

LIBRI NOVI

Methods for Studying Soil Microflora-Plant Disease Relationships, by L. F. JOHNSON, University of Tennessee, Knoxville, E. A. CURL, Alabama Polytechnic Institute, J. H. BOND, Clemson College and H. A. FRIBOURG, University of Tennessee. The Burgess Publishing Company, Minneapolis 15, Minnesota. 1959. 178 pp. \$ 3.50.

As an attempt to bring together the many techniques available for the study of the microbiota of the soil this manual was prepared under the auspices of the Technical Committee of Southern Regional Project S-26, titled „The Relationship of Soil Microorganisms to the Incidence of Disease in Plants”. Lithoprinted from typescript on pages $8\frac{1}{4} \times 5\frac{1}{2}$ inches, this spiral bound volume is clearly reproduced, well illustrated and relatively free of serious typographical error. It is well documented with a list of 237 references following the 15 chapters each of which treats a special aspect of the study of soil microorganisms.

Several techniques are described for taking soil samples, but it is emphasized that for each use, or even each soil, sampling techniques may be altered. Detailed techniques are given for the isolation of microorganisms from soil. A general technique is given in detail for soil dilution and plate counts, and several modifications are described, together with a listing of the agars used for fungi, Actinomycetes and for bacteria and/or Actinomycetes. Descriptions of special techniques for isolating fungi from soil include direct inoculation, the soil plate, the screened immersion plate, the immersion tube and its modifications, the isolation of fungal hyphae from soil and a special technique for the isolation of Ascomycetes from soil. Techniques are also described for the isolation of algae, amoebae and bacteriophages from soils.

Several procedures are given for qualitative and quantitative studies of soil microorganisms without isolation in pure culture. These include the buried slide, the direct microscopic examination of soil, the counting of soil algae by direct fluorescence and a flotation technique.

For the study of microorganisms in the plant rhizosphere, soil dilution and plate count techniques are given and are supplemented by serial root washing, the soil plate, the soil box, the contact slide, and the miniature root observation box. For the establishment of an artificial rhizosphere the collodion membrane technique and the sterile sand technique are described.

Soil microbial populations can be characterized taxonomically or by nutritional, ecological or antagonistic groupings. Each technique is described in detail. Antagonistic soil microorganisms can be isolated by random isolates in pure culture, the bacterial agar plate, layers of agar separating one or more potential populations, one of several spray techniques, or by the colonization of sclerotia.

Tests of microorganisms for antagonism in agar culture are listed and illustrated. Types of reactions and criteria for antagonism are described. Following suggestions for selection of a test method, table 1 presents a list of about 100 test organisms, test antagonists and the method used in making the tests.

The techniques offered for the assay of antibiotics and of sterile culture filtrates are the dilution method, wherein three different types of dilution tests are described in tables, the cylinderplate or cup method, and the paper-disc plate method.

The growth and survival of microorganisms in the soil are studied in sterilized soils or through the use of glass slides, glass tubes, cellophane, agar discs, or fiberglass. Each technique is described carefully, with its currently used modifications. The morphological form or condition of microorganisms in the soil is considered important to the understanding and interpretation of the qualitative and quantitative expression of soil populations.

Soil solutions are prepared by water extraction, displacement, a pressure-membrane apparatus or a soil perfusion apparatus. Techniques for determining the production of antibiotics in soils include extraction procedures, percolation, the soil-sandwich technique, and the buried slide. Methods to determine the persistence or inactivation of antibiotics added to the soil are listed.

Interactions between plant roots and soil microorganisms are studied by the extraction of chemicals from plant parts. Rhizosphere effects on microorganisms are studied by use of a cellophane bag technique, the collodion membrane sack technique and the sterile sand technique. The chemical nature of root exudates is studied by the use of a filter paper technique or an artificial rhizosphere. Six techniques are given for the extraction of chemicals produced by soil microorganisms.

The utilization of antagonistic microorganisms for the control of soil-borne plant diseases is described. Cultures of such organisms can be added to the soil, antibiotics or culture filtrates can be used, seeds can be treated with cultures of antagonistic organisms, organic amendments can be added to the soil, and crops can be rotated. Possible chemical interactions are described in two cases.

An extensive chapter on data analysis, experimental design and statistical procedures is included. It is the only chapter with an independent bibliography. Finally a chapter is given listing formulae of selected media. These are divided into all purpose media, media for the isolation of soil microorganisms, fermentation media for antibiotic production, culture solutions for higher plants, and media

for the inoculation of soil with parasitic or saprophytic microorganisms.

