

LIBRI NOVI

G. C. AINSWORTH & ALFRED S. SUSSMAN (editors). *The Fungi*. An advanced treatise. Vol. I. The fungal cell. xvi + 748 pp. Illustrated. The Academic Press, New York and London. 1965. Price \$ 24.—.

This is the first of three volumes intended to serve as a general and comprehensive survey of our current knowledge of fungi, with emphasis on modern approaches to their study and some stress on the numerous lacks in our knowledge of these organisms and suggestions as to possible ways in which the gaps may be filled. The second volume, under the general title of *The Fungal Organism*, is reviewed on p. 206, and the third, on *Ecology and Taxonomy*, is expected to follow shortly. In every respect except for a detailed taxonomic treatment, which would require many volumes, the entire work represents the closest approach to an encyclopedia of the fungi which we are likely to have for many years.

In the volume under consideration, there are 29 chapters, by as many authors, two of them as joint authors of a single chapter and one contributing two chapters. The chapters are grouped into four very unequal sections indicating in general terms the topics covered. Each chapter has its separate bibliography; figures, where used, are numbered separately for each. The *Introduction* includes two chapters covering admirably, in the space allotted, the historical background of mycology and a generalized outline of the structure and organization of fungi. The remaining chapters are, of necessity, more specialized. *Cell components* includes 12 chapters treating cell walls, flagella, ultra-structure, mitosis, chemical constituents, and metabolism. Under *Nutrition and growth of cells*, 14 chapters cover uptake, translocation, responses to chemical and physical environment, kinetics of growth, and related topics. The final heading, *Gene action*, includes only a single chapter with the same self-explanatory title. Three indexes, one to all authors cited, one to subjects, and one to names of organisms mentioned in the text, complete the volume.

There is inevitably some duplication, but much of this is more apparent than real. Careful editing has reduced it in many cases by the insertion of cross references in the text, and in other cases it is completely justified by the different emphasis involved. To read the entire volume with the care and attention the material demands would be a laborious and time-consuming task even for the few who could understand everything. All a less-talented reviewer can do is to read chapters of particular interest and to sample the others. Consequently any criticism is bound to reflect the limitations of the reviewer. But in a volume devoted to "the fungal cell", it would have been helpful to have a formal attempt at a definition of *cell*, with particular reference to the fungal elements to which the term has been applied, and with some detailed comparison with the

cells of other organisms. There is, to be sure, incidental comment in many places, but I have failed to find what I should regard as an adequate treatment of a problem which demands consideration. *Saprobe* and *saprophyte*, the latter implying commitment to plant relationship, appear to be used interchangeably. *Vegetative*, as used for fungi, not to mention protozoa, is open to the same objection as saprophyte. And whatever a *coenocyte* may be, the comparison of spatially limited "fungal coenocytes" with the "coenocytic" condition as seen in slime molds, implies several questionable and apparently unrecognized assumptions.

The task of assembling and coordinating so many papers must have been arduous, but it has been successfully accomplished, and the more routine editorial work has been done with care. It would be ungracious to mention the one or two harmless incongruities which have escaped editorial attention.

Because of the mass of information it contains, the general excellence of the treatment, and the wide range of subject matter, this volume and its successors should be available to all serious students of the fungi, senior as well as junior. I predict many years of usefulness for the work.

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G. C. AINSWORTH & ALFRED S. SUSSMAN (Editors). *The fungi*. An advanced treatise. Vol. II. *The fungal organism*. xvi + 805 pp. Illustrated. The Academic Press, New York and London 1966. Price \$24.—.

This is the second volume of a three volume work intended, when complete, to present a general account of our present knowledge of the fungi. The first volume, *The Fungal Cell*, has been reviewed previously in this journal (*Mycopathol. et Mycol. appl.* vol. 33 p. 205). The second volume, *The Fungal Organism*, contains 23 chapters by as many authors. As in the earlier volume, these are grouped into sections, seven in this case. The Protoplast, with a single chapter, might, as noted, have been included in the previous volume, but it does serve to bridge the gap between the two volumes. Cell aggregates, also with a single chapter, deals only with yeasts, recognizing that that category has no clear taxonomic signification. The Multicellular condition includes four chapters, on "vegetative" structures, sporulating structures in Fungi Imperfecti, fruit bodies in Ascomycetes, and the hyphal structures of the basidiocarp. Mechanisms of morphogenesis includes six chapters, on dimorphism, organiza-

tion and synthesis in the cellular slime molds, and morphogenesis in Myxomycetes, aquatic fungi, Ascomycetes and Basidiomycetes. Physiology and nutrition, with two chapters, Reproduction and inheritance, with six chapters, and Dissemination, with three chapters, conclude the volume.

For many reasons, including consideration of space, the wide range of subject matter, and the inevitable limitations of any reviewer in dealing with such a broad range of phenomena, it is impossible to discuss every chapter, but a few general comments may be in order.

TABER, in discussing morphogenesis in Basidiomycetes, starts with a clear and strictly ontogenetical definition of the term, and this, with various qualifications and refinements, is essentially the way it is used by the majority of the contributors to the morphogenesis section. CANTINO, however, in his chapter on morphogenesis in water molds, makes an interesting distinction between the use of the term in a narrow sense, restricting it to ontogeny, and its use in a broader sense, emphasizing its implications for phylogeny. His use of it in the latter sense in his paper adds greatly to the value of his discussion. With that in mind, it is interesting to note how often phylogenetic applications are or may be suggested in the companion papers, even when these are not explicitly mentioned. Phylogeny has been in some disrepute in recent years, for quite understandable reasons. But if it is recognized that phylogenetic speculation is always tentative and subject to revision, it may be of great use as a scaffold for workers in a number of different areas.

