given to 0."01. The data relative to eclipses, occultations, physical ephemerides and satellites, are given in Greenwich time instead of Washington time. The style of type adopted permits the publication of much of the material in a more condensed form without loss of legibility.

The preparation of the material for the *American Ephemeris and Nautical Almanac* for 1917, on the same general lines as the volume for 1916, is now well advanced.

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BOTANICAL NOTES

FOREST TREE DISEASES

A handy little field manual for the practical use of foresters has been prepared by E. P. Meinecke, forest pathologist, in the Bureau of Plant Industry of the United States Department of Agriculture, under the title "Forest Tree Diseases Common in California and Nevada." In less than 70 pages the author manages to call the attention of the reader to about twenty-five diseases of various parts of the tree, and to give some general notions as to the nature of disease in plants, and the structure of the fungi which cause most of the tree diseases. Twenty-four half-tone reproductions of photographs help to make it easier for the young forester to identify the particular trouble he may have in hand.

ANOTHER TREE BOOK

Appealing largely to foresters also, Professor J. H. Schaffner's "Field Manual of Trees," may well be noticed here. For the region covered (Virginia, Kentucky and Missouri northward, and westward "to the limits of the prairie") we do not know of a more useful little book than this. In about 150 pages the author makes it possible for the reader to determine the name and relationship of the native and more commonly cultivated trees of the northeastern United States. It should find a large use in the high schools of the country, and the young forester will find it a most handy book to have in his pocket when he goes into the woods.

A PHARMACEUTICAL BOTANY

In a little more than one hundred pages Professor H. W. Youngken and F. E. Stewart have condensed the principal morphological and taxonomic portions of botany that they deem should be known by the student before he enters the field of pharmacology. As a hand-book to accompany a course of lectures this little book should prove very helpful, and apparently this was the purpose the authors had in mind when they prepared the text. We imagine that this booklet or one something like it might prove useful in other applications of science, as in agriculture, horticulture, agronomy, medicine, etc.

FLORA OF SOUTHEASTERN WASHINGTON

More than a dozen years ago Professors Piper and Beattie, of the State College of Washington published a useful little book under the title "Flora of the Palouse Region," and now they bring out a revision and extension of that work as the "Flora of Southeastern Washington and Adjacent Idaho." In its present form it makes an octavo book of nearly three hundred pages of close, and rather small type. In all 1,139 species are described, and it should be understood that they are *described* and not merely indicated by keys, as is so commonly the case in recent local floras. In fact this is a genuine manual of the systematic botany of a particular region. There is a general key to the families at the beginning of the book, followed by descriptions of the families (with keys to the genera), descriptions of the genera (with keys to the species), and finally good descriptions of the species. The nomenclature is modern and all specific names are decapitalized. It is a most creditable piece of botanical work.

MORE FLORIDA MANUALS

Some time ago (February 27, 1914) we noticed the botanical activity of Dr. J. K. Small in the preparation of manuals of systematic botany, from the ponderous "Flora of the Southeastern United States," to his "Flora of Miami," "Florida Trees" and "Flora of

Lancaster County" (Penn.) and now we must add two more similar books to his credit. They are the "Flora of the Florida Keys" and the "Shrubs of Florida" both of which appeared within the last few months. The first is a neat little volume of about 160 pages containing descriptions of the seed plants growing naturally on the islands of the Florida reef from Virginia Key to Dry Tortugas, a distance of about 225 miles. As the author remarks, "we find here a tropical flora made up almost wholly of West Indian elements, and closely related to the floras of Bermuda, the Bahamas and Cuba." To a northern botanist it seems strange to find among the grasses no species of *Poa,* nor of *Bromus;* in the sedges no species of *Carex;* in *Brassicaceae* but four species; in *Rosaceae* no species; while the leguminous families aggregate 57 species; *Euphorbiaceae,* 45 species; *Malvaceae,* 17 species, and *Rubiaceae,* 22 species. Of the three families of composites there are but 44 species.

In the other little book (of 140 pp.) the northern botanist will be astonished to find a shrubby grass [*Lasiacis* (*Panicum*) *divaricata*], a buckwheat (*Coccolobis*) forming "evergreen shrubs or trees," the Castor-oil plant (*Ricinus communis*) "a small tree or shrub," a shrubby heliotrope (*Heliotropium*), and a low shrubby *Eupatorium.* Both books will well repay careful examination.

SHORT NOTES

AN interesting paper by Dr. W. B. McDougal on "The Mycorhizas of Forest Trees" appeared in the first number of the new *American Journal of Forestry* showing that in some cases the relations between the tree and the fungus is symbiotic and sometimes parasitic.

FREDA M. BACHMANN'S paper on "The Origin and Development of the Apothecium in *Collema pulposum*"[1] is a valuable contribution to the theory as to the phylogeny of the Ascomycetes propounded by Dr. E. A. Bessey,[2] in which he suggested that the first Ascomycetes were lichens. In her paper Miss Bachmann says "in the number and nature of its spermatia and in the manner in which they are borne, *Collema pulposum* forms about the most perfect conceivable connecting link between the aquatic red algae with many non-motile male cells which are, however, set free, and such terrestrial ascomycetes as *Pyronema* and the mildews where the male cells are reduced in number to one or two which remain permanently attached."

[1] *Archiv. für Zellforschung,* Band X., Heft 4.
[2] *Mycol. Centralbl.,* Vol. III.

A RECENT handful of papers from Professor Doctor Aven Nelson reminds one of the taxonomic activity of the director of the Rocky Mountain Herbarium at Laramie, Wyoming, and serves to show that there is still much to be done in the systematic botany of the central mountains of the country.

DR. O. E. JENNINGS'S "Manual of the Mosses of Western Pennsylvania" (1913) should have been noticed long ago, since it offers to botanists in the central east a descriptive manual of these plants accompanied by fifty-four full-page plates of original drawings. The book includes somewhat more than four hundred pages, and is a credit to the author, and the institution (Carnegie Museum, Pittsburgh) from which it is issued. All told more than 275 species and varieties are described. The treatment is modern, the specific names being decapitalized, and "the rulings of the International Botanical Congress, held in Brussels in 1910, have been followed."

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SPECIAL ARTICLES

CELL PERMEABILITY FOR ACIDS

SINCE Overton's first extensive and well-known studies and his publication of the lipoid theory, interest in the subject of cell permeability has continually increased. Although adherents of the theory have modified and supported it with subsidiary hypotheses the two essentials remain unchanged to-day, namely—(1) that substances which are most soluble in lipoids (fat solvents or fat-like bodies) enter living cells most readily and (2) that they do so because they dissolve in the cell surface which is lipoid in nature.