Economic botany will make its demands wherever in the course appropriate connections can be made. Its importance is evident but it can hardly hope for much opportunity of consecutive treatment.

Of direct interest will be some of the lower plants in their relation to the subjects of sanitation, hygiene, fermentation, decay and to disease.

Finally such a course will miss an end, if the student fails to comprehend some of the simpler principles of organic evolution and the fundamental biological deductions which have so profoundly affected philosophy.

This is the general nature of the course to be tried out in our numerous institutions of higher education, and it seems not unreasonable to hope that the experiment may bring about a certain amount of agreement in the profession as to what may constitute the best introductory course in botany. Some possible results of the experiment and the discussions that formally or informally will come out may be briefly outlined.

Is it not probable that comparative morphology, based on type studies and having for its end the outlining of evolutionary relationships between the great groups of plants, must give way in introductory treatments and work out its ends through courses that will follow? Physiology and ecology in simple form may take a more prominent place, especially as they bear on such practical subjects as agriculture, forestry, etc. Fundamental principles of genetics for the same reasons will call for attention besides having their obvious connection with broad biological principles. Evolution may be treated not so much as a record of past accomplishments in phylogenetic history but with respect to the manner through which it is ever working. Economic botany seems certain to make important demand on the content of an introductory course.

Comparative morphology needs no advocate of its value and interest. Its followers may feel confident in the security of its position in botany. Those who teach it know that satisfactory results are not obtained when the subject is crowded for time. There are no short cuts to an understanding of morphological relationships. The basis of study must be detailed and thorough laboratory work. It is a fair question whether comparative morphology will not find greater satisfaction and obtain better results unfettered from the time limitations of the crowded introductory course with its necessarily mixed topics.

Morphology, physiology, ecology, genetics and the long list of special botanical subjects—none of them can hope to build upon an introductory course with any considerable degree of security. Each must construct its program according to its own special requirements frequently dependent upon other subjects or sciences. Physiology rests upon physics and chemistry; genetics makes use of mathematics; all special lines of botany require to some degree a knowledge of morphology.

Under these conditions will not the introductory course come more and more strongly to stand out as one that attempts nothing more than the grounding of fundamental principles and a selection of information with rather definite reference to its general and practical interests, or its broad philosophical bearing?

BRADLEY MOORE DAVIS

WASHINGTON,
November, 1918

A POSSIBLE NEW FUNGICIDE FOR WHEAT AND BARLEY SMUT

THE eradiction of stinking smut from wheat grown on the Pacific coast appears to be contingent upon the prevention of reinfection of treated seed by spores of smut in the soil or upon its surface. Even though the wheat farmer may have a smut free field, his soil is subject to infection by smut showers from his neighbors who thresh and blow into the air myriads of smut spores which are carried for miles by the winds.

Formaldehyde treatment for stinking smut in seed wheat, which has been found so effective and cheap in the states east of the Rocky Mountains where soil infection apparently does not occur, is ineffective against smut infected soils everywhere.* This is due to the immediate evaporation of formaldehyde gas when the solution dries from the seed.

On the Pacific coast, wheat farmers have generally found that bluestone-treated seed escapes wholly or in part from soil infection. Bluestone solutions (1 pound to 4 or 5 gallons of water) are so strong that heavy loss in seed germination occurs. To prevent this loss, the bluestoned seed is dipped in a lime solution. This double dipping adds considerably to the cost and labor concerned in the seed treating process. Inquiries are frequently received requesting to know if the lime can not be mixed with the bluestone and but one dipping given. As the lime counteracts the effects of bluestone on smut spores, this process is not advisable.

In devising some means to meet the situation the writer devised tests using the lime sulphur-dip so universally used in spraying fruit trees for fungous pests. Preliminary tests with wheat and barley show the lime sulphur-dip at rather dilute solutions to be very effective against both stinking smut of wheat and covered smut of barley. As a thick coating of the dip adheres to the seed, it is quite effective against soil infection. The germ of seed wheat and barley dipped in a lime-sulphur solution even as strong as one part to one part of water gave, in these preliminary tests, no noticable deleterious effects on seed germination. If further more exhaustive tests confirm the preliminary ones, a fungicide which is much cheaper than bluestone and entirely lacking in destructiveness to the seed germ will have been secured.

W. W. Mackie

University of California,
Berkeley, Cal.

SCIENTIFIC BOOKS

A Text-book of Mycology and Plant Pathology. By John W. Harshberger. P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia, 1917. With 271 illustrations, vii + 779 pages.

Students as well as investigators in mycology and plant pathology will greatly welcome the appearance of the above named work, by Dr. Harshberger. This is perhaps the only American book of its kind which treats of mycology in its true relationship to plant pathology. The book is of special interest, as it is written by a man who combines the knowledge and the technique of the old and the young botanist. Dr. Harshberger's work is the result of twenty-seven years experience in teaching and in preparing men for the botanical profession.

Like all other of his works, Dr. Harshberger's present book is very exhaustive; indeed it may safely be called an encyclopedia of mycology and plant pathology. It contains a wealth of information all written in concise language. It is also abundantly illustrated, and the numerous references will be especially welcomed by students and investigators. A book of this nature should not be judged by some few imperfections, or errors, in spelling, but rather by its scope and its ability to cover the field in a precise way. In this the author seems to have succeeded.

The book is divided into four parts:

Part I. deals with systematic mycology. It is divided into twenty-one chapters in which the Myxomycetes, the Schizomycetes and the Eumycetes are considered at length. The Myxomycetes receive a considerable share of attention and emphasis is laid on the pathogenic forms. A complete bibliography is also appended. The discussion of the Schizomycetes is taken up in a similar fashion as the Myxomycetes. The pages dealing with the fungi are preceded by chapters on histology, chemistry, physiology, ecology, etc. A comprehensive treatment of enzymes in fungi is also given. The chapter on the geographic distribution of fungi will be appreciated by the plant pathologist. The distinctive features of the taxonomic chapters on the fungi is that emphasis is laid on the forms pathogenic to plants.

Part II. takes up a general consideration of plant pathology. The various forms of disease, the predisposing factors, the symptoms, etc., are very clearly set forth.

Part III. deals at first with a list of specific diseases of economic plants. These are taken up alphabetically and the reader is referred to a list of fairly extensive agricultural experiment station bulletins. The second part of