It is also interesting to note, under Reproduction and Inheritance, a chapter on the parasexual cycle, by ROPER, and one on extranuclear inheritance, by JINKS. These, with ESSER's chapter on incompatibility, all excellent, serve to emphasize some newer aspects of heredity which seem to offer great promise, and for the study of which fungi are peculiarly adapted as subjects for investigation.

These are examples of broad fields which appear to have important relevance for general biology. Other chapters, by the nature of their subject matter, seem at present more restricted in general application. Some seem to emphasize review of literature at the expense of interpretation. Nevertheless, the general tone is high, and all chapters will be consulted and cited in future work. Where illustrations are used, they are pertinent and usually clear. Each chapter has its own bibliography, and the three indexes – to authors, subject matter and taxa respectively – provide the necessary facilities for reference.

There is evidence of the same careful editorial planning and supervision which characterized the preceding volume and the proof reading has been equally meticulous. Of the few errors noted, only one need be mentioned. "*Costantiella*" p. 119 and index, should of course be *Costantinella*.

The third and final volume, now in press, will complete an extremely ambitious and useful work which will be of great service in every laboratory where fungi are seriously studied.

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MAZZUCCHETTI, G.: Microfunghi della cellulosa e della carta, attività e inquadramento sistematico. Il genere "*Chaetomium*". Pubblicazioni dell'Ente Nazionale per la Cellulosa e per la Carta. Laboratorio di cartotecnica speciale. (Microscopic fungi of the cellulose and of the paper, their activity and systematic. The genus "*Chaetomium*". Publications of the National Agency for Cellulose and Paper. With a preface of Prof. O. VERONA, director of Istituto di Microbiologia Generale, Agraria e Tecnica, University of Pisa, Italy.) 271 pp. 43 tables. Rome, 1965. (Italian).

The thorough knowledge of microscopic fungi, their morphology and physiology, is of major importance for the industry and for the total economy. Those who served in the South Pacific during the Second World War may have observed the amazing destructive power of microscopic fungi on textiles, leather and paper of any and all kinds. Books could not be kept for any length of time without being invaded by many species of fungi and finally completely destroyed. Among the many species which I had opportunity to observe, the genus *Chaetomium* held the first place.

Beside the more recent publications on the topic, e.g. AMES' important "Monograph of the *Chaetomiaceae*" (1965), MAZZUCCHETTI's monograph is a most welcome addition to the systematic knowledge of the genus *Chaetomium*, one of the most outstanding representative of paper-destroying fungi. The author records 109 species in the genus, describing and illustrating them in 41 tables. Table 42 gives a systematic survey on "Micromiceti" (microscopic fungi) including Phycomycetes, Ascomycetes and Fungi Imperfecti. Table 43 accounts for the "Macromiceti" (macroscopic fungi) encompassing Agaricales, Tremellales, Tulasnellales and Hymenomycetales. The thorough description of the species in conjunction with the illustrative tables makes the identification of the species within the genus quite easy. A useful bibliography and a list of the publications of the National Agency concerning the subject matter add to the usefulness of the monograph. The physical presentation on high stock paper is outstanding. This monograph is whole-heartedly recommended to general mycologists (taxonomists) in general and to industrial mycologists in special. The author can be congratulated on this fine achievement.

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PRESTON, R. D. (Ed.). *Advances in Botanical Research*, vol. 2. xii+382 pp., ill. Academic Press, London and New York. 1965. Price \$12.00.

One result of the much-publicized literature explosion has been the appearance of a rather large number of books presenting extensive reviews of special fields in a way that will serve not only those who are actively working in such fields, but will permit those whose primary interests are in other specialities to learn what is going on in the areas discussed. When the authors are competent and treat their subject-matter clearly, critically and concisely, as is the case in the present volume, they perform a very useful service, not adequately duplicated elsewhere.

There are six papers, covering a wide range of subject matter, united by a common effort to bring the subjects treated into line with the most recent developments in their respective fields. Four of them use the results of electron microscopy, two rather extensively, to illustrate their points. MANTON (Leeds) discusses phyletic implications of flagellar structure in plants. Her carefully selected and beautifully reproduced electron photomicrographs are particularly helpful in illuminating the text. WILLIAMS & HALE (Southampton), writing on fundamental problems in numerical taxonomy, are concerned with the critical analysis of systems and methods which have been proposed in that field. ROELOFSEN (Delft) reviews the newer knowledge of the ultrastructure of the wall in growing plant cells and its relation to growth, tying together morphological, chemical, and electron-microscopical studies. His paper is admirably supplemented by that of LAMPORT (East Lansing) on the protein component of primary cell walls, in which the author attempts to demonstrate the constant presence in such walls of "a unique hydroxyproline-rich primary cell protein which is involved in cell extension, hence named "extensin". MAHESHWARI & RANGASWAMY (Delhi) write on embryology in angiosperms, with emphasis on culture of embryonic tissue and its implications and with suggestions as to what may be expected from the future development of such work. LEVY (London) treats the soft rot fungi in relation to deterioration of wood. Although, as he is careful to point out, certain observations made a century or more ago touched on this problem, it is only in very recent years that the importance in this connection of certain ascomycete genera, e.g., *Chaetomium* and *Ophiostoma*, and a rather large number of imperfect fungi, has begun to be realized. They may be the primary agents of deterioration or, and this is perhaps of considerable importance, they may prepare the way for the attack of the more familiar and better-known Basidiomycetes, which historically have been regarded as almost the sole agents of wood decay.

Each paper is a unit, with its own bibliography and its separately numbered illustrations, but the pages are consecutively numbered

and there are complete indexes to authors and to subject matter. A brief examination of the indexes is interesting as showing a number of instances in which the same author is cited in different papers in different connections, and the number of times the same subject is treated from a different viewpoint by the several authors.

