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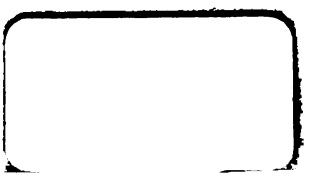

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JOURNAL

OF

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VOLUME XIII, 1912

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JOURNAL

OF

The New York Botanical Garden

EDITOR

FRED J. SEAVER

Curator

VOLUME XIII

WITH 24 PLATES AND 1 FIGURE

1912

PUBLISHED FOR THE GARDEN
AT 41 NORTH QUEEN STREET, LANCASTER, PA
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OF

The New York Botanical Garden

EDITOR

FRED J. SEAVER

Curator

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SHORE OF LAKE WASHINGTON, SEATTLE.

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VOL. XIII January, 1912. No. 145.

COLLECTING FUNGI ON THE PACIFIC COAST.

DR. N. L. BRITTON, DIRECTOR-IN-CHIEF.

Sir: Following your instructions to explore the Pacific Coast at several points in search of the larger fungi, I left New York October 13, accompanied by Mrs. Murrill, and went first to Seattle, Washington, where we made our headquarters for two weeks, and later proceeded down the coast with the approach of wintry weather.

The only stop made on the way to Seattle was at Chicago, where I visited the Field Museum of Natural History and delivered a public lecture on edible and poisonous fungi.

From the car windows, a general idea of the botanical features of the country was obtained, with the gradual change to new floral elements as new regions were entered. In Minnesota and North Dakota, immense fields of black prairie soil were becoming tinged with green by the sprouting wheat, and the last of the threshing was in progress. Trees were scarce, occurring in widely scattered groves consisting chiefly of oaks, birches, and poplars. Crossing the Canadian boundary into Saskatchewan, similar conditions of soil prevailed, but most of the wheat was still in the shock, and trees were rarely seen. Beyond Moose Jaw, much of the country is barren and hilly with scattered clumps of shrubs, resembling moorland, and is suitable only for grazing. All the lumber used throughout this region for building and railway purposes is brought from the Canadian Rockies. Posts and telephone poles are made of western white cedar.

On the morning of the fourth day from New York, the moun-

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tains were reached, and twenty-four hours were required to cross the two systems between Calgary and the coast. The scenery of this region is remarkably fine and strongly contrasted with the boundless stretches of prairie previously traversed. A complete change also takes place in the flora: splendid coniferous forests clothe the flanks of the snow-capped mountains, while aspens, alders, and willows mingle with firs and pines in the valleys. Extensive ranches with great herds of cattle, horses, and sheep; mines of various kinds; and large lumber camps and sawmills are passed in quick succession. At Banff, the Canadian Government has made one of the largest park reservations in the world, containing nearly 6,000 square miles of territory. Laggan, at 5,000 ft. elevation, is a small station with a few log bungalows, dense forests of firs and pines, and superb scenery. This place and Glacier, in the Selkirks, appear to be choice localities for collecting fungi in the summer. The summit of the Rockies is reached at Stephen, 300 ft. higher than Laggan, where the "great divide" occurs. A descent of 1,000 ft. is quickly made to Field, where watches are set to Pacific time, and nearly another thousand feet brings one to Palliser, named for one of the first expeditions to explore the Rockies, in 1858.

Golden is at the foot of the Rockies, and across the Columbia River to the west rise the heavily forested Selkirks still to be crossed. Among the somber-hued conifers, scattered poplars stand out vividly in their yellow autumn coloring, and birches reappear below 3,000 feet. Several new trees, some of them belonging to the Pacific Coast, make their appearance here.

Early on the morning of the fifth day, the valley of the Fraser River was reached, at slight elevation above sea-level, and we entered the rich grazing and lumbering region that continues all the way to Seattle, where we arrived in the middle of the afternoon.

Seattle, with a population of 300,000, is one of the most progressive and promising cities of the West. The climate is mild and humid, adapted to a luxuriant vegetation; the soil is glacial drift, through which streams easily wear deep gorges in which great trees grow and shelter myriads of smaller plants. Some

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VIEWS IN RAINIER NATIONAL PARK.

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of the finest of these gorges are included in the system of public parks; the botanist need not leave the city limits to find splendid collecting ground. Although bear, deer, grouse, wild geese, pheasants, gophers, etc., abound, there are no noxious reptiles or insects to disturb the collector. Beyond the city lie immense primeval forests of great beauty, containing giant red firs and white cedars over a thousand years old and from six to fourteen feet in diameter, pine and spruce in abundance, some hemlock, and scattered trees or clumps of oak, maple, alder, willow, and cascara. All of these trees are different from our eastern species.

The red fir, *Pseudotsuga taxifolia*, is the principal timber tree; the white cedar, *Thuya plicata*, is extensively used for shingles and posts, the heartwood containing an oil which resists decay; the large-leaved maple, *Acer macrophyllum*, is planted on the streets for shade throughout much of the Pacific Coast region, and the trunks often develop cancerous swellings which supply a fine "curly maple" for furniture; the single species of oak is usually so knotty and misshapen that its chief use is for firewood; "Cascara Sagrada," *Rhamnus Purshiana*, furnishes the well-known medicinal bark of commerce.

The University of Washington, situated in the suburbs of Seattle on the shore of Lake Washington, is unexcelled for location, the campus being one of the finest in the world. Several of the permanent buildings and many of the exhibits used in the exposition of 1909 were afterwards turned over to the university, the forestry and ethnology exhibits being particularly good.

We established ourselves at the University Inn, within a short distance of the botanical laboratories, and made excursions into Woodland Park, Ravenna Park, the forest north of Ballard, the shores of Green Lake and Lake Washington, a peat bog, and other localities that offered good opportunities for collecting fungi. These excursions were planned by Professor T. C. Frye, head of the botanical department, who very kindly placed at our disposal all necessary facilities. He also arranged to have Mr. S. M. Zeller, a graduate student in his department and an excellent collector, accompany me on many of these excursions.

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The number of fungi secured was far greater than I had anticipated. The season was exceptionally good and the weather unusually favorable both for collecting and preparing the specimens. Four boxes, containing 732 field numbers, or about 2,000 specimens, accompanied by descriptive notes, were sent to New York at the end of two weeks' stay in Seattle. It is estimated that over 100 species new to science are represented in this collection.

On October 26, a visit was made to Tacoma Prairies, about fifty miles south of Seattle. During the forenoon, the shores of a lake to the north of the prairie proper were explored and similar conditions to those at Seattle were encountered, although a number of species new to our collection were obtained. Here in the forest of *Abies grandis*, fine specimens of *Fomes Laricis*, a medicinal polypore rare in America, were found on fallen trunks; also a remarkable "fairy ring" one hundred feet in circumference formed by seventy-seven sporophores of a species of *Tricholoma*, some of them six inches in diameter.

The prairies are formed by a terminal moraine of considerable extent, the soil of which is so sterile that very little cover is found upon it. A short, slender grass, a resurrection moss, a pretty violet, one or two hawkweeds, and clumps of young *Abies grandis* just arriving after so long a time from the adjacent forest, with scattered specimens of *Pinus contorta*, constitute the chief vegetation in the autumn season. A single species of gill-fungus and a few puffballs grew in the open on these prairies, but a number of species, many of them similar to those of the pine barrens and peat bogs about Seattle, were found in the shade of the clumps of young fir trees.

The pleasure of the Tacoma trip was much enhanced by the splendid views obtained of Mt. Rainier, whose giant, snow-capped cone rises to the height of 14,500 feet above the coastal plains.

On Friday, November 3, we left Seattle for Salem, Oregon, arriving at 10 P.M. It had been our intention to do some collecting in the vicinity of Salem with Professor Morton E. Peck, of Willamette University, but we found by conference with him

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THE WILLAMETTE RIVER, OREGON.

LIFE-SAVING STATION, WITH SCRUB PINES, NEWPORT, OREGON.

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that instead of three or four inches of rain, the usual quantity for October, there had been only one-half an inch; so we proceeded next day to Corvallis and established ourselves near the new Agricultural Hall of the Oregon State College, within easy reach by three separate railway lines of the western slopes of the Cascades, the Coast Range, the intervening valleys, and the immediate coast. Some of the most promising localities were selected for us by Professor H. S. Jackson and these were visited in order. The weather, which had been rather dry for fungi, became stormy upon our arrival, and every day was more or less rainy. Periods of low temperature after the rains appeared interfered considerably with the development of gill-fungi, but by visiting sheltered places a very good representation of species was obtained.

On Monday, November 6, several hours were spent in exploring a dense fir forest south of Corvallis, which contained scattered specimens of oak, willow, and maple. A majority of the fungi found were similar to those at Seattle, but a considerable number were different; also, several eastern species were collected here that had not been seen in Washington. *Paxillus involutus* reached a foot or more in diameter; *Hygrophorus eburneus*, *Boletus luteus*, and *Lactaria deliciosa* were very abundant; *Hydnum Auriscalpium* occurred commonly on the fir cones; *Amanitopsis vaginata*, *Craterellus cornucopioides*, *Marasmius siccus*, *Russula nigricans*, *Tyromyces chioneus*, and *Armillaria albolanaripes* were found once or twice.

The following day, November 7, was spent at Glen Brook, twenty-three miles south of Corvallis, one of the terminals of the Corvallis and Alsea River Railway. The speed of the lumber train was six miles an hour, affording ample opportunity to make observations along the way. This entire valley of the Willamette River was formerly a lake and even yet is flooded during a portion of the winter, when wild geese frequent it in large numbers. The abundance of wheat stubble and clover also proves very agreeable to the handsome Chinese pheasant which has multiplied greatly in this valley since its introduction in 1877. The hills were covered with gnarled and

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twisted oaks, *Quercus Garryana*, which supported great quantities of mistletoe and a long gray lichen similar to the Spanish moss of tropical America. This lichen, a species of *Alectoria*, is very abundant on trees of all kinds on the Pacific Coast.

In the old fir forests at Glen Brook, from 400 to 1,000 feet elevation, there was splendid collecting, and I traveled a linear distance of about ten miles on foot before the train was ready to return. Mr. Carter, the owner of much of this woodland and the promoter of the railway, showed me every courtesy, and while the sparks from the fir in the fire-box of the engine lighted the sky like myriads of fireflies, he gave me an account of handling red fir and white cedar logs twelve feet thick with donkey engines. Indeed, some of the logs on our train were so large that it was deemed dangerous to pass the bridge near Corvallis in the dark, so we left the train there and walked into town.

All of the next day was required in working up the Glen Brook collection and getting the specimens to drying. On account of the rains, artificial heat had to be used for all the Oregon collections. A room with a large sheet-iron stove was devoted to this purpose, and over the stove were suspended parallel frames of wire netting, on which the specimens were spread. When completely dried, they were wrapped in newspaper with the accompanying field notes and descriptions and laid away in drawers until the time for packing and shipping arrived, when they were sent by express to New York to be put into boxes with naphthalene flake and kept in a dry place until my return. If not shipped promptly, there is danger of moulding, of insect attack, and of injury from frequent handling. Colored sketches, made by Mrs. Murrill, were numbered to correspond with the specimens and retained for comparison with later novelties.

On November 9, before daybreak, I left for a day's collecting at Mill City, on the western foothills of the Cascades fifty miles east of Corvallis, where there are large sawmills and virgin forests of red fir and other conifers. The yellow fir forests begin at Granite Mountain, a few miles farther on, but a snowstorm had visited this region and rendered collecting difficult if not impossible.

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ON THE WAY TO MUIR WOODS.

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On arriving at Mill City, I first climbed to 1,200 feet, north of the town, and spent the forenoon among the ancient red firs that afforded a partial shelter from the snowstorm that continued without intermission all day. The fungous flora here was not extensive, owing to the cold, but was quite different from that of the Willamette Valley. A large and handsome new species of polypore was found growing on a rich bank beneath one of these old firs.

The low, dense forests along the river were visited in the afternoon and many specimens secured, the majority of them similar to those found at Glen Brook. The next day was devoted to these collections. An excursion with Professor Jackson was arranged for Saturday, but an unusually heavy snow and a cold wave interfered, followed by a cold rain lasting all day Sunday.

On Monday, November 13, I crossed the Willamette River east of Corvallis and explored the low mixed forest in the river bottoms, giving attention chiefly to the dead logs and branches left by the lumbermen. On the under side of these logs, where the cold had not penetrated, a number of interesting timber-destroying species occurred. A second visit was also made to Hyatt's woods, south of town, where a few additional species had appeared since the heavy rains began.

On the afternoon of November 13, I boarded the daily train for Newport, situated on the coast at the mouth of Yaquina Bay seventy-five miles west of Corvallis. For some distance, the railway crosses the prairie valley of the Willamette and then begins the ascent of the Coast Range, following the windings of a rapid mountain stream. All of the timber between Corvallis and the coast near the railway has been burned off in the past and there seems little chance to collect except in some of the small wooded flats along this stream. Just before reaching Summit, the conditions seem fair. Again, at Elk City, beyond the Coast Range, another stream joins the one the railway follows and this flows through good timber several miles above Elk City. At Yaquina, passengers for Newport cross the bay in a small steamer, arriving about 6 o'clock at the little seaside resort built along the bay front and protected from the ocean winds by steep

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sandstone hills on the north and northwest. There is a good hotel and good beaches, which attract a number of transient visitors during the summer. Also, a good many persons own cottages along the bay and ocean front.

On the next morning, November 14, I braved the storm that had raged for two days and explored the pine barrens covering the sandy headland lying back of the life-saving station. This proved to be an exceedingly interesting region, yielding many novelties. I was much impressed with the ability of fleshy fungi to thrive in almost pure sand. Here under the pines I found numbers of specimens of the brilliant orange-red form of *Amanita muscaria*, which I was to see later in California. *Rostkovites granulatus*, one of the edible boleti, also occurred here in great abundance.

After the turn of the tide, I went eastward from Newport along the beach a few miles and turned into a lumber trail up a small stream, where the usual virgin forest conditions prevailed and the fungous flora was more like that in the Willamette Valley. The day's collections, which were large and important, were so saturated with water that they had to be spread out in a steam-heated room over night to reduce them to a normal condition and prevent many of them from collapsing completely. During the return journey to Corvallis next morning, I was able to complete the descriptions and have the specimens ready for the much-needed drying process.

Continued adverse weather conditions caused us to leave for California a few days earlier than we had planned. The Oregon collections, comprising nearly 400 field numbers, were shipped direct to New York and we caught the midnight express at Albany, November 16, bound for San Francisco.

The railway journey from Corvallis to San Francisco occupied two days, our train being held up fourteen hours at Keswick by a wreck. The Siskiyou Mountains, separating Oregon from California, were crossed after a very steep climb up to 4,000 feet from the fertile and beautiful Rogue River Valley. Soon after leaving Ashland, we entered a forest of oaks so abundantly covered with mistletoe that the trees appeared evergreen after

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IN THE HEART OF MUIR WOODS.

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their leaves had fallen. The southeastern slope of the Siskiyou range was clothed with a splendid forest of *Pinus ponderosa*, much resembling the forest of Montezuma pine west of Jalapa in Mexico.

As we descended into the valley and crossed the line into California, a very decided change took place in the climate and the flora, owing to the small rainfall. Stunted, thorny shrubs, and scattered trees (*Libocedrus decurrens*) partly covered old lava streams and volcanic hillocks. At Redding, cycads were growing in the open and new trees of various kinds appeared, belonging to a warmer and drier region. Several species of oaks, most of them evergreen, took the place of the single species found in Washington and Oregon. The large spherical live-oaks are left in the fields for shade, as palms are in the tropics. At Vina, the largest vineyard in the world, belonging to Stanford University, is located. The vines are kept cut back to short stumps very close to the ground, giving them a totally different appearance from those of either northern or southern Europe. Eucalyptus trees, so commonly planted in southern California, were first seen at Marysville, not far from Sacramento. Extensive orchards, hop-fields, cattle ranches, and wheat-fields dotted the valley in this region, and the entire country as far as the eye could reach seemed a fertile and promising one.

The first excursion for fungi after reaching San Francisco was made to Golden Gate Park, a large and handsome public plantation overlooking both the city and the ocean. The season, however, was unusually dry and very few specimens were found, most of these being gathered among the tree-ferns in a shaded ravine. During a period of rainy weather, the extensive wooded areas of this park should yield a rich harvest of fungi.

