once occupied by a glacier is not stated; but the hanging valleys join it only three or four miles from the end of a large existing glacier that is fed from the great snow reservoirs of Kabru peak (24,015 feet). Hence Garwood's explanation of these hanging valleys, involving so many hypothetical conditions—even the capture of the headwaters of the assumed east-flowing consequent being hypothetical in a region of so complicated structure and of so much dissection since the capture is supposed to have taken place—can not at present be advisedly accepted in place of the much more probable explanation by glacial erosion. The suggested explanation becomes all the less satisfactory when it is perceived to depend on two very doubtful postulates: (1) the discordant relation of trunk and branch valleys is assumed to result in part from a supposed tilting of the drainage basin, yet no proof of the principle underlying this assumption is adduced from demonstrably tilted basins in non-glaciated regions; (2) the hanging valleys are supposed to have been occupied by glaciers that maintained a highly specialized and persistent relation to the valley mouths; yet no examples are adduced to show that this relation prevails in any region of existing glaciers.

One more point; Garwood argues for the 'superior erosive power of water over ice,' and this implies a misapprehension. It is not essential to the glacial origin of hanging valleys that the *erosive power of ice should be superior to that of water,* but only that the *erosive work of ice should be unlike that of water.* How long a time the main glaciers of a mountain range may have taken to scour out their over-deepened main channels and to leave the channels of smaller side glaciers in the form of hanging valleys, and what amount of work might have been accomplished by rivers in the same time and place, no one yet knows. W. M. Davis.

BOTANICAL NOTES.

TWO MORE BOTANICAL TEXT-BOOKS.

Within a couple of months two books for beginners in botany have been offered to the high schools of the country. The first is the 'Introduction to Botany' prepared by Professor Stevens, of the University of Kansas, and brought out by Heath & Company. It is an attempt to introduce the beginner to all departments of the science. Accordingly, he is directed in his studies of seeds, seedlings, roots, buds, stems, leaves, growth, movement, modified parts, flowers, seed dispersal, selected spermatophytes (twenty-five kinds), slime moulds, bacteria, yeasts, algæ, fungi, lichens, mosses, ferns, horsetails, adaptation to environment, plants of different regions, plants of past ages and classification. In all of these topics the subject is treated comprehensively. There is something of structure, morphology, physiology, ecology, as well as of the philosophy of botany. Throughout the chapters are scattered nearly two hundred observations and experiments to which the pupil's attention is directed. Part II. of the book describes the school herbarium, laboratory equipment, reagents and processes, and Part III. is devoted to a pretty complete but not very satisfactory glossary. A short 'flora' is appended to the volume, in which selected spermatophytes are briefly described. The treatment here is quite conservative, the old nomenclature being strictly followed, although the sequences of families are those of Engler.

The book contains a great deal of valuable matter, but it is open to the pedagogical criticism of not separating the elementary and fundamental from the advanced and more technical aspects of the science. In the hands of a wise and well-trained teacher it will be a helpful book, but in too many cases its use will leave the pupil in a more or less dazed and confused state of mind, on account of the fact that too many things have been brought to his notice in the short time allotted to the study. The author should prepare another book in which only the elementary and fundamental parts of the subject are presented to the beginner, and then the present work might be enlarged and elaborated for the use of advanced students.

The second book, with the suggestive title 'Botany all the Year Round,' is from the hand of E. F. Andrews, of the High School

of Washington, Georgia, and bears the imprint of the American Book Company. As stated by the author, the book 'aims to lead the pupil to Nature for the objects of each lesson, and to provide that the proper material shall always be available by so arranging the lessons that each subject will be taken up at just the time of the year when the material for it is most abundant.' The book thus assumes that the work is to begin in September, and continue the whole year, which is quite right. The pupil first takes up the leaf and its uses, in which such subjects as transpiration, respiration, the parts of the leaf, leaf arrangement, leaf adjustment and transformation of leaves are studied. He next studies fruits, under the topics, fleshy, dry, dehiscent and aggregate fruits, and this is followed by studies of seeds and seedlings, where he learns about monocotyledons and dicotyledons, the forms, growth and germination of seeds, etc. In like manner he studies roots, and underground stems, the proper stem, buds, branches and flowers. All of this takes 236 of the 300 pages of the book. Then we have a short chapter (14 pages) on ecology, followed by 36 pages devoted to the lower plants. The appendix contains a most useful list of books for reference, and the index appears to be satisfactory. While it emphasizes too much the higher forms of plants at the expense of the lower, reminding us at once of the old Gray's 'Lessons in Botany,' which it is evidently intended to replace in the southern states, it is perhaps as advanced a book as can be used successfully in the region for which it was written. The compound microscope is evidently a thing almost undreamed of in the schools for which it is intended, and so there is nothing else to be done but to send the youngsters into the fields for their laboratory work. Like the preceding book, this one attempts too much, but the fault is not quite so great here as there.

All in all, the two books are creditable additions to the already long list of American textbooks of botany. When they have been tried by some years of practical use in the schools they can be so revised as to improve them along the lines suggested above. In the meantime they will be helpful to many teachers in the secondary schools of the country.