That the authors relied almost exclusively on the literature of plant pathology and of soil microbiology is quite apparent. For instance, the flotation methods used in searches for fungi pathogenic for man from soil samples are not described, although they could be useful to some users of this book. Despite its restriction to the study of organisms pathogenic for plants, this volume can have wide application in the field of microbiology in general and should be of use in any laboratory dealing with microbiological problems.

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KAMAT, M. N.: Hand Book of Mycology. Part I: Phycomycetes & Ascomycetes. 184 pp., 51 plates. Cloth, crown size. Prakash Publishing House, 360 Budhwar Peth, Poona 2, India. Price 20s.

This handbook is basically a manual for postgraduate students in mycology and also for the teachers showing a well conceived methodology and system in presenting the subject. The author is a renowned teacher of over 35 years' experience. This handbook is a combination of a text and a laboratory guide. It is profusely illustrated with Indian material. It discusses all the important mycological topics. The Indian literature and monographs are emphasized.

The handbook presents the material in 45 „exercises”. Well balanced, the first part of the volume deals with Phycomycetes, the second one with Ascomycetes. In both sections, first the general characteristics of the Families are given, than the laboratory instructions for the student follow with laboratory exercises in the important genera. To every „Exercise” well selected references are added to enable the student to dig deeper in the material of his special interest. Several useful appendices on mycological technique, on keys to important genera, monographic and general references close the handbook. The text is well written, clear and concise with most instructive illustrative material. In the references the Anglosaxon and particularly the American literature is exhaustively considered. The production of the book is highly satisfactory. Due to the highly original, didactic presentation of the material this hand book is warmly recommended both for the students and teachers in mycology.

TIBOR BENEDEK

FREDERICK K. SPARROW, JR., *Aquatic Phycomycetes*, Second Revised Edition. The University of Michigan Press, Ann Arbor. pp. xxv, 1187, 91 text figures. 1960 \$ 22.50

The first edition of SPARROW's book, published in 1940, has been the principal guide for the students of the chytrids and other aquatic fungi. The second edition brings together in one volume descriptions of all species mentioned in the first edition, brings up to date by reference, at least, those species of the Saprolegniaceae not included in the COKER and MATTHEWS monograph (*North American Flora* 2 (1): 1-76, 1937), and adds certain groups to round off the complete picture of those fungi known to be restricted to water or aquatic habitats.

The book was printed in The Netherlands by E. J. Brill, Leiden, on fairly heavy paper, making it rather bulky. It is relatively free of typographical errors and the plates are clear. A 31 page "list of substrata" is set up as a list in this edition in contrast to the paragraph style used in the first edition. In this way it is much more usable. It appears that members of all groups of algae, many Phycomycetes and Ascomycetes among the fungi, three species of bryophytes, seven pteridophytes, the pollen of many species of gymnosperms and angiosperms, a number of mature species of angiosperms, the woody parts of both gymnosperms and angiosperms. fruits, soft tissues and seeds of various higher plants, numerous kinds of invertebrate animals and numerous types of organic substances are host to the many kinds of organisms treated in this volume. A 60-page bibliography containing more than 1300 titles completes the book.

The introductory chapter indicates briefly the position of the Phycomycetes among the fungi and lists the orders into which the class is divided. These orders are arranged in three series: those which are zoosporic and aquatic exclusively, those which are zoosporic or "conidial" and which occur terrestrially or as amphibians, and those which are exclusively conidial which are terrestrial except for one genus. Treated in this book are all the aquatic members of the three groups. Phylogenetic relationships are summarized. The zoospore is described in detail and seven principal types are illustrated. The flagella are described, the whiplash and tinsel types are illustrated, and it is shown how each of the different groups of aquatic Phycomycetes has its own peculiar type of flagellation. A brief section on occurrence is followed by a more extensive discussion of the hydrobiological aspects of these fungi. Geographic distribution is discussed briefly. It is noted that the class is ubiquitous although certain groups are more common in tropical soils than others, and numbers of genera in a habitat fall off as one approaches the North Pole. A comprehensive discussion of collecting techniques is followed by an extensive description of techniques used by different specialists within the group for isolation and culture of these organisms which

are usually more fastidious than other types of fungi. A key to the ten orders of Phycomycetes completes the introduction. Key characters are broad enough to include members of these orders not treated in the text of this volume.

