WILLIAM A. SHURCLIFF, Polarized Light – Production and Use. 207 pp. with figs. Harvard University Press, Cambridge, Massachussetts – 1962. \$ 6.25.

This monograph deals with the essentials of polarized light and of polarizers, and attempts to make readily available to the nonspecialist the literature on this subject. The author lists some 500 references and more than 100 patents, with subject titles, and thus achieves this valuable goal. On the other hand, this reviewer finds the body of the volume to be rather limited in outlook. The volume steers away from any theoretical or mathematical description of the fundamental physics, and gives little feeling to the reader for the molecular basis of the phenomena described. There is virtually no discussion of the relations between the geometric and polarizational properties of crystals and there is only a poor description and listing of the chemical systems exhibiting polarization effects. The author, although sketching some uses in scientific research, pays little detailed attention to the laboratory uses of polarized light. On the other side of the coin, the book contains a very complete glossary of terms used in describing polarized light, polarizers and retarders. Chapters 1 and 2 are concerned with the description of the state of polarization of light beams, and Chapters 3 through 7 discuss the macroscopic properties, the types and performance characteristics of polarizers. Chapter 8 discusses in detail the methods (Use of the Poincaré Sphere and vector-matrix techniques such as the Mueller Calculus and the Jones Calculus) for describing the behavior of a light beam of known incident direction and polarization which passes through a polarizing system. Consistent with the author's background, there is particular attention to the sheet polarizers developed by E. H. LAND and the Polaroid Company, and to applications such as the control of intensity, glare and color (Chapter 9). All these items are described clearly and with examples, and are illustrated by means of neat linesketches.

To summarize, this book is written from essentially an engineering viewpoint and will teach the reader to compute the effects of known polarizing systems on an incident light beam and to design polarizers to desired specifications; it will furnish the reader with an overall survey of the applications and characteristics of the polarization phenomenon, and will provide him with a valuable set of references to delve more deeply into the subject.

JOHN A. WEIL

Chemistry Division Argonne National Laboratory Argonne, Ill. F. J. Morton & G. Smith. The Genera Scopulariopsis Bainier, Microascus Zukal, and Doratomyces Corda. Mycological Papers No. 86: 1—96, 29 text figures. Commonwealth Mycological Institute, Kew Surrey, 20 March 1963. 30s.

A brief introduction gives a historical survey of the form-genus *Scopulariopsis*, its perfect state, *Microascus*, and its stilbaceous counterpart, *Doratomyces*, formerly known as *Stysanus*. Methods of study and sources of materials are given, and occurrence, economic importance, pathogenicity and biochemistry are discussed. It is shown that while other species cause mild forms of human disease, *Scopulariopsis brevicaulis* causes more serious human disease, especially in the tropics. It is most commonly associated with onychomycosis although it produces other types of lesions. Where arsenical compounds are present in pigments used in tapestries and wallpaper, this fungus can also produce volatile arsenicals that have ill effects on persons inhabiting buildings decorated with these materials.

The three genera are described in detail. A key is presented to these genera, the 6 series into which Scopulariopsis is divided, and the recognized species of the three genera. Nine species of Microascus are recognized with no new species or transfers. Seventeen species of Scopulariopsis are recognized. The S. brevicaulis Series sensu stricto (or subseries brevicaulis) includes S. brevicaulis (SACC.) BAINIER, the type of the genus, S. flava (SOPP) comb. nov., S. asperula (SACC.) HUGHES, S. koningii (OUD.) VUILL., S. candida (GUEGUEN) VUILL., and S. fusca Zach. The S. brevicaulis Series, subseries acremonium includes S. acremonium (DEL.) VUILL., the new species S. canadensis, and the poorly known species S. oudemansii Vuill. In the S. spaerospora Series are placed S. sphaerospora ZACH, the new S. carbonaria, and the poorly known species S. nivea Demelius. The S. brumptii Series includes species formerly assigned to Masoniella, S. brumptii SALVANET-DUVAL, S. crocea VAN BEYMA, the new combination S. chartarum (SMITH), and the new species S. parvula. Finally, two species are included in the S. timicola Series, S. timicola (Cost. & MATR.) Vuill, and S. baarnensis, a new name based on Oospora polychroma van Beyma which is not the same as S. polychromica SZILVINYI, a species not recognizable from the literature and of which material was apparently not available.

