topmost sample with recent conditions. On this basis one can reconstruct the floras of the past with their climatic implications. These are correlated with macrofossils and human artifacts to piece out the prehistory of the human race. Archeological objects may be accurately dated by analysis of the small samples of peat that may adhere to them, provided the pollen diagram for this peat has been adequately studied.

The field of applicability of the methods of pollen analysis is ever-increasing, pertaining not only to fossil pollen—Quaternary, as well as pre-Quaternary—but to recent pollen also, such as honey and hayfever investigations, pollination ecology, glaciology, and even criminal investigations. These methods are brought up to date and clearly and pleasantly set forth in this volume.

ROGER P. WODEHOUSE

Lederle Laboratories Division
American Cyanamid Company

The Care and Breeding of Laboratory Animals. Edmond J. Farris, Ed. New York: Wiley; London: Chapman & Hall, 1950. 515 pp. $8.00.

Those concerned with the maintenance of an animal colony for research or teaching purposes will welcome this book and perhaps wonder why it hadn't been written before. Within its pages is a wealth of information on the housing, caging, breeding, feeding, and some common diseases of several laboratory animals.

The various chapters, contributed by 15 different authors, cover the following species: monkey, rat, mouse, guinea pig, hamster, rabbit, dog, cat, ferret, opossum, domestic fowl, reptiles, amphibia, fishes, and *Drosophila*. The reviewer was particularly impressed with the chapters devoted to the domestic fowl and fishes. In addition, there is a chapter on the control of laboratory pests and parasites of animals.

A considerable portion of the book is devoted to the subject of caging. In this one phase, particularly, it is apparently easy to become an authority, as evidenced by the many modifications described and illustrated. Such minor modifications must keep commercial cage designers busy. It would appear that some standardization of cages would benefit both the animal laboratories and the manufacturers.

The discussions on animal breeding are generally very good. In some chapters mating behavior and physiology of reproduction of the species are described in considerable detail. On the other hand, the genetic aspects of breeding, with one or two exceptions, are treated in a cursory fashion, and the reader will have to search elsewhere for information.

The student of nutrition will not find in this book any great amount of data on this subject. In many chapters the discussion of feeding is primarily concluded with the recommendation to feed a commercial mixed meal or pellet. This advice offers maximum convenience and under some conditions may be adequate. However, there are certainly many conditions where the experimenter will desire more control over this environmental factor that can so largely guide the development of his stock. The reviewer hopes that future editions will present more adequately the wealth of existing information on nutrition for most of the species discussed.

The scattered literature on the common diseases and parasites of laboratory animals has been nicely summarized and is a very useful adjunct.

Many, but not all the chapters offer a useful list of references to more detailed information. The illustrations are plentiful and well reproduced for the most part. A quick search for information is facilitated by a good index.

As a reference book for the experimenter and the student of zoology, this publication should prove most useful.

S. E. SMITH

Department of Animal Husbandry
Cornell University

The Medical Sciences

The Transmission of Nerve Impulses at Neuroeffector Junctions and Peripheral Synapses. Arturo Rosenblueth. Cambridge, Mass.: Technology Press, M.I.T.; New York: Wiley, 1950. 325 pp. $6.00.

Dr. Rosenblueth's monograph organizes the rather chaotic mass of information and inference regarding the mechanism of interneuronal and neuroeffector communication. It is a lucid and authoritative exposition of the case for chemical transmission at such junctions outside the central nervous system.

The first half of the book is a well-organized and well-documented review of the evidence upon which the theory of chemical transmission in the autonomic neuroeffector junctions is based. It is an up-to-date supplement to Cannon and Rosenblueth's monograph *Autonomic Neuroeffector Systems* (New York: Macmillan [1937]). The theory of sympathins E and I is clearly stated and ably defended. Objections and alternative theories are considered. There is a useful enumeration of the organs supplied by cholinergic and adrenergic fibers, with a résumé of established and controversial points.

This first half of the book provides a logical springboard for the second half, in which the argument for chemical transmission in autonomic ganglia and neuromuscular junctions is carefully developed. Dr. Rosenblueth states at the end of the book that "The argument for chemical transmission at peripheral synapses appears stronger than that which can be made for chemical transmission at autonomic neuroeffector junctions, yet the latter transmission is generally accepted as chemical whereas the former is still considered electrical by many experts in the field." This furnishes the key to an apparent "mission" of the work, namely, to show the parallelisms existing between the two systems (and the differences as well) and thus to develop a firm basis for the inference that

the mechanisms are similar. To the author's credit, it must be stated that he does not permit missionary zeal to obscure his judgment. Even the experts who oppose the theory of chemical transmission should welcome his scholarly presentation of the evidence pro and con. It brings the issues into sharp focus and crystallizes the case for chemical transmission with impressive evidence and compelling logic. Those whom it does not convince it will stimulate, and the latter will find it exceedingly valuable for its spotlighting of the areas of inadequate information.

