metabolism, 34. Section IV: Nature of integration, 30; conservative regulation (that is, *p*H, blood flow, and salts), 35; progressive regulation (that is, differentiation, growth, and reproduction), 19; nervous integration, 21. There is a 22-page index as well as 119 figures and 35 well-packed tables. Each chapter is provided with 20 to 40 key references.

In the present-day plethora of academic symposia written by many hands, it is a great pleasure to see that one man can still make a valid appraisal of the subject of animal physiology as a whole, and the book gains a great deal from this individual approach. Throughout the book, the author has shown that one can understand living systems only if one knows both the biochemical and the physiological parameters. Thus, at least 100 of the pages have biochemical formulas and equations on them, and the formulas are always integrated into the treatment of the general workings of the animal. Those who read this book will never become the kind of biochemist that thinks of the liver merely as a convenient source of mitochondria.

The text is very readable, and the factual data are arranged so that the major ideas and concepts stand out clearly. Both recent views (NAD, cyclical AMP, voltage clamp, and tubule counter-current exchange) and classical views (Lavoisier, Von Helmholtz, and Claude Bernard) are presented. Although the general approach is simple, the author does not fail to indicate that some of the present-day concepts are not consistent with experimental data, and a critical attitude is inculcated. A lot of ground work is covered, but Scheer has not forgotten that it is equally important to let the reader "have a glimpse of the stars" too. The overall effect of the book is that of an optimistic approach to physiology, and the reader will be left with the feeling that animal physiology is an exciting subject full of interesting problems waiting to be solved.

Some readers may feel that undue, or too little, emphasis is given to various aspects of the subject. I think the basic question that one should ask is, "Would I be content if, after one year of study, my students knew and appreciated the material presented in this book?" The answer must be an unqualified "Yes."

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Atmospheric Composition

Air Chemistry and Radioactivity. Christian E. Junge. Academic Press, New York 1963. xii + 382 pp. Illus. $13.50.

Christian Junge is particularly well qualified to write on atmospheric composition because of his life-long interest in the subject. He has worked in this field in Germany and in the United States, and he is continuing this work at the Universitätsinstitut für Meteorologie und Geophysik, Mainz, Germany.

This book could be more appropriately entitled, "Atmospheric Composition," since the author's main topics are the chemical composition of the atmosphere, of dust, of radioactive contaminants, and of rain. Five main subjects are considered: (i) gas composition; (ii) aerosol and (iii) radioactive materials (their quantities, composition, distribution, and transport); (iv) the chemical content of precipitation in the form of snow and ice; and (v) air pollution (a brief account). The second and third topics appear to be his main interests. His title for the fourth chapter, "Chemistry of precipitation," is vague; for example, he does not discuss the physical chemistry of nucleation.

First and foremost, Junge presents a complete discussion of the available information on the topics mentioned above. His list (418) of early and recent references should prove to be a valuable source of further information on particular subjects. It is important to realize, however, that he intentionally omits both experimental methods of obtaining atmospheric composition and a description of the atmosphere above 50 km where chemical reactions predominate. His approach to the interdependencies of composition and atmospheric processes involves a study of the facts and laws of injection, transport, and removal of all kinds of matter in our atmosphere. His consideration of chemical compounding in the homosphere is limited to the photochemical balance of ozone, the possible effects of lightning, radioactive decay, and a few other rare processes. The intriguing possibility that the mole fraction of water vapor increases with height in the stratosphere is explained by large-scale mixing processes in the region of the winter pole. Many interesting details about the large-scale circulation between troposphere and stratosphere are brought to light by his summary of the tracking of radioactive bomb products and other dusts. The CO_2 balance of the earth and the effects of photosynthesis, fuels, and seawater storage are discussed; however, the role of $C^{14}O_2$ is but briefly outlined.

In general, this survey is useful, and it will be welcome owing to the increasing importance of atmospheric composition in the scientific and in the political fields. Junge's summary of the many man-made contaminations of our air, both in the form of photochemical smog and in more subtle and—to date—innocuous ways, is particularly interesting and critical. This well-written and superbly executed book will be an asset not only to meteorologists, but also to chemists and even legislators who are battling air pollution and radioactive fallout.

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Ornithology

Birds of Wisconsin. Owen J. Gromme. Published for the Milwaukee Public Museum by the University of Wisconsin Press, Madison, 1963. xvi + 220 pp. Illus. Until 1 Feb., $18; $22.50.

Although this book's title is *Birds of Wisconsin* it should be "Illustrations of the Birds of Wisconsin," for it is a picture book that presents, in color, all the birds yet recorded with certainty from that state. As such, it is not intended to be a reference source for discrete details of occurrence and habit or other information; it is designed to give pleasure to its users as they thumb through the pages and enjoy the complete series of colored avian portraits, painstakingly painted by Owen J. Gromme, longtime curator of birds and mammals at the Milwaukee Public Museum. A companion text volume is contemplated.

The first 89 plates portray the 328 species of known Wisconsin birds; the remaining plates (16) are grouped under a subtitle "Birds in Action and in Habitat." The second group was painted with no intention of including them in a book but merely to depict various aspects of the birds in their surroundings and in poses evocative of remembered observational experiences. Opposite each of the first 89 plates is a page of corresponding, but smaller, silhouette sketches; each sketch is accompanied by a map of Wisconsin that

shows areas of seasonal occupancy and by a scale of the months that shows the seasonal presence of the species in the state.

The plates form a notable series of bird pictures, and they should give Wisconsin bird watchers many opportunities to recall personal observations and whet their desire to see species that they have not yet met with in the field. So many colored illustrations of North American birds have been published that another set no longer fills an acute need. In some instances the color used in this volume leaves something to be desired—for example the bobolink (plate 74), the scarlet tanager (plate 79), and the hermit thrush (plate 62) —but it is not possible to say whether this is the fault of the printer or of the artist-author. On the other hand, many of the figures are very satisfactory.