It will be noted that these are more than review articles; each one incorporates original work or opinion interpretive of or supplemental to the articles cited. For mycologists, the papers by MANTON and LEVY will probably be of greatest interest, but for mycologists who wish to keep in touch with development in other fields, all can be read with profit.

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VANBREUSEGHEM, R.: *Guide Pratique de Mycologie Médicale et Vétérinaire*. 206 pages avec 414 figures. (Practical guide of medical and veterinary mycology. 206 pp. with 414 figures.) Masson & Cie, Editeurs. 120, Boulevard Saint-Germain, Paris-VIe, 1966. Price: 72 F. (French)

The literature of mycology, in particular that of medical and veterinary mycology, is enriched with a masterly contribution. Only a worker of the stature of this author, with the most extensive knowledge of his chosen field, encompassing both the temperate and the tropical climate, active for decades in research and teaching, could produce such a concise, yet most detailed guide. The material is presented in three Parts. The first Part deals with general remarks on mycoses and pseudomycoses, introducing the student in several chapters into the realm of diseases caused by Fungi and Actinomycetales, including their diagnostic and modern therapy. The second Part discusses the causative agents of the mycoses and pseudomycoses, the pathogens being classed after the disease entities they determine in alphabetical order. The third Part brings the useful mycological techniques (isolation, inoculation, biochemical tests, staining methods) and a list of the general and special culture mediums. Beside the excellent, clear, detailed and essential description of Fungi and of the diseases caused by them, the illustrative material, representing the fungal parasites in micro- and macroscopical aspects and the diseases, often with histopathological sections of the lesions, gives the guide an incomparable value for all those interested and/or engaged in the study as well as in teaching of medical and veterinary mycology. A glossary and a detailed index enhance the usefulness of the guide. The autor has to be congratulated upon this signal achievement.

TIBOR BENEDEK

The Polyporaceae of North America: The Genus *Poria*, by JOSIAH L. LOWE. 1966. 183 p. 159 text figs. Technical Publication No. 90. State Univ. College of Forestry at Syracuse Universtiy. Syracuse, New York. Price \$ 1.50, paper back.

One of the most difficult groups of pore fungi with which the taxonomist of wood-rotting fungi is confronted is the group of miscellaneous species in which a pileus is lacking. These have traditionally been grouped as the "genus *Poria*" but a reasonably complete study of them has heretofore been lacking for the North American myco-flora. North American taxonomists have been waiting for DR. LOWE's observations on these fungi, and at last our patience is rewarded.

DR. LOWE includes 159 numbered species in his taxonomic treatment, of which 133 are recognized as valid elements in our myco-flora, a number roughly comparable to a moderately large genus of the gill fungi — such as *Pholiota* or *Galerina*. The introductory material is held to a bare minimum. The possible directions of evolution are not traced, the discussion of the micro-anatomy is very minimal and there are few comments on the seemingly innumerable types of hyphal end-cell encountered as cystidia. The fact that DR. LOWE has avoided all speculation will please many people, but many of us would have appreciated his comments since he is the one man who has a "feel" for the genus. In short, the bulletin is, as DR. LOWE has stated, designed to aid in the identification of the species, and he has adhered to this single purpose throughout. It will undoubtedly be the standard work on the North American porias for years to come.

Although LOWE's concept of *Poria* is traditional, he has used the important features such as color of context, mono-, di-, and trimitic hyphal systems, and color changes in KOH for defining the sections of the genus. Nomenclatural considerations are placed on the shelf as far as subdivisions of the genus are concerned since he simply designated the sections by Roman numerals I – V and commented in the text that certain ones could be recognized as subgenera. As he points out, the whole organization of the work was to facilitate identification. The 159 text figures are of vital importance to identification problems and enhance the value of the publication immensely.

LOWE uses the term 'simple-septate' for hyphal septa at which there are no clamps. This is in accordance with current usage. In view of what is now known about the septa of Basidiomycete hyphae from EM studies, I wonder if the term in the future is not going to cause some confusion? For one thing, the use of a term involving a special type of hyphal branch to designate a cross wall with which such a branch is not associated, has always perturbed me. It must be pointed out that we have several categories of septal apparatus if we can use such a term to describe the actual septum and the associ-

ated specialized branch when the latter is present: First, we have the classical situation of a septum with its associated clamp connection. In the formation of this mitosis of the dikaryon is a feature. Such a septum may be designated as a primary septum, and the term can be extended to include any septum formed in association with the division of the dikaryon. Thus we may have primary septa with associated clamp connections and primary septa with which no clamp connection is associated. As far as taxonomic considerations go, these two categories are the most important. The third type of septa may be (has been) designated as a secondary septum. Such septa are found in the basidia of Clavariaceae, where in many species the basidia are very long and narrow, in the caulocystidia of some species of *Leccinum* where they form above the ventricose portion of the cell thus cutting off the neck, and in aging hyphae generally after they have completely enlarged. As regards secondary septa, it is now thought that their formation is not associated with nuclear division, or that only one nucleus of the dikaryon divides. This creates an ambiguous situation as far as using the presence or absence of clamp connections for taxonomic purposes is concerned. As concerns the unclamped primary septa and the secondary septa, the taxonomist is in a dilemma and must resort to cytological observations to resolve the problem. This is usually not done.

Returning to DR. LOWE's publication, the keys are similar in format to those found in the Overholts manual. Since format in keys is a matter of personal preference, no comment on the format is relevant here. The keys are well constructed and in many instances separate out groups of obviously related species. The text figures are well done, but in many the cross walls at the base of the basidia or cross walls in the subhymenial hyphae are not shown. In his descriptions, however, measurements of the basidia are given and these obviously were made from measuring from the basal cross wall to the apex of the basidium. To the extent that these cross-walls are not shown the figures should be considered as diagrammatic. It is difficult to evaluate any taxonomic work before it is put to the acid test of hard use, but I venture to predict that DR. LOWE's work will stand up remarkably well for the area he has included. We can rest assured that he has given long and careful thought to his species concepts and that they are based, with few exceptions, on the observations of many collections. In summary, DR. LOWE is to be congratulated on a very practical treatment of *Poria*, which is exactly what he set out to accomplish. It will furnish an excellent base for further studies of the group from along more theoretical lines.

