

LIBRI NOVI

SINGER, ROLF. The Agaricales in Modern Taxonomy. Second fully revised and enlarged edition. vii+915 pp., 72 plates (1 col.), cloth. J. Cramer, Weinheim. 1962. Price \$ 30.00

SINGER, ROLF. Keys for the Determination of the Agaricales. 64 pp., paper. J. Cramer, Weinheim. 1962. Price \$ 2.00.

The older generation of mycologists, of which the present reviewer is a lingering relic, has lived through a time when the Basidiomycetes, exclusive of the rusts and smuts, were divided into two major groups, often called orders, the Hymenomycetes, in which the basidia were exposed at maturity, and the Gasteromycetes, in which the basidia matured and discharged their spores in an enclosed chamber. Within the memory of many now living, Hymenomycetes with septate or other specialized types of basidia were in large part removed from that group, leaving in it the homobasidiate forms with exposed hymenium to form a less heterogeneous order which became the Agaricales. This order was divided into a small number of families, based mainly on the form and texture of the basidiocarp and the configuration of the hymenial surface. In such a system, all fungi with the hymenium on radiating lamellae, or what by a bit of imagination could be called lamellae, were included in the Agaricaceae. There were, to be sure, some puzzling intermediates, and doubts as to the validity of this classification were expressed rather early, some of them, as SINGER points out, originating with FRIES himself. Over the years, attempts were made to improve the system as used in special groups, notably by KARSTEN, concerned particularly with the generic limitations of the pore fungi and FAYOD with those of the agarics. Even more important was the work of PATOULLARD, who dealt with the Hymenomycetes as a whole and whose work is only now beginning to receive adequate recognition. But the difficulties of the task are so great that no generally acceptable modern treatment of the homobasidiate fungi as a whole has yet appeared.

In 1951, SINGER¹) attempted on a most ambitious scale to modernize the treatment of the gill fungi. The present volume is the second edition of that work, published in book form, with the bibliography brought up to date, many parts rewritten and a number of important changes made. In the first edition the Agaricales was restricted to the gill fungi and boletes and was divided into 15 families, 13 of gill fungi and 2 of boletes. In the new edition the classification is basically similar but with some shifts of groups and a number of changes in subfamilies and tribes, and a sixteenth family the Polyporaceae is added. As here defined, the Polyporaceae includes only a restricted number of the genera and species ordinarily

¹) SINGER, ROLF. The 'Agaricales' (Mushrooms) in modern taxonomy. *Lilloa* 22: 1-832. 29 plates (1949) 1951.

referred to it. It is divided into two subfamilies, the Polyporoideae, further divided into two tribes, the Polyporeae, with the three genera *Polyporus* (in a greatly restricted sense), *Pseudofavolus* and *Mycobonia*, and the Lentineae, with five genera characterized by lamellate or venose hymenia, the three best known being *Pleurotus*, *Lentinus* and *Panus*. *Schizophyllum* is transferred from the Tricholomataceae, where it was placed in the first edition and assigned to a subfamily of its own. It may be predicted that this treatment of the Polyporaceae will arouse some heated controversy. Evidently foreseeing this, SINGER discusses his reasons in considerable detail (pp. 150—156; 165—167) and those who differ would be well advised to read these pages with care.

There are keys to the families, subfamilies, tribes and genera. Numerous species are cited and for most genera reference is given to published keys to the species. The keys themselves are complicated and difficult. Too often they include a dichotomy in which the first statement, heading in one direction, lists a number of characteristics, not all of which are always present and others are variously modified, which is followed by its alternative "not combining the characters indicated above". Such keys are not easy to follow until substantial experience has been acquired. Spore color is used to some extent, but an attempt is made to make it more precise than is usually the case, and it is definitely subordinated to other characters, including chemical tests, hyphal analysis and microscopic details of hymenium, stem and cuticle. All this is a legitimate part of a truly modern approach. But it may still be questioned whether the keys could not be made clearer and whether quite so many families are necessary.

There is no glossary but in its place there is a subject index which refers to the pages in the introduction where all terms used in the later pages are carefully defined.

The keys and the discussion of rejected genera are reprinted verbatim in the paper-bound pamphlet so that they may be available to students who may not feel able to purchase the complete volume.

Like its predecessor, this is a book for the specialist. A small group of well-prepared graduate students, working under a qualified leader in an area where abundant fresh material is available and with the volume itself and an adequate working library at hand, could spend a highly profitable summer working with these keys and would emerge from the experience not only with a fuller knowledge of the agarics than they could get in the traditional approach, but with a store of mycological information and techniques applicable to many other groups. Any serious students of the fungi, whatever their special interests, will be able to study the introduction with great profit, and it should be required reading in serious advanced courses in mycology.