On Monday, November 20, we visited the University of California and made arrangements through Professor Setchell and Mrs. Brandegee to examine the Harkness' types of fungi placed in storage by the California Academy of Sciences after the loss of their building during the great earthquake. These types are in envelopes within pasteboard boxes and are in good condition. The Academy is preparing to erect a handsome

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new building in Golden Gate Park in time for the Panama Exposition.

November 22 was devoted to an excursion to Muir Woods, the most famous collecting ground in the vicinity of San Francisco. From Mill Valley, charmingly located among hills and redwood groves and easily reached by ferry and electric train, the steep ascent of Mt. Tamalpais is easily negotiated in a train of special construction and the descent to Muir Woods is made by a gravity car. This whole region, including the mountain with its stunted shrubs and herbs, and the deep gorges in its flanks filled with immense redwoods (*Sequoia sempervirens*) and ferns, is of intense botanical interest.

Muir Woods is one of the few extensive tracts of virgin redwood forest now in existence. In 1908, the 295 acres comprised in this tract were given to the National Government by Mr. Kent and dedicated in honor of John Muir, the celebrated geologist. The largest trees, reaching 14 feet in diameter and 300 feet in height, stand on the floor of the cañon along the banks of a small stream. A few other trees, such as fir, alder, maple, and tan-bark oak, grow sparingly in the twilight between the towering redwood trunks. Muir Inn, situated on a promontory between two branches of the main cañon, is an excellent base for explorations in this vicinity. The best season for collecting fungi is usually during January and February; the best for flowers is probably in April.

On November 23, I went to Santa Rosa to see Mr. Burbank and his experimental grounds. After devoting several hours of his valuable time to my instruction and entertainment among the long hedgerows of spineless cacti and other interesting and important products of his genius, Mr. Burbank graciously remarked: "Most people take my time; a few give me theirs. You are of the latter class." One experimental plot of several acres surrounds the old homestead in the edge of the town; the other, which is much larger, is at Sebastapol seven miles away. Mr. Burbank is recognized as the greatest "selecter" of variations in plants, especially in young plants; there is no limit to his patience or devotion where a beneficial variety is concerned; he

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THE OLD HOME OF LUTHER BURBANK AT SANTA ROSA, CALIFORNIA.

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works with millions of seeds and thousands of seedlings in many plant families and from all parts of the world, and the climate of Santa Rosa is peculiarly favorable for plant growth and development. He has the power from long experience to judge plants at a very early stage, and he has also developed methods of forcing them quickly into fruit. An old apple tree stands in his grounds, which has been forced to mother as many as 600 tiny seedlings at one time in order to induce them to fruit in a year or two instead of requiring five to ten years. In this and many other ways, time and space are saved and quick results are obtained.

On the way to Santa Rosa, the town of San Rafael was passed, in the vicinity of which Moore collected practically all of the gill-fungi recorded in Harkness and Moore's list of Pacific Coast fungi.

On Friday, November 24, we left San Francisco for Palo Alto, the seat of Stanford University, and arranged for a collecting trip the next day with Professor L. S. Abrams in the Santa Cruz Mountains. Starting early, we drove to Preston's Ravine, at the foot of the mountains, where nearly a hundred numbers were found; then crossed over the range at an elevation of 2,000 feet and descended the western slope to La Honda, eighteen miles from Stanford, where we collected quite a number of interesting fungi in the moist redwood forest, and returned between seven and eight o'clock in the evening.

Palo Alto is a model town and Stanford University one of the most attractive institutions of its kind. The handsome buildings are all constructed according to a definite plan, and a considerable part of the campus of 8,000 acres is laid out in walks and driveways shaded with a variety of palms and bordered by groves of eucalyptus, live-oak, madronio, and various conifers and other evergreen trees. There are at present about 1,800 students at Stanford, 500 of whom are women. The institution is planned to accommodate not over 2,000, and it was decreed by the founder that not more than one fourth of these should be women, for the reason that an education under such favorable conditions and circumstances was deemed more necessary and more useful to men.

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Nearly two days were required to properly describe and care for the collections made at Preston's Ravine and La Honda. Some time also was devoted to the examination of specimens in the herbarium of the university. On the afternoon of November 28, I lectured before the professors and students of the botanical department on the subject of poisonous and edible fungi. Professor Abrams entertained us at his home the same evening. The following day, the final shipment of specimens was made and we left for Los Angeles and Pasadena, arriving at the latter place in time to enjoy Thanksgiving dinner with Mr. Daniel Wilson.

Pasadena is blessed with a superb climate, and is the winter home of one hundred and twenty-five millionaires. The houses are scattered over the low hills at the foot of Mt. Lowe and Mt. Wilson, the street borders and large yards being filled with pepper-trees, palms, climbing roses, orange-trees, and a great variety of subtropical decorative plants. McClatchie, the mycologist, lived here and made the largest existing collection of the mosses and fungi of southern California.

On the morning of December 1, I left Pasadena on the "California Limited" for New York, passing quickly from the great, fertile San Bernardino Valley up to the sterile tableland sparsely clothed with yucca and sage-brush, and on through the boundless desert to the region of the Grand Cañon and the Petrified Forest, where huge trees of past ages lie embalmed in agate, thence through thickets of dwarf red cedar and piñon for hour after hour, across the continental divide, past the pueblos of various Indian tribes, over Raton Pass at an elevation of nearly 8,000 feet, and down to the broad cultivated prairies again, with their wheat, corn, cattle, yucca, cottonwoods, jack-rabbits, and prairie-dog villages, until the Mississippi was reached at St. Louis.

The journey was broken here to visit the Missouri Botanical Garden and Washington University. The crowded collections of tender plants at the garden are to be housed next winter in a splendid new glasshouse 300 feet long and 60 feet high at the central dome, about equal in size to the famous Palm House at Kew Gardens. The library is one of the best in the country,

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and both it and the extensive herbarium have been largely transferred to steel cases in a strictly fireproof building. The fungi collected on the Harriman Alaskan Expedition, some of which occur also in Washington, are to be found here.

Professor W. Trelease, the director, received me cordially and devoted most of the day to my instruction, entertaining me at his home in the evening. Professor G. T. Moore piloted me over the University, which is rapidly expanding in equipment and scope, and we lunched together at the University Club. After dinner, I attended the meeting of the St. Louis Academy of Sciences, an old and famous organization, of which the botanist Engelmann was the first president, and Eads, the architect of the great bridge over the Mississippi, one of the charter members.

Leaving St. Louis Monday night, I arrived in New York early Wednesday morning, December 6, and found that all my collections had arrived in excellent condition. For convenience of reference, a list of these, with localities and numbers, is given below.

COLLECTIONS ON THE PACIFIC COAST.

Seattle, Washington	October 20–November 1	Nos.	1– 732
Tacoma, Washington	October 26	"	" "
Tacoma Prairies, Washington	October 26	"	" "
Glen Brook, Oregon	November 7	"	733– 792
Mill City, Oregon	November 9	"	793– 879
Corvallis, Oregon	November 6–11	"	880–1025
Newport, Oregon	November 13	"	1026–1099
Golden Gate Park, California	November 21	"	1100–1124
Muir Woods, California	November 22	"	1125–1158
Preston's Ravine, California	November 25	"	1159–1241
La Honda, California	November 25	"	1242–1305

It is estimated that this collection of fungi comprises about 3,700 specimens, and is easily the largest, most comprehensive, and best ever made on the Pacific Coast. When it has been worked over and compared with other collections from the same region, our knowledge of the fungous flora of that vast and intensely interesting land lying west of the Cascade Mountains will be much increased.

Aside from the interesting botanical features of the Pacific Coast, the botanical explorer cannot fail to be impressed with the

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vastness of things—ranches, orchards, vineyards, forests, lands to be tenanted, deserts to be reclaimed, mines to be worked—and with the big-hearted, patriotic, unshackled, enterprising, hopeful men and women who are pushing this section to the front. The enthusiasm everywhere shown in preparation for the coming Panama Exposition is only an illustration of the human energy that is actively asserting itself from one end of the Coast to the other.

Respectfully submitted,
W. A. MURRILL,
Assistant Director.

CONFERENCE NOTES.

The conference of the scientific staff and students was held in the main laboratory on December 4. The first paper, by Mr. William R. Maxon, of the U. S. National Museum, was entitled "Notes on the Tree Ferns of North America." The speaker enumerated the main features regarded as important in the major classification of the Cyatheaceae, and particularly of the tribe Cyatheae which is usually regarded as embracing three genera, *Cyathea*, *Alsophila* and *Hemitelia*, separated mainly upon characters of the indusium. Jenman and, more recently, Copeland have argued against maintaining these genera, the latter author reducing all to the single genus *Cyathea*, with several subgenera. The justification of this treatment was discussed at some length and the need suggested of a thorough revision of the group upon characters of minute morphology other than those of the indusium.

Mr. Maxon also reviewed a recent paper* describing a peculiar new fern from Panama, *Polypodium podocarpum*, a subpinnate species in which the sori are essentially apical upon special lobes of the pinnae and the apices of the fronds and of the pinnae are of indefinite evolution. The pinnae are produced frequently to a remarkable length, especially by injury to other parts of

* Maxon, William R. A remarkable new fern from Panama. (Smithsonian Miscellaneous Collections. Vol. 56, part 24. Pp. 1–5, *pls.* 1–3. November 22, 1911.)

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the frond. Several other examples of indeterminate apical growth in *Polypodium* were given and specimens of these shown.

The topic "A Subgenus of *Vittaria*," was presented by Dr. R. C. Benedict as follows: *Vittaria* J. E. Smith is a genus of perhaps forty species of tropical ferns, nearly all of which have leaves of grass-like outline. Its classification is, therefore, more difficult than in the case of most fern genera, and is indeed much the same problem as would be offered by a genus of grasses if no flowers and fruits were available. The differentiation of the species demands a careful study of the microscopic characters of the spores, paraphyses, and scales, and a study by cross-sections, of the arrangement of the vascular tissues in stem and leaf, and of the position in which the sporangia are borne. By using these methods of study, it has been found possible to determine specific limits accurately.

The paper presented at the conference was concerned with one subgenus of *Vittaria*, *Radiovittaria* including seven species, the characters of which have been sufficiently determined for publication. Illustrations of the seven species were shown. These with the text descriptions and discussion are shortly to be published. According to this paper the subgenus *Radiovittaria* includes seven species viz., *V. minima* (Baker) Benedict, *V. Gardneriana* Fée, *V. remota* Fée, *V. stipitata* Kunze, *V. Moritziana* Mett., *V. latifolia* Benedict, and *V. Williamsi* Benedict. The two last mentioned species are to be described in the forthcoming paper. Both are based on material collected in Bolivia by Mr. R. S. Williams of the Garden staff. *V. minima* has only recently been placed in *Vittaria*, the material here included having been previously placed in two other genera.

A. B. Stout.

NOTES, NEWS AND COMMENT.

Mr. Percy Wilson, assistant curator, spent a part of the month of December and January collecting in the provinces of Pinar del Rio and Havana, Cuba.

Mr. W. R. Maxon of the National Museum, Washington, recently spent several days at the Garden in continuation of his work on ferns for North American Flora.

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Dr. Charles Thom of the Experiment Station, Storrs, Connecticut, spent a day at the Garden recently, consulting the library.

Dr. B. M. Davis, assistant professor of botany in the University of Pennsylvania, was at the Garden December 19, looking up specimens of *Oenothera* to be used in work on mutation.

Dr. C. B. Robinson, formerly in the employ of the Garden, and for the past three years economic botanist in the Bureau of Science, Manila, has returned and is spending some time at the Garden.

Professor J. C. Arthur and Dr. F. D. Kern spent several days at the Garden the early part of January studying rusts in connection with work on North American Flora.

Mr. R. E. Stone of Cornell University visited the Garden in January to consult the fungous collections with special reference to parasites on leguminous plants.

Among other recent visitors at the Garden were Drs. A. F. Blakeslee and G. P. Clinton of the Agricultural College, Storrs, Connecticut; Professors J. C. Blair and Chalres D. Crandall of the University of Illinois; Dr. E. W. Olive of the State College of South Dakota and Professor R. B. Thomson of the University of Toronto.

Mr. Edward W. Berry, formerly a student of the Garden, has recently published a book (Bulletin No. 3 of the Geological Survey of New Jersey) of 233 pages and 29 plates on "The Raritan Formation." About 100 of the 128 plate figures of fossil plants are reproductions of figures in Newberry's "Flora of the Amboy Clays," the type specimens of which are in the museum of the New York Botanical Garden. Numerous incidental references may also be found to other types and figured specimens in the museum, collected by Dr. Arthur Hollick in Long Island, Block Island and Martha's Vineyard.

The meeting of the various scientific societies of the country at Washington during Christmas week was a notable one and well attended. The botanists had very full programs, as well as a dinner and a smoker, in which between one hundred and

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two hundred took part. The Garden was represented by Dr. N. L. Britton, Dr. W. A. Murrill, Professor R. A. Harper, and Mr. A. B. Stout. A movement to unite all American botanical associations under the Botanical Society of America was auspiciously inaugurated. The next meeting of the societies will be held in Cleveland; and the one following in Atlanta.

The Field Museum of Natural History, which has coöperated with the Garden in explorations in the Bahamas, will shortly erect a new museum building costing about five million dollars. The collections will be grouped in it under Anthropology, Botany, Geology, and Zoölogy. The California Academy of Sciences is also to have a new building in time for the Panama Exposition.

A new tropical laboratory for botanical and zoölogical research is soon to be established at Mayaguez, Porto Rico, with Dr. F. L. Stevens as director.

Dr. W. J. Gies, consulting chemist of the Garden and professor of biological chemistry in Columbia University, is one of the editors and has been very active in the establishment of the Biochemical Bulletin, volume I, No. 1 of which appeared recently. This publication which is to appear quarterly, each volume containing about five hundred pages, is the official organ of the Columbia University Biochemical Association for the publication of papers of a biochemical nature. In addition to the publication of biochemical research, some of the aims of the Bulletin are the extension of general biochemical knowledge and to furnish a means of keeping the workers in the home laboratories in closer touch with those who have gone out to other fields of labor. The first number of the bulletin contains 160 pages and is devoted to scientific papers and notes and news of a biochemical nature. One of the papers (pp. 7–41, with three plates) is by Professor Francis Ernest Lloyd and is entitled, "The tannin-colloid complexes in the fruit of the persimmon, *Diospyros*." We understand that the Biochemical Bulletin will aim to give special encouragement to the development of chemical studies in botany and that chemical papers on botanical subjects will be welcomed to its pages. Botanists are accordingly invited to

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contribute to the success and usefulness of the Bulletin. Among the editors and collaborators we note the names of the following botanists: Carl L. Alsberg, Gertrude S. Burlingham, E. D. Clark, C. A. Darling, C. Stuart Gager, Benjamin C. Gruenberg, William T. Horne, Homer D. House, J. E. Kirkwood, Elsie A. Kupfer, Burton E. Livingston, Winifred J. Robinson, Fred J. Seaver and A. D. Selby.

Many of the orchids in range 1 are now flowering freely. In house no. 15, next to the large dome, many of the Venus-slippers, represented by the genera *Paphiopedilum* and *Phragmipedium* are in bloom. Among these may be mentioned, as especially attractive, *Paphiopedilum Alcides* and *P. "Wm. McKinley,"* of hybrid origin, and an unusually fine form of *Paphiopedilum insigne*, known as Harefield Hall. The flower of this variety is especially large, with the standard broad and flat and beautifully marked with large spots. It is one of the best of the *P. insigne* forms. Many of the genus *Phragmipedium* are also in bloom. One of these, of hybrid origin, is *P. Cleola*, a pure white flushed with rose, and resembling, in general form, the native white lady-slipper, *Cypridedium reginae*. The rosy flowers of *Laelia anceps*, a Mexican species, are just making their appearance, and the striking *Laelia superbiens*, well described by its specific name, is coming into flower, its bright flowers borne, as in many others of the genus, in bunches at the top of long naked stems. It is a native of Guatemala. In strong contrast to this is *Laelia flava*, of Brazil, with its smaller yellow flowers. A plant of the Javanese orchid, *Vanda tricolor suavis*, with large white flowers spotted with purple, is attractive, not only on account of the beauty of its colorings, but also for its pleasing fragrance. In the far-away Philippines grows *Platyclinis glumacea*. An excellent plant of this is now in full bloom with many long slender drooping racemes of yellowish flowers. *Oncidium Kramerianum*, wild in northern South America, is striking in its coloring of orange and brown. The flower, with its long tail-like petals, is at the end of a long naked stem, resembling much a butterfly at rest, hence its name of the butterfly orchid. There are many other interesting orchids in this house. In house no. 12 are

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many plants of the Himalayan, *Paphiopedilum insigne*, in a number of color varieties, now in a profusion of bloom; and next to these a collection of the Andean genus, *Masdevallia*, some of which are now flowering.