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E. MÜLLER-KÖGLER. Pilzkrankheiten bei Insekten. 1965, 460 Seiten mit 40 Abbildungen und 12 Tabellen, Verlag Paul Parey, Berlin, Deutschland. Price DM 93.—

The title accurately indicates the coverage of the book "Fungus Diseases of Insects." This is the first of such books dealing exclusively with the fungal diseases of insects and other arthropods. The author, having specialized in the study of insect mycoses at the Institute of Biological Control of Insects at Darmstadt, Germany, gives the reader an accurate and extremely comprehensive picture of the research dealing with this segment of Insect Pathology.

The book has three main divisions. The first section includes a discussion of the biological control of insects and mite pests of cultivated plants with pathogenic fungi during the years 1937 through 1963. Experiments employing various entomogenous fungi Imperfecti and species of *Entomophthora* against specific pests are discussed in some detail. A majority of these first 62 pages is devoted to entomogenous species belonging to the genera *Beauveria*, *Metarrhizium*, *Aspergillus*, and *Spicaria*. The species of *Entomophthora* tested against insects are also mentioned, along with a short discussion of the use of fungi against medically important insects. In Part I the author concentrates much of his discussion around the stage of insect used, dosage, environmental factors, and percent mortality produced by the fungal species.

The second major section is devoted to the fundamentals of the application of entomogenous fungi and includes such areas as diagnosis, isolation and culture of pathogenic fungi, virulence of the pathogen, and culture and application of infectious material. Finalizing this section is a discussion of the possible effects of such fungi on warm blooded animals and useful insects. Perhaps this section and also Part III should have preceded Part I because of their fundamental importance in the study of any insect mycosis.

The third part, including over half of the book, covers the fundamentals of infections, pathogenesis, and the epizootiology of fungus diseases of insects. A thorough discussion follows regarding the penetration of the insect host by fungus, resistance in fungal infection, conditions required for infection, and the mode of action of entomogenous fungi. A discussion on the epizootiological aspects of insect mycoses, a much needed area of research, is pursued in the last part of the book (pp. 308—347).

The material is moderately illustrated with 40 figures and 12 tables. The bibliography constitutes a wealth of information, listing over 1100 references, many of which are difficult to obtain. The author has furnished the reader with an extensive index for each species of entomogenous fungus and its specific host. The book is remarkable for its completeness and accuracy of information. Because of such extensive coverage, the interested research worker

will be able to ascertain the gaps in our knowledge regarding insect mycoses. The author is to be commended for giving an extremely useful and informative reference book to teachers and students who are interested in fungus diseases of insects.

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Incompatibility in Fungi. A Symposium held at the 10th International Congress of Botany at Edinburgh, August 1964, edited by KARL ESSER and JOHN R. RAPER. 128 pp. Illustrated. Springer-Verlag, New York, 1965. Price: DM. 24.—

Twelve papers, presented at the symposium on fungal incompatibility in 1964, have been compiled in a paper-back edition entitled, *Incompatibility in Fungi*. Each contribution which is the work of a recognized authority in the field, includes a bibliography and notes of the open discussion. The clarification of the vague and often misunderstood term, "fungal incompatibility", is aptly presented at the beginning of this volume (foreword and introduction). Incompatibility factors are defined as the specific genetic factors which regulate mating competence in the absence of morphological differentiation, thus indicating clearly these are not sexual factors. This volume encompasses the following material: 1) heterogenic and homogenic incompatibility systems and their significance in restricting or encouraging outbreeding and recombination; 2) the function of the mating type locus on the sexual process of certain filamentous Ascomycetes; 3) incompatibility in tetrapolar Basidiomycetes emphasizing a) the genetic architecture of the mating type loci; b) the role of these loci on the morphogenetic aspects of dikaryosis; c) some biochemical aspects and some hypothetical models relating to the mode of action of the incompatibility factors and 4) mechanisms of recombination in the vegetative cells of Basidiomycetes. This book is a valuable contribution towards an understanding of fungal incompatibility. It also points out wide gaps in our knowledge of this field and some intriguing problems to be solved. This volume is recommended to students of fungal genetics and to investigators active in or contemplating research in this promising field, however, the complexity of many of these papers renders it of limited value to mycologists lacking a background in fungal genetics. Nevertheless, this latter group would probably find the struggle rewarding.

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VERONA, O.: *Microbiologia Agraria*. Con 279 figure nel teste. 1094 pp. Unione Tipografice-Editrice Torinese. Torino, 1966. (Agricultural Microbiology, with 279 figures in text. 1094 pp.) (Italian) Lira 14.000.—

