None. Now, King's splendid book has met the need, without superficiality.

This book is recommended unreservedly as a textbook for courses of about one academic year, at roughly the first-year graduate level. It may be used to broaden the horizons of spectroscopists who have, by reason of training or availability of instruments, been confined to a single spectral region, or to acquaint theoretical quantum chemists with the bases for the numbers that they often must use. The intellectual and real prices of the book bring it within reach of these potential users.

As with many of the best texts, support by thorough discussion or lectures on difficult points will be desirable. Systems and methods are introduced in order of increasing complexity, and the topics are connected carefully, but often tersely. The second half of the chapter on group theory is an example of material for which such elaboration will be desirable.

The following are examples of the small number of confusing usages—the use (p. 196) of the term "O-branch" instead of "anti-Stokes lines" for a pure rotational Raman spectrum, and the implication (p. 401) that assignments of symmetry species to the excited electronic states of benzene are securely based on experiment rather than mainly on theory. These difficulties are slight, and among those noted none were more serious. In addition, none of the surprisingly few misprints noted could lead to misunderstanding.

Finally, the book is well produced, and it is a particular pleasure to find an accurate description on the publisher's dust jacket: "Dr. King writes with clarity and authority. His text is a distinguished contribution to a dynamic field."

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Botany

The Life of Plants. E. J. H. Corner. World, Cleveland, Ohio, 1964. xiv + 315 pp. Illus. $12.50.

Faced in biology with a bewildering proliferation of knowledge, much of it recondite detail, Corner has come, in this highly original, artfully written, beautifully and originally illustrated book, to a solution of "how to write a small book about plants *in toto*." His *The Life of Plants* masterfully combines the macroscopic and microscopic into a well-balanced whole, the best work of its kind that I have seen. It is new in concept, new in approach, new in examples. Corner truthfully states in the introduction that "the books that deal with general botany have grown so tediously compendious . . . so thoroughly dull and dully thorough, that I have no hesitation in offering this survey, understandable, I hope, and therefore open to experiment, proveable and progressive."

The author, who is a Reader in taxonomy at the University of Cambridge, is a mycologist, and he has had a wealth of experience, chiefly in the tropics of both hemispheres, that has transcended his own specialty: He is one of the most versatile and well-rounded plant scientists of these times. This is reflected throughout his work—indeed, primarily on account of it, the book lives and breathes.

Some botanists may not agree with all of his approaches and interpretations. They are there, however, as a challenge and stimulus—and this alone is valuable. The book is full of stimuli, many of them statements of such simple thoughts that they often have been forgotten because of their simplicity: "The comparison of a grass and a tree, of a meadow and a forest, is a sterile exercise, until it is remembered that a tree, as a seedling, is also a small plant"; "Growing up in botany means occupying more room"; "The extremes of fungus life are the slow massive growths with large spore output and the small quick growths with small spore output. . . ."

The book is arranged in 15 chapters ranging from such topics as "The ocean" through "The land plant" to "Beyond the forest." Speaking in his final chapter on human activity and machines, the author warns that "The botanist must hurry if he would take the opportunity that a few brief centuries of his science have revealed; for soon there will be rice-fields to every river-brink. The unmindful tree begot, indeed, the seed of its own destruction."

In an appendix, there are chosen references designed for further reading and study, in addition to a selected bibliography of 152 titles. An excellent glossary and index are provided. The line drawings are clear and precise, and the photographs, most of them by Corner himself, are superb; there are eight full-page color plates. The paper and printing are of highest quality, and I certainly feel that, at $12.50, the book is not overpriced.

I would count the beginning student of botany fortunate who was taught from Corner's *The Life of Plants* by a teacher who could do it justice as a textbook. It may not, and probably will not, become a widely used text, but its influence will long be felt. For the teacher who uses it must be—to some extent, if not to the extreme that is true of Corner—entirely imbued with an unlimited feeling for and oneness with the Plant Kingdom as a dynamic part of life on earth. The title is, indeed, most meaningful: *The Life of Plants*.

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The Rockefeller Awards

Adventures in Public Service: The Careers of Eight Honored Men in the United States Government. Delia Kuhn and Ferdinand Kuhn, Eds. Vanguard, New York, 1963. xiv + 272 pp. Illus. $3.95.

In 1951, because of his concern with apparent deterioration in the morale and in the public image of employees of the U.S. Civil Service and the U.S. Foreign Service, John D. Rockefeller, III, was instrumental in the establishment at Princeton University of the program known as Rockefeller Public Service Awards. This original program was essentially a fellowship program, and under it, with funds of nearly a million dollars contributed by Rockefeller, from 1952 to 1960, 79 outstanding federal careerists were enabled to take sabbatical leave for advanced study or research at a university or in some comparable educational activity. The program was entirely successful: it gave widespread public recognition to the fact that the award winners were representative of the many highly competent and dedicated federal career workers, and it demonstrated the need and desire of many of these careerists for further education to increase their capabilities. Much of the purpose of the original program was accomplished with the Government Employees Training Act of

1958 (PL 85-507); President Eisenhower acknowledged that the Rockefellow Public Service Awards Program was a major factor in bringing about this legislation.