For each of the ten orders treated, detailed information is given concerning historical background, development and morphology, reproduction and cytology. The discussions of morphology and cytology are well illustrated. Since the Chytridiales is the largest order treated, it is natural that this order is described most fully. Establishment and development of the thallus is divided into four types: the *Olpidium* type, the *Entophlyctis* type, the *Chytridium* type and the *Rhizidium* type. The general structure of the thallus is described in detail. Reproduction is divided into a discussion of non-sexual and sexual reproduction. Cleavage of the zoospores, their discharge, their structure and behavior, and their germination are considered especially in reference to deviation from the usual type of activity. Sexual reproduction is considered in detail, diagrammed, and illustrated. The parasitism of chytrids is discussed, the chytrid epidemic is considered and saprophytism and facultative parasitism are discussed. It is thought that it cannot yet be definitely stated that host specificity is of importance since few studies have been made of this characteristic. The effect of the chytrid on the host cell and the resistance of algae to chytrid infection are discussed in the light of present knowledge based on observation and speculation concerning observed structures. It is suggested that most cases of hyperparasitism are based on erroneous reports or identifications of organisms found living together or observed in samples.

Discussion of morphology, cytology and reproduction in the Blastocladiales is based largely on work on *Allomyces* published by EMERSON and WILSON. Because this is among the best known Phycomycete genera in these regards this is a lengthy and valuable preface to the systematics of the order.

Since this book is largely a systematic account of an important segment of fungal species, an analysis of the numbers of species treated in each of the 10 orders is considered pertinent. There are 9 flagellate orders and 1 conidial order. The flagellate orders are divided into "uniflagellate" and "biflagellate" orders. Of the uniflagellate orders, the Chytridiales is the largest order with 9 families arranged in 2 series. Sixty-three genera are considered in which are placed 385 recognized species. In addition 2 forms and 2 varieties are recognized. Nine imperfectly known genera, and 131 imperfectly known species distributed among recognized genera as well as among excluded, rejected, or imperfectly known genera, are described or otherwise discussed to the extent that such comments are useful. Twenty-three species are rejected or excluded. The text of this chapter includes 1 new genus, 1 new name, 5 new species, and 21 new combinations.

Three families are recognized in the Blastocladales. These include 7 genera, 48 species and 3 varieties. There are 4 imperfectly known or rejected species and 1 hybrid species (in *Allomyces*). In the Monoblepharidales 2 families are recognized. These include 3 genera, 16 species, 3 varieties, 1 excluded species and 1 rejected genus. Three families are placed in the Hypochytriales and to these are assigned 6 genera, 14 species, 1 imperfectly known genus, 2 imperfectly known species, 1 excluded genus and 1 species of doubtful affinity. Two new genera and 2 new combinations are included.

There are 5 biflagellate orders. These include the Plasmodiophorales with 1 family to which are assigned 7 genera, 18 species, 2 imperfectly known species and 1 imperfectly known genus. In addition certain species which are known to attack aquatic plants are cited but not described.

The species descriptions in the Saprolegniales are confined to those groups not listed by COKER and MATTHEWS (l.c.). Three families are considered with 24 genera, 54 species, 3 imperfectly known species and 2 imperfectly known genera. For those species in the Saprolegniaceae not considered by COKER and MATTHEWS citations are given, and a recent publication by T. JOHNSON (1956) is considered sufficient reference to species of *Achlya*.

Two families are assigned to the Leptomitales and these include 7 genera, 20 species, 2 varieties and 1 excluded species. Two names are given a new status in this order. In the 3 families of the Lagerhemiales are placed 8 genera, 64 species, 1 variety, 1 form, 18 imperfectly known species, 1 excluded species, 1 doubtful genus with 3 species and 2 imperfectly known genera each with 1 species. One new name and 1 new combination are included.

In the Peronosporales, an order which includes the most important plant parasites belonging to the Phycomyces, only one family is included, the family which has species whose zoospores are flagellated. Five genera with 8 species, 1 excluded species and 4 imperfectly known genera are considered. A key, extracted from MIDDLETON'S key (Me. Torr. Bot. Cl. 20: 1—171, 1943) with recent additions, is given to 37 species of *Pythium* parasitic on water plants or known to occur in water. Five species of *Phytophthora* parasitic on aquatic plants or occurring on plant parts in water are described.