The author calls his monumental work a "comprehensive treatise", but that is, to say the least, a gross understatement. This work is an encyclopedia of agricultural microbiology. Such an immense material is brought together, well worked up and critically sifted, of morphological, physiological and biochemical nature, that it defies a detailed analysis. The work is composed in four parts. The General Section deals with the microbial world: discussing their morphology, the chemical composition of the microbial cell, their nutrition, respiration, multiplication and reproduction, the influence of external factors on the microbial development. The First Section discusses the immense role of the microorganisms in productive processes: soil fertility, mineralization of organic material, nitrification, denitrification, fermentation of cellulose, decomposition of lignin, hemicellulose, pectine, the production of carbon dioxide in the soil and the formation of methane. The presentation of the natural, microbial surroundings of the green plants (phytosphaera): above ground (epigeal) and radicle (rhizosphaera), below ground, is most remarkable. Furthermore, we learn in great detail about the role and composition of the microorganisms in natural dung, in composte and their influence on the fertility of the soil. The Second Section brings the role of microorganisms in transformative processes: alcoholic fermentation in wine and beer, vinegar, milk and in the baking process, in the decomposition of paper. The Third Section, finally, deals with the conservation processes of natural products: garden and orchard products, forage, wood and animal products. This short analysis of the contents of this encyclopedia can give only a faint indication of the immense riches of critically worked up material. The excellent illustrative material adds a great deal to the clarity and easier understanding of the text. An exhaustive author and material index substantially adds to the usefulness of the work. Those in command of the Italian language certainly will agree with the reviewer that the work is beautifully written, in a simple, fluid, easily understandable fashion. The Publishing House deserves great praise for the fine presentation of this outstanding work. The reviewer believes that the greatest compliment on the outstanding achievement of the author is the sincere wish to see, as soon as possible, an authoritative English edition of this encyclopedia to be put in the hand of the widest range of microbiologists, agrarian and otherwise.

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BADER, G.: Die viszeralen Mykosen. Pathologie, Klinik und Therapie. Mit 118 Abbildungen und 7 Tabellen im Text. VEB Gustav Fischer Verlag, Jena. 1965. 423 Seiten. (The visceral mycoses. Pathology, Clinic and Therapy. 118 figures and 7 tables in the text.) Price: 64.70 MDN (German).

The topic of the visceral or deep-seated mycoses was repeatedly presented by clinicians and mycologists. This is probably the first time that a general pathologist deals with this subject. Based on exhaustive pathological and experimental knowledge, the author deals with the visceral mycoses occurring in Europe. In the general section are presented: the system of mycoses from morphological point of view; the pathomorphosis of the mycoses; the morphology of the causative organisms and the tissue reactions elicited; cytology of the fungi and of the mycotic granulomas; diagnostic of mycoses by staining methods and by methods of light-, polarization-, fluorescence-, phasecontrast-, darkfield-microscopy. In the special section the author deals with Candidosis, Geotrichosis, Cryptococcosis, Sporotrichosis, Histoplasmosis, Torulosis, Rhodotorulosis, Aspergillosis, Penicilliosis, Chromoblastomycosis, Cladosporiosis, Mucormycosis, Actinomycosis and Nocardiosis. The text is well written, the profuse and well selected illustrative material, as well as the most exhaustive bibliography add much to the value of this outstanding monograph. It can be recommended not only to the pathologist, but to the mycologist as well as to the clinician. The physical appearance of the work is excellent.

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CASH, EDITH K.: A Mycological English-Latin Glossary. Mycologia Memoir No. 1 Published for The New York Botanical Garden in Collaboration with the Mycological Society of America, by Hafner Publishing Co. New York & London, 1965. IV, 152 pp. Paper, Price: \$8.50.

This glossary, accumulated by the author over a period of years, attempts to bring together the Latin words used or likely to be used in the preparation of Latin diagnoses of fungi. At a time, when the knowledge of classical Latin and Greek is rapidly declining or already non-existent, such a glossary as this is of the greatest usefulness and fills a long existing gap. The print which is so important in a dictionary does not leave anything to be desired. The paper and the physical appearance of the work is excellent. Mycologists of the English speaking world owe much to the author for her unfailing endeavor to achieve such a necessary and excellent work. The glossary does not need any further recommendation.

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PINETTI, P. & LOSTIA, A.: L'Infezione Dermatofitica Del Pelo in Vitro. Edizione Rassegna Medica Sarda, Cagliari, 1966. (Dermatophytic infection of the hair in vitro). With 48 fig. in black and white, 180 pp. Price not given. Paper. (Italian).

This is a most remarkable monograph on fundamental research concerning the basic details of the attack and invasion and final destruction of the hair material by dermatophytes. The material is presented in eight chapters. The first three chapters deal with the chemical and structural constitution of the hair and of the hair keratin; with the nature, significance and mechanism of the keratinolysis by dermatophytes; with the experimental techniques of dermatophytic infection of the hair in vitro. Chapter IV gives a detailed, well illustrated presentation of how the dermatophytic infection of the hair begins, how the attack continues up to the final destruction of the organized keratinous material. In further chapters the behavior of the hair of different animal species toward infection as well as the characteristics of the aggression of different species of dermatophytes are investigated. In Chapter VII the interesting and still controversial aspect of the behavior of non-dermatophytes toward hair material is discussed. The final Chapter VIII is devoted to the discussion of the factors which influence the dermatophytic infection of the hair in vitro. This unique monograph on a fundamental topic of dermatomycology is most warmly recommended even for those who are not in command of Italian, simply on account of the rich and universally understandable language of the illustrative material. The physical make-up of this monograph is impeccable. PINETTI enriched the dermatomycological literature again with a most valuable contribution. Warm congratulations.

TIBOR BENEDEK

DROUHET, E.: Les candidoses et leur diagnostic de laboratoire. Laboratoire Squibb, 143 Avenue de Malakoff, Paris 16e. 47 pp. Price and year of publication not given. (French)

This brochure contains practically everything known about the morphology, biology, serology, immunology and pathological effect of the species *Candida*. Beside a goodly number of statistical tables concerning morphological differentiation within the genus *Candida*, serology and immunology, two excellent color plates illustrate the cultures of the different *Candida* species and the appearance of the fungus in pathological tissues. The author has to be congratulated on the masterly presentation of a difficult and complicated subject within less than fifty pages. Beside a number of black and white illustrations a detailed bibliography makes this pamphlet valuable to any mycologist interested in the subject.