Meteorology for December.—The total precipitation for December was 4.09 inches of which 1.48 inches fell as snow. The maximum temperature of 65° was recorded on December 12 and a minimum temperature of 10.5° was recorded on December 5.

ACCESSIONS.

MUSEUMS AND HERBARIUM.

14 specimens of hepatics from Quebec. (Given by Dr. C. B. Robinson.)

4 specimens of mosses from Missouri. (By exchange with Dr. John Davis.)

2 specimens of *Leskea algarvica* from Portugal. (By exchange with Dr. George Roth.)

3 specimens of mosses from Guadeloupe Island, Lower California. (Collected by Dr. J. N. Rose.)

18 specimens of *Andreaea* from Greenland, Sweden and Spitzbergen. (Given by Dr. A. LeRoy Andrews.)

13 specimens of flowering plants from the eastern United States. (Given by Mr. E. E. Steele.)

2 specimens of *Chamaesyce glyptosperma* from Ontario. (Given by Mr. John Dearness.)

1 specimen of *Chamaesyce* from Italy. (Given by Dr. N. L. Britton.)

1 specimen of *Kneiffia Sumstinci* from Pennsylvania. (By exchange with the Carnegie Museum, Pittsburgh, Pennsylvania.)

2 specimens of *Linaria Linaria* from Ontario. (Given by Mr. William Scott.)

2 specimens of mosses from Saguenay County, Quebec. (Given by Dr. C. B. Robinson.)

4 specimens of *Riccia* from Connecticut. (Given by Miss Annie Lorenz.)

4,500 specimens from Cuba. (Collected by Dr. J. A. Shafer.)

1 specimen of *Parthenium Hysterophorus* from Louisiana. (Given by Mr. E. C. Wurzlow.)

1 specimen of *Festuca octoflora* from Alabama. (Given by Dr. R. M. Harper.)

60 specimens of ferns from eastern North America. (Distributed by Dr. Philip Dowell.)

2 specimens of fungi from Siberia. (Given by the United States Department of Agriculture.)

3,700 specimens of fungi from Washington, Oregon and California. (Collected by Dr. and Mrs. W. A. Murrill.)

11 specimens of ferns from the vicinity of New York City. (Given by Dr. Philip Dowell.)

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86 herbarium specimens from British America. (By exchange with the Geological Survey of Canada.)

2 herbarium specimens from New York. (Given by Mr. K. P. Janson.)

49 specimens of flowering plants from Colorado. (By exchange with Mr. George E. Osterhout.)

4 specimens of fungi from North America. (By exchange with Professor J. C. Arthur.)

164 herbarium specimens from British Columbia and Hudson Bay. (By exchange with the Geological Survey of Canada.)

4 specimens of Amaranthaceae from Ohio. (By exchange with Professor John H. Schaffner.)

2 specimens of *Xanthium* from Colorado. (By exchange with Professor J. C. Arthur and Dr. F. D. Kern.)

5 specimens of *Potentilla*. (By exchange with the Seed Laboratory, Ottawa, Canada.)

48 specimens of mosses from Washington and Oregon. (By exchange with Professor A. S. Foster.)

407 specimens from St. Eustatius, Saba and St. Martin, West Indies. (By exchange with the Botanical Garden, Utrecht, Holland.)

PLANTS AND SEEDS.

12 plants for conservatories. (By exchange with National Museum, through Dr. J. N. Rose.)

2 plants of *Agave*. (Given by Mrs. C. Cole Bradley.)

3 plants of *Campanula isophylla*. (Given by Mrs. N. L. Britton.)

1 plant of *Primula*. (Given by Dr. H. H. Rusby.)

1,260 lily bulbs for decorative plantations. (Purchased.)

1 plant of *Cycas revoluta*. (Given by Mrs. J. H. T. Stempel.)

6 plants of *Cordyline australis*. (Given by Mr. H. Schniewind, Jr.)

3 orchids for conservatories. (By exchange with Messrs. Lager & Hurrell.)

2 plants for conservatories. (By exchange with Messrs. Knight & Struck.)

6 orchids for the conservatories. (By exchange with Mr. J. A. Manda.)

66 plants for conservatories, derived from seeds from various sources.

2 packets of seeds of Manihot. (Given by Mr. F. H. Hunicke.)

1 packet of seed. (Given by Dr. H. H. Rusby.)

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EDITOR

FRED J. SEAVER

Curator

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DR. C. B. ROBINSON, *Assistant Curator.*
GEORGE V. NASH, *Head Gardener.*
A. B. STOUT, *Director of the Laboratories.*
DR. JOHN HENDLEY BARNHART, *Librarian.*
DR. H. H. RUSBY, *Curator of the Economic Collections.*
DR. WILLIAM J. GIES, *Consulting Chemist.*
COL. F. A. SCHILLING, *Museum Custodian.*
JOHN R. BRINLEY, *Landscape Engineer.*
WALTER S. GROESBECK, *Clerk and Accountant.*
ARTHUR J. CORBETT, *Superintendent.*

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CHARLES FINNEY COX.

Charles Finney Cox, Treasurer of the New York Botanical Garden since 1899, an original member of the Corporation, and a member of the Board of Managers since the formation of that Board in 1895, died at his residence, No 5 Delavan Terrace, Yonkers, N. Y., on Wednesday, January 24; he was a little more than sixty-six years old, having been born on Staten Island, January 16, 1846. He studied at the College of the City of New York, and subsequently at Oberlin College, where he obtained the degree of A.B., and that institution, of which he was later a trustee, subsequently conferred upon him the honorary degree of A.M. Lafayette College awarded him the degree of LL.D. in 1911.

Mr. Cox had a keen appreciation of the progress of modern science, and for a man not professionally within the scientific ranks, an extraordinary knowledge of its details in many branches. He was a member of many learned societies and an officer of several from time to time, having been president of the New York Microscopical Society in 1888; of the Council of the Scientific Alliance of New York from 1891 to 1906; of the New York Academy of Sciences 1908 and 1909, treasurer of that body for several years previously, and again accepted the duties of that position in December, 1911.

Microscopy was his favorite subject for personal investigation, and his studies with the microscope of plant and animal life extended over many years; the instrument itself, and the history of its development and perfection were of great interest to

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him from the standpoint of the wonderful additions to knowledge obtained by its use, and their applications to the welfare of mankind. This acquaintance with the facts and methods of microbiology made him, most fittingly, the first chairman of the Charity Organization Society's Committee on the Prevention of Tuberculosis, following the discovery of the bacillus which causes that human affliction, the vast importance of which he at once recognized; his service, in this position, has been of inestimable value to humanity. To all the work of the Charity Organization Society he rendered signal service over a long period of time, accepting membership on many of its important committees.

A close and critical student of the facts and observations on which the theory of evolution is based, he formed one of the most complete collections of Darwiniana ever brought together. In 1909 he represented the New York Academy of Sciences at the centennial celebration of Darwin's birth, held at Oxford, England, and he has spoken of this as one of the most interesting episodes of his life.

He was one of the incorporators of the New York Botanical Garden, named in the charter granted by the Legislature in 1891, and had previously been active in advocating the establishment of the institution. The subscription of the guarantee fund required by this charter was successfully accomplished, largely through his efforts; he became a member of the Board of Managers at its formation on February 12, 1895, and his service in that capacity has been continuous; at the annual meeting in January, 1899, he was elected treasurer, and this position he has held ever since, besides serving on the finance committee and the executive committee; his advice and counsel have been of the wisest and always helpful. The Garden has received important gifts from him, including his collection of microscopes, illustrating the history of that instrument, many books on microscopy and botany, and contributions to its funds.

When we consider that all these public services were given freely, while he was continually engaged in the most confining type of a business career as the manager of vast financial in-

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terests, we can but wonder how it was possible; he was modest and unassuming in all his relationships, a most lovable character, and a perfect gentleman.

WHEREAS, Charles Finney Cox, one of the original promoters of the New York Botanical Garden, and its Treasurer from 1899 until his recent death, departed this life on January 24, 1912, after long and faithful service.

Resolved: That the Board of Managers, mourning his untimely death, hereby places on record its appreciation of his noble, manly character; his engaging personal qualities; his invaluable services to this institution during so many years; his zeal and intelligent interest, amid many pressing business cares, in the progress of natural science; his own personal studies and able contributions therein; and his devotion and ready assistance at all times by counsel, advice and pecuniary means towards the successful development of the Garden enterprise.

Resolved: That in his death, we mourn the loss of an invaluable associate and an endeared friend, and that we extend our sympathies to his bereaved family, to whom a copy of these resolutions is directed to be sent.

The foregoing memorial and resolutions were approved by the Board of Managers of the New York Botanical Garden, at a meeting held January 30, 1912.

N. L. BRITTON,
Secretary.

BOTANICAL EXPLORATION IN CUBA.

DR. N. L. BRITTON, DIRECTOR-IN-CHIEF,

Sir: The following brief report on botanical exploration on the Sierra de Anafe, a small mountain range in the province of Pinar del Rio, Cuba, between Caimito and Guanajay, is here presented.

Sailing from New York on December 9, I arrived at Havana on the morning of the 13th, and the following day, accompanied by Brother Léon of the Colegio de la Salle, Vedado, went by rail to Guayabal which is at about the center of the range. We

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were very hospitably received at the home of Mr. Arthur Shaler Williams, where I made my headquarters during my stay of a little over two weeks. Having, on several occasions, the kind coöperation of Brother Léon and the comfortable quarters at Mr. Williams', my work was greatly facilitated.

The tree-like cactus of this region, a species of *Leptocereus* (*L. Leoni*), was observed only on the southern slope. A small colony containing several large individuals, one of which was fourteen feet tall, was found on December 19 on a hillside near Caimito, and an excellent wood section from one of these specimens was prepared for the museum. The bark of this species is very thin and of a grayish-green and unlike many other castuses, the wood is very heavy and close-grained. Many individuals were carefully examined for flowers and fruits, as these are rather imperfectly known, but, unfortunately, the plants were neither in flower or in fruit at this season. A species of *Selenicereus*, a vine-like cactus, was also collected, together with specimens of a species of *Agave*, which bore showy yellow flowers.

Another floral feature of the range is a species of *Thrinax* (*T. punctulata*), which is confined to the jagged rocky slopes and perpendicular cliffs on the north side. Specimens from five to thirty-five feet tall were growing from the shallow pockets of some of the cliffs. The observer can but wonder how these palms, with apparently so insecure a foothold on the sides of such vertical walls, have been able to withstand the severe storms that occasionally sweep across the island.

Of the shrubs, *Myginda uragoga*, a member of the Staff-tree family, and a plant which appears to be of rather local distribution in Cuba, was frequently seen on the cool, shaded slopes, also hanging from the faces of the cliffs. On some of the more exposed hillsides, a *Malpighia* (*M. cubensis*), is very plentiful. This species, together with a variety of other shrubs, forms a dense thicket through which one is obliged to proceed with great caution. Many of the stinging, needle-like hairs that are appressed to the under surface of the leaves soon found a lodging place and caused me much discomfort.

Several apparently uncommon species of *Passiflora* were found

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in the dense hillside thickets, the fruit of one of these being much sought after by birds.

Between the two ridges the surface is relatively flat and for the most part used for pasture-lands, or is under cultivation. In the vicinity of small habitations two familiar weeds, the peppergrass (*Lepidium virginicum*) and the common plantain (*Plantago major*), are established.

This entire range was thoroughly explored between December 14 and January 1, and the collection obtained here will undoubtedly prove of much interest.

Returning to Havana on the afternoon of January 1, I visited the following day the valley of the Rio Bacuranao in company with Brother Léon, and on the 3d, we had the pleasure of his colleague, Brother Victorin's, company to Cumbre Hermosa, where several plants not represented in our herbarium from the province of Havana, were obtained.

The afternoon of January 4 was given to exploration of the Jata Hills at Guanabacoa, where many interesting small grasses were found, and several shrubs among which were two species of *Malpighia*, and an *Erythroxylon* (*E. alaternifolium*) which grew very plentifully.

The large collection of plants brought together by Dr. J. A. Shafer during November and December, in the extreme western part of the province of Pinar del Rio, was placed in my care at Havana, and included with my collection which I brought through to New York on January 9.

Respectfully submitted,

PERCY WILSON,

Assistant Curator.

THE FLOWERING OF THE JAMAICA CANDLE-WOOD TREE.

Among some of the rare and little-known species brought from the West Indies by the various expeditions of the Garden, and installed in the living-plant collections, are a number of specimens of the Jamaica candle-wood (*Peltostigma pteleoides*), one of which flowered at Conservatory Range 2, on January 6, 1912.

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This plant, a member of the Rue family, was discovered on the Santa Cruz Mountains, Jamaica, by William Purdie in 1844, who was making a botanical collection for the Royal Gardens at Kew, and plants grown from seed collected by him flowered there in February, 1849. In his Icones Plantarum, Sir William Hooker described and figured (*plates 698* and *699*) this new plant under the name of *Pachystigma pteleoides*. As the name *Pachystigma* had been used for a South African genus in the Madder family, Hooker's plant was renamed two years later by Walpers as *Peltostigma pteleoides*. Subsequent collectors in Jamaica failed to find this species until its rediscovery, after a long search, by Dr. N. L. Britton and Mr. William Harris in September, 1907, on a wooded hill at Potsdam, on the Santa Cruz Mountains, probably the original locality, at about 2,600 feet elevation. The trees were in young fruit at the time of their visit, and numerous seedlings were obtained from which the specimens at the Garden were grown.

The Jamaica candle-wood, or ptelea-leaved peltostigma is a slender tree, sometimes attaining a height of eight meters. The leaves are alternate, the dark-green leaflets usually three, and closely resemble those of the hop-tree, *Ptelea trifoliata*, a native of the United States, sometimes grown in our parks. The flowers are an inch or more in diameter and sweet-scented, with the petals of a creamy white and nearly equal, and the sepals deciduous and unequal, the interior ones large and somewhat petal-like, the outer smaller. The stamens are numerous and inserted on a thick, fleshy disk, and the ovary is covered with short hairs giving it a velvety appearance. This species appears from the history of the living material at Kew and here to flower when at the age of five years.

Herbarium specimens from southern Mexico and Guatemala from altitudes up to 5,500 feet appear identical with the Jamaica plant.

PERCY WILSON.

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CONFERENCE NOTES.

The January conference of the scientific staff and registered students of the New York Botanical Garden was held in the laboratory of the Museum Building, Monday, January 15, at 4 P. M.

A general synopsis of the work on the mosses for the first part of Vol. 15 of North American Flora, was presented as follows:

1. Sphagnaceae, Dr. A. Le Roy Andrews	100 species reduced to	37
2. Andreaeaceae, Miss Julia T. Emerson	12 species reduced to	11
3. Archidiaceae, Mrs. N. L. Britton	8 species reduced to	4
4. Dicranaceae, Mrs. Britton and R. S. Williams:		
1. Bruchiaeae, Mrs. N. L. Britton	22 species reduced to	20
2. Ditricheae, Mrs. N. L. Britton	19 species enlarged to	25
3. Bryoxiphieae, Mrs. N. L. Britton	1 species enlarged to	2
4. Seligerieae, Mrs. N. L. Britton	6 species enlarged to	9
5. Dicranelleae, Mr. R. S. Williams	55 species reduced to	29
6. Rhabdoweisieae, Mr. R. S. Williams	2 species	2
7. Dicraneae, Mr. R. S. Williams	230 species reduced to	117
5. Leucobryaceae, Mr. R. S. Williams:		
1. *Leucobryum*	26 species reduced to	8
2. *Leucophanes*	3 species reduced to	2
3. *Octoblepharum*	5 species reduced to	3

Dr. A. Le Roy Andrews, of Cornell University, stated that the number of species of *Sphagnum* recorded for North America had been increased from 19 listed by Lindberg in 1882 to 100 in Warnstorf's treatment in Pflanzenreich, just issued. After critical studies and comparisons with W. I., C. and S. A. forms, he had been able to reduce this number to 37 species and 8 varieties. He also stated that "With reference to nomenclature, where the facts seemed clear he has followed the principle of priority starting with Linnaeus, involving the adoption of 6 old names only, and no new changes are made."