The order including only conidial species is the Entomophthorales. One family is considered and in it only the genus *Ancylistes* which has three species parasitic on desmids. In addition 1 imperfectly known species and 3 excluded species of this genus are mentioned.

Two comments are in order concerning taxonomic techniques. In several places a species is cited as "pro parte". According to the International Code of Botanical Nomenclature, a species is based on a type. If the type contains more than one element, only the element chosen by the monographer can be considered the type of the described species. Thus the final description can apply only to

that portion of the type selected by the author as being representative of the original concept. Thus if the method of selecting the type specimen is described adequately in the discussion, the "pro parte" is superfluous.

The species, not the typical variety of the species, when more than one variety is proposed, is credited to the original and combining authors. Thus it seems to this reviewer that *Phlyctidium brevipes* var. *brevipes* (ATKINSON) MINDEN (p. 221) is more correctly cited as *Phlyctidium brevipes* (AKTINSON) MINDEN var. *brevipes*. No authority name should follow the second *brevipes*, but to prevent the appearance of a trinomial the "var." should be included. The complete citation, then, for the second variety would be *Phlyctidium brevipes* (ATKINSON) MINDEN var. *marinum* KOBAYASI and OOKUBO. In citing varietal taxa throughout the book the earlier form was used consistently except in several cases where the recognition of the typical variety was omitted.

Apparently, cost and space considerations made it prohibitive to include all species of aquatic fungi, especially when monographs describing the other species are readily available to most laboratories.

This text will be a most useful tool of the aquatic biologist dealing with the fungi. It will be a very useful book in the mycology laboratory where the student is learning the different types of fungi and how to identify them. It will aid the student of aquatic fungi in the identification of almost any fungal material he finds in aquatic habitats whether these are saprobic or parasitic.

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JAEGER, E. C.: The Biologist's Handbook of Pronunciations. Illustrated by M. VAN DAME and the Author. 317 pp. Charles C. Thomas, Publisher, Springfield, Ill. USA.

This handy pronouncing guide includes over 9,000 commonly used and often mispronounced technical terms. With each specific name is given its original Greek or Latin meaning or English equivalent. For ready reference a table shows the needed diacritical marks. Sixty-two drawings, beautifully executed by the Artist MORRIS VAN DAME and the author call particular attention to words often mispronounced. With the rapidly declining and mostly non-existing knowledge of Greek and Latin this guide fills a definite gap. Its wide usage and frequent consultation is urgently recommended.

TIBOR BENEDEK

Illustrated Genera of Imperfect Fungi, 2nd Edition, H. L. BARNETT, West Virginia University, Morgantown, West Virginia: Burgess Publishing Company, Minneapolis 15, Minnesota 1960. 225 pp. \$ 4.50.

This publication was conceived by the author a number of years ago after he prepared a few pages of illustrations for mycology students at West Virginia University. These pages demonstrated the value of illustrations and he proceeded to expand the material into that of a manual publishing the first edition in 1955 containing 302 genera out of an estimated 1000 genera. He made an effort to place emphasis on common or important genera but has included a number of unusual forms.

Most of the drawings are original with the author, were made free hand by him and the remainder were traced from original illustrations, the author crediting the source in case the latter was true. He stippled hyphae, conidiophores and conidia to indicate the presence of dark pigment while hyaline structures are not treated this way. The appearance of the fungus is shown under different magnifications, the low magnification drawings made by use of the stereoscopic microscope, high power or oil immersion views were used for high magnification drawings.

The 2nd revision includes a total of 462 genera, an increase of about fifty per cent over the 1st edition. He has especially included a number of genera from foreign countries because of the worldwide interest in imperfect fungi. Twenty-four genera of Conidial Phycomycetes which are similar to the Moniliales, are followed by the Moniliales, Sphaeropsidales, Melanconiales and Mycelia Sterilia. The authorities for the generic names are taken from AINSWORTH & BISBY and for the most part, synonyms have been omitted. The author has stressed the fact that arrangement of genera are based primarily on descriptions of spore characters such as color, shape, number of cells and in some cases characters of the conidiophores. As usual one finds a Key to the Included Genera followed by descriptions and illustrations, then references and finally the index.