PLANT PATHOLOGY IN THE COLLEGES.

IN the 'Proceedings' of the Sixteenth Annual Convention of the Association of Agricultural Colleges and Experiment Stations, held at Atlanta, Ga., October 7–9, 1902, Professor Wilcox, of Alabama, makes some lively criticisms of botanical teaching in the colleges and universities of the country. His remarks are of course mainly directed towards the agricultural colleges, but they apply with equal force to the larger institutions. In but few of the colleges is there any attempt to teach plant physiology, and where it is entered as one of the botanical courses Professor Wilcox shows that it is often not physiology at all that is given. Pathology as a subject for the study of the college student is almost unknown even in the agricultural colleges. He says "the situation respecting the teaching of plant pathology is even more serious and non-effective than that of physiology. Substitution of an entirely different subject from real pathology seems to be the rule rather than the exception in the teaching of this subject." The difficulty which faces the Bureau of Plant Industry in the United States Department of Agriculture every time an additional plant pathologist is wanted is an indication of the truth of the charge brought against the colleges by Professor Wilcox.

A DISEASE OF THE WHITE ASH.

DR. HERMANN VON SCHRENK, of the United States Department of Agriculture, in charge of the Mississippi Valley Laboratory at St. Louis, has issued a bulletin describing a disease of the white ash caused by the fungus *Polyporus fraxinophilus*. The disease is prevalent in the Mississippi valley, and is particularly severe in Missouri, Kansas and Nebraska, where this tree reaches its western limit. The disease, which has been named the 'white rot,' changes the hard wood of the tree into a soft, pulpy, yellowish mass, making it unfit for lumber purposes, and bringing about the early death and overthrow of the tree. Accordingly, in regions where this

disease is common the ash never grows to be a very large or very old tree. It is said that in Forest Park, St. Louis, nearly all of the white ash trees are diseased. Susceptibility to the disease, mode of entrance of the parasite, the microscopic changes of the wood, and remedies, are discussed in this bulletin. Five excellent plates serve to make the matter plainer than is possible by text alone.

Charles E. Bessey.
The University of Nebraska.

THE BRAIN OF SILJESTRÖM.

The brain of Professor Per Adam Siljeström, of Stockholm, has recently been described by Retzius.* Siljeström was an eminent physicist and pedagogue who died in 1892 at the age of seventy-six. He was connected with the Paul Gaimard Polar Explorations, and is best known for his valuable researches on Mariotte's law, and for his efforts in behalf of the reformation of the school systems in Europe. Most of his work in this line was done subsequent to his visit to the United States in 1849–50, where he studied the various school systems and published his views. His intellectual abilities are spoken of as having been of the highest order.

Retzius adds his description of this brain to those of the astronomer Hugo Gylden and the mathematician Mme. Sonya Kovalewski. Siljeström's brain weighed 1,422 grams and is splendidly developed. Its convolutions are particularly rich in the frontal and parietal association areas, and it appears in most respects more complex than do those of Gylden and Kovalewski. The brain shows that special order of normal asymmetry so typical of the higher brains. As in Gylden's and Kovalewski's brain, the right Sylvian fissure proper is shorter (47 mm.) than the left (58 mm.), and the marginal gyre shows a similar complexity; these features are of interest in their possible relation to the mathematical abilities of these persons.

A small abscess of the size of a hazelnut involved the right subfrontal gyre.

E. A. S.

* *Biologische Untersuchungen*, Neue Folge, X., 1902 (Stockholm).

THE NEW ALGOL VARIABLE.

The Algol variable, 4.1903, recently discovered by Mme. Ceraski, proves to be an object of unusual interest. The Carnegie grant has enabled an examination of the photographs, taken with the Draper telescopes, to be made. This has shown that the star has a period of 1.3574 days $= 1^d\ 8^h\ 34^m.7$, and a range of 2.4 magnitudes. About half an hour before minimum, the rate of diminution in light amounts to between two and three magnitudes an hour, and is probably greater than that of any other star yet discovered. A minimum was predicted here, and was observed photographically and photometrically, 1903, March $19^d\ 16^h\ 24^m$, G. M. T.

Edward C. Pickering.
Harvard College Observatory,
March 24, 1903.

SCIENTIFIC POSITIONS UNDER THE GOVERNMENT.

The Civil Service Commission announces that on May 5, 1903, an examination will be held for the position of assistant physicist. The subjects and weights are:

1. Education and experience..... 50
2. Thesis (each competitor will be required to present a thesis of not less than 2,000 nor more than 2,500 words on some subject appropriate to the line of work indicated by the special subject of the examination below which he proposes to take; thesis to be prepared prior to date of examination and to be given to examiner on that date. In preparation of thesis, competitor may consult such books or publications as he desires, but the thesis must be entirely his own composition and must be accompanied by an affidavit to this effect) 20
3. Any one, *and only one*, of the following four subjects:
   (*a*) Magnetic testing and research and the absolute measurement of electrical quantities, such as currents, resistances, capacities, inductances, etc.
   (*b*) Electrical testing and photometry. This includes the testing of instruments used for the measurement of both direct and alternating currents, of the various switchboard, portable,