The genus Doratomyces was established by CORDA and is the valid name for those species formerly assigned to Stysanus. Included in this genus as presently constituted are: D. stemonitis (PERS. ex FR.), which includes Echinobotryum atrum CORDA as a subsidiary spore form, D. purpureofuscus (FR.), D. microsporus (SACC.), D. nanus (EHRENB. ex LINK), D. phillipsii (BERK. & LEIGHTON), and D. putredinis (CORDA), all being new combinations.

Descriptions of species and discussions of materials studied are quite complete for all the species in all three genera. The monograph is illustrated with excellent line drawings showing spores, annellophores, and related structures clearly. A list of over 180 species names is presented in alphabetical order. Some of these names are no longer usable because specimens are not available for study, many are synonyms. An extensive bibliography is presented.

This is a long awaited and an excellent monograph. It is indispensable for the library of anyone working with the moniliaceous fungi whose spores are borne on annellophores.

WM. BRIDGE COOKE

Robert A. Taft Sanitary Engineering Center Cincinnati, Ohio

Gregory, P. H. The Microbiology of the Atmosphere. 251 pp. with 28 figs., 7 plates, Interscience Publishers, Inc., New York, 1961.

This book deals with an analysis of the many factors which determine and control the amount and type of particulate matter which may reach any point. While the author speaks primarily of such microbiological substances as bacteria, viruses, spores of moulds, pollen, and protozoa, his analysis should apply to other particles such as dusts from insect disintegration, smoke and industrial wastes and other natural and man-created particles which may contaminate the atmosphere. He discusses the layers of the atmosphere and the effect of physical forces on them, the various mechanisms of liberation of biological particles (to which he gives the general term of "spores"), the processes involved in diffusion and how particles are deposited. Findings of the earth's surface, upper air and ocean air are described. Evidence is presented that under some circumstances particulate matter has been transported virtually thousands of miles from its source. The techniques of various methods of air sampling are compared. Throughout the book the physics and mathematics of the factors involved are presented in clear fashion. The volume is packed full of data, ideas and much food for thought.

This book should be of substantial value to the general biologist, microbiologist, plant pathologist, botanist, public health and air pollution expert, allergist and mycologist. In fact, its contents should be of interest to all biologists and physicians.

SAMUEL M. FEINBERG

Department of Medicine Northwestern University Medical School Chicago, Ill. "Symbiotic Associations". Edited by P. S. NUTMAN & BARBARA Mosse. Cambridge University Press. 1963. Price: \$ 9.50.

As the editors' preface states, "the origin, organization and functioning of symbiotic systems are discussed" in this book. That the diversity of such systems was recognized and treated during this thirteenth symposium of the Society for General Microbiology is apparent from the list of subjects and participants given below:

"Integrative and disintegrative factors in symbiotic associations," R. Dubos & A. Kessler; "Bacteriophage lysogeny," W. Arber; "Experimental studies of lichen physiology," D. D. Smith; "Factors influencing the balance of mutual advantage in legume symbiosis," P. S. Nutman; "The root nodules of non-leguminous angiosperms," G. Bond; "The biochemistry of nitrogen fixation," D. J. D. Nicholas; "Some effects of forest tree roots on mycorrhizal Basidiomycetes," E. Melin; "Vesicular-arbuscular mycorrhiza: an extreme form of fungal adaptation," Barbara Mosse; "Algae and invertebrates in symbiosis," M. R. Droop; "Symbiosis and aposymbiosis in arthopods," Marion A. Brooks; "Ambtosia beetles and their fungi, with particular reference to *Platypus cylindrus* Fab.; "Symbiotic associations: the rumen bacteria," R. E. Hungate; "The growth and metabolism of rumen ciliate protozoa," G. S. Coleman; "Studies on bacterial associations in germ-free animals and animals with defined floras," M. Lev; "Defence reactions of orchid bulbs," J. Nürsch.

On the whole, the balance of topics treated has been effectively maintained although the large amount of work on gnotobiosis in vertebrates has been given only brief review. Perhaps the recency of this field is an excuse for this imbalance but the tantalizing glimpse provided by Lev into the anatomical differences between germ-free and conventional animals begged for amplification. Furthermore, the interesting symbionts of the vascular cryptogams are mentioned only briefly, if at all. Nevertheless, a rich array of organisms were discussed and selection always is necessary, so that the convenors have done well to include as much as they did, in their "frugal matter-of-fact style," as described by Dr. Nutman.

