cially effective. Dissections of the pelvis, shown in Section 6, include both male and female and demonstrate relationships and structural details by conventional and lateral approaches to ischio-rectal fossa, perineum, and pelvic structures. The anatomy of the prostate and prostatic urethra is demonstrated in interesting detail. The paucity of female subjects in many anatomy laboratories adds value to the dissections of the female pelvis and perineum. The skill and detail expressed throughout these dissections should be instructive and challenging to the student, and they may be appreciated by the professional anatomist who finds little time available for preparation of comparable demonstrations.

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Laboratory Innovation

Atlas of Plant Morphology. Portfolio 1, *Photomicrographs of Root, Stem, and Leaf* (xvii + 60 pp. 1959. $3); Portfolio 2, *Photomicrographs of Flower, Fruit, and Seed* (xxii + 48 pp. 1962. $2.75). Emma L. Fisk and W. F. Millington. Burgess Publishing Company, Minneapolis, Minn.

For many years the preparation of drawings has been a mainstay in the organization of laboratory courses in botany, especially in plant anatomy and morphology. On the theory that an accurate, well-labeled drawing is graphic representation of the student's powers of observation and ability to interpret what he has seen and that this is equal to understanding, the laboratory drawing method of instruction persists today in many educational institutions. Considering the ultimate reward to the student, the question of whether or not the time spent in preparing such illustrations is too time-consuming and merely an exercise in art work was doubtlessly in the minds of authors Fisk and Millington when they sought to replace, in large part anyway, this means of expression by producing an atlas of photomicrographs all set up for labeling.

The photomicrographs are to supplement the study of microscopic preparations, not to replace them. Properly used, say the authors, the photographic plates enhance the quality of the student's observations and drawings (supplementary drawings are recommended where necessary) and free the student for more actual study of the specimens. This has been successfully demonstrated in classes taught by the senior author at the University of Wisconsin. Whether laboratory courses in descriptive botany will be materially affected, whether teachers of botany will alter their ideas about the value of laboratory drawings as a basis for such courses, or whether these two atlases will become widespread in their use will depend, of course, on the experiences of teachers who elect to try this method of laboratory instruction. Old ideas die hard, especially those that have been proven valuable by respected and successful teachers in many countries.

The titles of the two portfolios explain, almost, their contents. Each consists of a series of punched sheets suitable for insertion in a standard three-ring, loose-leaf binder; each has three sections: a brief introduction, several pages of explanatory text, and the atlas proper, the bulk of the portfolio. The photographs are halftones, and each is directly labeled with only the common and scientific name of the plant of which a part is depicted in the photograph. The legend section is essential, for only here is the plant part named, and only here is there a guide to the tissues and cells illustrated. It also serves as a table of contents.

It would be unfair to criticize the quality of each photomicrograph, for in general, they comprise a very fine set of photos, considering the limitations of reproduction by the halftone method, the large-scale publishing, and the price of the folios. It is apparent that the microtechnical operations previously necessary for the production of stained tissues were superb, and the original photomicrographs were doubtless of high caliber.

There are a few typographical errors and omissions in the legends, and some morphological terminology to which I might take exception. But, these are really inconsequential. However, there is one observation that should be directed to potential users and to the authors: Many of the anatomical features that are mentioned for examination in the legends cannot possibly be distinguished in the relevant illustration. The following might be cited as examples: alternate bordered pits in wood of *Quercus alba*; tracheids and apotracheal wood parenchyma in *Q. borealis*; details of the vascular system in developing carpels of *Ranunculus*; and spines on pollen grains of *Gossypium* and *Silphium*. The legend should be modified for any illustration on which the anatomical features mentioned are not easily identified on the published photomicrograph.

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Mostly Bacillus

Spores. vol. 2. H. Orin Halvorson, Ed. Burgess, Minneapolis, Minn., 1961. ix + 296 pp. Illus. $5.

This is a collection of 15 original research papers. The majority of the papers are followed by a "discussion" that is actually the presentation, by another authority working in the same specific area of spore research, of related work.

The broad scope of the research presented will make the book of interest to a number of different disciplines. For those interested in the metabolism and physiology of the bacterial spore itself there are papers on the biochemistry of the sporulating cell, spore permeability, the differences in spore and vegetative cell enzymes, the possible roles of DPA in the spore, the cytological and chemical changes in heat-killed and germinated spores, and the effects of physical and chemical agents on germination. Papers touching upon genetics, pathogenicity, radiation resistance, and the fungi are also included. The authors of one paper have developed a hypothesis of the pathogenesis of anthrax, while another investigator reports the differences in *Neurospora* ascospores activated by heat versus those activated by chemicals. In another paper, the correlation of radiation resistance with the development of certain, as yet unidentified, cystine-rich structures in the developing spore of bacteria is discussed. In the area of genetics, there are papers on the transformation of certain characters of the vegetative cells of *Bacillus subtilis* by DNA and the ability of phage-infected bacterial spores to transduce other strains.