Miss Julia T. Emerson followed with notes on *Andreaea* in which she stated that 4 species of this genus had been recorded by Lesquereux and James in 1884. This number had been increased to 12 since, which she had been able to reduce to 10 and added one new species from Toccoa Falls, collected by Dr. Small.

Mrs. Britton stated that in the genus *Archidium* the species

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resemble each other so closely that it is difficult to separate them but that there seemed to be little doubt that of the 8 species listed for N. A. only 4 could be clearly distinguished.

The Dicranaceae including 33 genera and 204 species have been arranged for the sake of convenience in the sequence of Engler and Prantl Pflanzenfamilien, though a few changes and additions have been recorded; notably the addition of *Pringleella* from Mexico. This family has required a great deal of critical study and many comparisons have been made including much sectioning of leaves and reduction of species. In most cases original specimens have been seen and our thanks are due to Professor Macoun for enabling us to study all of Kindberg's species. Mr. Williams has devoted much time and labor and skill to making sections and slides of the more critical species and will be prepared to print drawings of many of these should it become desirable.

When printed, this part will include 5 families, 38 genera and 269 species as at present recorded.

A. B. STOUT.

PUBLICATIONS OF THE STAFF, SCHOLARS AND STUDENTS OF THE NEW YORK BOTANICAL GARDEN DURING THE YEAR 1911.

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Arthur, J. C. New Species of *Uredineae*—VII. Bull. Torrey Club **37**: 569–580. *f. 1.* 11 Ja 1911;—VIII. Bull. Torrey Club **38**: 369–378. 21 Au 1911.

Barnhart, J. H. Report of the librarian. Bull. N. Y. Bot. Gard. **7**: 324–347. 16 Mr 1911.

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Britton, E. G. Reviews, current literature. Bryologist 14: 38, 39. Mr 1911.

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——— An undescribed *Opuntia* from Jamaica. Torreya 11: 130. 19 Je 1911.

——— *Opuntia Traceyi* sp. nov. Torreya 11: 152. 19 Jl 1911.

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Eggleston, W. W. *Habenaria ciliaris* in Vermont. Vermont Bot. Club Bull. 6: 16. Ap 1911.

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Howe, M. A. A little-known mangrove of Panama. Jour. N. Y. Bot. Gard. 12: 61–72. Ap 1911.
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——— Some recent University of California publications. Torreya 11: 176–180. 14 Au 1911. (Reviews.)
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——— List of lichens collected in the Yukon region by Mr. R. S. Williams. Bull. Torrey Club 38: 287–293. 6 Jl 1911.
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——— *Austinella* gen. nov. Bryologist 14: 70, 71. *f. 1.* Jl 1911.

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NOTES, NEWS AND COMMENT.

Dr. Roland M. Harper recently spent several days at the Garden following his return from a ten months stay in Alabama.

Dr. David R. Sumstine, of Pittsburgh, has been awarded a research scholarship for the month of July to enable him to continue his researches on certain groups of imperfect fungi.

Dr. E. P. Meinecke, forest pathologist in the Bureau of Plant Industry, and at present stationed at San Francisco, California, recently spent several days at the Garden consulting that part of the mycological herbarium relating to the diseases of forest trees.

At a meeting of the Board of Managers, held January 30, 1912, Mr. James A. Scrymser was elected Treasurer of the New York Botanical Garden to succeed Mr. C. F. Cox. Mr. Scrymser has been Chairman of the Finance Committee of the Board of Managers since the organization of the Garden, and by his acceptance of the office of Treasurer continues and supplements his valuable services to the institution.

Professor R. A. Harper has given to the Garden his collection of California fungi consisting of 232 numbers, made during the winter and spring of 1911, while he was at the University of California. A large majority of the specimens are polypores or

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gill-fungi. The latter are also represented by a collection of about 60 excellent photographs secured by Professor Harper some years ago at Berkeley.

Among recent visitors at the Garden were Dr. Charles Brooks, of New Hampshire State Agricultural College, Dr. Mel. T. Cook, of Rutgers College, New Jersey, and J. M. Greenman, assistant curator in the Field Columbian Museum, Chicago.

In house no. 4, conservatory range 1, on a post near one of the columns, is a woody vine, now in bloom, known to botanists as *Norantea guianensis*. This is growing vigorously, its long rambling branches reaching out in all directions for support, following its native habit of growing on trees. On the end of some of these branches is a long inflorescence, looking at a distance like a thick red rod. A closer inspection, however, will reveal that this is made up of numerous rather insignificant flowers, borne mainly upon the upper side of the axis, each pedicel bearing at its apex a pendulous body over an inch long. This is attached by a short slender stalk, the remaining portion being a curved hollow cylinder. This organ is technically known as a bract, and it is these bracts which make the inflorescence so conspicuous and showy. Their use to the plant is problematic.

This vine is a native of Guiana and northern Brazil, and is one of the fourteen species comprising the genus *Norantea*, all with the exception of one species on the island of Guadeloupe, confined to tropical continental America, the greater number being peculiar to Brazil. They are either trees or vines with spirally arranged leaves. The flowers are inconspicuous, as compared with the large showy bracts, which are either saccate or spoon-shaped.

The genus *Norantea* is one of five genera comprising the *Marcgraviaceae*, a family of plants confined to the tropics of America. Most of the other species belong to the genus *Marcgravia*, also mainly confined to the tropics of continental America. Of the sixteen known species three are found in the West Indies. One of these, *M. oligandra*, is confined to Cuba, another, *M.*

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Sintenisii, is known only from Porto Rico, and the third, *M. umbellata*, occurs in both the West Indies and Brazil. Specimens of the two last mentioned will be found at conservatory range 2. These are sometimes known as the West Indian ivy, from the habit of the sterile branches clinging closely to the bark of trees, or to the faces of cliffs, much after the manner of the ivies of temperate regions.—*Geo. V. Nash.*

Meteorology for January.—The total precipitation recorded for the month was 2.44 inches of which 1.25 inches fell as snow. Maximum temperatures were recorded of 53° on the 23d, 49° on the 19th, and 42° on the 3d and 9th. Minimum temperatures were recorded of −6° on the 12th, 3° on the 16th, 5° on the 7th and 5.5° on the 28th.

ACCESSIONS.

MUSEUMS AND HERBARIUM.

1,083 specimens from western Cuba. (Collected by Mr. Percy Wilson.)

65 museum specimens of marine algae from California. (Collected by Mr. H. B. Snyder.)

2 specimens of mosses from the Everglades, Florida. (By exchange with Mr. George B. Kaiser.)

1 specimen of *Thelia hirtella* from Greencastle, Indiana. (By exchange with Professor Howard J. Banker.)

200 specimens "Fungi Columbiani," fascicles 35 and 36. (Distributed by Mr. Elam Bartholomew.)

5 specimens of ferns from tropical America. (By exchange with Mr. C. Belhette.)

2 specimens of *Oenothera grandiflora* from Alabama. (By exchange with Professor Bradley M. Davis.)

12 specimens of mosses from North America. (By exchange with the United States National Museum.)

72 specimens from British Columbia and the Hudson Bay region. (By exchange with the Geological Survey of Canada.)

3,748 specimens from western Cuba. (Collected by Dr. John A. Shafer.)

40 specimens of mosses from the Southern States. (Given by Dr. John K. Small.)

148 specimens from New Mexico and Arizona. (By exchange with the United States National Museum.)

37 specimens of hepatics. (By exchange with Mr. Franz Stephani.)

25 specimens of fungi from Lafayette, Indiana. (By exchange with Professor J. C. Arthur.)

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20 specimens of fungi from the Isle of Pines. (By exchange with the Carnegie Museum.)

8 specimens of fungi from North Carolina. (By exchange with Mr. E. R. Memminger.)

2 specimens of fungi from Toronto, Canada. (By exchange with Mr. Thomas Langton.)

1 specimen of *Hapalopilus gilvus* from California. (By exchange with Professor C. F. Baker.)

4 specimens of polypores from Trinidad. (By exchange with Mr. J. B. Rorer.)

3 specimens of fleshy fungi from Hope Gardens, Jamaica. (Given by Mr. William Harris.)

2 specimens of fungi from Colorado. (Given by Professor Ellsworth Bethel.)

1 specimen of *Calyptospora Goeppertiana* from Oregon. (Given by Dr. H. D. House.)

4 specimens of fungus from Seattle, Washington. (By exchange with Mr. S. M. Zeller.)

35 specimens, "Ascomycetes," fascicle 49. (Distributed by Dr. Heinrich Rehm.)

1 specimen of *Stictis radiata* from Ohio. (By exchange with Dr. Bruce Fink.)

PLANTS AND SEEDS.

2 orchids for the conservatories. (By exchange with Mr. J. A. Manda.)

2 palms. (Given by Mrs. N. L. Britton.)

40 Cuban plants. (Collected by Dr. J. A. Shafer.)

14 cactuses. (By exchange with U. S. National Museum, through Dr. J. N. Rose.)

114 orchids. (By exchange with Messrs. Lager & Hurrell.)

4 plants derived from seed.

4 packets Mexican seed. (Given by Dr. Francis C. Nicholas.)

1 packet of Cuban seed. (Given by Brother Léon.)

1 packet of seed of *Aloe hereroensis*. (By exchange with Dr. Paul Range.)

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EDITOR

FRED J. SEAVER

Curator

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SPRING BEAUTY.

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JOURNAL

OF

The New York Botanical Garden

VOL. XIII June, 1912. No. 150.

WILD PLANTS NEEDING PROTECTION.[1]

2. "SPRING BEAUTY" (*Claytonia virginica* L.).

(WITH PLATE XCV.)

In wet meadows, on grassy banks and even shady woodlands the Spring Beauty covers the ground in May with quantities of white flowers. It blooms consecutively for two or three weeks, opening a new blossom each day, gradually lengthening out its racemes, till sometimes they have borne as many as fifteen flowers. These measure half an inch or more across, have five white or pale pink petals, veined with rose-color; the stamens are five with pink anthers, and the style is three-lobed. There are two fleshy spreading sepals and the pedicels lengthen gradually from one half to an inch in length and become reflexed as the three-angled capsule matures. Half-way down the stem below the raceme, two narrow fleshy leaves, three or four inches long, clasp the stem, and a few basal ones arise from the large tuberous root which is buried rather deeply in the ground. Usually only the flowering stems are picked, so that the plant survives, but it will make no seed and stand little chance of spreading. The seeds are brown, reniform, slightly roughened, and the embryo is curved.

The Spring Beauty was named by Linnaeus in 1753 in honor of John Clayton, an American botanist and correspondent, who wrote, in 1743, a flora of Virginia. It was first figured by Plukenet in his Phytographia in 1691. There are about twenty-five

[1] Illustrated by the aid of the Stokes Fund for the Preservation of Native Plants.

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species of *Claytonia* known to grow in northern North America, of which three occur in the eastern United States, one of these with broader leaves, *C. caroliniana* Michx., having about the same range as *C. virginica*, from Nova Scotia southward along the Alleghanies to Georgia and Texas.

They belong to the Purslane family, or Portulacaceae, with which they agree in their fleshy leaves, and flowers that bloom for a short time. The family is a large one, but the plants are usually small, few of them with showy flowers like *Portulaca grandiflora*, which occasionally escapes from cultivation.

ELIZABETH G. BRITTON.

BOTANICAL EXPLORATION IN ORIENTE, CUBA.

DR. N. L. BRITTON, DIRECTOR-IN-CHIEF.

Sir: Embarking from New York November 15, 1910, I arrived at Antilla November 21. Crossing Nipe Bay next morning to Preston, there to await the uncertain arrival of the coast-wise steamer to Baracoa, which was reached on the evening of November 25, I soon found myself comfortably installed in the house of my good friend and fellow-townsman, Mr. Charles Rees, of the Piloto Mining Company.

Owing to the heavy rains of an unusually late rainy season, the trails were all but impassable, and the streams frequently unfordable, so that no satisfactory arrangement could be made for the establishment of a base on El Yunque, and I concluded it would be more practicable to go there afoot with the least equipage possible. Leaving Baracoa at noon, accompanied by two stout boys, wading Rio Duaba, thence to and up the narrow but very fertile valley of Arroyo Henequen, which stream it was necessary to cross twenty-one times before reaching the bohio of a tenant on Tabajo, we reached the finca of Mr. W. H. Bemis, situated high up in the foothills and close to the base of El Yunque. Some collections were made along the aforementioned arroyo and in the hills before nightfall. As it rained heavily during the night, my host, who was also to be my guide, informed me next morning that it

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would be impracticable to go to the summit for several days; consequently the morning was spent in collecting among the foothills, but as it still continued to rain, thus decreasing the prospects of an early ascent, and as the intervening streams would respond accordingly and probably make it impossible to return to Baracoa when desired, it seemed best to return at once. On the way back we found that Rio Duaba had risen considerably and was unfordable afoot. Fortunately a friendly Cuban with a mule happened along and assisted us in crossing and Baracoa was reached about dusk.

Through the kindly offices of Mr. J. G. Diesend, of the Baracoa Fruit Company, passage was secured to Rio Yamuri on a passing fruit steamer during the night of December 5. Here I was welcomed by Mr. Thomas Forrestal, of the Banana Elevator Company, whose kindly hospitality and wise guidance greatly facilitated my work among the high coastal cliffs and deep river gorge in the vicinity, also the region eastward to Cape Maisi, from which I returned by a more southerly route to Rio Yamuri and finally, after a delay of some three days due to flooded streams, returned overland to Baracoa, passing through Mata, a small hamlet situated on a beautiful little bay of the same name. This is undoubtedly the Mata referred to by Charles Wright in a letter to Dr. Asa Gray from Baracoa.

On December 18, I started on another and more successful attempt to reach the summit of El Yunque, which was accomplished the following day, but as there was attractive collecting all the way up, there was little opportunity to explore much of the top, which is flat and mostly covered with a second growth of shrubbery, having been a caffetal previous to the Ten Years War.

Another opportunity to get into the Sierra de Moa region, from which so much interesting material was secured the previous winter, presented itself on December 22, Mr. Rees having invited me to accompany him to Camp La Gloria of the Piloto mining properties. The trip westward along the north coast by a small motor boat to a point on Moa Bay was a very rough one, but the route into the mountains was over a much better trail than

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that traversed a year ago. The heavy rains, however, together with the traffic of pack animals, had played such havoc that we were frequently compelled to dismount and finally it was necessary to abandon our mounts before camp was reached just about dusk the following day. The camp was situated by a small stream on an irregular plateau lying between the mountain range and Rio Yaguani at an altitude of about 2,500 feet. It was in charge of Mr. E. La Londe, assisted by Mr. W. H. Bemis, whose kindly interest in our work I had experienced on former occasions. The camp was conducted according to American standard of comfort, in so far as that was possible under the adverse conditions encountered, and they did all that was in their power to aid me during the eight days that I remained there. The region is covered with a dense growth of shrubs and small trees, a few large trees occurring along the streams. There is also an occasional old pine tree, apparently the remnant of an ancient forest, younger pine trees occurring only along some of the mountain sides. There is little or no soil, but the surface is covered with a water-soaked mat of moss and humus; trunks and branches are generally enveloped in moss also. Beneath this is a layer of earthy limonite (iron ore) deposited upon the foundation of serpentine rock. The object of the camp was to ascertain the depth of this deposit and estimate the quantity of ore available. This was done by drilling to rock bottom at the intersection of parallel lines one kilometer apart running at right angles and as every third one of these was cut through the jungle, this afforded access to an otherwise inaccessible area. Most of the collecting was done along these trochas, but the mountain sides were examined on the way to the camp and again on my return to the coast. A very rocky stream was also visited and its course examined for some distance. Incidentally, I got as far east as to site Camp San Benito, visited last winter. The little clearing was covered with a dense growth of fireweed (*Erigeron*) and small-fruited tomatoes. On this occasion Mr. La Londe accompanied me and we were overtaken by rain and nightfall several miles from camp on a rough and rocky trocha with the dismal prospects of spending the night in the bush in

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misery. This, however, was obviated by one of the searching parties with lanterns, etc., sent out from camp to find us, but it was well toward midnight before we reached camp.

