mosses are described in its numbers that the professional also must have access to it. Latterly the illustrations have been improved, some of the half-tones being especially fine, so that in this particular it is a desirable addition to the periodical-shelf of any botanical library. Compared with the much older French journal *Revue Bryologique,* the American publication makes a very good showing indeed, and, while perhaps not quite so technically scientific, ours is quite the superior in illustrations, printing and arrangement of matter. For this country our journal is much more useful than the French one.

THE BOTANISTS AT PITTSBURG.

IT is not too early for the botanists of the country to be planning for the Pittsburg meetings in and in connection with the American Association for the Advancement of Science, on June 30 and July 1, 2, 3. Coming so closely after the end of the college year, this should find an unusually large number of botanists free to attend the meetings, after which the practically unbroken vacation still lies before each one. On many accounts this should be a large meeting of the botanists. The place of meeting is within easy reach of both eastern and western botanists, and the region is one which should offer many botanical attractions quite out of the usual lines. If the local botanists do their duty, as doubtless they will, there should be some interesting excursions, and opportunities for the examination of recent and also of fossil vegetation. Botany includes the vegetation of the past as well as that of the present, and here will be an opportunity for studying the former which should not be allowed to pass unimproved. Botanists should not require the geologists to be the only ones interested in the plants of the earlier ages.

A NEW DISTRIBUTION OF FUNGI.

UNDER the title of 'Ohio Fungi Exsiccati,' Professor W. A. Kellerman, of the State University, Columbus, Ohio, has begun the distribution of sets of specimens of the fungi of Ohio, each accompanied by a copy of the original description of the species. Fascicles I. and II. have now appeared, and it is possible to make out the place and value such a collection will have for working botanists. In the prefatory statement accompanying the first fascicle we are told that the fascicles will appear from time to time as material may be available. "Original descriptions of all the species, or that given in connection with the first use of the binomial or technical designation, will be printed on the labels, in addition to the data usually given." Every botanist will see at once the importance of a distribution of this nature, and it is to be regretted that the edition is so small, the number of copies being but few more than those sent to working botanists. The first fascicle contains sixteen specimens, of which five are of *Puccinia,* three of *Æcidium,* four of *Cintractia,* and one each of *Peronospora, Phyllosticta, Septoria* and *Ustilago.* The second fascicle is larger, including twenty-six specimens, of which seven are species of *Puccinia,* five of *Uromyces,* three of *Ustilago,* two of *Gymnoconia,* two of *Gymnosporangium,* and one each of *Æcidium, Glœosporium, Melampsora, Piggotia, Polystictus, Stereum* and *Urocystis.* The specimens are ample and are put up in neat packets. Although these sets are intended for exchanges only, and not for sale, we are informed that a few copies may be obtained by those who wish to purchase them, at one dollar per fascicle.

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AERONAUTICS.

MR. WILBUR WRIGHT presented to the Western Society of Engineers, September 18, 1901, a notable paper describing experiments resembling those of Liliendahl, but decidedly more successful. Advances have been made rapidly in many directions during the past fifteen or twenty years in some directions of interest in connection with aeronautics. The motors have been greatly reduced in weight and special constructions have been made by Langley and others in which the motor weighs but ten pounds and even less per horse-power, where, not many years ago, weights of sixty pounds were exceptional and an engine weighing forty pounds per horse-power was a marvel. Little

more has been done in the study of the principles of safety and stability of the flying machine than was accomplished by Liliendahl, by Pilcher and by Chanute, in Germany, in England and in the United States, respectively. It is almost ten years since Maxim mounted his machine and actually flew a short distance at high speed and with disastrous results to his machine and danger to himself, and the experiment has not been repeated. Langley's experiments and discussions have provided us with a correct knowledge of the physical and the mathematical principles involved in flight, so far as measures of lift and of head resistance are concerned, but the applied theory is still to be illustrated in any full-sized and practically useful apparatus. The steadying action of the balloon is relied upon wherever, as in the case of Myers, of Frankfort, N. Y., the oldest and most successful among pioneers in this line of development, and in that of Dumont, the inventor and exploiter, one seeks to traverse the air safely. Only when stability and permanence of stability can be insured can aviation become practicable. The experiments of the Messrs. Wright, of Dayton, O., mostly conducted at the shore on the coast of North Carolina, have seemingly advanced our knowledge greatly in this direction.

The Wright apparatus is double-decked like that of Chanute, but the endeavor was to provide for direction and balance without shifting the body of the aviator with every change in the direction and force of the wind. It was found that practice would make perfect the experimenter here, as in every other field of action; that constant practice should be provided for; that the horizontal position should be assumed by the operator and that it is actually practicable; that a small steering vane could be set in advance of the aeroplanes adopted and successfully employed in directing flight and in counteracting the fluctuating action of the wind in disturbance of the position of the center of pressure on the planes; that twisting the planes is a more effective method of meeting the changes of pressure produced by wind disturbances of small extent than any system of movement of the body.

The machine finally adopted spread 308 square feet of canvas, was 22 feet long, 7 feet high and double-decked. The wings or planes were given the section observed in the wing of the pigeon, *i. e.*, slightly curved from front to rear and with the curvature sharply increased at the leading edge in a degree determined, necessarily, by experiment. Gliding or soaring was successfully attempted with this construction, in winds of velocities ranging from 11 to 27 miles an hour, and distances were attained with small elevation at the start up to a maximum range of about 400 feet; the operator finding no special difficulty in either steering or balancing the machine. The rate of drop was as low as two feet per second in some instances.

These investigations have probably disclosed a method of study of the action of the aerodrome which is comparatively safe, which permits the investigator to dispense with a motor if he so desires during the preliminary work of tracing out the principles underlying stability and safe operation of the aviator in a moving atmosphere. The work is a distinct contribution to existing knowledge in this fascinating field of research.

R. H. T.

U. S. CIVIL SERVICE EXAMINATIONS.

The Civil Service Commission announces an examination on May 6 and 7, for positions in the Philippine service of agricultural chemist, analytical chemist, physical chemist, physiological chemist and pharmacologist with salaries of $1,500 to $1,800. In announcing this examination, the Commission sends the following statement:

These examinations offer an excellent opportunity to enter a service which has many attractive features and to see a most interesting part of the world. The Philippine Service is classified, and the law contemplates promotions on the basis of merit from the lowest to the highest positions.

Thirty days' leave of absence is granted each year, exclusive of Sundays and holidays, and those employees who are promoted to $1,800 per annum are entitled to thirty-five days, or about forty days including Sundays and holidays. Leave is also cumulative, and at the end of three years those who have to their credit cumulative leave for two years may visit the United States without having