way 13.5 feet beyond this line, was ploughing into ground moraine and overturning boulders. August 27, 1904, the nose stood 12.5 feet beyond the Vaux line, indicating but little change. August 27, 1905, it was found to have retreated 34 feet from its position of last year, with its nose embedded in debris, standing 21.5 feet back from the reference line of 1899. This nose now consists of a thin slab of ice, sloping to the west and veneered with fine debris, so that a small amount of melting will lead to a further recession of 30 to 35 feet. The ice in the left lateral moraine is seen to extend four feet beyond the reference line, 25.5 feet beyond the nose, and probably extends several feet farther. Thus while its neighbor, the Illecillewaet, seems preparing for an advance, the Asulkan has made an unusually, for it, great retreat and seems ready, the coming year, to repeat the performance.

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BOTANICAL NOTES.

THE MISSOURI BOTANICAL GARDEN.

The administrative report for 1905, of which advance galleys have been received at the office of Science, is an unusually long and full one. The officers of the board of trustees preface their annual financial statement by an abstract history of the institution for the sixteen years during which it has been under their charge.

Attention is called to the fact that while the gross revenue from the Shaw estate has increased 32.5 per cent. general taxes have increased 62 per cent., while heavy special street and sewer taxes have compelled close economy in the administration of their trust and ultimately absorbed a large fund saved out of the revenue to meet these or other emergency calls. By the conversion of unproductive property bequeathed for the support of the garden into income-yielding property, however, they are hoping to largely increase their revenue; and the belief is expressed that the full realization of the purposes of the founder of the garden and the plans of its director is only a question of time —the foundation being ample and safe.

The value of the original garden, with permanent improvements, is said to have nearly doubled, and details are given of the larger items of improvement. Its area has also been increased nearly one half. Plant houses and frames have been more than doubled in capacity, and the collection of living plants has grown from not over 3,000 to about 16,000 species. The library has been enlarged from about 5,000 to over 50,000 books and pamphlets, and is valued at $84,248. The herbarium, from about 60,000 unmounted specimens, has increased to 524,000 mounted sheets, valued at $79,216.

From a gentleman's country estate, the institution has thus been brought into a well-grounded scientific establishment which now has exchange relations with 859 institutions interested wholly or in part in gardening, horticulture or forestry. The average annual expenditure on its maintenance is said to be $43,675.33, of which the larger items are $23,271.39 for gardening, $5,217.67 for office expenses, $4,418.82 for the library, $2,531.91 for the herbarium, $930.34 for the instruction of garden pupils and $1,000.83 for research purposes. An average of 83,500 persons visit the garden yearly.

Training in gardening has been given to 39 persons, of whom 15 completed the four years' course; and twenty of the number are stated to be now responsibly and successfully employed. In addition to participating in undergraduate botanical work in Washington University, with which the garden is closely allied, though it is independently managed, graduate opportunities have been offered which have enabled five persons to win the master's and six the doctor's degree, with major work in botany. Through the entire period, the policy of administration has been to afford the freest use of the garden facilities for investigation, and to provide for the research use of a part of the time of capable employees, and the Annual Reports of the garden are well known for their original contributions to botanical knowledge.

It may not be generally known that the

following courses in botany are given in the Shaw School of Botany: (1) 'Elementary Morphology and Organography,' (2) 'Cytological Technique,' (3) 'Plant Physiology, including Ecology,' (4) 'Systematic Botany,' (5) 'Plant Pathology and Applied Mycology.' When one takes into the account the growing plants in the garden, the great collection of dried specimens in the herbarium, and the large library, it is evident that here are admirable opportunities for study by those wishing to obtain a thorough knowledge of botany.

The report of the director shows that the customary growth has occurred in the year just closed: 1,769 species of living plants were added to the collections; 34,535 specimens were incorporated in the herbarium, and 5,382 books or pamphlets and 97,676 index cards were added to the library. The number of visitors reached 100,830—of whom nearly one fourth were drawn by a successful exhibition of 211 choice varieties of chrysanthemums, in November; and the director reports an increasing loan-use of the herbarium and library by investigators who are unable to go to St. Louis for study.

LABORATORY OUTLINES FOR GENERAL BOTANY.

UNDER this title, Professor Schaffner, of the Ohio State University, has prepared what must prove to be a very useful laboratory guide in general botany for college students. It is a pamphlet of nearly a hundred pages, and includes suggestions for one hundred and six studies, distributed throughout the vegetable kingdom. After three studies of living cells the student is started up the series beginning with *Pleurococcus, Merismopedia, Lyngbya,* etc., to *Closterium, Spirogyra, Vaucheria, Hydrodictyon, Cladophora, Fucus,* etc. Then follow *Mucor, Empusa, Saprolegnia* and *Plasmopara,* and after these *Chara* and *Polysiphonia.* Some higher fungi follow, as *Morchella, Uncinula, Ustilago, Puccinia, Fomes, Psalliota, Bovista,* with the lichen-fungi *Parmelia* to *Cladonia.* Following these are *Oedogonium* and *Coleochaete,* leading to *Riccia, Marchantia, Sphagnum, Polytrichum* and *Anthoceros.* He then takes up *Ophioglossum, Botrychium, Adiantum, Pteridium,* etc., and *Lycopodium* and *Selaginella,* finally reaching the seed plants, where he takes *Cycas, Ginkgo, Pinus,* etc. In the angiosperms he properly begins with *Sagittaria, Ranunculus* and *Alisma,* following with *Sedum, Trillium, Cypripedium, Catalpa, Cornus, Ageratum, Chrysanthemum* and *Taraxacum.* This is an admirably arranged series, and it brings out clearly the author's idea of the evolution of the vegetable kingdom, and the natural relationship of the various groups. The twenty histological studies and the pages on microtechnique will be useful to those who wish to give some time to the elements of cytology. The book might be introduced into many botanical laboratories with great profit to the students.