There is an excellent bibliography of 720 titles. Particular effort was made to provide full documentation of the more controversial issues. Two other admirable features are the fine selection of figures and the concise chapter and section summaries.

Rosenblueth deserves great credit for the clean-cut pattern which he has drawn from heterogeneous data, and for pointing out the places where the fabric is thin. His monograph fills a definite need for such a condensation and evaluation. It is indeed fortunate that the task of preparing such a book was undertaken by one whose own tireless investigations have enabled him to probe the depths of the problem and whose breadth of vision enables him to place it in proper perspective.

G. N. Loofbourrow

Department of Physiology
University of Kansas

A Manual of Artificial Radioisotope Therapy. Paul F. Hahn, Ed. New York: Academic Press, 1951. 310 pp. $6.80.

In the applications of radioactive isotopes to clinical therapy, one of the major problems has been the diversity of sources through which the literature has been scattered. This manual is a collection of 14 chapters on pertinent topics in relation to isotope therapy which will be a welcome addition to the library of physicians and radiological physicists in the field. It does not attempt to cover much of the basic material that has been included in several recent volumes on physics, as well as on clinical isotope use. It does give specific and recent data on standards and dosage, practical procedure in the use of radioactive phosphorus, iodine, and gold, and deals with instruments and autoradiography.

As suggested in the definition of this volume as a manual, the subject matter is chosen for immediate application rather than for comprehensive coverage, and it is apparent that much of the material will become outdated quickly. Nevertheless, there is a real need for the book, and it is hoped that revisions will appear at frequent intervals, as our knowledge and practice change.

The first 4 chapters deal with considerations of standards and units, general criteria for choice and use of radioactive isotopes, and internal dosimetry. All presuppose general background knowledge of the field. An excellent chapter reviews the medical indications and techniques of radiophosphorus therapy, and similar excellent coverage is given for radioactive iodine in the diagnosis and treatment of hyperthyroidism and the study and treatment of carcinoma of the thyroid. Two chapters deal with intravenous and direct infiltration uses of colloidal radioactive isotopes, although these are not widely employed as yet. Worth-while chapters are included on therapeutic instrumentation, health physics, autoradiography, procurement, and hospital program planning.

In most instances the contributing authors are outstanding authorities in their fields, and the quality of presentation is generally excellent. Useful tables of certain isotope characteristics are included, although a few more illustrations and tabular data would be desirable in certain instances.

Richard H. Chamberlain

Department of Radiology
Hospital of the University of Pennsylvania

Toxaemias of Pregnancy: Human and Veterinary. Ciba Foundation Symposium. John Hammond, F. J. Browne, and G. E. W. Wolstenholme, Eds. Philadelphia: Blakiston; London: J. & A. Churchill, 1950. 280 pp. $4.50.

This small book contains 30 formal papers of varying length on the title subject presented at a symposium held January 12–14, 1950. Eighty-seven persons participated in or attended the meetings, largely from the British Empire, although there were several from the Continent and the United States.

It is impossible to review in any detail the great amount of thought and investigation on the toxemias of pregnancy covered in these papers. If we compare the result with a similar effort carried out in Washington, D. C., in 1940, we find marked advances in knowledge and far better editing and potential distribution. To quote the foreword: "Further research, biological, chemical and clinical will doubtless clarify the position. In the meanwhile here is—I think it will be agreed—an excellent basis from which these researches may develop." To this statement I agree. The book should be an essential in every "toxemia-of-pregnancy" library.

Practically every aspect of the subject, scientific and clinical, is covered in a most up-to-date fashion. In the course of these discussions, historical facts of importance prior to 1940 are emphasized. A complete picture of the problem is thus presented. Each article is pointed, not diffuse. This is far from the case with much of the literature.

It is evident that so-called toxemia in cattle is a different disease altogether from that in women, to cite F. J. Browne.

The bulk of the evidence presented seems to incriminate the placenta and/or decidua as the cause of human eclampsism. The exact mechanism, however, is not agreed upon. Possibly all or some of the suggested pathologies are the cause.

Although difficult to select, 3 of the 30 papers are most thought-provoking. Theobald has treated by

morphine only, "between 50 and 60 cases of eclampsia in three years," with two deaths. This includes 7 patients with intercurrent eclampsia (2 with two attacks at an interval of six days) who subsequently gave birth to living babies. This experience gives rise to two questions: Why is there so much eclampsia? Is English eclampsia the same as it is in Boston, U.S.A., or do the women in England react differently?