The continuing need for private sponsorship of special public recognition of the career Federal worker is being met by the new Rockefeller Public Service Awards Program, begun in 1960. The new program, like its predecessor, is designed "to enhance the prestige and improve the morale of those who devote their lives to public service." Normally, a new award is made every year, in each of five different fields of activity, to a person who has already achieved high distinction in the federal service.

The present volume is an account of the lives and careers of eight of these distinguished "new program" Rockefeller Public Service Award winners. The careerists and their biographers are: Hugh L. Dryden (Howard Simons), Llewellyn E. Thompson (Wallace Carroll), Sterling B. Hendricks (Gove Hambidge), Colin F. Stam (E. W. Kenworthy), Thomas B. Nolan (George R. Stewart), Robert H. Felix (Herbert C. Yahraes, Jr.), Robert M. Ball (Oscar Schisgall), and Richard E. McArdle (Milton MacKaye). In addition to the foreword by Princeton's President Robert Goheen, the book also contains portraits of the eight awardees, brief biographical sketches of the authors and editors, a short general introduction to the requirements, opportunities, and rewards of federal service (intended for the young reader), a list of winners under the original program, and a complete list of awards winners under the new program.

The stories of these men of accomplishment are lively and fascinating reading. The authors have done a uniformly excellent job in making one aware of the profound influence that these people have on our everyday lives. There is, of course, high drama in the account of Llewellyn Thompson's negotiations with the Russians over the Trieste problem and of his relations with Khrushchev during the U-2 incident. This is the stuff of which headlines are made. There is quiet but compelling drama in the story of the never-ending battle waged by Chief Forester McArdle against the enemies of our forest lands—both the natural enemies and those of the human variety. With each account one realizes how much the destiny of America can be shaped by the decisions of public officials in high places, and therefore how lucky he is to have men like these around. These men richly deserved their awards and the other honors they have received.

The interplay between the men and their institutions is revealing. The story of the man necessarily requires the telling of the story of his institution, and this is done with skill. Some of the men and their institutions grew up together; with others this was not so, but strong mutual influence always existed.

What could have been a stuffy book, is not. The quite varying personalities of these eight men come through with clarity. We see something of their nonprofessional lives, and we see how they react under the pressures and frustrations of public office. All in all, this is a well-researched, well-planned, and engrossing treatment. It is heartily recommended to readers of all kinds.

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Organic Chemistry Textbook

Basic Principles of Organic Chemistry. John D. Roberts and Marjorie C. Caserio. Benjamin, New York, 1964. xxvi + 1315 pp. Illus. $13.90.

This volume is big in scope, big in treatment, and just big. With the addition of a couple more pages, it would have weighed exactly 2 kilograms.

In the preface the authors mention that the book was originally conceived as a revision of Lucas' remarkable textbook, remarkable in that, three decades ago, it introduced thermochemistry and bond energies at the elementary level. Although this volume is far more than a revised Lucas, it does generally retain his order of presentation of functions (aliphatics, then aromatics, then heterocyclics and special topics). It has greatly expanded the physical scope. In the authors' words—"This book is not only designed as an introductory text for the student of organic chemistry; it aims also to reach the chemistry major, graduate student, and research man alike. . . ."

In developing the chemistry of a homologous series, a teacher or student should consider coverage of the following topics: structure and nomenclature, physical properties, sources and methods of preparation, reactions, uses, laboratory aspects, and theoretical aspects. Nomenclature is treated expertly here. It is refreshing to note the care that has been devoted to it, and despite a few slips good usage generally prevails, even in paragraphs not directly concerned with naming. Names that should be unspaced are unspaced, and two-word names are given as two words. Isocyanides are not called "isonitriles." Esters of toluenesulfonic acid are called toluenesulfonates, not tosylates. "Bromo acid" is not abused as "bromoacid," and "keto ester" is not maltreated as "ketoester."

The treatment of physical properties is outstandingly well done, especially with regard to spectroscopy and nuclear magnetic resonance, which are developed in detailed fashion with clear presentations for interpretation of spectra. In general, solubilities in water are ignored, although a few are listed. Odors are omitted, even those of esters or isocyanides. Bond lengths are shown for many compounds, and ΔH values are given for many reactions. Theoretical aspects dealing with reaction mechanisms, resonance, conformations, molecular orbitals, and excited states in photochemistry are all handled in a way that is illuminating to the reader.

Expansion of a text at one or more places usually necessitates shrinkage at others, even in a book this size. The shrinkage here seems to have occurred at syntheses, reactions, and uses. Much is included, naturally, but the "laboratory feel" for organic chemistry is somewhat slighted. Two examples will illustrate. Under acetic acid, for example, one never encounters its commercial synthesis or the term glacial acetic acid. Again, the authors mention changing an alkylacetylene $RC{\equiv}CH$ into its anion, $RC{\equiv}C^-$, by KNH_2, but they fail to record reaction of $RC{\equiv}C^-$ and an alkyl halide ($R'X$) to yield $RC{\equiv}CR'$, or the synthesis of $RC{\equiv}CH$ from acetylene itself with KNH_2 and RX. Omissions of this type are not necessarily bad. They give the teacher something to do.

In summary, this is an important textbook. It is certain to have a profound impact on the teaching of organic chemistry for years to come.

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