I left Camp La Gloria January 1, 1911, in a drenching rain, and, as it had been raining during most of my stay, the trail became all but impassable, so that of the seven mules starting for the coast that morning but four reached it; the others becoming exhausted were abandoned at various grassy plots along the trail. It was nearly dark when the storage camp on the coast was reached, and I was informed that the small sailboat which was to take me back to Baracoa had arrived a short time before and was anchored in the bay. Next morning the weather conditions were such that the captain would not venture out to sea that day or the following day, thus giving me an opportunity to examine the vegetation along the shore of Moa Bay. The coastal formation is of conglomerate limonite or iron stone and, to my great surprise, carried with it the vegetation known to me heretofore only from the mountains; thus tree-ferns grew within fifty feet of salt water and many mountain shrubs almost touched an occasional mangrove, *Rhizophora*, which occurred very sparingly at this point.

Early next morning our little craft ventured out and beat its way eastward with difficulty, reaching Taco Bay, the protection of which we sought for the night; Baracoa was reached late in the afternoon of January 5. My anxiety as to the condition of the moisture-laden specimens was greatly relieved when I found that they were in good condition. It required about a week of constant attention to get the material properly dried under the adverse weather conditions. The driers were kept dry and warm by a process new to me, Lizzie, the cook, having suggested the bake-oven as the proper medium to secure the desired results. In the meantime, I succumbed to an attack of a low, enervating fever, which wholly incapacitated me for about ten days and left me in no condition to attempt the contemplated trip overland to Guantanamo, which I was informed was very tedious and difficult and would take over a week's time. But as I desired very much to collect across the island, I arranged with a boatman,

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who was to sail around to Guantanamo, to take my luggage to that place and to stop at the town of Imias on the south coast and pick me up, I having intended to cross over on foot consuming several days to collect along the route, but when the time came for doing this, the boat-man insisted on postponing the trip for a week; to this I could not agree, so this scheme was also abandoned. As there was a coast-wise steamer for Guantanamo in three or four days, I concluded to make the trip, at least as far as Bermejal, well across the divide near which there is said to be a grove of *Juniperus*, specimens of which it is very desirous to obtain, as the relationship of this Cuban tree is not well understood. This was attempted on January 30, going on horseback to Sabanilla, after experiencing considerable difficulty in crossing the swollen waters of Rio Miel. From here I proceeded into the hills afoot, up a very muddy and difficult trail until after dark before coming to the shack of a friend of the Cubano I had with me. Here I swung my hammock for the night. Next morning the weather conditions were by no means encouraging, and it was with difficulty that I secured an additional man to accompany me. The weather turned out to be worse than predicted, heavy rains and cold winds continuing all day, so that progress was slow and collecting difficult. It was after three o'clock before the next shack was seen. This we entered for shelter and as we had taken no rations with us, we were glad to partake of the meager food that the occupants provided. In lieu of coffee they served a concoction of the leaves of some zinziberaceous plant, well sweetened and very hot. This the woman assured me was very good for colds and to prevent fever, which (as said by these people) is sure to follow such exposure as we had passed through unless some precaution is taken. No further attempt was made to proceed. We remained here until the next day, building a fire in the open room, in which we swung our hammock, to keep warm during the night. Realizing that it would be impossible to proceed further and hoping to return to Baracoa in time to catch the steamer which was due the next day, we started back in the morning, progress being impeded by the illness of one of the men; and it was with

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difficulty that we reached the home of his friend, where I hired two mules, divided our water-soaked collections, and proceeded to Baracoa, arriving there late at night. The region passed through is a very rough one after leaving Sabanilla, between which and Baracoa a good road leads up the valley of Rio Miel, through a gravelly and conglomerate region. The hills south of Sabanilla are of serpentine formation, reaching an altitude of about 1,000 feet; many of the higher ones are covered with earthy, red limonite supporting groves of *Pinus cubensis*. South of the divide the soil is light-yellow, containing numerous small angular particles of milky-white quartz and supporting a rich vegetation.

On the evening of the next day, I embarked for Guantanamo, reaching the port of Caimanera on the morning of February 3 and Guantanamo that evening. The next day being Sunday, I could not get my baggage until Monday morning. I occupied the time until February 6 in drying the wet material brought from Baracoa and making arrangements to get into the hills to the northward. In the latter, our very good friend, Mr. Theodore Brooks, aided me greatly.

Leaving Guantanamo in the morning with a guide, two horses, and a pack animal, I arrived at La Perla, an extensive coffee estate in the prosperous times before the Ten Years War and adjoining Monte Verde, another coffee estate, famed as being the eastern headquarters of Mr. Charles Wright. The region is one of limestone, and virgin forests abound. The old caffetals have also become reforested with coffee, pimento, various species of *Citrus* and an occasional *Morus*, prominent members of the second growth. The altitude is about 2,000 feet; the atmosphere is very humid and it is said to rain about three hundred days in the year. Ferns, orchids, and Peperomias abound everywhere and the forest floor is covered with a luxuriant growth. There are large groves of Palma Bobo, *Euturpe* sp. The high and extensive limestone cliffs known as the Farallones de La Perla, with its various and peculiar exposures, supported a rich and interesting flora. A small area of serpentine formation a few miles northward is covered by a pine-land flora. Monte Verde

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itself is very hilly and contains much old pasture-land of no great botanical interest. In the ruins of the old stone mansion in which Wright lived, several large trees are now growing and the walls are covered with a great variety of ferns. The falls of Rio Palenque, also known as Monte Verde Falls, were visited and some interesting collecting was had in the rich tropical forest above the falls. The deep gorge below the falls, which is cut through a peculiar stratified formation the like of which I had not heretofore seen in Cuba, no doubt affords plant species unusually encountered elsewhere. It was impracticable, however, to make an examination of it at this time. My stay of about ten days in this region was under unusually favorable circumstances, as my host, Mr. Charles Maurel, not only provided me with unusual comforts, but took the greatest interest in my work and accompanied me on most of the excursions made in this prolific region. We secured an unusually large number of specimens in spite of the almost constantly rainy weather encountered while there.

I returned to Guantanamo, February 28, with a large lot of damp or wet material which required several days to dry and make ready for shipment to Santiago. Here, Mr. Jennings S. Cox, Jr., of the Spanish American Iron Company, supplied me with much valuable information concerning some of the places visited by previous botanists. He also advised me as to the most advantageous route to reach the summit of Gran Piedra, the high mountain lying some distance east of Santiago and reported to have an altitude of 5,000 feet, which, however, is probably somewhat exaggerated. Gran Piedra was approached by way of Firmeza, which was reached by the railroad of the Juragua Iron Company, whose mines are situated there. Passage on the railroad and accommodations at the officers' clubhouse were kindly provided for me by Mr. De Beruirn Whitaker, vice-president and general manager of the company, and the various officials at the mines advised and entertained me while at Firmeza. I started for the mountain top on the morning of February 4 with a very indifferent guide and a boy, going up steep grassy hillsides. Mango in stunted form is frequent and about the only

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tree met with, as it is very dry for the first 2,000 feet of elevation, after which the ravines become more interesting, frequently have water in them, and tree-ferns and other moisture-loving plants become more numerous as the altitude increases. The tree-fern, of which there are several species, is quite abundant about the summit, especially on the north side of some of the lower ridges. The big rock was reached late in the afternoon and a considerable collection was secured by nightfall. The night was spent under an overhanging rock, which afforded protection from rain and wind, but it was necessary to build a fire to keep comfortable. Collecting was resumed shortly after daybreak next morning in a dense fog and a dripping vegetation, and many kinds of ferns, orchids, and other plants that I had not seen elsewhere were secured. I started on the descent about one o'clock, collecting on the way down through the upper and moister region, reaching Firmeza shortly after dark with all the party well loaded with plants, but regretting that I had not made arrangements providing for several days' stay at the summit.

Monday morning I returned to Santiago, dried and packed my material, and left for Antilla, from which port I embarked, arriving in New York on the morning of March 15, 1911.

Respectfully submitted,

J. A. SHAFER.

JACQUIN'S SELECTARUM STIRPIUM HISTORIA ICONIBUS PICTIS.

Through the liberality of Mr. Andrew Carnegie, the library of the New York Botanical Garden has been able to secure a copy of what is undoubtedly the most valuable single volume in modern botanical literature, that is, in the botanical literature of the last one hundred and fifty years. It is of especial value to the New York Botanical Garden, in view of the systematic botanical exploration of the West Indies by this institution for some years past, in that it is devoted exclusively to the plants of the Antillean region and adjacent South America.

In the year 1752, Nicolaus Joseph Jacquin, then 25 years of

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age, went to Vienna to complete his medical education. He was already an enthusiastic student of natural history, especially botany, and attracted the attention of the emporor, who commissioned him to visit the West Indies for the purpose of collecting materials for the imperial cabinet. With several assistants, he spent about four years (1755–59) in carrying out this task, collecting a large amount of material, especially plants, both living and dried. The year following his return he published a brief enumeration of the plants observed which were either new or otherwise noteworthy; this was followed in 1763 by a folio work in which were given full descriptions of the plants mentioned in the earlier enumeration, and copper-plate illustrations of many of them.

Our recent acquisition is a later edition of the last-mentioned work, issued without title-page date in 1780 or 1781, in which the text has been entirely revised, and instead of 183 copper-plates there are 264 colored plates copied entirely by hand from the author's original paintings. The work is beautifully done, and a number of species are illustrated which did not appear on the plates of the first edition.

Of this work with hand-painted plates the edition is stated by different authorities as 12 or 18 copies, and of course it has always been extremely scarce. A copy was sold in 1818 for about $400.00, and probably not more than two or three have changed hands since that time; it is not unlikely that ours was the last to remain in private hands. There are copies in Vienna, Berlin, Göttingen, Dresden, the library of the British Museum, and the Library of Congress at Washington; but there is none at Kew, and it is possible that ours is the only copy in a strictly botanical library.

JOHN H. BARNHART.

SPRING AND SUMMER FLOWER SHOWS.

The floral exhibitions of The Horticultural Society of New York, given in coöperation with the Garden, were inaugurated with the exhibition of May eleventh and twelfth. A special

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exhibition was held on May twenty-fifth and twenty-sixth, consisting primarily of a large display of lilacs by Mr. T. A. Havemeyer. The exhibition for June occurred on the eighth and ninth, and the regular July exhibition will also be held this year in June, on the twenty-ninth and thirtieth. There will therefore be no regular exhibition in July, and that for August will occur toward the end of the month. The exhibitions are held in the halls devoted to paleobotany on the ground floor of the Museum building. The prizes at these exhibitions are offered by the New York Botanical Garden, and are awarded through the exhibition committee of the council of The Horticultural Society of New York.

The flowers exhibited, after delighting the many who come to view them, are donated at the conclusion of the exhibitions to hospitals and other similar institutions, thus giving many more, unable to attend, the opportunity of seeing these beautiful products of the art of the horticulturist.

At the exhibition on May 11 and 12, prizes were offered for collections of the flowers of shrubs and trees, herbaceous plants, bulbs, and for wild flowers and other plants. The F. R. Pierson Co. took the first prize for the classes of shrubs and trees, Mr. T. A. Havemeyer, A. Lahodny, gardener, taking the second. Mr. Havemeyer took the first prize for a collection of narcissus. For a collection of wild flowers, the first prize went to Mr. E. B. Southwick, who also secured a special prize for an interesting collection of the English daisy, *Bellis perennis*. Special prizes were also awarded as follows: Lager & Hurrell, for orchids; Jas. A. Macdonald, Richard Wagner, gardener, for gloxinias; L. C. Tiffany, John Miller, gardener, for four plants of self-colored calceolarias; Adolph Lewisohn, John Canning, gardener, for three excellent plants of *Calceolaria hybrida*.

The exhibition of May 25 and 26 had for its main feature a large display of lilacs, over sixty kinds, exhibited by Mr. T. A. Havemeyer, who has a very large collection of these delightful shrubs at his place at Glen Head, Long Island. The gem of this display was Mad. Antoine Buchner, with its lavender buds, opening to a white, daintily flushed with rose. Its flower clusters

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are large and well-formed, its color clear and crisp, and the foliage perfect. Among others, the following were especially noteworthy: Dame Blanche and Miss Ellen Willmott, pure white, double; Montaigne, white flushed with lilac; Sieboldi, with creamy white buds, opening almost white, with just a faint indication of cream; Montgolfier, dull lilac, the involute margins exposing the paler outer surface, giving the flowers a margined appearance; Cristophe Colomb, pale lavender, large clusters; Edmund Boissier, large flowers of deep bright lilac; Reaumer, bright lilac, full clusters; Milton, deep lilac; Pasteur, deep bright lilac; Monument Carnot, almost a light blue; Volcan, full clusters of deep bright lilac flowers; and Negro, deep red purple. Mr. Havemeyer also made large exhibits of the flowers of shrubs and trees, azaleas, and of tree peonies. An interesting exhibit was a seedling hybrid of the tree peony, *Paeonia Moutan*, with *Paeonia lutea*, decorative in its fully double flowers, the petals yellow, ruby at the base.

Mr. John Lewis Childs exhibited an attractive vase of *Gladiolus Panama*, the flowers a bright pink; also vases of Silver Sheen and Niagara, of the same genus. The New York Botanical Garden arranged an exhibit of trees and shrubs, herbaceous plants, and tulips.

The exhibition held on June 8 and 9 was the largest ever given by the Society during the summer. The largest exhibitor here was again Mr. Havemeyer. The most attractive feature of this exhibition was a large and magnificent display of herbaceous peonies made by him. Over two hundred vases were shown, containing over twelve hundred blooms. There were many delightful things among these, ranging all the way from the purest white, through pink and rose, to the deepest crimson, and in every form, from the single flower, with its center of yellow stamens, to the large fully double ones in which the stamens were entirely replaced with petals. This collection entirely filled one of the center tables, and also considerable floor space.

The first prize was awarded to Mr. Havemeyer for the largest and best collection of these flowers, not less than six flowers of

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THE JUNE FLOWER SHOW, WITH PEONIES IN THE FOREGROUND.

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each variety; his display contained about one hundred and ninety vases. The first prize also went to him for the best six flowers each of white, light pink, rose and crimson varieties, and for the best collection of singles, three flowers of each. The F. R. Pierson Co. took second in all of these.

Being a little too early for roses, only three entries were made in this class. Gen. E. A. McAlpin, J. Woodstock, gardener, took first prize with a choice collection of sixty-five varieties, the second prize going to Mr. H. Darlington, P. W. Popp, gardener, for a collection of fifty-nine varieties. A large collection of flowering shrubs and trees secured the first prize for Mr. Havemeyer, A. Lahodny, gardener, the second going to Mrs. F. A. Constable, Jas. Stuart, gardener. Among the notable things in the collection of Mr. Havemeyer were some charming forms of the genus Philadelphus, commonly known as mock orange or syringa: Lemoine's Glory, with large striking flowers; Mer de Glace; Coquette; Manteau d'Hermine, very graceful and floriferous. Another pleasing plant was an azalea with pure white crowded flowers, delightfully fragrant. It resembled a compact form of *Azalea viscosa*.

The first prize for the best collection of rhododendrons and azaleas, or either, went to the F. R. Pierson Co., for a fine display of rhododendrons, the second being secured by Mr. Havemeyer. The class of herbaceous plants was not well represented, the single collection taking the first prize for Mr. Henry Siegel, Thos. Aitchison, gardener. Of irises, there were several entries. A large collection of fine flowers, some ninety odd vases, brought the first prizes to Mr. Havemeyer; a smaller collection of twenty-seven vases, of fine flowers, gave the second prize to Mrs. F. A. Constable.

While there was not a large exhibit of orchids, there were some very choice plants displayed. Lager & Hurrell took the first prize for the best six orchid plants, six varieties. For three orchid plants, three varieties, the first prize went to the same parties, the second to Mr. Clement Moore, J. P. Mossman, gardener. A superb plant of *Cattleya Gigas* gave the first prize for the best single orchid plant to Mr. Moore, an unusual form of the same

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species securing second prize for Lager & Hurrell. Mr. Moore also took first prize for a collection of cut orchids.

A special prize was awarded to Mr. Henry Siegel for *Lilium microphyllum*, a recent introduction from China by Mr. Wilson, and exhibited in May at the International Flower Show in London. Other special prizes were awarded as follows: Mrs. F. A. Constable, for vases of campanulas; John Lewis Childs, for a collection of yellow callas; H. Darlington, for a collection of gladiolus and sweet peas.