The second paper of outstanding interest is that by Schneider on "Thromboplastin Complications of Late Pregnancy." This paper offers, by implication, an explanation of incoagulable blood in pregnancy caused by afibrinogenemia—a long-time source of obstetrical mortality only recently found to be curable by fibrinogen therapy.

In the final summary, F. J. Browne shows the impossibility of explaining eclampsism on the basis of the offered theories. He further brings up the need for study of the adrenal cortex hormones in causing toxemia. He concludes with these words: "Some of us have long felt that the problem of eclampsia is beyond the mere clinician, and that it will only be solved by such teamwork as this between physicians, physiologists, endocrinologists and chemists together with an obstetrician to keep his colleagues in touch with the clinical aspects of the problem."

The essayists, editors, and publishers are to be congratulated on this book.

FOSTER S. KELLOGG

Boston, Massachusetts

Structure et Activité Pharmacodynamique des Médicaments du Système Nerveux Végétatif. D. Bovet and F. Bovet-Nitti. Basel, Switzerland and New York: S. Karger, 1948. 849 pp. Sw. fr. 85.–.

D. Bovet and Mrs. F. Bovet-Nitti have been associated for more than a decade with Professor Fourneau at the Institut Pasteur, Paris, and moved a few years ago to the Istituto Superiore di Sanità in Rome. Their main interest has always centered around the structure and pharmacodynamic action of compounds affecting the autonomous nervous system. Due to their outstanding contributions their names are familiar to all investigators interested in the subject. Their book centers around 3 compounds: adrenaline, acetylcholine, and histamine. A great fraction of each section is devoted to the chemical structure of the compounds, their derivatives, analogues, and homologues. From there the authors proceed to the analysis of the pharmacodynamic actions; the correlation with structural modifications and the structural relationship with antagonistically acting compounds are analyzed. Applicability of various compounds and their toxic effects are also described.

This study is an outstanding contribution to the field, and the amount of information given is amazing. There is no other text of this type available. The work is full of original ideas and interesting new facts. In spite of the extraordinarily wide range covered, one never has the feeling of "desk chemistry," but of a presentation based upon great experience and competence derived from experimental work. Of particular interest is the chapter on antihistamines and curare and curarelike compounds. During the past few years both types of compounds have attracted much attention in pharmacological research and medical application. The pioneer work of Bovet in these two fields makes him particularly qualified, and these chapters contain much material that cannot be found elsewhere. For the enzymologist interested in competitive actions, the structural modifications of antagonistically active compounds will be a rich source of valuable information. The physiological implications of some pharmacodynamic actions are only occasionally and very briefly mentioned. Some of the physiological views are not shared by the reviewer. These aspects do not form an integral part of the book, however.

This volume should be in every library and is highly recommended to all investigators in the field.

DAVID NACHMANSOHN

Department of Neurology
College of Physicians and Surgeons
Columbia University

The Physiology and Pathology of Exposure to Stress. Hans Selye. Montreal, Canada: Acta Endocrinologica, 1950. 1,025 pp. $14.00.

Dr. Selye's theory of stress as the motivating factor in the pathogenesis of a multitude of disorders ranging from arthritis to hypertension, and his concept of the General-Adaptation-Syndrome, as the mechanism of response of the organism to external stimuli, are by now well known. Although propounded some years ago, these theories were propelled to fame by the discovery of the remarkable effects of cortisone and ACTH, and have been widely heralded as offering a theoretical basis for the assumed physiological actions of these drugs. Selye's ideas have been received by many in both scientific as well as lay circles as inaugurating a new era in medical thought and as epoch-making in importance. A smaller, less vocal, but perhaps more critical, group on the other hand has been unwilling to accept the Selye hypothesis as of any fundamental significance and, in fact, feels that the concept is neither new nor enlightening. According to this group, the general adaptation syndrome is no more than Claude Bernard's concept of the constancy of the internal environment or Cannon's concept of homeostasis carried to absurd lengths. The lumping together of arthritis, hypertension, and a host of other disorders on the basis of superficial resemblances is also deprecated. It is true, to be sure, that the same agent (e.g., desoxycorticosterone) may induce an elevation in blood pressure and changes in the fibrous tissue of the joints and in the myocardium. However, the observed rise in pressure does not constitute hypertensive cardiovascular disease, the changes in the joints are not those of arthritis, and the myocardial damage is not acceptable as identical with rheumatic

fever. After all, tissues can respond in only limited ways to damaging influences, particularly when viewed by the relatively crude methods of microscopic anatomy.