TIBOR BENEDEK

COMMONWEALTH MYCOLOGICAL INSTITUTE: C.M.I., Description of Pathogenic Fungi and Bacteria. Kew, Surrey, England, 1965 Set 7, Nos. 61-70. Price: 5/—.

This set is entirely consecrated to the description of the form-species of *Microsporon*. It contains: *M. audouinii*, *M. canis*, *M. distortum*, *M. equinum*, *M. ferrugineum*, *Nannizzia fulva*, *N. grubyia*, *N. gypsea*, *N. incurvata*, *N. obtusa*. The whole set contains a concise masterly description of the form-species from the pen of PHYLLIS M. STOCKDALE. Beside the mycological description of the species there are note on clinical appearance of the infections caused, on geographical distribution, and on literature. This is a very valuable set and warmly recommended for use in mycological courses.

TIBOR BENEDEK

C.M.I. Descriptions of Pathogenic Fungi and Bacteria, Set 8, Nos. 71-80. Commonwealth Mycological Institute, Kew, Surrey, England, 1965. 5/—.

This set is prepared by G. C. AINSWORTH and contains the following species: *Sphacelotheca* (*cruenta*, *destruens*, *reiliana*, *sorghii*), *Tilletia barclayana*, *Tolyposporium* (*ehrenbergii*, *penicillariae*), *Ustilago* (*crameri*, *maydis*, *scitaminea*). Every species has its concise description with useful illustration, the disease it causes, its geographical distribution, physiologic specialization, mode of transmission and pertinent literature quotations. These notes are excellently conceived and perfectly executed. The whole series is warmly recommended.

TIBOR BENEDEK

WILSON, J. W. & PLUNKETT, O. A.: The Fungus Diseases in Man. 428 pp. Profusely illustrated in black and white and in color. University of California Press, Berkeley and Los Angeles, 1965. Price: \$15.—.

During the last decade a number of outstanding monographs was published in the United States, dealing with superficial and/or deep-seated mycoses in humans. Even though the basic subject in all of them is identical, they are all justified, simply by the fact that their point of view of presentation of the subject matter is individually different, which gives a special, noteworthy flavor to their work. Medical mycology as a subject matter has so many facets that no monograph, how exhaustive it may be, can present all the details equally well in every point.

The present volume is a proof of this point of view. This monograph is certainly not one more of the same kind, presenting the

subject matter of medical mycology, but beside the basic substance, these two noted authors give their presentation a special flavor based on their long clinical and mycological experience. It is a practical, comprehensive, and fully illustrated guide to these infections in man which are caused by fungi. More than 200 individual color photographs (on 54 plates) illustrate the clinical and histopathological aspects of human fungous infections. The special flavor of their presentation is given by the excellent elaboration of the immunological aspect of mycotic infections which is in any detail usually missing in other monographs. This work is divided in four parts. Part I deals with the systemic mycoses. Part II brings the "intermediate mycoses" (Candidiasis, Chromoblastomycosis, Phycomyces, Aspergillosis, Rhinosporidiosis). The superficial mycoses are presented in Part III. The fundamentals of medical mycology (morphology, nutrition, classification and identification) are presented in Part IV. Every chapter has its individual, well selected bibliography. Glossary and an index add to the usefulness of the volume. The text is well written, in a fine fluid language. The illustrative material is most remarkable. This volume, if it would not have any other, great, intrinsic value, ought to be recommended as an outstanding Atlas in color of superficial and deep-seated mycoses in man. This fine monograph deserves to be on the working table of every clinician dealing with mycotic infections, and in the hand of every mycologist in teaching and research. The physical appearance of the work is impeccable.

TIBOR BENEDEK

Antimicrobial Agents and Chemotherapy, 1965, Editor: GLADYS L. HOBBY, 1138 pp. American Society for Microbiology, Ann Arbor, Michigan, 1966, \$15.00.

This volume is the Proceedings of the joint meeting of the Fifth Interscience Conference on Antimicrobial Agents and Chemotherapy and the Fourth International Congress of Chemotherapy held in Washington, D.C., October 17-21, 1965.

Introductory addresses by E. B. CHAIN, Twenty-five years of Penicillin Therapy in Perspective; SELMAN A. WAKSMAN, A Quarter-Century of the Antibiotic Era; and JOHN F. ENDERS, Infectious Diseases Society of America, are followed by scientific reports assigned by the editors to the following categories: Infectious Diseases and Immune Mechanisms, 17 papers; Chemistry of Antibiotics and other Antimicrobial Agents and the Biogenesis of Antibiotics, 8; Pharmacology and Pharmacokinetics of the Antimicrobial Agent, 16; Experimental Studies and the Mode of Action of Antimicrobial Agents, 42; Chemotherapy of Cancer and Viral Infections, 23; Clinical Studies of Antimicrobial Agents, 22; New Antimicrobial Agents, 38; Symposium of the Chemistry of Anti-

biotics, 4; Symposium on Biogenesis of Antibiotics, 1; Symposium on Clinically Important Antibiotics as Biochemical Tools, 3; Symposium on the Penetration of Drugs into Tissue, 5; Symposium on the Chemotherapy of Mycobacterial Diseases, 3; Symposium on Cancer Chemotherapy, 3. Reports of eight Round Tables and Informal Discussions are also included.

Of particular interest to mycologists are a number of papers dealing with antifungal agents and fungal infections. Blood serum is reported to enhance the antifungal activity of hamycin for *Candida albicans*. A bioassay method for the determination of hamycin in serum using *Paecilomyces varioti* is described. The pathogenesis of candidiasis is discussed. The toxicity of orally administered hamycin is reported to be similar to that of intravenously administered amphotericin B in dogs. Hamycin is reported to be an effective agent in the treatment of monilial vaginitis. 1,3-Bis (2-chloroethyl)-1-nitrosourea is reported to inhibit the growth of a variety of yeasts and filamentous fungi. The modes of action of cycloheximide, griseofulvin, and the antifungal polyenes are reviewed. A round table on antifungal agents deals with clinical aspects of the use of hydroxystilbamidine, amphotericin B, X-5079C, and hamycin.