Most of the papers are reviews by recognized authorities on the subject. Some unevenness is engendered by the differing amounts of original unpublished work presented but perhaps this is inevitable. Moreover, some generalizations are put forward which appear to me to be unwarranted. Thus, Dubos suggests that "several types of cells can and do exist with several mechanisms of information storage which are and remain independent of each other." As an example, he uses the failure of the loss of chloroplasts by Chlorella to affect this cell in any way other than through the photosynthetic system. This may be true but it neglects the fact that the ability to form these organelles is dependent upon the nuclear apparatus, in a manner analogous to that by which Kappa depends upon the genome of Paramecium. There may be some gain to phylogenetic speculation by thinking of the cell "as an assembly of several independent genetic organelles which have been thoroughly integrated" but the fact of integration is a phylogenetic as well as ontogenetic reality. Furthermore, it is surprising to learn that Brooks believes

that the nature of symbionts in arthropods is still at issue. She states that there is "No reason to believe that cell fragments cannot be cultured as well as whole cells." True enough, but neither can such an argument prove that cell fragments can be cultured. Surely the data accumulated through the use of the electron microscope, and the developing knowledge of the nature of isolated symbionts of insects have laid this negative argument to rest.

The separate topics in this book cohere by virtue of the recurrence of certain themes which characterize the field at this time. These include the fragility of the balance between parasitism, symbiosis and independent existence. Such is demonstrated to be the case in lysogenic viruses, as well as in several of the higher organisms. Another theme which recurs is the need for the separate growth of the symbiotic partners in order that the nature of the relationship be fully elucidated. In this case, it is startling to learn how few the number of symbiotic microorganisms is that have been cultured free of other organisms, let alone on defined media. In this way, and in others, most of the papers in this volume successfully achieve Dr. Smith's aim "to formulate working hypotheses to guide future research."

ALFRED S. SUSSMAN

Department of Botany The University of Michigan Ann Arbor, Michigan

CURRIE, D. J. & SMIALOWSKI, A.: Photographic Illustration for Medical Writing. With 87 black and white illustrations and 6 color plates. 116 pp. Charles C. Thomas, Springfield, Ill. 1962. Price \$ 7.50.

This handsome volume is an excellent addition to the many publications on medical photography. It stands well in its own right. It definitely belongs in the hand of everybody who intends to write a well illustrated paper or book. Every phase of creation of an illustration in black and white or color, from taking the photograph down to the printer's proof, is considered, well described and well illustrated. Writers who will heed the advice of the authors will have fewer rejections and editors will have much less struggle with the illustrative material, if well presented. The physical appearance of the book is impeccable. It is highly recommended.

TIBOR BENEDEK

R. CIFERRI, Revisio Ustilaginearum (Pars 1. *Tilletiaceae*). Quaderno, No. 27, XIV, 431 pp. (1963). Istituto Botanico Della Università, Laboratorio Crittogamico, Pavia. L. 3,000.

This first part of a revision of the taxonomy of the smuts of the world is introduced by a foreword in English giving the author's plan of approach and basic philosophy of the taxonomy of the smut fungi. A brief historical review precedes discussion of morphological and biological characteristics on which speciation is based. Morphological characters include well-defined structural differences, relatively small differences in shape of any formed element, and statistically recognizable differences in size. Biological characteristics include matrical characteristics based on direct, indirect or supposed evidence of parasitism, ecological, and pathographic characteristics.

The author uses the standard binomial nomenclature, but for subspecies, variety, form, race, etc., he uses a trinomial without indication of subspecific level. In formal presentation of taxa the names of the author or authors of the binomial are placed after the species name in the usual way. This is followed by the name of the subspecific category and its author's name. Where this type of combination is made by CIFERRI, the name of the author is included in parentheses with only rare indications as to whether a new combination is proposed or not. If the subspecific epithet was published as a nomen nudum or as some other invalid or illegitimate taxon, this may be noted in the synonymy but the validating author is not credited. This method of citing subspecific categories is at variance with the understanding of Fischer & Shaw (Phytopathology 43: 181—188, 1953) and with the method required by The International Code of Botanical Nomenclature. With this method, 26 species in 4 genera have more than one subspecific category, the most complex being Entyloma compositarum with 21 trinomial variants.