Full credit must be given to the author for his mastery of his subject matter and of the extensive literature. Space does not per-

mit discussion of his phylogenetic theories nor of all his taxonomic decisions. He gives fully his reasons for the positions he has taken, and he has made a determined and on the whole successful effort to be fair to those who hold opposing views. The result is a major work which will have a lasting impact on mycological classification. But, as stated earlier, some means must be found, if it is at all possible, to clarify and simplify the system he presents. If the study of the fungi in general, and of the agarics in particular, should result in ever-increasing complexity, it may appear that our only recourse will be to the computer. Perhaps that is as inevitable as some insist. If so, then, as the same persons admit, it will destroy taxonomy as we know it. Whether that will be satisfactory is for the future to say, but certainly its consequences should be examined carefully. The alternative is a taxonomy employing to the full all modern techniques and ways of thinking but also capable of being presented as an understandable part of a greater whole, with meaning for the many who do not want to become specialists in ever more restricted fields. We need treatments like those of SINGER's. We also need critical revisions of such works in the light of a comprehensive view of the field as a whole.

The book is beautifully printed and has been carefully proof-read. The few typographical errors noted do not interfere with the meaning. Some of the half-tones are helpful; others are not as clear as might be desired. The line drawings are extremely useful.

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REY, M.: *Les Mycétomes dans l'Ouest Africain*. (Mycetomas in West Africa). R. Foulon & Cie, 29, Rue Deparcieux, Paris. 276 pp. Paperback, 1961. Illustrated. No price is given.

This substantial monograph is an important contribution to geographic pathology in general, and to the most serious question of this deep seated mycosis, in special.

The author deals in the most detailed manner with the history, etiology and pathogenesis of this chronic, destructive mycosis. Its clinic is thoroughly discussed and well illustrated. There are good chapters on sero-immunology and animal experimentation, as well as on therapy. The text is well written, fluent and easy reading. The physical appearance of the book is excellent. It should be constantly consulted by those interested and/or working in the field of tropical dermatology and tropical dermato-mycology.

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CHRISTOPHER CARRUTHERS, PH. D: Biochemistry of Skin in Health and Disease. Pp. 263. Charles C. Thomas, Publisher, Springfield, Ill., 1962, cloth \$ 9.75.

This compact volume will no doubt often be opened by those who have need for biochemical information about the skin. It essentially represents a skillful compilation of data distilled from the nearly 500 bibliographic references which are listed in the book and on this basis alone will prove of much value to investigators who deal with human skin.

After a short introductory chapter devoted to ultrastructure of the human epidermis and hair follicles, the following areas receive biochemical consideration in separate chapters: keratinization and proteins; pigmentation; lipid composition; enzymes; water, minerals pH and sweat; connective tissue; human hair and diseases of the skin. On the whole there is little attempt made to evaluate, correlate, interpret, or point out the significance of the material presented so that the book reads rather like a collection of concise abstracts. There is considerable variation in depth as well as currency of coverage in different areas. To cite just a few examples where these are deficient, in sections where arginase activity is considered no mention is made of the absence in human epidermis of other enzymes of the Krebs-Henseleit cycle such as ornithine transcarbamylase and arginine synthetase which suggests that in the epidermis arginase serves functions other than simply as part of the Krebs-Henseleit cycle. In the chapter on lipids where the data of JONES *et al.* is presented, there is no mention of the fact that their method of analysis based on the extent of spread of sebum as a monomolecular film on water is not reliable for quantitating sebum as it reflects primarily the free fatty acid content of sebum which is a variable component because it is secondarily modified by bacterial lipolytic activity. The assumption is also made that 7-dehydrocholesterol in the skin derives from cholesterol rather than, as suggested by WHEATLEY and also KANDUTSCH and associates, that it is a precursor of cholesterol in a special predominantly cutaneous terminal pathway for cholesterol synthesis. Similarly, under the section on diseases of the skin, no mention is given to the failure of American investigators to confirm NISHIMURA *et al.*'s claims about the excretion of 2,5-dihydroxyphenylpyruvic acid in the urine of patients with so-called collagen diseases.

Despite drawbacks such as these and perhaps more typographical errors than usual, this book presents a remarkable amount of cutaneous biochemical information in handy form and deserves to be on the book shelves of all concerned with cutaneous biochemistry.

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ROLF SINGER, *Mushrooms and Truffles: Botany, Cultivation and Utilization*. World Crops Books, Interscience Publishers Inc., New York. pp. i—xxiii, 1—272. 32 pls. 1961.

There has long been a need for a work dealing with the various kinds of mushrooms and other fungi cultivated for human consumption throughout the world, and it is a fair statement to say that in the present volume SINGER has filled this gap very effectively. This book should be on the shelf of every person interested in cultivated mushrooms. Although SINGER is known especially for his works on the classification of wild mushrooms and their relatives throughout the world, because of his early experiences in growing mushrooms commercially, and the fact that he knows the world literature on mushrooms generally exceptionally well, he is eminently qualified for the task he undertook. The book is not a routine set of instructions on how each kind of mushroom is grown, but rather it is a discussion of each of the steps in the process for each species. In this way he was able to bring his breadth of experience in Mycology to bear on the problems at hand, and for the most part discuss them effectively. He is to be congratulated on the results of his endeavors.