MORE PHILIPPINE PLANTS.

FROM the Bureau of Government Laboratories at Manila we have Bulletin 29, bearing date of September, 1905, and containing two papers, viz: (I.) 'New or Noteworthy Philippine Plants, III.,' and (II.) 'The Sources of Manila Elemi,' both by Elmer D. Merrill, botanist. In the first paper seventy-two new species are described, and twenty-seven hitherto described species are included and in some cases further described. Since many new species were described in bulletins 6 and 17 under the same title, a full index to all the species in the three bulletins is added for the convenience of botanists who may wish to consult them. The species of two genera are summarized, viz: *Medinella* (with 21 species) and *Rhododendron* (with 14 species). Of the former eleven species are new, and of the latter four.

THE NORTH AMERICAN FLORA.

UNDER date of December 18, 1905, Part 2 of Volume 22 of the 'North American Flora' was issued by the New York Botanical Garden. Eight families are monographed, viz: *Saxifragaceae* and *Hydrangeaceae* (by Dr. Small and Dr. Rydberg), *Cunoniaceae, Iteaceae* and *Hamamelidaceae* (by Dr. Britton), *Pterostemonaceae* (by Dr. Small), *Altingiaceae* (by Percy Wilson), and *Phyllonomaceae* (by Dr. Rusby). The family *Saxifragaceae*

is by far the largest of those treated in this part, having 255 species. In this family the largest genera are *Lithophragma* with 20 species; *Heuchera,* 72; *Therefon,* 10; *Saxifraga,* 7; *Muscaria,* 7; *Micranthes,* 56; *Spatularia,* 7, and *Leptasea,* 15. The next family in number of species is *Hydrangeaceae* with 52, and here the genus *Philadelphus* is the dominant one, with 36 species. Of the remaining families only *Cunoniaceae* and *Hamamelidaceae* have more than one species, the former having two and the latter four. The total number of species described in this part is 317, among which one finds a considerable number of new species.

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WORK AT THE LAKE LABORATORY FOR THE SEASON OF 1905.

The work in the past summer at the Lake Laboratory was, perhaps, the most successful of any session that has been spent there and distinctly encouraging for successful sessions in the future. Of the twenty-six students enrolled, eleven were college or university graduates; two having the title of Ph.D. and five that of master. Fifteen of the number were engaged in advanced or research work of university or graduate grade and in most cases for university credit; four were engaged in advanced work under the direction of the instructors, while six were doing independent research work for part or all of the time. Seven of the number are teachers in a university or college and two teachers in high schools, eleven being now or recently engaged in teaching in some capacity.

The following institutions were represented there this season: Cincinnati University, Columbia University, Denison University, De Pauw University, German Wallace College, Johns Hopkins University, Kenyon College, Ohio University, Ohio Northern University, Ohio State University, Ohio Wesleyan University and Miami University. If we include institutions which have been represented within the last few years we should add to these, Chicago, Michigan, Nebraska, Stanford, Amherst, Cornell, Antioch and Fargo, which have been represented either by investigators or by students.

A very enjoyable and profitable feature of this season's session was the meeting of the American Microscopical Society which brought a number of prominent scientific workers from various parts of the country and especially from Ohio, the Ohio Academy of Science holding a field meeting at the same time. This meeting consisted of the presentation of a number of scientific papers which were read at the laboratory and to which all the students were invited; an evening lecture by the president and social meetings, the most prominent of which was the luncheon which the university gave to the visiting members.

As heretofore, much attention has been given to original investigation and some of the more important topics studied this year are: 'The Brain of Amia,' by Professor Charles Brookover, Buchtel College; 'The Naididæ of Cedar Point,' by Professor L. B. Walton; 'Studies on the Life History of the Catfish and Investigations of Protozoa,' by Professor F. L. Landacre; 'Studies of the Insects which act as Scavengers of the Beach Débris,' by W. B. Herms; 'Correlation Studies of Toads,' by Professor W. E. Kellicott; 'On the Flora of Cedar Point,' by Otto E. Jennings, and on the 'Protozoa of Sandusky Bay,' by Miss L. C. Riddle. The results of some of these studies will appear in published papers in the near future; others will doubtless be continued for more complete results.

Herbert Osborn.

THE BRITISH ASSOCIATION.[1]

The list of officers for the seventy-sixth meeting of the British Association, which will open at York on August 1, next, is now practically completed. The meeting promises to be one of great interest. It was at York that the association came into being in 1831, when Lord Milton (afterward Lord Fitzwilliam) was president, and the attendance numbered only 353 persons. Thirteen years later the association again met in York, with the Rev. G. Peacock as president, and yet a third time

[1] The London *Times.*