An attractive display of herbaceous peonies and of flowering shrubs and trees was made by the Garden.

GEORGE V. NASH.

SUMMER LECTURES, 1912.

Lectures will be delivered in the Lecture Hall of the Museum Building of the Garden, Bronx Park, on Saturday afternoons, at four o'clock, as follows:

July 6. "The Botanical Exploration of Cuba," by Dr. N. L. Britton.

July 13. "Aquatic Flowering Plants," by Dr. John H. Barnhart.

July 20. "Fossil Plants and Their Significance," by Dr. Arthur Hollick.

July 27. "Some Floral Features of Southern Florida," by Dr. Marshall A. Howe.

August 3. "Indian Agriculture," by Dr. A. B. Stout.

August 10. "City Trees: Their Planting and Protection," by Mr. Carl Bannwart.

August 17. "Exploring the Pacific Coast—II. Washington to Oregon," by Dr. W. A. Murrill.

August 24. "Grasses and Some of Their Uses," by Mr. George V. Nash.

August 31. "Exploring the Pacific Coast—III. Oregon to California," by Dr. W. A. Murrill.

September 7. "Plant Parasites and Some Means of Controlling Them," by Dr. F. J. Seaver.

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The lectures, which occupy an hour, will be illustrated by lantern slides and otherwise. The doors will be closed at 4:05, and opened again at 4:15 to admit those arriving late.

The Museum Building is reached by the Harlem Division of the New York Central and Hudson River Railway to Botanical Garden Station, by trolley cars to Bedford Park, or by the Third Avenue Elevated Railway to Botanical Garden, Bronx Park. Visitors coming by the Subway change to the Elevated Railway at 149th Street and Third Avenue.

NOTES, NEWS AND COMMENT.

Mr. Fred J. Seaver, curator, received the degree of Doctor of Philosophy at the Iowa State University on June 12.

Professor Eduard Strasburger, the eminent plant cytologist of the University of Bonn, Germany, died May 20, at the age of sixty-eight.

Dr. A. B. Stout, director of the laboratories, spent a week during June in Washington and Philadelphia, where he inspected various lines of work being done in plant breeding.

Miss Emily Topp has been granted a research scholarship at the Garden for the month of August to continue her studies on variegation in *Miscanthus*.

Professor Douglass H. Campbell, of Leland Stanford University, California, visited the Garden June 15, on his way around the world in search of special plant material for studies in morphology and systematic botany.

Dr. John K. Small, head curator of the museums and herbarium, was given the honorary degree of Doctor of Science at the one hundred and twenty-fifth anniversary of Franklin College, at Lancaster, Pa., June 13.

Dr. B. O. Dodge, of Columbia University, was awarded a research scholarship for the month of June to assist him in investigations on the Ascobolaceae, a family of inconspicuous fungi not very well known in this country.

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Mr. Fred D. Fromme has been awarded a grant of $50 from the Students Research Fund to assist him in collecting and studying the local parasitic fungi, especially those belonging to the group of plant rusts.

Mr. W. W. Eggleston, of the United States Department of Agriculture, was awarded a research scholarship at the Garden for the month of May to assist in carrying on research on various poisonous plants and on the taxonomy of the plants of the apple family.

The water-lilies in the aquatic garden are now in full bloom. The first blossoms appeared about June 1, and they will continue in great profusion until checked by the cold weather. *Castalia Marliacea carnea* has flesh-colored flowers, while the variety *rosea* has flowers a little deeper in color, making it more striking. Of most vigorous habit, is *Castalia alba candidissima*, with pure white flowers of great size. *Castalia tuberosa* is another white-flowered form.

Dr. E. B. Copeland, dean of the College of Agriculture, Los Baños, Philippine Islands, paid a visit to the Garden on June 13. The college is one of the branches of the University of the Philippines, and is situated in a beautiful locality at the base of Mount Maquiling, about forty-five miles from Manila. Although work began only three years ago, the institution has made very great progress, and lasting results of a most beneficial nature to the islands are rightly expected, as the work is at once scientific and highly practical. Dr. Copeland leaves San Francisco on his return to the East at the end of the month.

Through the assistance of Professor P. Baccarini of Florence, Italy, the New York Botanical Garden has recently secured two Bizzaria plants. One of these plants is now about four feet in height and is bearing fruits which show decidedly the mixture of orange and lemon tissue. The Garden has also purchased living plants of the following chimeras (graft hybrids); *Cytisus Adami*, *Crataego-mespilus Asnieresii* and *Crataego-mespilus Dardari*.

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The American Association of Museums held its seventh annual meeting in New York during the week beginning June 3. On Tuesday, June 4, sessions were held and the members were entertained at the American Museum of Natural History. On Wednesday, a morning session was held at the Metropolitan Museum of Art, where the members were the guests of the Museum until evening, when a session was held at the Museum of Natural History. Thursday was Brooklyn day, the Brooklyn Institute of Arts and Sciences being the host; the forenoon was spent at the Central Museum and the afternoon at the Children's Museum. An evening session was held at the Museum of Natural History, after which the Association adjourned to meet next year in Philadelphia.

A large number of the members, however, remained until the end of the week. On Friday, they were the guests of the New York Zoölogical Park during the morning and at luncheon. In the afternoon, arrangements were provided for an inspection of the grounds, conservatories, and museum of the New York Botanical Garden, followed by a complimentary dinner in the evening by the director-in-chief, Dr. N. L. Britton, at the "Hermitage" in Williamsbridge. Dr. W. P. Wilson, director of the Philadelphia Museums and treasurer of the Association, in responding to the toast of "our guests," recalled the fact that the first meeting, at which the association was organized, was held in New York in 1906, and that it was at the Museum of the New York Botanical Garden that the report of the committee on organization was submitted and adopted. On Saturday, the Staten Island Association of Arts and Sciences provided an automobile trip through Staten Island, followed by a reception at the museum building of that institution.

Meteorology for April.—The total precipitation recorded for the month was 2.28 inches. Maximum temperatures were recorded of 80° on the 6th, 61° on the 11th, 75° on the 16th, and 70° on the 24th. Also minimum temperatures were recorded of 25° on the 4th, 28° on the 9th, 35° on the 20th, and 36° on the 27th.

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Meteorology for May.—The total precipitation for the month of May was 3.45 inches. Maximum temperatures were recorded as follows: May 7, 77°; May 21, 90°; May 27, 85°. Minimum temperatures were as follows: May 1, 33°; May 14, 42°; May 23, 49°; May 31, 50°.

ACCESSIONS.

Museums and Herbarium.

414 specimens of lichens, hepatics and mosses from Canada. (Distributed by Mr. John Macoun.)

1 specimen of ***Tetraplodon australis*** from Massachusetts. (By exchange with Mr. Frank Dobbin.)

11 specimens of ***Fissidens*** from South America. (By exchange with the Natural History Museum, Paris.)

1 specimen of ***Grimmia calyptrata*** from Arizona. (By exchange with Dr. C. F. Millspaugh.)

10 specimens of marine algae from California. (By exchange with the University of California.)

9 specimens of mosses from Missouri and Arkansas. (Given by Mr. B. F. Bush.)

3 specimens of mosses from Newfoundland. (By exchange with Mrs. A. R. Northrop.)

2 specimens of ***Bruchia*** from North America. (By exchange with Mr. Jules Cardot.)

3 specimens of mosses from Washington. (By exchange with Mr. George B. Kaiser.)

10 specimens of hepatics from New York, New Jersey, and Connecticut. (Given by Miss C. C. Haynes.)

12 specimens of mosses from Montevideo, Uruguay. (By exchange with Dr. Florentino Felippone.)

1 specimen of ***Grimmia tenuicaulis*** from Alberta, Canada. (By exchange with Mr. George B. Kaiser.)

2 specimens of the fruits of ***Strychnos spinosa*** from Miami, Florida. (Given by Mr. Edward Simmonds.)

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Vol. 7, part 1, 1906; part 2, 1907. part 3, 1912. Ustilaginaceae—Aecidiaceae (pars).

Vol. 9, parts 1 and 2, 1907; part 3, 1910. Polyporaceae—Agaricaceae (pars). (Parts 1 and 2 no longer sold separately.)

Vol. 16, part 1, 1909. Ophioglossaceae—Cyatheaceae (pars).

Vol. 17, part 1, 1909. Typhaceae—Poaceae (pars).

Vol. 22, parts 1 and 2, 1905; parts 3 and 4, 1908. Podostemonaceae—Rosaceae (pars).

Vol. 25, part 1, 1907; part 2, 1910; part 3, 1911. Geraniaceae—Burseraceae.

Memoirs of the New York Botanical Garden. Price to members of the Garden, $1.00 per volume. To others, $2.00. [Not offered in exchange.]

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JOURNAL

OF

The New York Botanical Garden

EDITOR

FRED J. SEAVER

Curator

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JOURNAL

OF

The New York Botanical Garden

VOL. XIII. November, 1912. No. 155.

BOTANICAL EXPLORATIONS IN SANTA CLARA AND ORIENTE.

DR. N. L. BRITTON, DIRECTOR-IN-CHIEF.

Sir: Arriving at Sancti Spiritus, February 13, where I had gone by rail from Havana, I found that the quarters at the hotel were such that it would have been impractical to remain there, so I had some difficulty in finding a suitable stopping-place until the Rev. H. G. Smith solved my problem by taking me into his own home, where he and his good wife did everything to make me comfortable. To them I owe much gratitude. Mr. Smith also helped me in various ways during the time I remained there.

The surrounding region, which is given over almost exclusively to pasturage, was, at this time, quite dry. The various thickets on grass-covered serpentine hills were examined with rather poor results. Rio Yayabo and several of its tributaries were also examined, but little was found along their banks. One little brook north of town, about a mile from the railroad station, was found to be quite rich, especially as to the variety of small trees and shrubs. A small peculiar outcropping of soft, white lime rock, several miles to the eastward, supported a different plant association. Here an upright cactus, probably a *Harrisia*, was of interest.

The chief object of my coming here, however, was to examine the flora of the Banao Hills, but I found that I was at a poorly selected base for that purpose, being too far distant, so that little information concerning them seemed available and no one

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appeared to know of a guide with knowledge of the region. The meeting of Señor Rafael Garcia-Rijo, who has large holdings in the region, resulted in suitable arrangements to get into these distant hills. He became greatly interested in my work, and introduced me to Mr. John B. Roosevelt, a retired American engineer, who had done considerable surveying in that region and was pleased to accompany me.

Accordingly we left Sancti Spiritus at daybreak on February 27, with two good horses provided by Mr. Roosevelt, going southward through a series of pasture-lands, crossing several small rivers and low ridges of what appeared to be micaceous shist formation, the flora of which was examined from time to time and some collections made. The town of Banao consists of a very few cheap houses, and like many other rural towns of the island has seen better days, but it would probably make a tolerable base for a more complete examination of the hills. To the north and west the hills are principally of limestone formation. Eastward and northward toward Sancti Spiritus, the hills seem to be of serpentine and micaceous shist. Lomo Obispo is the most prominent and highest of these, but as it looked very dry and was said to be entirely under pasturage, I did not think it advisable to spend the time necessary to reach and ascend it.

From Banao we passed around the southern side of the hills, crossing over some of the foot-hills covered almost exclusively by "corojo," *Acrocomia fusiformis* (Swartz) Cook, intermingled with low spreading trees of "guao," *Comocladia* sp., the rough bark of which is a favorite habitat for a bright rose-colored orchid, probably a *Broughtonia*, which grew in considerable abundance and by its bright rose-colored flowers, added a brilliancy to portions of the otherwise dull landscape. A variety of small shrubs but scarcely any herbaceous plants were seen in this association. Passing northward, after having forded Rio Higuarojo, across an old and long-abandoned sugar plantation, La Seiba, through forests, most of it seemingly of second growth, we reached the home of Mr. William R. Harrison, on the banks of Rio Unimaza, just before dark, having, it was said, traveled sixty miles that day. Mr. Harrison, his father and a brother

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each have a home on the old Pitajones tract, and are engaged in planting coffee in the forests, both virgin and second growth. Their method is quite different to that practised in Oriente, as they remove very little of the forest growth the first year and then they gradually thin out the tall trees and remove the undergrowth as the coffee plant requires the space. This method is an inexpensive one and is used by the Cubans, some of whom it is said have been very successful with coffee.

The valley of the Rio Unimaza is quite broad and fertile in this vicinity, its altitude being about 1,000 feet. It is very thinly settled, but there are abundant evidences of a former prosperity, such as a very large individual of the Mexican rain tree, *Pithecolibium Saman*, in the forests and that African pest, *Dichrostachys nutans*, locally called "aroma," forming thorny, impenetrable thickets of great extent, some of these trees attaining a trunk diameter of six inches. In the forests, especially along the streams many interesting plants were seen and collected.

The surrounding hills vary considerably; some are very rocky, quite dry and barren; others being moister, support a rich growth of trees and smaller plants. I got as far north as Ciegos de Ponciano where, in a rich rocky valley, I saw for the first time the Cuban walnut, *Juglans cubensis*, a fine large tree with a trunk diameter of three to four feet.

I remained here until the morning of March 3, during which time the Harrisons did all they could to aid me. One of them usually accompanied me on my excursions into the forests, and to them I owe my sincere thanks. Returning to Sancti Spiritus by the same route, with frequent stops for collecting and at a place called Rincon, secured specimens of the leaf fiber of the "corojo" in two grades; the finest called "pita corojo" is stripped from very young leaves of this spiny palm. It is plaited into bridles, and various other parts of harnesses. "Cascara corojo" is a coarser grade and is used to make rope. Several days were required to dry and pack the collections preparatory to moving on to Manzanillo in Oriente, the environs of which are mostly sugar-cane plantations or pasture-lands and little was obtained in the hill or coastal thickets which I examined. I operated as

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far inland as the town of Yara mostly through pasture-land on dry savannas with discouraging results until March 14, when I moved on to the historic town of Bayamo, the immediate vicinity of which I found to be quite similar to that of Manzanillo, and as the foot-hills of the Sierra Miestra are a considerable distance to the south and as I was due to join your party at Santiago, I spent but two days—February 15 and 16—afield there, passing on to Santiago where I made an excursion to San Juan Hill and the river valley beyond, until I joined you on March 21, after which I participated in the various excursions by yourself and Professor Cowell as far as Ensenada de Mora from which place I returned to Santiago April 1, packed and shipped to Antilla my own collections, and those of your party left at Santiago.

Having a day to spare, I went as you suggested to Holguin in quest of a further supply of that rare little cactus, *Coryphantha cubensis* Britton, discovered by me several years ago on a serpentine hill northwest of town. This was secured on March 4 with the kindly assistance of my good friend Angus Campbel after five hours of diligent search. A few other plants not collected in this region heretofore by me were also secured. Next evening I arrived in Antilla and sailed the following day from Nipe Bay, and arrived in New York, April 10, 1912.

Respectfully submitted,

J. A. SHAFER.

CHINESE TEA PAINTINGS GIVEN TO THE MUSEUM.

A series of twelve Chinese paintings representing the cultivation and preparation of tea were presented to the Garden early in the year by Dr. Reginald H. Sayre, of this city, one of the members of the Garden Corporation. They were brought from China for Mr. Charles H. Hall by Mr. John L. Grosvenor about a century ago, and were probably painted about the middle of the eighteenth century. Dr. Sayre says they used to hang in a large hall in his old home and are associated with the earliest

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recollections of his childhood. The pictures are in their original frames and measure 23 × 28 inches; the canvas used is of very high grade and the brush work exceedingly delicate. The perspective is excellent, showing that the generally accepted idea that Chinese artists are lacking in this respect is incorrect.

These paintings have been renovated and carefully mounted in four panels placed on the broad landing between the main floor and the second floor of the museum, directly opposite the main entrance of the building. At present, they are not arranged in series, but are grouped so as to give harmonious and pleasing effects and to display each picture in the best light. Taking the panels in order from left to right and the pictures from top to bottom, the subjects represented are, as follows:

Tea leaves being carried from the fields in baskets by laborers.
Tea leaves being tasted by women to determine their quality.
Women receiving baskets of green leaves from the field and taking them to the curing house.

Field of tea plants with women picking the leaves.
Tea leaves being dried over slow fires, mainly by women.
Women assorting the finer grades of tea.

