain this power. Where scientists, properly for their own purposes, have ignored a part of experience, general opinion has gone farther and denied its existence altogether. This has led to what Mr. Huxley calls "nothing-but" thinking: that "values are nothing but illusions that have somehow got themselves mixed up with our experience of the world; mental happenings are nothing but epiphenomena, produced by and entirely dependent upon physiology; spirituality is nothing but wish fulfillment and misdirected sex." So human values have been debased and the moral forces which might oppose the encroachment of power have been, by this much, weakened.

The author hopes that scientific people will give more care than they have given to the consequences of their work and that inventors and engineers will consciously devote their efforts to those applications of science which favor liberty and peace. Specifically, he hopes for more technical aid to small producers and cooperative enterprises and for research in applied science designed to relieve the economic tensions which menace international peace.

R. T. Cox

The Johns Hopkins University, Baltimore

Butalastic polymers: their preparation and applications. A treatise on synthetic rubbers. Frederick Marchionna. New York: Reinhold, 1946. Pp. vii + 642. (Illustrated.) $8.50.

Those familiar with the author's three-volume treatise, *Latex and rubber derivatives and their industrial applications*, are likely to be predisposed favorably to any publication in the field of rubber coming from his pen. The present volume is disappointing despite the worthy objectives which the author has set for himself (pp. 7, 8) and the pleasing arrangement of subject matter in certain chapters, notably Chapters 1, "Historical"; 2, "Butadiene and Its Homologues"; 3, "Halobutadiene Preparation"; 9, "Photochemical Polymerization"; 10, "Polymerization of Haloprene"; 15, "Plastic and Fluid Butalastic Compositions"; and 16, "Filming, Extruding, Coating and Laminating." The skillful rewriting of the patent literature into a volume of ready reference is undoubtedly useful, but this volume is noncritical in that it gives no adequate indication of the relative importance of synthetic rubbers, particularly those which have achieved paramount commercial importance during the present decade.

The book is organized into three major sections apart from an introduction and a brief historical review: Part I, dealing with the source and production of monomers; Part II, with polymerization mechanisms and processes; and Part III, with the properties, processing, compounding, vulcanization, and uses of *butalastics*.

The author chose the term "butalastics" at the suggestion of Ernst A. Hauser, a choice that met the approval of Gustav Egloff. With this concurrence on the part of specialists in the fields of latex and petroleum, respectively, the die was cast, and future readers of this book will have to struggle with a completely artificial nomenclature woven inextricably throughout the text. The use of terms such as "butalastics-1" for polymers of butadiene or its homologues, "butalastics E" for butyl rubber, "butalastics-3" rather than terpolymers containing one or more butadiene homologues, and "butalastics V" rather than butadiene-vinyl copolymers and homologues, seems confusing and complicated and omits or conceals the familiar names which have achieved wide commercial acceptance.

The reviewer was surprised both to find no mention of GR-S, the Government's styrene copolymer, which for many years has been the mainstay of the whole United Nations' rubber industry, the production of which has exceeded 2,000,000 tons, and to read (p. 8): "The author however, is of the opinion that no matter how good and useful these butalastics are and will be, and how much superior they may be to the natural product in several respects, they will never replace natural rubber in the production of tires which have absorbed for many years more than 68 per cent of the world's production of crude rubber." The facts are that, starting about 1944, 98 per cent of the rubber used in passenger tires was GR-S, and until recently at least 80 per cent of all of the rubber used in the industry has been synthetic.

The literature sources cited include no references subsequent to 1943, and many early patents in the field purportedly covered are omitted.

A United States patent list and three indexes (author, catalysts of polymerizations, and subjects) covering 43 pages have been provided, but the author index does not include all of the authors cited in the text. The subject index is extensive and, with experience, can be used effectively.

Despite the many miscellaneous and interesting items which have been brought together in associations which will provoke reflection and reference to the sources cited, "There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy."

H.L. Trumbull

The B. F. Goodrich Company, Akron, Ohio

The production of tobacco. Wightman W. Garner. Philadelphia-Toronto: Blakiston, 1946. Pp. xiii + 516. (Illustrated.) $4.50.

This book is of world-wide interest and importance not only because tobacco is so extensively used and cultivated but also because of the place it occupies in world trade. The importance of tobacco becomes apparent if it is realized that the aggregate annual production of this crop is about 6,500,000,000 pounds, only about one-quarter of which is grown within the United States.

Since general treatises are available on essentially all other important crops, one may properly inquire why a comprehensive account on tobacco production has previously been lacking. That no one else except Dr. Garner has been qualified to write such a book constitutes the all-sufficient reason. This volume is the product of about 40 years of field and laboratory research and experience. It is truly a monument to the author's broad acquaintance with all phases of the industry, to his incisive scientific judgment, to his painstaking

accuracy in assembling and interpreting data, and to his zealous devotion to fundamental research. It is an invaluable contribution and will satisfy a long-felt need among tobacco specialists, agricultural students, intelligent growers, manufacturers, tobacco dealers, and all others interested in tobacco.

The book is divided into three parts. The first, containing two chapters, deals with botanical aspects of the tobacco plant and its history, and with problems bearing on type, grade, and quality of leaf as related to utilization by manufacturers.