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Organic Chemistry

Newer Methods of Preparative Organic Chemistry. vol. 2. Wilhelm Foerst. Translated from the German by F. K. Kirchner. Academic Press, New York, 1963. xvi + 417 pp. Illus. $14.50.

This is the second volume in a series of books which contain a collection of review articles, treating selected topics of organic synthetic procedures; the first volume appeared in German in 1944 (the English edition in 1949) and was very well received. This volume, like the first one, is written in the vein of *Organic Reactions* but is less exhaustive than the latter.

The translation is generally well executed, with the exception of the first part of the chapter on reduction with complex hydrides, which reads awkwardly. The implication that the book presents an up-to-date review of the latest developments in the field is somewhat misleading, for the original articles on which the volume is based were published in *Angewandte Chemie* more than 5 years ago and the German edition, published in 1960, was brought up-to-date as of 1959. The lack of very recent literature coverage is not as important in some chapters as in others, and in general it is outweighed by the authoritative treatment of the subjects.

The following subjects are discussed: (*i*) syntheses: with acetoacetaldehyde, with ethyl 2-cyclopentanonecarboxylate, and with ketene; (*ii*) preparations: of peptides and ureas from reactive amides, of long chain carboxylic acids from 1,3-cyclohexanediones, of phosphines and their analytical importance, of intermediates of carbohydrate metabolism, and of phenylsodium. Furthermore, there are chapters on the reduction of carbonyl compounds with complex hydrides, alkylation of aromatic amines, amidomethylation, oxidations with noble metal catalysts, alkylation of phenols with alkenes, and oxidations with lead tetraacetate. All chapters, except the one on hydride reductions, contain useful examples of experimental procedures.

A notable feature is the inclusion of an author index in the English edition. On the other hand, the grouping of references at the end of each chapter (and the repetition of some references) is regrettable, for research chemists usually prefer to have the citation of references placed at the bottom of each page.

The book will be useful as a reference source to the English-speaking chemist who is searching for basic preparative information on the subjects treated.

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Notes

Radioecology (Reinhold, New York, 1963. 766 pp. Illus. $16.50), edited by Vincent Shultz and Alfred W. Klement, Jr., and published for the American Institute of Biological Sciences, contains 86 papers, many of them by several authors, and two useful bibliographies, one on terrestrial and freshwater radioecology, the other on marine and aquatic radioecology. The material, which is the proceedings of a symposium held in September 1961, has been reproduced in a quick and functional way (without indexing, however), to make the information available as soon as possible. The problems presented in this work may best be summarized in the words of E. P. Odum (page 645):

"Since radiation ecology is an interdisciplinary area, halfway between important groups of physical sciences on the one hand and biological sciences on the other, it is clear that the future student who approaches the area from either side must be better oriented to the principles of the other side than is the case at present. The future of mankind may well depend on how well education can fill the gap between life and the atom."

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New Books

Biological and Medical Sciences

Advances in Small Animal Practice. vol. 4. Proceedings of a congress (London), March 1962. Bruce V. Jones, Ed. Pergamon, London; Macmillan, New York, 1963. 138 pp. Illus. $8.50.

Analytical Methods for Pesticides, Plant Growth Regulators, and Food Additives. vol. 1, *Principles, Methods, and General Applications*. Gunter Zweig, Ed. Academic Press, New York, 1963. 651 pp. Illus. $24.

Animal Ecology. Aims and methods. A. Macfadyen. Pitman, New York, ed. 2, 1963. 368 pp. Illus. $10.

Antibiotics, Second International Symposium. Naples, 1961. pts. 1 and 5. pt. 1, *New Antibiotics: Side Effects of Modern Chemotherapy* (376 pp., $20.50); pt. 5, *Antibiotics: Chemoprophylaxy and Chemotherapy of Lesions Caused by Ionising Radiations* (308 pp., $17). H. P. Kuemmerle, P. Preziosi, and P. Rentchnick, Eds. Karger, Basel, Switzerland, 1963. Illus.

British Pharmaceutical Codex, 1963. Published by direction of the Council of the Pharmaceutical Society of Great Britain. Pharmaceutical Press, London, 1963. 1469 pp. Illus. £5 5s.

Canadian Cancer Conference. vol. 5. Proceedings of the fifth Canadian Cancer Research Conference, June 1962. R. W. Begg, C. P. Leblond, R. L. Noble, R. J. Rossiter, R. M. Taylor, and A. C. Wallace, Eds. Academic Press, New York, 1963. 493 pp. Illus. $14.

Les Chemins de la Vie. Etienne Wolff. Hermann, Paris, 1963. 255 pp. Illus. Paper.

Comparative Physiology of Vertebrate Respiration. G. M. Hughes. Harvard Univ. Press, Cambridge, Mass., 1963. 159 pp. Illus. $2.75.

The Control of Chromatophores. M. Fingerman. Pergamon, London; Macmillan, New York, 1963. 194 pp. Illus. $7.50.

Cytodifferentiation and Macromolecular Synthesis. A symposium (Asilomar, Calif.), June 1962. Michael Locke, Ed. Academic Press, New York, 1963. 286 pp. Illus. $10.

Epidemiology and Communicable Disease Control. Fred B. Rogers. Grune and Stratton, New York, 1963. 112 pp. Illus. $5.50.

Essays on Nucleic Acids. Erwin Chargaff. Elsevier, New York, 1963. 223 pp. Illus. $8.

Essays on Protozoology. H. Sandon. Hutchinson, London, 1963. 143 pp. Illus. Paper, 15s.