This manual is intended primarily as a manual for the student, with brief descriptions and illustrations to facilitate recognition and identification of some of the imperfect fungi. Students of general mycology as well as those in medical mycology should find the manual very useful. Descriptions of some fungi pathogenic for man and animals have been included. The reviewer might suggest that since the author has included drawings of bud cells produced in tissue by the dimorphic, pathogenic fungus *Blastomyces dermatitidis*, that he also include budding cells produced by *Histoplasma capsulatum* and *Sporotrichum schenckii* for the sake of uniformity. Also would it not be a good idea to include a glossary? Most students find it a very useful adjunct to their understanding of a subject filled with confusing terminology.

Outside of these few criticisms, the reviewer considers it a very useful manual for all students of mycology as intended by the author.

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ESTHER MEYER

M. WELSCH, Die bakteriologischen Untersuchungen und die Resistenzprüfungen gegen Antibiotika. Translated into German by W. ROTH. pp. 98. Georg Thieme, Stuttgart, 1960.

This manual is one of a series entitled "Diagnostik." Its author is a member of the faculty of the Medical School of the University of Liège, Belgium. It has three purposes: 1) to instruct the physician in the types of services that he may expect from a clinical bacteriological laboratory, 2) in the proper collection of specimens for bacteriologic examination, and 3) in the general technics of bacteriologic examination. Those technics which are most practical for clinical practice are stressed. Technics for the evaluation of the antibiotic sensitivities of bacteria are given in some detail. The only important technic of clinical bacteriology which is not mentioned is the quantitative urine culture. Methods for mycologic and parasitologic examination are not given, although they are alluded to. Although some technics are referred to eponymically, no references are cited.

This booklet achieves its limited purpose quite well and should find popularity among German speaking interns and resident physicians.

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THOMAS G. BENEDEK

SCHABINSKI, G.: Grundriss der Medizinischen Mykologie. Mit 126 Abbildungen im Text und 5 farbigen Tafeln. 183 pp. VEB G. Fischer Verlag, Jena, 1960. Price: DM 34,20

This excellently written introduction into Medical Mycology should serve the purposes of the laboratory personnel (student, physician, assistant). The understanding of mycological technique and diagnosis is made easy by the well selected illustrative material: clinical photographs, photographs of giant cultures in black and white, and in color as well as the photomicrographic details of fungi discussed. Technically this introduction is divided in four parts: 1) General mycology; 2) European fungus infections; 3) Tropical and subtropical mycoses; 4) Contaminants and Formulae (culture mediums, staining technic, etc.). Every chapter has a well selected bibliography not only of the German, but also the French and American publications. Those in command of the German language may consult this introduction with definite profit. The production of the book is excellent.

TIBOR BENEDEK

BERNARD S. MEYER, DONALD B. ANDERSON & RICHARD H. BÖHNING: *Introduction to Plant Physiology*. D. Van Nostrand Co., Inc., Princeton, N. J. 1960. 541 pp. \$7.50.

This book is a condensed version of MEYER & ANDERSON's perennially successful textbook, *Plant Physiology*, first published in 1939 and now in its second edition (1952, 784 pp.). It may be expected to be more useful than the longer text in typical one-semester courses in plant physiology.

An effort has been made to bring the book up to date in areas, such as photosynthesis and metabolism, in which considerable progress has been made in recent years. This effort has not, in my opinion, been entirely successful; the organization and spirit of the book have not kept pace with the times, and even though much new material has been inserted, many passages of the present book are similar if not identical to those in the original textbook. Outdated organization gives rise to problems like that on p. 200, where reference is made to phosphoglyceric acid and other compounds as involved in photosynthetic carbon fixation, without the student having any background yet about metabolism, into which the compounds or their conversions could be fitted to make them interesting and plausible. When the related processes of glycolysis are covered later (p. 283) photosynthesis is not brought into perspective.

The treatment of metabolic processes tends, in my view, to be lifeless and disjointed, and to convey little feeling for why we think the various metabolic sequences outlined occur or are important. The discussion of carbon fixation in photosynthesis, about which so much elegant work has been done, seems particularly disappointing. I deplore the presentation of metabolic pathways as sequences of long, unfamiliar chemical names connected by arrows, without any structural formulae to help the student visualize the compounds involved or their relationships.

While the aspects of physiology tied most closely to modern developments in biochemistry are the ones which fare most poorly, inadequacies are not confined to these areas. For example, the discussion of mineral ion absorption makes no mention of active transport or carriers. The chapters on water relations, though occupying almost a third of the book, show little indication of any advance over the static, dry and non-analytical approach to this subject of the thirties.

This volume will undoubtedly be useful to teachers who have used MEYER & ANDERSON's *Plant Physiology* and are not anxious to teach the subject from a more modern frame of reference. Those who do have this desire will most likely not be satisfied with the book.