This annual publication continues to be a valuable contribution, and its size attests to the intense activity in the field of antimicrobial agents and chemotherapy.

GEORGE W. LONES

PONCHET, J.: Étude des Communautés Mycopericarpiques du Caryopse de Blé. (Investigation of the mycopericarpic communities of the caryopsis of wheat (*T. sativum*). Annales de Epiphyties, vol. 17, no. hors-série 1. Institut National de la Recherche Agronomique, 149, rue de Grenelle, Paris-7e. 111 pp. 1966. Price: 16 F. (French).

This monograph deals with the study of the flora of microscopic Fungi capable of developing on the grain of wheat as a special biotope, as a refuge of an original biocenose. The frequency of the principal species, their ecologic requirement, their localization, their evolution in time and space, are established. Diverse techniques to demonstrate the mycoflora according to the stage of development of the grain are described. Special attention is given to the study of interaction of species, their action on germination and particularly, the action of *Alternaria* sp. affecting the growth of the wheat grain. The first Part of this monograph gives an analytic and ecologic study of the flora of the caryopsis. The second Part brings the etiology of the mycoflora of the caryopsis. The third Part discusses the evolution and effects of the mycoflora in the course of the germination of the caryopsis: the evolution of

the biocenose during the germination; the effects of micromycetes on the growth of the young plant; physiologic activity of *Alternaria* sp. and the effects of different aspects of the biocenose on the wheat plant. This monograph, particularly condensed, is dedicated to an agronomic problem of great actuality, which may interest the producer and merchant of wheat, as well. Furthermore, it may interest specialists in the field as to the biocenose of microorganisms and as to the many phenomena concerning the germination of the seed and the growth of the young plant. The illustrative material is satisfactory and there is a good list of references added. It can be well recommended.

TIBOR BENEDEK

BERTAUX, A. *Les cortinaires*. 136 p., 165 fig., 16 colored pl. Editions Paul Lechevalier, 18 Rue des Ecoles, Paris Ve, France. 1966. Price 30 francs.

ANDRÉ BERTAUX, who died in 1965, was one of those French amateur mycologists who come to have a remarkable knowledge of fungi. The agaric genus *Cortinarius* was BERTAUX's specialty, and his *LES CORTINAIRES*, the second volume of Lechevalier's 'Études Mycologiques' (see *Mycopath. et Mycol. Appl.* **23**: 359), presents an excellent introduction to the genus. The booklet's format is attractive, and the French is not difficult.

Because of the multiplicity of species of *Cortinarius* and the problems of their identification, the author wisely recommends that the beginner first learn well the diagnostic characters of the genus and its subgenera and sections. (The infrageneric classification used by BERTAUX is Friesian.) He gives a good discussion of these characters as well as of those that delimit species. Other topics covered in the introductory portion are fruiting periods, edibility, and poisoning by *C. orellanus*.

Descriptions of the 164 species included in the booklet are concise and include spore size and sometimes shape and ornamentation. The descriptions are arranged somewhat as if in a key, but I would fault the booklet for lacking a suitable key to facilitate identification. The figures are small sketches of one basidiocarp of all but one of the species, and the plates show well, for 16 species, all characters needed for field identification.

The booklet ends with a discussion of color reactions with chemicals, a brief glossary, a bibliography, and an index.

All in all, a good place for anyone to begin a study of *Cortinarius*.

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"The Cellular Slime Molds," Second Edition, by JOHN T. BONNER. Princeton University Press. Princeton, N. Y. 1967. Price: \$7.50.

It was DR. BONNER's object "to describe the slime mold rather than write a history" and in the second edition of his monograph he has succeeded very well in editing the voluminous literature to accomplish this end. The chapter headings include "Aggregation Organisms," "The Cellular Slime Molds," "Growth," "Morphogenetic movements" and "Differentiation" so that a broad coverage of the biology of these organisms is encompassed.

Many of the newer data are reviewed and woven into the text so that this revision is not the result merely of unassimilated interleaving of new facts but rather an integrated and coherent review. The style is lucid and straightforward and the illustrations usually are clear and pertinent although some photographs suffer from lack of contrast, as in Plates 7 and 8. Editorial care has been exerted to provide an adequate index and full citations in the bibliography although it is somewhat annoying to find references which are cited in footnotes but not the bibliography at the end.

In such a brief book it is inevitable that discipline in the selection of materials must be exerted. My own bias would have led to the inclusion of greater detail on the biochemistry of differentiation for a relatively small proportion of the book is devoted to this subject. Still, the relevance to development of many of these data is not yet clear and, since the focus of much of the book is on development, I can understand the omission.

There are few details of the text with which I can quibble (the misspelling of cytochrome on page 50 is one). Perhaps the discussion of the mechanism of phototaxis on pages 118-120 is the most serious of the difficulties that I have found. Thus, it is said that the slug moves away from light normally (page 118 and Fig. 18). Yet, on page 120, when an experiment in which slugs are submerged in mineral oil is described, DR. BONNER observes that "they also will reverse their direction of orientation and go away from the light."

But these faults are few in the perspective of the feat DR. BONNER has accomplished of welding the elements of disparate disciplines into a coherent study of the cellular slime molds. As I noted above, the focus is upon development and hypotheses are based upon a wide distribution of data from organisms as diverse as algae, sponges and mammals. Moreover, in addition to describing these slime molds, DR. BONNER has articulated many unsolved problems and pointed the direction to much future research, bonuses which commend this book to the attention of mycologists, developmentalists and other biologists as well.