Keys to families, genera, and species, are in Latin as are all generic and species descriptions. Citations and synonymies are given for all recognized categories, types are listed for the family and genera recognized, and habitat, host and distribution are given for each species. Each of the doubtful and excluded species is discussed and probable correct disposition is indicated. Following the systematic treatment, indices are given to hosts and smut species recognized.

A total of 356 species of fungi is considered in the systematic part. This includes 41 doubtful species and 51 excluded species in each of 6 and 7 genera. The genera are arranged alphabetically and include the cited number of species: Burrillia (7), Doassansia (18), Entorrhiza (6), Entyloma (79), Melanotaenium (10), Jamesdicksonia (1), Narasimhania (1), Polysaclopsis (1), Tilletia (84), Tracya (2) Tuburcinia (including Urocystis) (52), and 3 unknowns.

Keys to each genus are first based on host family, then morphological and other characters are considered. Within each genus the species are arranged alphabetically. This makes page numbers in

keys less necessary, although it is not always easy to find species

without page numbers.

The book is printed on heavy paper in large type, apparently by an offset process. A minimum of typographical errors was noted during a hurried check. The author noted that while this is a compilation, many species including his own had to be submerged in synonymy and that a critical world-wide monograph is still needed.

WM. BRIDGE COOKE

Robert A. Taft Sanitary Engineering Center Cincinnati, Ohio

R. CIFERRI & C. CAMARA, Tentativo di Elencazione dei Funghi Italiani. I. Erisifali. Quaderno No. 21, 48 pp. 1962. Istituto Botanico Della Università, Laboratorio Crittogamico, Pavia. L. 800.

II. Uredinali. Quaderno. No. 23, 98 pp. 1962. L. 1,500.

III. Peronosporales. Quaderno. No. 30, 93 pp. 1963. L. 500 (Preliminary Enumeration of Italian Fungi.)

This series of lists of Italian fungi is introduced in part I by a brief history of Italian fungal lists and the method of developing the series.

In Part I the Erysiphales are listed alphabetically according to genus. The systems proposed by Salmon, Jaczweski and Blumer are considered basic, and recent studies of imperfect states by Golovin, Ciccarone and Ciferri and Corte are followed. The genera *Blumeria* Golov. and *Linkomyces* Golov. are rejected because they were based on characters of doubtful validity and are nomina nuda.

The list includes 612 taxa of which 462 are considered to be synonyms of the 150 species listed from Italy. A few new combinations are proposed but as published these are invalid since any reference to the basinym is omitted. No subspecific categories are recognized. New combinations for imperfect states are proposed even when the taxon is placed in synonomy with that of the perfect state. In general Merát basinyms are ignored.

Part II, Uredinales, lists 727 species of rust fungi for Italy. In addition, 837 synonyms are listed with the species to which the authors assign them. These are assigned to 34 genera of which *Puccinia* is the largest with 404 species. GÄUMANN, ARTHUR and GUYOT are cited as authorities whose lists are followed so long as ranges overlap. No subspecific categories are accepted, no new combinations were noted in a cursory glance at the lists, and no family distinctions are made. Type of life cycle is noted for each species.

Part III, Peronosporales, lists 523 taxa of which 208 species in 10 genera are accepted as valid records for Italy. *Peronospora* is the largest genus with 141 species. The list includes species of both families in the order. While the work of others is recognized, the list basically brings Berlese's list up to date in the Gäumann system. No subspecific categories are recognized. At least one invalid new combination is made in which no basinym is cited.

The appearance of these three orders first in this listing of Italian fungi attests to the importance of these fungi in plant disease. Since they include obligate parasites, there are few taxonomic problems based on culture methods. These lists can be useful in geographic studies of plant disease and in adding to information concerning species relationships. They are printed on fairly heavy paper by an offset process and appear to have few typographical errors.

WM. BRIDGE COOKE

Robert A. Taft Sanitary Engineering Center Cincinnati, Ohio

Ellis, M. B. Dematiaceous Hyphomycetes. IV. Mycological Papers, No. 87, Commonwealth Mycological Institute, Kew, Surrey. 42 pp. 26 figs. 1963. Price 15 s.

