References

1. "Twelfth Report of the Human Renal Transplant Registry," *J. Am. Med. Assoc.* **233**, 787 (1975).
2. D. M. Bernstein and R. G. Simmons, *Am. J. Psychiatry* **131**, 1338 (1974); C. H. Fellner and J. R. Marshall, *ibid.* **126**, 1245 (1970); R. M. Eisendrath, R. D. Guttmann, J. E. Murray, *Surg. Gynecol. Obstet.* **129**, 243 (1969).
3. R. G. Simmons, S. D. Klein, R. L. Simmons, *The Social Impact of Transplantation* (Wiley-Interscience, New York, in press).

Ionic Intermediates

Halonium Ions. GEORGE A. OLAH. Wiley-Interscience, New York, 1975. xvi, 190 pp., illus. $18.50. Reactive Intermediates in Organic Chemistry.

This monograph by George Olah, who is also the editor of the series in which it appears, is restricted to long-lived haloniums in solution or in the form of isolated salts, although important references to halonium ions as reaction intermediates are included. The coverage is comprehensive (there are 218 references, some from 1974), with full attention given to work done outside of Olah's laboratories.

Part A of the book, on acyclic halonium ions, has five chapters, including ones on dialkyl-, alkylaryl- and diarylhalonium ions. Part B, on cyclic halonium ions, has six chapters, including ones on ethylenehalonium and tetramethylenehalonium ions. Extensive tables of ^{1}H and ^{13}C nuclear magnetic resonance data are included, as are many spectra from the original papers.

The writing is clear and careful, although I noted perhaps 20 typographical errors. The book has a few controversial features. In the nomenclature section Olah has numbered the halogen "one" in the tetramethylene halonium ion and related cyclic ions. Since *Chemical Abstracts* regards the tetramethylene radical as an entity that must have carbon numbered one, the present book ensures that a hodgepodge of numbering systems will continue to be used. Olah's efforts to discriminate between sigma and pi bonding of positive halogen to alkenes involve considerable intuitive thinking in an area where there are no sharp dividing lines.

The reagent methyl fluoroantimonate is mentioned a number of times. However, work to be published in the *Journal of the American Chemical Society* in spring 1976 has indicated that the reagent is actually methylated sulfur dioxide (in sulfur dioxide solvent). The mechanisms, but usually not the products, of various halonium-ion-forming reactions will require some modification as a result of this reassignment of structure. The author index of the book often refers the reader only to a page in the list of references where the reference number can be found rather than to the page of the text where the reference is cited. The nine-page subject index appears to be comprehensive.

Olah's book is the first review of stable halonium ions that includes ions other than aryl halonium ions. Researchers who may wish to explore the use of halonium ions can proceed with confidence that the main areas explored to date are outlined in it.

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Excited Atoms and Molecules

The Excited State in Chemical Physics. J. WM. MCGOWAN, Ed. Interscience (Wiley), New York, 1975. xii, 492 pp., illus. $25.50. Advances in Chemical Physics, vol. 28.

Excited atoms and molecules are important in many diverse environments, including planetary atmospheres, interstellar clouds, photolytic reactors, lasers, flames, discharges, and explosions. Experimental and theoretical techniques used to study excited states are equally varied. There is a definite need to summarize the widely scattered literature of this field and to unify our understanding of the physics and chemistry of excited species. This book is partially successful in providing such a summary. It is a collection of seven articles that review the properties and behavior of excited atoms and small molecules. Electronic, vibrational, and rotational excitation and their interconversions are examined from both theoretical and experimental viewpoints.

The book has one major deficiency: it is out of date. Most of the chapters appear to have been assembled about 1971. Some of them include supplements with more recent references, but they are not complete and newer work is not incorporated into the text. Important developments such as laser-induced fluorescence monitoring of excited products, molecular beam studies with excited reactants, modern theories of nonadiabatic collisions, and isotope separation are not discussed at all.

The most informative chapters, in my opinion, are those by McGowan, Kummler, and Gilmore on upper atmospheric processes and by L. Krause on sensitized fluorescence, both of which include useful and up-to-date tables of excited state properties. The chapters by Ian W. M. Smith on reactions of excited species and by Robert C. Amme on vibrational and rotational excitation also contain valuable information, although much of it can be readily found in other recent reviews. The chapter by E. E. Nikitin on nonadiabatic collision theory is particularly out of date, containing no mention of recent work by Bauer, Fisher, Pechukas, Preston, Miller, and George. Nevertheless, it is a valuable and important chapter, as is the other theoretical chapter, by Joyce J. Kaufman, on excited state potential energy surfaces.

The primary purpose of this book, according to its preface, is to gather together and critically summarize the various diverse aspects of excited state research. Although it falls short of this objective, it should be a valuable resource for the nonspecialist.

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Integrative Marine Biology

Marine Ecology and Fisheries. D. H. CUSHING. Cambridge University Press, New York, 1975. xiv, 278 pp., illus. Cloth, $27.50; paper, $6.95.