Probably only the mellowing effects of time will relegate the concept of stress, as outlined in this book, and the therapeutic and physiologic significance of cortisone and ACTH, upon which in large measure it is predicated, to their proper importance. The critical reader will find much to alienate his admiration; the uncritical and inexperienced reader will be carried away by the extravagance of the author's concepts. Both will agree that Dr. Selye has assembled an astonishing array of apparently unrelated facts. Whether the result is an epoch-making new concept, a hodgepodge of irrelevance, or an interesting survey will undoubtedly be argued for some time. In any case, he has presented his argument with his usual fervor and the liberal use of such neologisms as "Cushingoid," "corticoid," "trophophylaxis," etc., which characterize his prolific writings.

ARTHUR GROLLMAN

Department of Physiology and Pharmacology
Southwestern Medical School of the
University of Texas

Elements of Bacterial Cytology. 2nd ed. Georges Knaysi. Ithaca, N. Y.: Comstock, 1951. 375 pp. $5.00.

During the past decade interest in bacterial cytology has increased rapidly. Development of the electron and phase microscopes and refined microchemical techniques has led to the contribution of additional knowledge to the already vast volume of literature that followed Cohn's classic work on bacterial morphology.

In 1944 Knaysi presented a concise organization of the information and judgment derived from more than 15 years of study and research on the nature of the bacterial cell. Many valuable but widely scattered descriptions of the structures and behavior of microorganisms were selected to illustrate each aspect of cytology. This second edition has been expanded to include the most recent research on the structure, chemical composition, and motility of the cell. New charts and photographs admirably illustrate the structures referred to in the text. Many unsolved and controversial problems have been presented and discussed by the author, whose contributions in this field eminently qualify him for the task.

Important additions have been made in many sections of the book. The discussion of the variation in the form and size of the bacterial cell during the processes of growth and reproduction presents evidence of cytological differences among microorganisms. There is an entirely new chapter on the chemical composition and structural organization of the cell. The subject of the bacterial nucleus has been more thoroughly presented in the light of recent research. A consideration of the changes in the osmotic pressure of the cells and medium during growth supplements the section on the physicochemical properties of bacterial membranes. The revised chapter on the motion of bacteria discusses both sides of, perhaps, the most controversial question in cytology today. Outstanding electron micrographs show the details of spore germination and greatly increase the value of the chapter on the spores of bacteria. There has been little or no revision of the sections dealing with the cytology of the actinomycetes, spirochetes, and myxobacteria. The author obviously has not attempted to include all the recent literature; however, the student will find the references to earlier work most useful.

The bacterial cytologist encounters many imposing problems in his efforts to observe and explain the nature of living cells. Many of the techniques that have been employed result in important changes that may kill the cells or, at least, alter their activities. Slight modifications in procedures may cause marked differences in the appearance and behavior of the cells, with the resultant lack of agreement among investigators. The straightforward and well-illustrated presentation of the various observations, followed by their considered interpretations, by one of the leaders in bacterial cytology should prove of real value in orienting the reader in a field confused by many conflicting opinions.

Elements of Bacterial Cytology most adequately accomplishes the aim of the author to present a clear concept of the structure of the bacterial cell "according to what is judged to be the best present knowledge."

RUTH LOFGREN

Department of Bacteriology
University of Michigan

Scientific Book Register

A Study of Classic Maya Sculpture. Tatiana Proskouriakoff. Washington, D. C.: Carnegie Institution of Washington, 1950. 209 pp.; 111 figures. $5.75 paper; $6.25 cloth.

Genetic Neurology: Problems of the Development, Growth, and Regeneration of the Nervous System and of its Functions. Conference sponsored by the International Union of Biological Sciences. Paul Weiss, Ed. Chicago: Univ. Chicago Press, 1950. 239 pp. $5.00.

The Mountain of Giants: A Racial and Cultural Study of the North Albanian Mountain Ghegs. Carleton S. Coon. Cambridge, Mass.: Peabody Museum of American Archaeology and Ethnology, Harvard University, 1950. 105 pp., 16 figures. $4.75.

Native Orchids of North America: North of Mexico. Donovan Stewart Correll. Waltham, Mass.: Chronica Botanica; New York: Stechert-Hafner, 1950. 399 pp. $7.50.

An Introduction to Universal Serologic Reaction in Health and Disease. Reuben L. Kahn. New York: Commonwealth Fund, 1951. 159 pp. $3.50.

Selected Topics in X-Ray Crystallography from the Delft X-Ray Institutes. J. Bouman, Ed. Amsterdam: North-Holland; New York: Interscience, 1951. 375 pp. $11.00.