Laborers planting tea.
Cheaper grades of leaves being dried over fires by men.
Grading, packing, and shipping the dried tea.

Laborers preparing the soil for the planting of tea.
Sprinkling the small tea plants with liquid manure.
Bringing tea from a rural plantation to a tea merchant, the ceremonies accompanying a sale being indicated.

The usual tea-picking scene, reminding one of cotton-picking in the southern United States, is notably absent from this series. The presence of so many women and the comfortable houses figured indicate that the better grades of tea are being handled. The word "tea" in China may represent a wide range of variations, from the costliest products of the real tea plant to the cheapest substitutes made from the leaves of willows and other wild shrubs and herbs.

W. A. MURRILL.

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COLLECTING FUNGI IN THE ADIRONDACKS.

DR. N. L. BRITTON, DIRECTOR-IN-CHIEF.

Sir: Following your instructions, I spent the last half of July and the first half of October, of the season just passed, in the Adirondack Mountains making a general collection of fungi. An attempt was made to get complete descriptive notes from the fresh specimens of most of the gill-fungi collected, to be used later in publication, and in this I was assisted by Mrs. Murrill, who made sketches of many of them in their natural colors.

Lake Placid was selected as a base and excursions were made by boat and otherwise to desirable collecting regions in the vicinity. Many different kinds of localities were visited, such as pure forests of pine, balsam, and spruce, tamarack swamps, sphagnum bogs, sugar-maple groves, deciduous woods, mixed coniferous and deciduous woods, open fields, and exposed, mossy hilltops. The higher mountains were not visited because we were not there at the proper season for collecting above three thousand feet. It was not our expectation to add many novelties to the known fungous flora of North Elba after the long and brilliant work of Dr. Charles H. Peck, state botanist, in that region, but we hoped to increase our knowledge of this flora and to enrich the Garden herbarium with well selected and well preserved specimens of as many species as possible.

The collection obtained was greater than we had expected, comprising 1,175 field numbers and about 2,000 specimens. Many of these grew on living tree trunks and fallen timber and are of special interest in connection with the care and protection of the state forests situated in the Adirondacks. Others represent edible or poisonous species of gill-fungi and are interesting to those who advocate a wider use of members of this group of plants for food. A majority of the species are different from those found in the vicinity of New York City, belonging as they do to a more northerly phytogeographic area extending from eastern Canada and New England westward to the prairies and southward along the Alleghanies. The fungi of this area have

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many points in common with those of northern Europe, being largely of common origin, and the two areas must be studied together before either can be properly understood mycologically.

Our thanks are due the manager of the Grand View Hotel and the officials of the Lake Placid Club for many courtesies extended during our stay in that delightful region.

On our return from Lake Placid, we stopped at Albany to represent the Garden at the dedicatory exercises of the magnificent new State Education Building. The ceremonies, held October 15 to 17, were very elaborate and were attended by several hundred delegates from educational institutions located in various parts of the world.

A list of the polypores and boletes collected at Lake Placid is here appended. It contains most of the wood-destroying species of the region and may serve as a check list for foresters and others interested in this destructive group of fungi.

THE POLYPORES AND BOLETES OF THE LAKE PLACID REGION.

Numbers below 400 refer to July collections, and those above 400 to collections made in October. The list of boletes is rather small because most of these plants appeared in August.

POLYPORACEAE.

ANTRODIA MOLLIS (Sommerf.) Karst. *318*. On deciduous wood.

BJERKANDERA ADUSTA (Willd.) Karst. *373, 466, 575*. On dead deciduous wood; not common.

CERRENA UNICOLOR (Bull.) Murrill. *332, 630*. On deciduous wood.

COLTRICIA PERENNIS (L.) Murrill. *385*. Common.

COLTRICIA TOMENTOSA (Fr.) Murrill. *419, 899*. About coniferous stumps.

CORIOLELLUS SERIALIS (Fr.) Murrill. *355, 587*. On coniferous wood.

CORIOLUS ABIETINUS (Dicks.) Quél. *320*. Very common on dead balsam fir and other coniferous trees.

CORIOLUS BIFORMIS (Kl.) Pat. *364*. Seen only once.

CORIOLUS NIGROMARGINATUS (Schw.) Murrill. *329*.

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CORIOLUS PROLIFICANS (Fr.) Murrill. Very destructive to fallen timber.

CORIOLUS PUBESCENS (Schum.) Murrill. *423, 758, 1046.* One beech log was covered with milk-white sporophores which threw down a distinctly cream-colored spore-print, while another beech log nearby bore avellaneous sporophores which were thinner and yielded no spore-print, possibly because immature.

CORIOLUS VERSICOLOR (L.) Quél. Very destructive both to living and dead timber.

DAEDALEA CONFRAGOSA (Bolt.) Pers. *325.* An interesting and very variable species.

ELFVINGIA FOMENTARIA (L.) Murrill. A common and conspicuous species.

ELFVINGIA MEGALOMA (Lév.) Murrill. *376.* A very common and conspicuous species.

FOMES POPULINUS (Schw.) Cooke. *302, 900.* On sugar maple trunks and stumps.

FOMES ROSEUS (Alb. & Schw.) Cooke. *841.* Common on coniferous logs.

FOMES UNGULATUS (Schaeff.) Sacc. A very common and conspicuous species.

FOMITIPORIA PEREFFUSA Murrill. *159.* This species sometimes covers the entire under surface of deciduous logs. This specimen grew underneath a beech log.

FOMITIPORIA PRUNICOLA Murrill. *378.* Common on standing trunks of *Prunus pennsylvanica.*

FUSCOPORIA FERRUGINOSA (Schrad.) Murrill. *821.* On deciduous logs.

GLOEOPHYLLUM HIRSUTUM (Schaeff.) Murrill. *14, 742, 742½.* Common on coniferous stumps and logs. Also found on a dead spot caused by borers in a trunk of *Prunus pennsylvanica* growing at the edge of coniferous woods.

HAPALOPILUS RUTILANS (Pers.) Murrill. *333.* Collected once, on birch.

HEXAGONA STRIATULA (Ell. & Ev.) Murrill. *352, 365, 374.* On beech and maple logs.

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INONOTUS RADIATUS (Sowerby) Karst. *649, 653, 669, 876.* The typical form was found on birch and alder, while the variety described by Peck in 1873 from Indian Lake as *Polyporus glomeratus* occurred only on maple.

IRPICIPORUS LACTEUS (Fr.) Murrill. *305, 965.*

ISCHNODERMA FULIGINOSUM (Scop.) Murrill. *403, 541, 660.* The usual dark, resinous form occurred on stumps and logs of conifers, while the paler, larger form so common on the under side of basswood logs was here found about four feet above the ground on a dead standing sugar maple trunk in an open field.

PHAEOLUS SISTOTREMOIDES (Alb. & Schw.) Murrill. *274.* At the base of a living larch.

PIPTOPORUS SUBEROSUS (L.) Murrill. *375.* Common on birch trunks.

POLYPORUS ELEGANS (Bull.) Fr. *311, 348.* Not common.

POLYPORUS FISSUS Berk. *982.* Seen only once. This species develops much better farther south.

POLYPORUS POLYPORUS (Retz.) Murrill. *690, 737, 1077.* Common on birch sticks and other dead deciduous wood.

PORIA ATTENUATA Peck. *64.* A resupinate species described from Croghan, New York. It occurs throughout the eastern United States on deciduous logs and is distinguished by its beautiful rosy-isabelline color.

PORODAEDALEA PINI (Thore) Murrill. *303, 346, 386.* Very destructive to conifers.

PYCNOPORUS CINNABARINUS (Jacq.) Karst. *371.* Not rare.

PYROPOLYPORUS IGNIARIUS (L.) Murrill. A very common and conspicuous species.

TYROMYCES ANCEPS (Peck) Murrill. *879.* On the south side of a balsam fir stump in a field. Described in 1895 from specimens collected by E. A. Burt on a dead hemlock trunk at Stony Brook, Massachusetts. *T. Ellisianus* Murrill is related, but has larger tubes.

Tyromyces balsameus (Peck). *Tyromyces crispellus* (Peck) Murrill. *859.* Cespitose on coniferous stumps. Described from the Adirondacks by Peck in 1878 as *Polyporus balsameus*, and from Osceola, New York, by the same author in 1885, as

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Polyporus crispellus. By a study of fresh specimens, it was possible to combine the two names and to place the species definitely in the genus *Tyromyces*.

TYROMYCES CHIONEUS (Fr.) Karst. *310, 487, 578, 1026*. Not rare on dead deciduous wood.

TYROMYCES GUTTULATUS (Peck) Murrill. *351, 574, 689, 824, 890*. This exceedingly well named species was rather often seen on the tops of stumps of various conifers. It is fragrant, and astringent and slightly acid at first to the taste, becoming bitter after being held in the mouth about two minutes.

TYROMYCES SEMIPILEATUS (Peck) Murrill. *133*. Collected only once, but not rare on deciduous wood in the eastern United States.

BOLETACEAE.

BOLETINUS CAVIPES (Opat.) Kalchb. *970*. Abundant in one spot in low coniferous woods.

BOLETINUS PICTUS Peck. *812*.

BOLETUS CLINTONIANUS Peck. *780*. Under a white pine in moss and grass.

CERIOMYCES AURIPORUS (Peck) Murrill. *561, 1101*.

CERIOMYCES COMMUNIS (Bull.) Murrill. *295, 361, 362, 592*. Common.

CERIOMYCES SUBGLABRIPES (Peck) Murrill. *116*. In dry maple woods.

CERIOMYCES SUBTOMENTOSUS (L.) Murrill. *238, 317*.

CERIOMYCES VISCIDUS (L.) Murrill. *296*. Common.

GYROPORUS CYANESCENS (Bull.) Quél. *1082*.

ROSTKOVITES GRANULATUS (L.) P. Karst. *390*. Rather common.

SUILLELLUS LURIDUS (Schaeff.) Murrill. *298*.

TYLOPILUS FELLEUS (Bull.) P. Karst. *400*. Common and large.

TYLOPILUS GRACILIS (Peck.) P. Henn. *34*. On dead coniferous wood. Tubes melleous, becoming brownish when bruised; context cremeous, unchanging, of nutty flavor.

Respectfully submitted,

W. A. MURRILL,
Assistant Director.

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FLOWER EXHIBITIONS.

The Horticultural Society of New York, in coöperation with the Garden, held its exhibitions as usual during the summer and fall, in the halls devoted to paleo-botany on the ground floor of the Museum. The premiums for the July and August exhibitions were offered by the Garden, to be awarded by the exhibition committee of the council of The Horticultural Society of New York. The exhibitions were well attended and gave pleasure to many people. This was especially the case on Sunday afternoons. The flowers at the close of the exhibitons were distributed to hospitals and other similar institutions.

The usual July exhibition was held a little earlier this year, taking place on the last two days of June. The premiums offered were for roses, Japanese irises, sweet peas, herbaceous plants, shrubs and trees, and vegetables. Open-to-all and non-commercial classes were provided for irises and sweet peas.

Mr. A. P. Stokes, of Noroton, Ct., Andrew Whitelaw, gardener, won the first prize for roses, the second going to Mr. H. Darlington, of Mamaroneck, N. Y., P. W. Popp, gardener. Scott Bros. secured the first prize, open to all, for twelve vases of Japanese irises, with an exhibit of superb blooms, Mr. John Lewis Childs, of Floral Park, N. Y., taking second.

Six vases of sweet peas, in the open to all class, won the first prize for Miss M. T. Cockcroft, of Saugatuck, Ct., Adam Paterson,gardener, the second going to Mrs. J. B. Trevor, of Yonkers, N. Y., Howard Nichols, gardener. Miss Cockcroft also took the first prize for a vase of sweet peas, Mr. H. Darlington, second. To Mrs. F. A. Constable, Mamaroneck, N. Y., James Stuart, gardener, was awarded the first prize for a collection of flowers of herbaceous plants. A large collection of the flowers of shrubs and trees gave the first prize to Mr. T. A. Havemaeyer, of Glen Head, N. Y., A. Lahodny, gardener, the second to Mr. H. Darlington.

To Mr. James A. Macdonald, Flushing, N. Y., Richard Hughes, gardener, was awarded the first prize for six vases of Japanese irises, in the class for non-commercial growers, the second to Mr.

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T. A. Havemeyer. Among non-commercial growers, for three vases of sweet peas, the first prize was secured by Miss M. T. Cockcroft, the second by Mrs. J. B. Trevor.

The classes for vegetables were open to all. Twelve vegetables gave Mrs. J. B. Trevor the first prize, and Mrs. F. A. Constable the second. Six vegetables brought the first prize to Mr. James A. Macdonald, the second to Mr. T. A. Havemeyer. Special mention was made of a collection of miscellaneous plants exhibited by Mr. John Lewis Childs. Special prizes were awarded to: Mr. Louis C. Tiffany, of Oyster Bay, N. Y., John Miller, gardener, for twelve chrysanthemum blooms; and to Mr. T. A. Havemeyer, for collections of lilies and hydrangeas.

The Garden exhibited large collections, not for competition, of the flowers of herbaceous plants and of shrubs and trees.

The August Exhibition was held Saturday and Sunday, August thirty-first and September first. On account of Monday, the second, being Labor Day, the exhibition was continued through that day. It was primarily an exhibition of gladioli, for which most of the premiums were offered; a few premiums were offered for montbretias. Prizes were offered in classes open to all and for non-commercial growers. There was a large and magnificent display of these attractive flowers, filling the two long center tables and several side tables. The flowers were in excellent condition at the close of the exhibition and were sent to hospitals and other institutions.

A large collection of gladioli, excellent flowers, exhibited by Mr. John Lewis Childs, almost filled one of the long center tables, and secured for him the first prize for a collection of named varieties, in the open to all class. For twelve varieties, three spikes of each, in the same class, the first prize was awarded to Mr. Arthur Cowee, of Berlin, N. Y., for a collection of superb flowers, the second going to Mr. T. A. Havemeyer. Mr. Cowee also captured the first prize, in the class open to all, for the best vase of any white variety of gladiolus, twenty-five spikes. The first prize for a table center piece went to Mr. T. A. Havemeyer.

The prizes offered to non-commercial growers were won as follows: For a collection of named varieties of gladioli, the first

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by Mr. T. A. Havemeyer, the second by Mr. H. Darlington. For six varieties of gladioli, two spikes of each, the first by Mr. Havemeyer, the second by Mr. Darlington. For a vase of any white variety, six spikes, the first by Mr. Havemeyer, the second by Mr. Darlington. For a vase of any pink variety, six spikes, by Mr. Havemeyer.

The first prize for a collection of montbretias, in the class open to all, was won by Mr. John Lewis Childs; that for non-commercial growers by Mr. H. Darlington.

The exhibition of Saturday and Sunday September twenty-eighth and twenty-ninth, was also held in the Museum building, New York Botanical Garden. This was arranged mainly for dahlias and asters. The inclement weather just previous to the time of the exhibition so damaged these flowers that few were fit for exhibition purposes. Mr. H. Darlington won first prizes for the following: collection of fifty dahlias; collection of twenty-five dahlias; and for five each of show, decorative, cactus, and peony-flowered; vase of ten single dahlias.

The Garden made an exhibit of the flowers of herbaceous plants. GEORGE V. NASH.

LATE AUTUMN LECTURES, 1912.

Lectures will be delivered in the Lecture Hall of the Museum Building of the Garden, Bronx Park, on Saturday afternoons, at four o'clock as follows:

Nov. 23. "Recent Exploration in Bermuda," by Dr. N. L. Britton.

Nov. 30. "A Botanical Expedition to Cuba," by Dr. W. A. Murrill.

Dec. 7. "Some Floral and Scenic Features of Jamaica," by Dr. M. A. Howe.

Dec. 14. "The Vegetation of Southern Florida," by Mr. G. V. Nash.

The lectures, which occupy an hour, will be illustrated by lantern slides and otherwise. The doors will be closed at 4:00, and opened again for a moment at 4:15 to admit those arriving late.

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The Museum Building is reached by the Harlem Division of the New York Central and Hudson River Railway to Botanical Garden Station, by trolley cars to Bedford Park, or by the Third Avenue Railway to Botanical Garden, Bronx Park. Visitors coming by the Subway change to the Elevated Railway at 149th Street and Third Avenue.

NOTES, NEWS AND COMMENT.

Dr. P. A. Rydberg, curator, is spending several weeks studying in the United States National Museum, Washington, D. C.