The second part, which constitutes approximately half of the book, is devoted to applied phases of tobacco production. The topics treated in its 12 chapters include varieties, soils, cropping systems, fertilization, seed beds, transplantation, cultivation, harvesting and curing practices, grading and marketing, cost of production of the different types, and important diseases and insect pests.

The third part, containing 9 chapters, deals with the physiology, genetics, and chemistry of the tobacco plant. Herein theoretic considerations and technologic practices are evaluated in such a way as to be of especial value to research workers and manufacturers in all parts of the world.

Dr. Garner has employed ample references and excellent illustrations throughout. Undoubtedly the book will be universally commended as being well balanced, informative, stimulating, very readable, and extremely useful.

F. A. WOLF

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Notes on microscopical technique for zoologists. C. F. A. Pantin. Cambridge, Engl.: at the Univ. Press; New York: Macmillan, 1946. Pp. viii + 75. (Illustrated.) $1.50.

This little book presents a small number of carefully selected and well-tested methods which the staff of the Department of Zoology, Cambridge University, have found satisfactory for the instruction of advanced students and those commencing research in zoology. We can agree with the author's statement in the Preface: "Experience shows that the student needs some guide through the embarrassing number of methods offered to him by current handbooks of microscopy and histology." The author therefore presents a selection of standard methods, accompanied by lucid but brief comments on their use. In addition, a variety of items of useful information and a small number of important references are presented. The student's knowledge of processes is assumed to be such that definitions can be dispensed with and discussions reduced to a minimum, thus bringing about a great saving of space.

The book is divided into three parts: I, General Methods (53 pp.); II, Special Methods (nervous system, cytoplasmic inclusions, specific constituents, special methods for Protozoa, etc.) (6 pp.); III, Appendix (cultivation of organisms, saline media, physical and chemical data, and preparation of records) (8 pp.). Three pages are devoted to fact and bibliographic indexes.

Beginning graduate students will find in this book a good selection of important methods and references to many special methods which may be needed in certain types of research.

The style is good, and the directions are easy to follow.

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Scientific Book Register

DUFOUR, L. *La météorologie populaire en Belgique.* (2nd ed.) Brussels: Office de Publicité, 1946. Pp. 123. (Illustrated.)

ENGLE, EARL T. (Ed.) *The problem of fertility: proceedings of the conference on fertility held under the auspices of the National Committee on Maternal Health.* Princeton, N. J.: Princeton Univ. Press, 1946. Pp. viii + 254. (Illustrated.) $3.75.

FRENCH, JOHN C. *A history of the university founded by Johns Hopkins.* Baltimore: Johns Hopkins Press, 1946. Pp. xii + 492. (Illustrated.) $4.75.

HARRIS, ROBERT S., and THIMANN, KENNETH V. (Ed.) *Vitamins and hormones: advances in research and applications.* (Vol. IV.) New York: Academic Press, 1946. Pp. xvii + 406. (Illustrated.) $6.80.

JONES, W. H. S. *Philosophy and medicine in ancient Greece.* (Supplements to the Bulletin of the History of Medicine.) Baltimore: Johns Hopkins Press, 1946. Pp. 100. $2.00.

KEENAN, J. G. *Elementary theory of gas turbines and jet propulsion.* London: Oxford Univ. Press, Geoffrey Cumberlege, 1946. Pp. viii + 261. (Illustrated.)

LEACH, W. JAMES. *Functional anatomy of the mammal: a guide to the dissection of the cat and an introduction to the structural and functional relationship between the cat and man.* New York-London: McGraw-Hill, 1947. Pp. viii + 231. (Illustrated.) $2.50.

MEES, C. E. KENNETH. *The path of science.* New York: John Wiley; London: Chapman & Hall, 1946. Pp. xii + 250. $3.00.

NATHANSON, JEROME. (Ed.) *Science for democracy.* New York: King's Crown Press, 1946. Pp. x + 170. $2.50.

PALME, ARTHUR. *Speedlights: construction and use.* Boston: American Photographic Publishing Co., 1946. Pp. viii + 128. (Illustrated.) $2.50.

REDDICK, H. W., and MILLER, F. H. *Advanced mathematics for engineers.* (2nd ed.) New York: John Wiley; London: Chapman & Hall, 1946. Pp. xii + 508. (Illustrated.) $5.00.

SMITH, EDWARD S. C., *et al. Applied atomic power.* New York: Prentice-Hall, 1946. Pp. xii + 237. (Illustrated.) $4.00.

STILES, WALTER. *Trace elements in plants and animals.* Cambridge, Engl.: at the Univ. Press; New York: Macmillan, 1946. Pp. xi + 189. (Illustrated.) $2.75.

WATERS, W. A. *The chemistry of free radicals.* Oxford, Engl.: Clarendon Press, 1946. Pp. viii + 295. (Illustrated.) $6.50.

WEBB, GERALD B., and POWELL, DESMOND. *Henry Sewall: physiologist and physician.* Baltimore: Johns Hopkins Press, 1946. Pp. ix + 191. (Illustrated.) $2.75.