This paper discusses 29 species, assigned to 13 genera, of which 26 species are fully described and illustrated; the other three are the subjects of critical notes. The majority of the genera possess smoky or dark, septate or dictyoid spores which suggest those of Helminthosporium, to which a number of them have previously been referred. One new genus, Spondylocladiopsis, with a single new species is erected. Other new species are proposed in Periconia (1), Arthrinum (1), Helicoma (1), and Stigmina (2). New combinations including a new name, are proposed in Sirosporium (6), Anellophorella (1), Exosporium (2), Sporidesmium (1), Stigmina (4), Corynospora (3), and Bactrodesmium (1).

There are no keys, but a key to Sirosporium is promised in a forthcoming paper.

G. W. MARTIN

Department of Botany University of Iowa Iowa City, Iowa

AJELLO, L., GEORG, K. LUCILLE, KAPLAN, W. & KAUFMAN, L.: Laboratory Manual for MEDICAL MYCOLOGY. U.S. Department of Health, Education and Welfare, Public Health Service. Communicable Disease Center, Atlanta, 22 Georgia. Public Health Service Publication No. 994, January 1963. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. - Price \$ 2.25. Paper, ringbinding, 307 pp.

At the first moment, in getting a new laboratory manual for Medical Mycology in hand, one would think, it is one too many, since we have quite a number of satisfactory manuals for this purpose. However, thoroughly scanning this manual, one has to change a preconceived idea. The authors, due to their superior knowledge in research and teaching, offer a most remarkable manual for medical mycologic courses. This publication is a compilation of the several sections initially reproduced at the Communicable Disease Center for use in its training courses. In nine sections they cover, in a most up-to-date manner, the whole field of medical mycology. After an Introduction to Medical Mycology (Section A), a study of the saprophytic fungi follows (Section B). Superficial mycoses are covered by Section C. Cutaneous mycoses (Section D), one of the larger chapters, deals with the dermatophytes (54 pages). The yeast-like fungi are covered by Section E. The subcutaneous mycoses are discussed in Section F. The largest chapter (81 pages), Section G, covers in two parts the systemic mycoses: (I) the diphasic fungi; (II) the actinomycetales. Finally Section H covers the rare mycoses (aspergillosis, phycomycoses, etc.). A special chapter discusses the use of fluorescent antibody techniques, a new method of growing importance in the quick diagnosis of deep-seated mycoses.

The culture techniques, e.g. the very important slide culture technique, are lucidely presented, the latter illustrated with an excellent plate. There are numerous tables, e.g. covering the cultural characteristics of ringworm fungi, the nutritional requirement of dermatophytes, etc. The reviewer wants to underscore the excellence of presentation of the nutritional requirement of fungi and of the fluorescent antibody techniques which phases of mycology are not dealt with in any of the currently used manuals. General cultural techniques, cultural mediums, staining methods are fully covered. Praising words are due to the well selected, excellent bibliography which brings, for the thorough orientation of the students, not only the American references, but also those of the pertinent European and South-American literature. The authors have to be congratulated upon the excellent, didactic presentation of their material, the fluid lucidity of their language, the precision of their methodology. It is hoped and wished that this outstanding manual should have the widest use both in undergraduate and postgraduate courses of medical mycology. TIBOR BENEDEK

Hefepilze als Krankheitserreger bei Mensch und Tier. Herausgegeben von C. Schirren & H. Rieth. (Yeastlike fungi as causative agents of disease in man and animal. Edited by C. Schirren & H. Rieth). 148 pp. 48 figures. Springer-Verlag, Berlin-Göttingen - Heidelberg, 1963. Paper.

This publication contains the presentations and discussions given during the second meeting of the German Mycological Society at Hamburg, March 18, 1962. The subject matter encompassed: A) Generalities and diagnostic; B) Yeastlike organisms on the skin; C) Yeastlike organism and Onychomycosis; D) Cryptococcosis; E) Generalized Candidiasis and its therapy; F) Mycoses of the Lung; G) Candidiasis due to therapy; Yeastlike organisms in veterinary medicine; H) Yeastlike organisms in ophthalmology, gynecology and obstetrics, and dentistry. The authors and discussants treated their subjects on a broad basis and from very different angles. The whole presentation reflects the views and present stand of research caused by yeastlike organisms.