This is an important book. In it Cushing attempts to integrate the theory and knowledge of fishery biology with that of marine ecology. Whether the reader thinks he has been successful will depend on background, bias, and degree of skepticism concerning the theory and content of either field. But such an integration is clearly necessary and, whatever one thinks of some of Cushing's interpretations, he has obviously chosen the right path and has made progress along it.

For the landlocked reader an explanation is in order. There are at least three classes of marine biologists. There are the fishery scientists, who study stocks, their recruitment, growth, and other aspects of population dynamics as affected by fishing pressure. They are frequently employed by the state, are in the unenviable position of being directed to do mission-oriented research, and often treat their subjects as if fish lived in a biological vacuum. There are the biological oceanographers (sometimes also called marine biologists), who are concerned with the structure, function, and efficiency of transfer of energy and materials through food webs. These are often academics and sometimes have the unfortu-

nate habit of lumping widely disparate species into some sort of trophodynamic slush. This makes it difficult to discern the factors that may be involved in the regulation of single-species stocks of fish. A third group of marine biologists (sometimes also called biological oceanographers) is those who find it convenient to use as objects of study organisms that just happen to live in seawater. The molecular biochemistry of sea snake venom is an example of an effort in this last category.

Cushing wishes to meld the first two of these approaches and quite properly ignores the third. He correctly points out that no general theory of regulation seems to be emerging from the traditional approach of fisheries scientists and suggests some reasons. The main problem seems to be that, in a wide variety of stocks and species, there is a very poor relationship between size of spawning stock and subsequent recruitment of juveniles to the stock. Cushing has gathered together many data sets to plot recruitment as a function of spawning stock size. The resulting scatter diagrams (*J. Cons. Int. Explor. Mer* **33**, 340 [1971]) cover an expanse of paper that is mind-boggling. This can only mean that there are truly enormous variations in rates of larval mortality for given year classes, and the question is why. Cushing's point is that we are unlikely to get much insight into this problem from the study of the stock itself but rather should also investigate the ecology of fish larvae and the factors affecting their survival. He reviews a number of possible factors, among them variations in the match-up between spawning and larval drift on the one hand and the timing of the process of plankton production on the other, climatic events that may influence density-dependent processes at all ages, and changes in the nature of the biotic habitat due to variability in large-scale vertical and horizontal mixing.

Central to his arguments is the notion that there is competition for food among larvae and between larvae and other zooplankton. Changes in competition coefficients could, therefore, be invoked to account for the observed variation in larval survival, and herein lies the weakness in the book. It is by no means clear that planktonic systems are generally regulated by competitive interactions: predation seems to be at least equally important. Variations in predation rate, due perhaps to changes in type of predator, could be quite significant. Cushing cannot be accused of ignoring this aspect, however, for he does point out that some episodes of changing species structure of the plankton seem to be associated with variations in larval abundance. These plankton changes are not merely some sort of perturbation of ordinary seasonal succession but rather are long-lasting structural changes in the community. This is not a serious flaw, for the reader can easily see this sort of evidence if that is what he is looking for.

Cushing's book should be read and his thesis discussed and debated. It is almost certain that we are on the verge of developing a general theory of marine community regulation, and his book is an important contribution to it.

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Books Received

Acquired Resistance of Microorganisms to Chemotherapeutic Drugs. F. E. Hahn, Ed. Karger, Basel, 1976. x, 272 pp., illus. $56.25. Antibiotics and Chemotherapy, vol. 20.

Advances in Optical and Electron Microscopy. Vol. 6. R. Barer and V. E. Cosslett, Eds. Academic Press, New York, 1975. xii, 332 pp., illus. $33.25.

Aging. Vol. 1, Clinical, Morphologic, and Neurochemical Aspects in the Aging Central Nervous System. Papers from a meeting, Los Angeles, Sept. 1974. H. Brody, D. Harman, and J. Mark Ordy, Eds. Raven, New York, 1975. xii, 222 pp., illus. $16.

AIBS Directory of Bioscience Departments and Faculties in the United States and Canada. Peter Gray. Dowden, Hutchinson and Ross, Stroudsburg, Pa., ed. 2, 1976 (distributor, Halsted [Wiley], New York). xxvi, 660 pp. $25.

American Chemists and Chemical Engineers. Wyndham D. Miles, Ed. American Chemical Society, Washington, D.C., 1976. xii, 544 pp. $28.50.

Analysis of Intrauterine Contraception. Proceedings of a conference, Cairo, Egypt, Dec. 1974. Fouad Hefnawi and Sheldon J. Segal, Eds. North-Holland, Amsterdam, and Elsevier, New York, 1975. xii, 490 pp., illus. $31.25.

Architecture for the Poor. An Experiment in Rural Egypt. Hassan Fathy. University of Chicago Press, Chicago, 1976. xviii, 234 pp. + plates. Paper, $5.95. Reprint of the 1973 edition.