Individuals who are particularly in-

terested in the anaerobes may consider it a deficiency that, with the exception of one paper, all of the research reported has involved work with bacterial spores of the genus *Bacillus*.

An editorial oversight diminishes the value of one paper from which all seven of the tables have been omitted in publication.

The book should find its greatest audience among those actively engaged in research, but its value to advanced students as a guide to areas of current research interest should not be overlooked.

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Microspores and Agents

The Story of Pollination. B. J. D. Meeuse. Ronald Press, New York, 1961. x + 243 pp. Illus. $7.50.

Many of the incompletely solved, yet fascinating, examples of quite precise pollinator-flower relationships and the associated biological time clocks receive interesting attention in this book, which is written in language suitably simple for "young persons between the ages of eight and eighty." To a notable degree, the author's enthusiasm for, and long association with, his subject is revealed in the carefully constructed text. One is led to share his excitement in viewing closely such moments as the hummingbird sipping nectar from the flower of *Lobelia cardinalis* and the beetles reacting remarkably to devices insuring pollination in *Calycanthus* and various aroids.

Meeuse covers, within the limits of 20 well-interlinked chapters, matters as diverse as the bee's perception of the light-polarization pattern of the sky to the pollination of *Kigelia* and other tropical plants by bats. Occasionally there are digressions of sufficient extent to make me wonder why the phrase, "and pollinators" was not appended to the title of the volume.

To a major extent, the highly selected bibliography refers to important works on bees and other pollinators. In view of the limited, and partially inaccurate, character of the two plates on pollen grains, interested readers would have been materially aided by citations directing them to such definitive works on pollen as those of Maurizio, Zander, Hodges, Hyde, Wodehouse, and Erdtman. The balance of the illustrations are of high caliber. Hilda Kern's color plates, which include an exquisitely executed one of *Iris siberica,* are choice and unusual additions to the book. One should note that, in Fig. 28, the legends for *E* and *F* have been reversed.

The text is admirably free of typographical error. It is almost a matter of quibbling to protest that 233,644 pollen tubes (page 214) do not represent "over a quarter of a million." The general format appears to be a satisfactory compromise for the intended audience. Meeuse has produced a distinctive contribution to a phase of biology which, since the days of Darwin, Kerner, and Knuth, has hardly received the attention it could well be given.

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Ecological Viewpoint

A Synthesis of Evolutionary Theory. Herbert H. Ross. Prentice-Hall, Englewood Cliffs, N.J., 1962. xii + 387 pp. Illus. Trade ed., $10; text ed., $7.50.

Herbert H. Ross, principal scientist of the Illinois Natural History Survey and professor of entomology at the University of Illinois, is well known for the breadth of his approach to taxonomic, ecological, and evolutionary problems in the study of insects. Those interests are here exemplified in a still broader way, both by the judicious use of entomological examples (among others) of evolutionary processes and by unusual and welcome emphasis on community, biome, and general ecological aspects of evolution.

Introductory chapters treat the history of evolutionary theory, the origin of the universe, the solar system, and the earth, and the nature and origin of life. Four chapters are then devoted to basic evolutionary processes in populations and to speciation. Another four discuss in considerable detail the evolution of communities and biomes and the geotectonic, environmental factors that are stressed throughout the book. A few final pages summarize the whole. Apart from interesting dissent on some minor points, the evolutionary theory expounded is that familiar through the works of Dobzhansky, Huxley, Mayr, and others.

The most valuable and to some extent the pioneering part of the book is its integration of evolutionary theory and ecology. This should be helpful to many students and practitioners of ecology, biogeography, and related subjects, whose approach has been less dynamic. The book is clearly not meant to be a general textbook of evolution and intentionally omits many subjects that would be expected in such a text. The first half of the book is less successful than the second half and unfortunately cannot be highly recommended, although it is somewhat refreshing to find viruses omitted from a discussion of the origin of life and the Hardy-Weinberg equilibrium from a treatment of population genetics.

The author's known talents have not produced a synthesis as broad and adequate as his name and the book's title seem to promise, but this disappointment is combined with gratitude for what, in fact, has been done.

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Excellent Reference Source

A Survey of Cardiac Glycosides and Genins. J. Hampton Hoch. University of South Carolina Press, Columbia, 1961. i + 93 pp. $3.50.

During the past decade a tremendous advance has occurred in the isolation and identification of many new cardiac glycosides and genins. To date approximately 400 such compounds have been isolated and characterized. This advance has been the result primarily of developments in chromatographic methods and the discovery of new botanical sources.

The author has compiled, from the multitudinous reports in the scientific literature, important botanical, chemical, and pharmacological data for most of the known cardiac glycosides and genins. These data are summarized and presented in tabular form in three tables that comprise most of the book. The first table lists some 380 compounds having cardiotonic activity together with information on the botanical origin, the family, and the part of the plant utilized, and references. Chemical informa-