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Medizinische Mykologie und Pilzkrankheiten von ENDRE FEJÉR, DÁNIEL OLÁH, SEBESTYÉN SZATHMÁRY, LAJOS SZODORAY und JÓZSEF URI. Price: \$ 12.—.

(Verlag der Ungar. Wissensch. Akademie, Budapest, 1966).

Die zuerst 1957 in ungarischer Sprache erschienene medizinische Mykologie (ref. in *Mycopathologia* vol. IX, 3 pag. 256) löste im Ausland ein beachtenswertes Interesse aus. Diesem Umstand dürfte zugeschrieben werden, dass die Publikation des Werkes auch in deutscher und russischer Sprache herausgebracht worden ist. Nun liegt die deutsche Ausgabe der fünf Autoren in zeitgemässer, die neuen Resultate der mykologischen Forschung berücksichtigender Form vor. Sie umfasst 988 Seiten mit 489 Abbildungen.

Nach einer kurzen historischen Übersicht folgt die Beschreibung der botanischen Verhältnisse, usw. der allgemeinen (Morphologie, Biologie, Ursprung der Dermatophyten) und speziellen Botanik (284 Seiten) von SZATHMÁRY, dann das Kapitel der klinischen Mykologie. In diesem Teil behandelt der allzu früh verstorbene OLÁH zunächst die mykologische Laboratoriumstechnik und die Dermatomykosen (Trichophytie, Mikrosporidie, Favus usw.) (105 S.). Nachher widmet FEJÉR den Fuss- und Nagelmykosen (119 S.), ferner der Pilzallergie und pilzallergischen Krankheitsformen (136 S.) eigene Abschnitte. Es folgen einige Kapitel ebenfalls von SZATHMÁRY: durch Sprosspilze verursachte Erkrankungen, die Aktinomykose und verwandte Krankheiten, seltener auftretende mykogene Krankheitsbilder, Pneumomykosen, Ohren- und Augenmykosen (113 S.).

In einigen kurzen Abschnitten bespricht OLÁH die Mischinfektionen, die tropischen Mykosen, die Tier-Mykosen und die Prophylaxe der Pilzkrankheiten (20 S.), während SZODORAY auf 6 Seiten die Berufsmykosen erörtert. Im Schlusskapitel berichtet URI über die Antibiotica-Forschung, mit besonderer Rücksicht auf die menschenpathogenen Pilze (56 S.).

Die ausführliche Literatur ist kapitelweise zusammengestellt (72 S.). Namen- und Sachregister machen 35 Seiten aus.

Das gross angelegte Werk gewährt einen Einblick in das weitverzweigte Gebiet der Mykologie. Von medizinischem Gesichtspunkt besitzen die Dermatophyten, die in botanischer Hinsicht eine besondere Stellung einnehmen, die grösste Bedeutung. SZATHMÁRY gebührt übrigens das Verdienst, die Herkunft der Dermatophyten aus dem Boden zuerst betont zu haben. Der botanische Teil scheint zwar für Mediziner überdimensioniert zu sein, er mag jedoch das Interesse der Botaniker erwecken.

Neben der ätiologischen Klassifikation hielten Verff. für notwendig, einige polyätiologische Krankheitsformen, wie die Fuss- und Nagelmykosen, vermutlich infolge ihrer hochgradigen Verbreitung, in besonderen Kapiteln zu behandeln, was zwar dem einheitlichen Gesichtspunkt nicht entspricht, sie erhalten jedoch eine sorgfältige reich illustrierten Beschreibung.

Besonders hervorzuheben wäre das Kapitel der mykotischen Allergie mit der anschliessenden Beschreibung der auf Pilzsensibilisierung beruhenden Krankheitsbilder, das in derartig kompletter Form, mit Rücksichtnahme der neuesten immunbiologischen Beziehungen, einzigartig in der Weltliteratur da steht. Die Beachtung des pilzallergischen Pathomechanismus führte ausserdem FEJÉR zur Aufstellung neuer, bisher kaum gewürdigter Krankheitsformen mykotischen Ursprungs (z. B. Pruritus mycogenes usw.). Die besondere Bedeutung dieser durch BR. BLOCH inaugurierten experimentellen Mykologie und der von der reaktiven Antwort des Organismus ausgehenden Abschnitte liegt darin, dass sie in den Pathomechanismus eines bedeutenden und wichtigen Teiles der mykotischen Prozesse Einblick gewähren und die Perspektive für weitere Forschungen eröffnen.

Die Wichtigkeit der durch Sprosspilze bedingten Erkrankungen rückt heutzutage immer mehr in den Vordergrund, nur vermisst man im Candidiasis-Kapitel die neueren Resultate der Forschungen über Candidiasis-Allergie und Serologie, die nur gestreift sind.

Die Einfügung des abschliessenden Teiles über die Antibiotica-Forschung findet ihre Berechtigung vor allem in dem mykotischen Ursprung der Antibiotica.

Das Werk ist in einem klaren, leicht fasslichen Stil gehalten. Die Ausstattung ist ausgezeichnet, das schwarz-weiße Bildermaterial, von einigen Ausnahmen abgesehen, ist durchaus entsprechend und sorgfältig ausgewählt.

E. RAJKA (Budapest)

The Thelephoraceae of North America by E. A. BURT

The reprint of "The Thelephoraceae of North America" by E. A. BURT, price \$22.50, published by Hafner Publishing Company, New York and London, 1966 — is an exceptionally fine job of book-making and will be found very useful by all students of this large and difficult group. A foreword by A. L. WELDEN is included which contains biographical data on Professor BURT. This adds perspective to the work.

The typography is very clean and sharp, the line drawings are as good as the originals, and the photographs in general are good and show what they were intended to show, although in my review copy some are a bit weak. It is a great advantage and time saver to have this monumental work between two covers.

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