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CHARLES L. FERGUS, *Illustrated genera of Wood Decay Fungi*, 132 pp., 81 figs. Burgess Publishing Co. Minneapolis, Minn. 1960. Price \$4.00.

This publication is the third in the Burgess Life Science Series; all three so far published deal with particular groups of the fungi. Certainly it will be as favorably received as the two preceding it, *Illustrated Genera of Imperfect Fungi* by H. L. BARNETT (ed. 2, 1960) and *Illustrated Genera of Rust Fungi* by GEORGE B. CUMMINGS (1960). Dr. FERGUS states that he hopes his manual "will fill a definite need, that of the general forester to identify decay fungi", and that it will also be useful in Forest Pathology laboratory courses. In this reviewer's opinion, Dr. FERGUS has been too conservative in indicating the possible uses of this manual. Not only the general forester and the college student enrolled in Forest Pathology, but also Botanists and Naturalists, as well as Mycologists, will want to add this publication to their libraries.

In a short introduction the economic importance of wood decay fungi is discussed, the use of the dichotomous keys is explained, and brief directions for the collection for wood decay fungi are outlined. The keys fall into four categories. The first key is to the families of basidiomycetous fungi causing wood decay. It utilizes both macroscopic and microscopic characters. This is followed by a generic key based entirely on macroscopic characters. Separate keys to the genera of each family (except Polyporaceae) are also provided. Finally, for genera containing more than a few important species, keys are included. For the Polyporaceae a single key to species has been prepared. A concise diagnostic description for each of the 85 genera is given; the black and white illustrations provided for 81 genera are excellent. As acknowledged by the author, the keys are based on those developed by L. O. OVERHOLTS and used both by him and his students (including this reviewer) for many years at Pennsylvania State University. Over the years the keys have been constantly revised to increase their usefulness. Several species which are perplexing to the neophyte are keyed out at two or more different points so that a correct determination can be reached even though a "wrong" choice is made at one branch in the keys. A list of well-chosen general references, a glossary and an index complete the manual.

A few ascomycetous genera, such as *Xylaria*, *Daldinia*, and *Ustulina* cause wood decay. The omission of these genera actually results in the manual being a treatment of only the basidiomycetous genera causing wood decay. Species belonging to such genera as *Auricularia*, *Exidia* and *Tremella*, although they do not initiate wood decay, are consistently found on decaying wood and play an important role in decomposition. Consequently, there is every justification for Dr. FERGUS' including them in a manual on wood

decay fungi. On the other hand, species of *Septobasidium* (occurring on the bark of trees, but parasitic on scale insects), of *Exobasidium* (on leaves and twigs of members of the Ericaceae) and of *Phlogiotis* (found on the ground under conifers) are not normally associated with wood decay and are apparently included only because of their sylvan habitats and the fact that they are Basidiomycetes.

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M. FAURE, R. PAUTRIZEL and L. LEMINOR. Die serologischen Reaktionen bei den parasitären und infektiösen Erkrankungen. Translated into German by W. ROTH. pp. 80. Georg Thieme, Stuttgart, 1960.

This manual is another in the series entitled „Diagnostik.“ Its principal author is in charge of the teaching of serology at the Pasteur Institute. The first portion is devoted to an explanation of what a serologic reaction is, what the main types of serologic reactions are, and what diagnostic significance such reactions have clinically. For a presentation of such brevity the exposition is very satisfactory.

The other three fourths of the manual consider the serologic reactions which are appropriate for the investigation of human infectious diseases of bacterial, viral and parasitic etiology. Serologic examinations which pertain to mycoses are only mentioned. The considerations required for the interpretation of the various tests are emphasized, while details of the technics are largely lacking. There is no bibliography.

This manual is a source of rapid and useful reference for the German speaking physician-in-training as well as in practice.

