sequent chapters dealing with nutritional intake, absorption and excretion, and riboflavin deficiency syndromes. Currently, these chapters strike me as a compendium of phenomenological observations without rational conclusions. This reflects the state of the science.

The chapter by Lambooy on biological activity of analogs of riboflavin and that by McCormick on riboflavin metabolism may be of interest to pharmacologists and medicinal chemists. Although the literature references in some chapters are as recent as 1974, no mention is made of either roseoflavins, 6- and 8-hydroxyflavins, or 5-deazaflavins as analogs of biological interest.

The concluding chapter by Rivlin on the medical significance of riboflavin and cancer and on hormonal regulation of riboflavin metabolism may be the most stimulating and tantalizing to life scientists. They serve the function of indicating problems of medical interest where much of the basic research knowledge is still lacking. These include transport of the vitamin in plasma and across cellular membranes, regulation of enzymes of flavin metabolism by adrenocorticotropic hormone and thyroid hormone, and adaptation of flavin adenine dinucleotide synthetase in hepatomas.

It is likely that this volume is of more direct interest to medical and clinical researchers than to biochemists or enzymologists, yet the latter groups will find it worth perusal also because the material is not usually reviewed in biochemical publications.

CHRISTOPHER WALSH
Departments of Chemistry and *Biology, Massachusetts Institute of Technology, Cambridge*

Genetics of Fungi

Mycogenetics. An Introduction to the General Genetics of Fungi. J. H. BURNETT. Wiley, New York, 1975. xiv, 376 pp., illus. $34.

Fungi have had considerable, but quite selective, attention from biologists for many years. A mycologist will concentrate on taxonomy; a molecular biologist on mitochondrial DNA or enzyme aggregates; a geneticist on gene conversion and tetrad analysis; an industrial researcher on mushroom, beer, penicillin, or citric acid production; and an agriculturalist on rusts, smuts, and other pathogens. Few workers in any of these fields can know much about the other specialties, largely because of the variety of intellectual traditions involved. Yet one phenomenon that bedevils or intrigues almost all workers is the variability and diversity of fungi. Usually fungal variation is mastered or exploited in narrow ways appropriate to a given situation. But by now fungal biology is advanced enough to support sophisticated population and evolutionary studies. Fungi offer enough unusual genetic mechanisms, such as mitotic recombination, heterokaryosis, and non-Mendelian systems, to suggest that unique modes of evolution might be discovered. Many phenomena in quantitative genetics, pathogenesis, mating type systems, and isolating mechanisms are waiting to be fully rationalized in terms of these unusual genetic mechanisms. The book under review is an initial and largely successful attempt to do this. In the course of it, mycological phenomena are brought to the attention of geneticists, and experimental mycologists are invited to consider their world in genetic terms.

The first major section of the book is an introduction to mutagenesis, formal genetics, and the unusual features of the genetic system of fungi referred to above. Unfortunately, the author is forced to be quite telegraphic when dealing with well-known aspects of these subjects, and the use of algebraic discourse, which is almost wholly dispensable to an intuitive understanding, makes these aspects even more daunting for a naive reader. Also, many phenomena, such as complementation or temperature-sensitivity of mutants, are described initially without reference to physiological or molecular mechanisms, which gives the appearance of superficiality. The unique genetics of fungi is treated more amply, however, with well-chosen examples and references. The second major section of the book, on fungal population genetics, demonstrates through examples of work on mutation, mating systems, natural and experimental selection, and isolating mechanisms, that a sophisticated population genetics of fungi is well within our grasp. While speculation is limited, the author points clearly to problems, such as the sympatric origin of species, deserving of solid genetic work. A final section integrates some of the themes of the previous two in a discussion of the applications of mycogenetics. These include descriptions of improvements in penicillin yield, the analysis of virulence and aggressiveness of plant pathogens, and the analysis of recombination mechanisms and gene action. But for the last two topics, the section is a very successful reinforcement of the preceding material. Throughout, the prose is simple and the illustrative tables and figures, taken from the original literature, are informative.

Mycogenetics is highly recommended to biologists conversant with genetics who wish to explore this field. One might hope, with Burnett, that the book will stimulate a more intensive study of the population biology of fungi.

ROWLAND H. DAVIS
School of Biological Sciences, University of California, Irvine

Northern Ungulates

Alces. Moose Ecology. Ecologie de l'Orignal. Papers from a symposium, Quebec City, Mar. 1973. J. BÉDARD, E. S. TELFER, M. L. WOLFE, J. PEEK, D. W. SIMKIN, P. C. LENT, and R. W. RITCEY, Eds. Presses de l'Université Laval, Quebec, 1975 (U.S. distributor, International Scholarly Book Services, Portland, Ore.). x, 742 pp., illus. Paper, $27.50. *Le Naturaliste Canadien*, vol. 101 (1974).

This publication consists of papers that were presented at an international symposium on moose ecology. Of the 42 papers, four are from workers in the U.S.S.R. and four from Scandinavian biologists. With one exception the papers are in English. All the major workers in the field have contributed, and with few exceptions the papers meet a high standard. As a result the volume is a complete and up-to-date summary of all aspects of moose ecology under current investigation, and it will be essential reading for all those who are interested in game biology and wildlife management.

The volume is made up of six sections. There are eight papers on habitat distribution over almost the entire range of the species. It is difficult to compare these papers because of the lack of standardization of the information presented. It is remarkable to find such a large list of environmental factors being considered responsible for regulating the distribution of moose. The factors appear to vary not so much with the geographical distribution of the moose as with the state or provincial boundaries involved.

Of the five papers on nutrition, three are good reviews of food habits, energy requirements, and blood chemistry. In the first, the author comments also on the lack of standardized data collection systems. The paper on blood chemistry is an outstanding contribution in its clarity and as a data source. Emphasis is placed on the role of stress in the handling of large ungulates and subsequent effects on blood parameter values.

The next two sections consider inter-