Assessment of Skeletal Maturity and Prediction of Adult Height (TW2 Method). J. M. Tanner, R. H. Whitehouse, W. A. Marshall, M. J. R. Healy, and H. Goldstein. Academic Press, New York, 1975. viii, 100 pp., illus. $22.25.

Asteroids, Comets, Meteoric Matter. Proceedings of a colloquium, Nice, France, Apr. 1972. Cornelia Cristescu, W. J. Klepczynski, and B. Milet, Eds. Editura Academiei, Bucharest, Romania, 1974 (U.S. distributor, Scholium International, Flushing, N.Y.). 334 pp., illus. $37.50.

Astronomy. A Popular History. J. Dorschner, C. Friedemann, S. Marx, and W. Pfau. Illustrations by G. Löffler. Translated from the German edition (Leipzig, 1975). Van Nostrand Reinhold, New York, 1975. 208 pp. $22.50.

Automata Theory. An Engineering Approach. Igor Aleksander and F. Keith Hanna. Arnold, London, and Crane, Russak, New York, 1975. xiv, 172 pp., illus. $15.50. Computer Systems Engineering Series.

Basic Electric Circuits. A. M. P. Brookes. Pergamon, New York, ed. 2, 1975. viii, 354 pp., illus. Cloth, $12; paper, $8.50. Pergamon International Library.

Bibliography of Electrophoresis 1968–1972 and Survey of Applications. Zdenek Deyl, Jan Kopecky, Jiri Davidek, Milada Juricova, and Rudolf Helm. Elsevier, New York, 1975. xiv, 862 pp. Paper, $83.50. Supplementary vol. No. 4, 1975, to the *Journal of Chromatography*.

Biochemistry and Pharmacology of Platelets. Proceedings of a symposium, London, Jan. 1975. Associated Scientific Publishers (Elsevier, Excerpta Medica, North-Holland), New York, 1975. viii, 352 pp., illus. $23.95. Ciba Foundation Symposium 35 (new series).

The Biology of Cancer. A New Approach. P. R. J. Burch. University Park Press, Baltimore, 1976. vi, 452 pp., illus. $29.50.

The Biology of the Guinea Pig. Papers from three symposia, 1972 and 1973. Joseph E. Wagner and Patrick J. Manning, Eds. Academic Press, New York, 1976. xii, 318 pp., illus. $30.

Chemical Tools in Catecholamine Research. Proceedings of a conference, Göteborg, Sweden, July 1975. North-Holland, Amsterdam, and Elsevier, New York, 1975. Two volumes, illus. Vol. 1, 6-Hydroxydopamine as a Denervation Tool in Catecholamine Research. Gösta Jonsson, Torbjörn Malmfors, and Charlotte Sachs, Eds. xx, 372 pp. Vol. 2, Regulation of Catecholamine Turnover. Olle Almgren, Arvid Carlsson, and Jörgen Engel, Eds. xx, 310 pp. The two-volume set, $53.95.

Chemistry, Energy, and Human Ecology. Fred Kabbe and Lois Kabbe. Houghton Mifflin, Boston, 1976. xii, 448 pp., illus. $11.95.

Chromosome Variations in Human Evolution. Papers from a symposium, London, Jan. 1974. A. J. Boyce, Ed. Taylor and Francis, London, and Halsted (Wiley), New York, 1975. x, 132 pp., illus. $12. Symposia of the Society for the Study of Human Biology, vol. 14.

Chronic Illness in Children. Its Impact on Child and Family. Georgia Travis. Stanford University Press, Stanford, Calif., 1976. xviii, 556 pp. $19.50.

Collective Phenomena and the Applications of Physics to Other Fields of Science. Papers from a seminar, Moscow, July 1974. Norman A. Chigier and Edward A. Stern, Eds. Brain Research Publications, Fayetteville, N.Y., 1975. xxvi, 492 pp., illus. Paper, $10.

College Programs for Paraprofessionals. A Directory of Degree-Granting Programs in the Human Services. New Human Services Institute, Queens College. Human Sciences Press (Behavioral Publications), New York, 1975. viii, 136 pp. $9.95.

The Color Atlas of Intestinal Parasites. Francis M. Spencer and Lee S. Monroe. Thomas, Springfield, Ill., ed. 2, 1975. xviii, 158 pp. $14.75.

Commutative Algebra. Vol. 1. Oscar Zariski and Pierre Samuel with the cooperation of I. S. Cohen. Springer-Verlag, New York, 1976. xii, 332 pp. $14.80. Graduate Texts in Mathematics 28. Reprint of the 1958 edition.

Complex Carbohydrates. Their Chemistry, Biosynthesis, and Functions. A Set of Lecture Notes. Nathan Sharon. Addison-Wesley, Reading, Mass., 1975. xxii, 470 pp., illus. Cloth, $21.50; paper, $12.50.

Computer Science. Programming in BASIC.