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MICROBIOLOGY: Historical Contributions from 1776 to 1908. Edited by R. N. DOETSCH, Rutgers University Press, New Brunswick, N.J. 223 pp., illustrated, 1960. Price \$ 5.- -

History of the natural sciences in any of its branches should be known and better known by the active workers than usually it is the case. The history of science has been and is concerned with ideas as they are logically related to and arising from the conditions of time and circumstances. This well edited book brings

great original contributions to the development of microbiology over a period of 132 years. Almost every one of these papers represented in its own time and place a break through the frontiers of knowledge into new and previously uncharted areas. The men and their work represented in this volume are mile stones along the hard road of development of microbiology. This volume contains contributions of SPALLANZANI, SCHWANN, PASTEUR, COHN, TYNDALL, KOCH, LISTER, SCHLOESING, BURRILL, EHRLICH, WINOGRADSKY, WARINGTON, BEIJERINCK, SMITH and ORLA-JENSEN. To every contribution the author's portrait is added. Moreover, there is at the end of every contribution a well selected list of readings for those who want to have more detailed information about the single problems. The old adage: „Historia est magister vitae” holds true also for the natural sciences, revealing the birth of ideas, the hard way, the great struggle they go through to ultimate victory. This volume is warmly recommended to all microbiologists.

TIBOR BENEDEK

HERB. I. M. I. HANDBOOK, Methods in use at the Commonwealth Mycological Institute, edited by J. C. F. HOPKINS. Commonwealth Mycological Institute Ferry Lane, Kew, Surrey, 1960. 103 pp. Price 12s.6d.

This concise volume brings the practices of the „Herbarium, Imperial Mycological Institute” (Herb. I.M.I). Thirteen members of the Institute Staff participated in writing this „Handbook”. After an introduction by the present director of the Institute, J. C. F. HOPKINS, WILTSHIRE presents the history and development of I.M.I. The Herbarium is described by ELLIS, and DEIGHTON discusses the method, how to describe a fungus. The standard laboratory procedures used at I.M.I. are presented by DADE. The pathogenic Phycomycetes are treated by WATERHOUSE, Bacteria and the Herbarium by HAYWARD. The methods of collecting fungi are presented by BOOTH, DEIGHTON and AINSWORTH. DEIGHTON discusses the „Index of Fungi” and WATERHOUSE the „Bibliography of Systematic Mycology”. MARTIN reports on the Review of Applied Mycology and AINSWORTH on the Review of Medical and Veterinary Mycology. The volume contains, furthermore, a list of the present Staff of I.M.I. and a useful list of its publications. Six photographs and eight line drawings illustrate the volume. This „Handbook” contains not only the history of one of the world leading Mycological Centers, but it brings a treasure of the most useful information. The physical make-up of the volume is excellent. It should be at hand on the shelf of every mycological working place.

TIBOR BENEDEK

SADLER MOSS, E. & MCQUOWN, A.L.: Atlas of Medical Mycology. Second edition, 335 pp. Williams & Wilkins Co. Baltimore, 1960. Price \$11.-

Seven years after the first edition and two reprints the second edition of this work made its appearance. The title is somewhat misleading, for this work is far more than a usual atlas used to offer. It is a most comprehensive presentation of medical mycology. It is introduced by a useful "Glossary" with proper spelling (particularly for those whose knowledge of Latin is somewhat wanting) and short explanation of terminology peculiar to mycology. In thirty chapters the whole breadth and depth of medical mycology is covered. The material is first presented by "Classification of Fungi" in descriptive terms along with exhaustive synoptic illustrative material. Every chapter states first the etiologic agent, than the definition of the disease entity, the clinical forms, laboratory diagnosis, mycology, histopathology (both authors are pathologists by their backgrounds) and a short description of treatment and prognosis.

Despite the fact that there are at least several equivalent treatises on medical mycology, this work is simply not "one more" among its peers. It does not contain anything more than other similar texts do, but the concise, clear didactic presentation of the whole material gives a uniqueness to this work. Several synoptic, detailed tables on dermatomycoses, classification, key to fungous infections will be most useful for the students. Every pathogen is described and illustrated as a giant culture along with its microscopical morphology and with its appearance in histological section. A special chapter is consacrated to the mycological technic. Others are dealing with immunology, with contaminants (outstanding), with preparation of the most useful culture mediums and with a chapter on special stains for fungi. Thirteen, mostly colored, plates, a courtesy of the Upjohn Company, enhance the value of the "Atlas".