The plan of the work is simple. He treated the kinds of mushrooms grown "commercially" in the world in the descending order, apparently, of their total dollar value in commerce. Thus, the common white *Agaricus bisporus* grown in the United States is treated first. To many people his discussion of the botany of *Agaricus bisporus* will seem tedious, but it would be difficult to make a factual presentation of this subject other than tedious. The taxonomy of *Agaricus* species is one of the most uninspiring subjects in mycology. Those actually seeking advice on how to start growing mushrooms commercially still need to get one of the standard bulletins as a guide, but for background reading SINGER's book is one of the best investments they can make.

Agaricus bisporus, *Volvariella volvacea* (the Paddy straw mushroom), and Shiitake (*Lentinus edodes* of the orientals) are the most important of the cultivated mushrooms. SINGER also discusses the commercial growing of morels and number of other fungi, including, of course, the truffles. For a number of the lesser grown species, like morels, there is no true culture (commercial growing) in the form of a controlled method in a laboratory. The contrast between the scientific procedures used in cultivating *Agaricus bisporus*, and the simple, approximate duplication of conditions as they are found in nature as followed for other species is of course interesting, and depending on the species, both are still used in a single country such as France.

SINGER presents the idea that a morel fruiting body "is a morphologically stabilized multiplication of pezizoid (Pezizaceae) cups on a stipe-like stroma, each alveole corresponding to an individual

cup', p. 164. It is my impression that this thesis is not accepted by all students of the ascomycetes, and certainly is not by field mycologists like myself who have seen large numbers of the Helvellaceae, many in all stages of development. In my estimation it would have been better to have left out the comments on phylogeny or to have presented both points of view.

The book is well written and reasonably free of typographical errors. It is well indexed, has a glossary and bibliography. The last chapter gives tables of the food and mineral values for a number of species.

The book is very useful to people like myself who are always being badgered for "all that is known" about commercial growing of edible fungi. We can now simply suggest they buy SINGER's book.

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WEHMEYER, L. E., A World Monograph of the Genus *Pleospora* and Its Segregates. ix+451 p., 135 figs., 12 plates. 1961. University of Michigan Press, (Ann Arbor) Price \$15.00.

This is a conservative treatment of well over 1200 collections of *Pleospora*, including the types of over 400 species. The chapter contents include (1) a review of the morphology and taxonomy of the group; (2) an account of the host and geographic distribution of its members; (3) a description of the new genus *Platyspora* and its 3 species; (4) a key to the genera and species; (5) a summary of the 96 species of *Pleospora* and a description of each; (6) a treatment of the 8 species of *Clathrospora*; (7) descriptions of 7 species of *Pyrenophora*; (8) and lastly 80 pages are devoted to species under the title *nomina dubia, confusa, nuda, and non vidi*.

Dr. WEHMEYER regards the morphology of the ascospores as of primary importance in distinguishing species of *Pleospora*. By means of a chart he summarizes his concept of the phylogenetic relationship within the genera studied.

Four genera are distinguished in the taxonomic account, namely *Pleospora*, which is divided into 5 subgenera, *Platyspora*, *Clathrospora*, and *Pyrenophora*. Most of the species have an extensive synonymy, indicating the authors conservatism. Only 7 new species of *Pleospora* are recognized. All species are illustrated by line drawings of a single ascospore and by doing so variations in size of ascospores is not taken into account. It would appear that variation in dimensions of ascospores could lead to confusion in specific identifications.

This study is limited to the use of herbarium specimens, a fact which constitutes its most serious adverse criticism. Conidial stages

of some of the species have been described, which fact indicates that artificial cultivation would have greatly supplemented the treatment. But one person working alone is unable to do everything that is essential in a monographic study of so many species. The painstaking task of critically examining so many specimens deserves the thanks of all mycologists.

Dr. WEHMEYER has given us a useful, workable treatise. The keys are easy to follow. The type is clear. The paper is of good quality. Proof reading has been very carefully done and errors and misprints are few.

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NEGRONI, PABLO: *Micosis Cutaneas y Viscerales*, tercera edición. Lopez Libreros Editores S.R.L. Buenos Aires, 1961. [Cutaneous and visceral mycoses. 3rd ed.]. 130 pp. illustrated (82 figures) in black and white.

This useful compendium of the outstanding Argentine mycologist was first published in 1944. It is an excellent didactic presentation of general medical mycology and of the superficial and deep-seated mycoses. The illustrative material is well suited for the orientation of the general medical practitioners.

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