Of special interest are the investigations on the occurrence of yeastlike organisms on the normal skin and mucous membranes (Götz, Schirren), on a statistically significant material. However, the overemphasis and significance of yeastlike organisms as causative agents of lesions of the skin and mucous membranes (Candidiasis) reaches phantastic dimensions. The etiologic significance of yeastlike organisms is based exclusively on a positive culture which in itself is no evidence at all. Seborrheic dermatitis of the axillae and inguinal region is stamped "candidiasis" based on a test tube evidence. Based on the same evidence (culture derived from detritus masses) onychia and paronychia due to yeastlike organisms are created. No critical evaluation of the primary lesion (the golden rule in any dermatologic diagnosis), no histopathologic evidence and/or re-inoculation experiment are presented anywhere in the instances of the so-called superficial "candidiasis".

The deep-seated mycoses due to yeastlike organisms are well presented based on sufficient evidence (culture, histopathology,

serology).

German medical mycology is not alone in the gross misinterpretation of yeastlike organisms as etiologic agents. Since the end of the second World War it is a universal trend. Mycologists entering the dermatologic field have no idea of the pathogenesis and differential diagnosis of the skin entities treated as mycoses; dermatologists entering the mycological field are fascinated by pure cultures derived of surface detritus masses of skin lesions of an entirely different etiologic origin. It will take another generation or two until dermatologists will learn again that mycologic enthusiasm without due consideration of Koch's postulate, also in mycology, can lead only to grave diagnostic errors and phantastic etiologic misinterpretations.

Antimicrobial Agents and Chemotherapy, 1962, edited by J. C. SYLVESTER, 834 pp. American Society for Microbiology, Ann Arbor, 1963.

This volume is the Proceedings of the Second Interscience Conference on Antimicrobial Agents and Chemotherapy held in Chicago from October 31 to November 2, 1962. The interdisciplinary nature of the conference is evident in the variety of subjects treated in the 108 papers by authors from this and six foreign countries. In addition to the reports of research, there is a summary of a panel discussion of International Integration of Antibiotic Sensitivity Tests.

The editors have grouped the papers into the following categories: Infectious diseases, 21 papers; Chemistry of Antibiotics, 5; Synthetic Antimicrobials, 10; Clinical Evaluation, 30; New Antibiotics, 10; Antibiotics-General, 9; Cephalosporins, 7; Cancer Chemotherapy, 7; Antibiotics — In Vitro Activity, 9. Ten of the papers deal wholly or in part with antifungal agents or fungal diseases. There is a limited subject index. The volume collects in one book a great amount of information on current developments in the area of antimicrobial agents and chemotherapy. As an annual publication, it serves as a useful record of progress in this vital area.

G. W. Lones

Medical Mycology Section National Institute of Allergy & Infectious Diseases Bethesda 14, Md.

EDWARD GURR: Staining Animal Tissues, L. Hill. Publisher, 1963, Price 84/—.

The name Edward Gurr is well known to those of us who are concerned with histologic dyes. The publication of his book is a welcome sight. The volume is separated in three sections. Section 1, the best part of the book, gives first a brilliant account of the theories of staining and then concludes with a listing and classification of the dyes used in histology. This is not merely a recitation of known facts, but an authoritative, well-written account which sums up the author's many years' experience with the practical as well as the theoretical aspects of staining. There is material here not only for the practitioner or beginner, but for the seasoned histologist as well. The simple, forthright style makes this section highly readable.

Section 2 deals with staining procedures. The author deals first with the methods of fluorescence microscopy and fluorochromy. It is unfortunate that this is passed over so quickly; one wishes also that some reference had at least been made to the important recent

advances of coupling antibodies with fluorescent dyes to detect their location. Most of the better known histological techniques are outlined. These are described in a straightforward manner, but unfortunately, are often replete with ambiguities and one not familiar with the technique may find himself at a loss. The few histochemical techniques outlined are not adequately done. To single out only one, the Dopa Reagent, p. 187, a technician familiar with the technique of Laidlaw (1932) and the many subsequent modifications, would have no success if he followed the incomplete instructions given here. Section 3, the Appendix, deals with fixation, embedding, mounting media, sectioning, etc. This useful section needs no comment. The index is complete, but as all overcomplete indices, it has one glaring fault. When an entry has many page references. the reader is given no hint about those pages which are particularly significant and those which are not. Fuchsin acid, for example, has three lines of references, most of no consequence, but the reader must look at them all to find what he needs.

In summary, this is a moderately good technique book. It is a little disappointing that the directions are often incomplete and ambiguous.

WILLIAM MONTAGNA

Biology Department Brown University Providence 12, R. I.