Where there is too much light, there is also plenty of shadow. This holds true also for this publication. Since both authors are pathologists first, one could have expected that they will apply the stern scrutiny of their basic discipline also to the etiologic and pathogenetic evaluation of certain "pathogenic" organisms in definite entities. In this respect they completely failed. They could not rise above the deadly conformity of any of the current mycological texts. Onychomycosis, otomycosis, tinea pedis are caused by *Candida albicans* and a number of hyphomycetes. One clearly feels, that in these most important dermatological entities the authors are completely lacking the necessary first hand information. There is not a word about the primary lesion of the involvement of the nail organs; not a word about the primary lesion, the deep seated sagograin-like blister, in "tinea pedis", entities whose etiology and pathogenesis have nothing to do with *Candida albicans*

or any of the hyphomycetes. The authors claim their evidence by holding up "pure cultures" of the different microorganisms which were found in the detritus masses of the skin lesions. Even repeated "pure" cultures are not the final evidence for their etiologic and pathogenetic role. And the authors have the finest, most adequate method at their finger tip to cut through the detritus masses of this Augian stable. They did not use it and thus, became the victims of misleading dermatologic "advice". It is useless to go more in detail in this matter since the authors did not know or have completely ignored all the progress achieved in etiology and pathogenesis concerning onychomycosis, otomycosis, "tinea pedis" the last thirty years. They are not worse or more neglectful than the authors of any other similar texts reviewed in these pages through the years. But since they are pathologists, they have no excuses for these errors and omissions.

Concerning the illustrations what the authors present under "Candidiasis" on pages 71—74 are classical forms of seborrheic dermatitis, an endoparasitic-bacterial affliction. On page 72 the involvement presented as "Candidiasis" is again not a "Candida" infection, but pompholyx of the nail organ, of endoparasitic-bacterial origin. Similarly erroneous are the captions of the illustrations on page 212 representing "dermatophytosis". The expert sees it at first glance that the illustrations represent nummular eczema and lichen Vidal, both skin manifestations of hypovitaminosis A.

There are few errors in spelling. On page 169 in the caption it should read "flask" instead of "flash". On page 153 it should read "Mucor corimbifer" and not "corimbifera". On page 187 the authors consistently use "detritis" where the word is "detritus". On page 180 contrary to the spelling rules of the International Code of Botanical Nomenclature they write "Microsporium stillianus". Since the nomen proprium is "Stillians", the genitive of the word is "stilliansis".

Of course, these small errors can be easily eliminated in the next edition, which the reviewer hopes will be forthcoming in due time. The physical appearance (print, paper, illustrative material) of the work is impeccable. There is a well selected bibliography which, however, contains only American publications.

Despite the fact that the authors were unable or unwilling to break through the iron wall of deadly conformity blanketing medical mycology what they as pathologists would have been expected to do, this book, nonetheless, is warmly recommended for the beginner and also for the advanced student in medical mycology on account of the unique didactic presentation and of the rich illustrative material.

TIBOR BENEDEK

DEIGHTON, F. C. African Fungi. I. Mycological Papers, No. 78. Commonwealth Mycological Institute, Kew, Surrey. pp. 43. 2 plates, 22 text figures. 1960. Price 12s. 6d.

A number of different fungi are discussed, mostly Hyphomycetes but including a few Ascomycetes and one genus assigned to the Mycelia Sterilia, having in common their African origin, mainly Sierra Leone. Four new genera, 11 new species and 2 new combinations are proposed.

The new genera, *Megalodochium* (p. 17), *Helicominopsis* (p. 20), and *Hansfordiellopsis* (p. 33) and *Ampullifera* (p. 36), all assigned to the Hyphomycetes, are fully described and well illustrated. Other genera discussed are *Tretopileus*, *Memnoniella*, *Linotexis*, *Hansfordia*, *Sclerographium*, *Trichothyrium*, *Hansfordiella*, and *Xylohypha*.

The disseminules of *Monotospora sphaerophora* BERK. & CURT. are found to be gemmae, not conidia and this provides an earlier epithet for *Tretopileus opuntiae* B. O. DODGE. BERKELEY and CURTIS described it very briefly and assigned it to the Dematiaceae; DODGE described it in great detail, with excellent illustrations, but did not place it in any taxonomic group. The fungus, under its new name, *Tretopileus sphaerophora* (BERK. & CURT.) HUGHES & DEIGHTON, is assigned to the Mycelia Sterilia and, it is suggested, may prove to have a wide distribution in the tropics. The treatment of *Xylohypha* merely legitimizes MASON's raising of a subgroup of *Hyphelia* FRIES to generic rank, and does the same for its three recognized species.

It is impossible in the brief space available to cover all of the topics treated. It is to be hoped that from time to time these notes will be summarized in systematic form. Meanwhile, anyone concerned with the increasingly intricate classification of the fungi cannot afford to neglect the valuable and suggestive contributions appearing in this series.

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