Dr. John K. Small, head curator, left New York, October 31, for southern Florida, where he will spend several weeks studying the flora of that region. Professor Hugo de Vries will accompany him on this expedition.

Dr. Arthur Hollick, curator, has a three months' leave of absence from the Garden and will spend the time in a continuation of his studies of the fossil flora of Alaska. The work will be carried on at the United States National Museum.

Mr. Stewardson Brown, curator of botany in Philadelphia Academy of Sciences, spent several days at the Garden in October and November studying recent collections of Bermuda plants.

Dr. Fred J. Seaver gave a lecture before the Horticultural Society at the American Museum of Natural History, October 26 on "Insect Parasites and Some Means of Controlling Them."

Miss Vera Charles, of the United States Department of Agriculture, visited the Garden in October to examine the collections of fungi.

Dr. W. A. Murrill, assistant director, represented the Garden at the dedicatory exercises of the new State Education Building held in Albany, October 15 to 17.

Mr. Frank Meyer, agricultural explorer for the United States Department of Agriculture, visited the Garden recently. He will soon sail for China where he will conduct botanical exploration in the interior for the next three or four years.

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The regular meeting of the Torrey Botanical Club held in the museum on October 30 consisted of a symposium on the flora of Bermuda. The subject was introduced by Dr. Britton and the discussions were participated in by the various persons who have collected and studied the plants of those islands.

Professor Jules de Schokalsky, president of the Section of Physical Geography in the Imperial Geographical Society of Russia, and Major General of the Imperial Russian Marine, and Professor Vladimir Doubiansky, curator of the Imperial Botanical Gardens of St. Petersburg, visited the Garden on October 21 to examine the herbarium and museum and to arrange for an exchange of museum material from desert regions.

Dr. N. L. Britton, director-in-chief, accompanied by Mrs. Britton, attended and participated in the exercises in connection with the unveiling of the tablet on the oldest and largest tree on the island of Manhattan at Inwood. The tree is a tulip and measures 19 feet in circumference and is probably more than two hundred years old.

The autumn lectures to the 4B and 5B pupils of the public schools were held during the latter part of October and early November. The weather was unusually favorable and the lectures were well attended.

Meteorology for October.—The total precipitation recorded for the month was 3.44 inches, of which two inches fell within two hours on the 23d. Maximum temperatures were recorded of 82.5° on the 6th, 73° on the 18th, 69° on the 21st, and 74° on the 30th. Also minimum temperatures were recorded of 39° on the 2d, 42° on the 9th, 36° on the 16th, and 38° on the 26th. There was no killing frost during the month.

ACCESSIONS.

MUSEUMS AND HERBARIUM.

256 specimens of flowering plants from Quebec. (Given by Professor C. S. Williamson.)

1 specimen of *Drepanocladus uncinatus* from Connecticut. (By exchange with Dr. George E. Nichols.)

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3 specimens of mosses from Ithaca, Wisconsin. (By exchange with Dr. J. M. Greenman.)

3 specimens of mosses from Oregon and Michigan. (Given by Dr. H. D. House.)

34 specimens of mosses from Washington. (By exchange with Mr. A. S. Forster.)

115 specimens of mosses from the herbarium of J. J. Crooke. (Given by Dr. N. L. Britton.)

1 specimen of *Galactia nummularia* from St. Martin, West Indies. (By exchange with the Botanical Garden, Utrecht, Holland.)

11 specimens of hepatics from New England. (Given by Miss Annie Lorenz.)

6 specimens of fleshy fungi from Mantoloking, New Jersey. (Given by Mrs. F. M. P. Pearse.)

11 specimens of fleshy fungi from Bronx Park. (Collected by Miss Mary E. Eaton.)

1 specimen of *Vaccinium Sintenisii* from Porto Rico. (By exchange with the Royal Botanical Garden, Berlin, Germany.)

2 photographs *Cavendishia Endresii* and *C. latifolia*. (By exchange with the Royal Gardens, Kew, London, England.)

2 specimens of *Rubus* from tropical America. (By exchange with the Royal Botanical Garden, Berlin, Germany.)

13 specimens of flowering plants from Guatemala. (By exchange with Professor T. D. A. Cockerell.)

13 specimens of gill-fungi from Plandome, New York. (Given by Dr. W. S. Thomas.)

15 specimens of fleshy fungi from Stockbridge, Massachusetts. (Given by Mr. D. D. Field.)

1 specimen of *Fissidens crassipes pennsylvanicus* from Pennsylvania. (Given by Dr. A. F. Krout.)

1 photograph of the type specimen *Vaccinium caracasanum*. (From the Botanical Garden, Brussels, Belgium.)

1 photograph of the type specimen of *Vaccinium pachyphyllum*. (From the Royal Gardens, Kew, London, England.)

2 specimens, *Thibaudia costaricensis* and *T. domingensis*. (By exchange with the Royal Botanical Garden, Berlin, Germany.)

1 photograph of *Satyria clonantha*. (From the Royal Gardens, Kew, London, England.)

1 specimen of fungus from California. (Given by Professor J. C. Arthur.)

60 specimens of fleshy fungi from the Bronx. (Collected by Dr. W. A. Murrill.)

19 specimens of flowering plants from Utah. (By exchange with Professor A. O. Garrett.)

3 specimens of flowering plants from Vermont. (Given by Miss Margaret Slosson.)

1 specimen of *Pinus Banksiana* from Michigan. (Given by Dr. R. M. Harper, through the United States Forest Service.)

1 photograph of *Ostrya virginica* from New York. (Given by Mr. M. J. Breitenbach.)

1 trunk of *Hevea brasiliensis* from Ceylon. (Given by Mr. F. Crosbie Roles.)

2,152 specimens from Pinar del Rio, Cuba. (Collected by Dr. J. A. Shafer.)

93 specimens of flowering plants from Porto Rico. (By exchange with the Agricultural Experiment Station, Porto Rico, West Indies.)

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10 specimens of *Rosa* from North Dakota. (By exchange with Dr. John Lunnell.)

534 specimens of flowering plants from South Dakota. (By exchange with Professor S. S. Visher.)

2,000 specimens of fungi from the Adirondacks. (Collected by Dr. W. A. Murrill.)

PLANTS AND SEEDS.

1 plant of *Persea Persea*. (Given by Mrs. Noble.)

1 plant of *Crinum* sp., from Vera Cruz, Mexico. (By exchange with Dr. J. C. Harvey.)

10 plants of *Opuntia*. (By exchange with U. S. Nat. Museum, through Dr. J. N. Rose.)

142 plants for conservatories, from Bermuda. (Collected by Dr. N. L. Britton and Mr. Stewardson Brown.)

96 cactus plants from western Kansas. (Collected by Dr. J. N. Rose and Mr. Wm. R. Fitch.)

1 plant of *Marica*. (Given by Mrs. John P. Althoff.)

3 plants for outside collections. (Given by Miss E. Kittredge.)

21 plants of *Hevea brasiliensis*. (Given by Federated Malay States, through Rubber Exhibition.)

4 plants of *Hevea brasiliensis*. (Given by N. Y. Commercial Co.)

24 plants for conservatories. (Given by German Kali Works.)

6 cycads. (By exchange with Botanical Garden, Glasnevin, Dublin, Ireland.)

4 plants for outside collections. (Given by Mrs. W. Gilman Thompson.)

1 plant of *Beaucarnea recurvata*. (Given by Dr. C. Nicolai.)

1 plant of *Peristeria elata* from Panama. (Given by Dr. J. F. Kemp.)

4 plants of *Epidendrum* from Jamaica. (By exchange with Department of Agriculture, Jamaica.)

24 plants derived from seeds from various sources.

1 packet seed of *Passiflora* from Bermuda. (Collected by Dr. N. L. Britton and Mr. Stewardson Brown.)

1 packet seed of *Cocos Datyl*, from Mexico. (By exchange with Dr. J. C. Harvey.)

1 packet of Cuban seed. (Collected by Dr. J. A. Shafer.)

1 packet of seed of *Xiphidium xanthorrhizon*. (Collected by Dr. J. A. Shafer.)

2 packets palm seeds from Mexico. (By exchange with Dr. J. C. Harvey.)

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OF

The New York Botanical Garden

EDITOR

FRED J. SEAVER

Curator

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BAY LAVENDER (*Tournefortia gnaphalodes*) COAST OF CONEY ISLAND, BERMUDA.

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JOURNAL

OF

The New York Botanical Garden

VOL. XIII. December, 1912. No. 156.

BOTANICAL EXPLORATION IN BERMUDA.

WITH PLATES CIII, CIV, CV, CVI, CVII.

TO THE SCIENTIFIC DIRECTORS,

Gentlemen: For the purpose of further studying the flora of Bermuda, and the presumable origin of the plants composing that flora, I spent the period from August 26 to September 21 on those islands, accompanied by Mrs. Britton and by Mr. Stewardson Brown, curator of botany in the Philadelphia Academy of Natural Sciences; and accompanied by Mr. Brown, and by Dr. Fred J. Seaver, a curator of our museums, the period from November 29th to December 14th, was given to the same investigation; I had previously given three weeks to this study with Mrs. Britton and Mr. Brown, in the autumn of 1905,* during which period a large portion of the land area of about 19¼ square miles was studied and collections aggregating 427 field numbers were made. These were supplemented by Mr. Stewardson Brown in the winter of 1908 by 231 field numbers and again by him in the spring of 1909 by 66 field numbers,† and further by a collection of 85 field numbers by Miss Delia West Marble, also in the spring of 1909. The two expeditions of 1912 obtained over 650 field numbers. A total of more than 1,450 separate collections of plants have thus been made during the progress of this investigation and these aggregate over 5,000 specimens.

Previous to 1905, the collections of Bermuda land plants available for students in New York consisted only of a few specimens

* See Journal N. Y. Bot. Gard. 6: 153–158. 1905.

† See Proc. Acad. Nat. Sci. Phila. 1909: 486–494. 1910.

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preserved in the herbarium of Columbia University, obtained by Mr. I. F. Holton in 1854 and presented by him to Dr. Torrey, and a small lot brought back by Professor James F. Kemp in 1885, contained in the same herbarium.* The collections obtained during the present expedition have made the representation of the Bermuda flora at the New York Botanical Garden the best in the world; a nearly complete duplicate set of the herbarium specimens has been deposited at the Academy of Natural Sciences in Philadelphia.

Attention has been given to the study and collecting of all land plants, cryptogams as well as phanerogams.

To Mr. Benjamin D. Gilbert's "Revision of the Bermuda Ferns" published in 1898,† we have added no species.

Mrs. Britton's work on the mosses has added greatly to the known species growing in Bermuda.

An account of the liverworts was published by Professor A. W. Evans in 1906;‡ one species has since been added.

Dr. Marshall Avery Howe of our staff visited Bermuda in the summer of 1900, and made large collections of marine algae, but other visits at different times in the year are necessary to make his knowledge of the algal flora measurably complete. There is little known as yet about the microscopic algae.

The numerous lichens collected are now being studied by Professor L. W. Riddle and others.

The fungus flora is not completely known. A considerable number of specimens have been collected and partly studied by specialists. The "Challenger" Expedition obtained only 23 species of fungi, but there are very many more. Mr. and Mrs. Bernard O. Dodge collected some 40 species in the summer of 1911. Our second trip of 1912 was especially organized for the study and collection of these plants by the presence of Dr. Seaver, who obtained over 150 species, which are now being studied.

Biologically, and as regards origin, interest centers on the species native to this little archipelago, so far separated from

* See Bull. Torrey Bot. Club 12: 45–48. 1885.

† See Bull. Torrey Bot. Club 25: 593–604. 1898.

‡ See Bull. Torrey Bot. Club 33: 129–135. 1906.

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BERMUDA RED CEDAR (*Juniperus bermudiana*) HARRINGTON HOUSE, BERMUDA. AN ENDEMIC BERMUDA SPECIES.

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SAND DUNE WITH VINES OF BAY-BEAN (*Canavali lineata*) AND OF BEACH MORNING-GLORY (*Ipomoea Pes-caprae*), NEAR TUCKER'S TOWN, BERMUDA. BOTH OCCUR IN SIMILAR SOIL IN FLORIDA AND THE WEST INDIES.

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other land both in distance and by the abysses of the ocean. The approximate number of these known up to the present time is indicated in the following table.

Flowering plants	150	species,	of	which	about	10	are	endemic.
Ferns and fern allies	19	"	"	"		4	"	"
Mosses and moss allies	51	"	"	"		3	"	"
Lichens	50	"	"	"	some	6	"	"
Fungi	175	"	"	"	at least	8	"	"
Algae	250	"	"	"	some	5	"	"
About	695				About	36		

Some species of land plants recorded as observed in Bermuda many years ago cannot be found there now, and these have either been obliterated by the destruction of their habitats, or some of the old records are erroneous. Some species previously regarded as native, seem more likely to have been introduced.

The endemic flowering plants, ferns and mosses now increased by subsequent study from my estimate of 11 in 1905 to 16 or 17 are related in greater or lesser degree to species of the West Indies, the southeastern United States or tropical continental America, the two apparent exceptions to this relationship noted in my report of 1905 having since been found to have American congeners. They are not nearly as closely related to old world types as to American, and the conclusion that they have been derived from American ancestors by modification or mutation during long periods of isolation from their relatives seems inevitable. Knowledge of the endemic lichens and fungi is as yet too imperfect to yield a similar conclusion, but this appears likely, and the five endemic algae are American in affinity.

Excluding the endemic lichens, fungi and algae, the nearest living relatives of the endemic species appear to be as follows; this suggested relationship need not imply that the Bermuda species have been derived from the others, but common ancestry is probable.

1. **Eleocharis bermudiana** Britton,* Bermuda Spike-rush, nearest to *Eleocharis albida* Torrey, of the southeastern United States and West Indies.

*Eleocharis bermudiana Britton, n. sp. Culms slender, weak, 3 dm. long or less; spikelet thicker than that of *E. albida*, the black trigonous achene short-beaked. Marshes. Type from South Shore Road, Bermuda (*Brown and Britton, No. 240*).

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2. **Carex bermudiana** Hemsley, Bermuda Sedge, nearest to *Carex Walteriana* Bailey, of the southeastern United States.
3. **Sabal Blackburnianum** Glasebrook, Bermuda Palmetto, nearest to *Sabal Palmetto* (Walt.) Lodd., of southeastern United States, Bahamas and Cuba.
4. **Peperomia septentrionalis** S. Brown, Bermuda Peperomia, nearest to *Peperomia obtusifolia* (L.) Dietr., of Florida and the West Indies.
5. **Sisyrinchium bermudianum** L., Bermuda Iris, related to *Sisyrinchium alatum* Hooker of Mexico more closely than it is related to any species of the United States or the West Indies.
6. **Eleaodendron Laneanum** A. H. Moore, Bermuda Olive-wood, nearest to *Eleaodendron attenuatum* A. Rich., of Cuba and the Bahamas.
7. **Ascyrum macrosepalum** S. Brown,* Bermuda St. Andrew's Cross, nearest of *A. linifolium* Spach of Florida and the Bahamas.
8. **Chiococca bermudiana** S. Brown, Bermuda Snowberry, Blolly, nearest to *Chiococca alba* (L.) Hitchc., of Florida and the West Indies.
9. **Erigeron Darrellianus** Hemsley, Bermuda Fleabane, apparently related to *Aster falcatus* Klatt., of Central America.
10. **Juniperus bermudiana** L., Bermuda Red Cedar, nearest to *Juniperus lucayana* Britton, of the Bahamas.
11. **Adiantum bellum** Moore, Bermuda Maidenhair-fern, nearest to *Adiantum cuneatum* Langsd. & Fisch., of South America. Recently recorded from Guiana, but the equivalency not yet proven.
12. **Diplazium Laffanianum** (Baker) Christensen, Governor Laffan's Fern, nearest to *Asplenium Mildei* Kuhn, of the South American Andes, according to Gilbert.

* **Ascyrum macrosepalum** S. Brown, n. sp. Differs from *A. linifolium* Spach, by the larger leaves; broadly ovate, heart-shaped sepals which are 10–12 mm. long and 7–9 mm. broad and in the seeds which are greenish brown instead of black and larger, nearly 1 mm. long, and broader in proportion to their length. Frequent in marshes and on hillsides. Type from Paget Marsh, Bermuda (*Brown and Britton, No. 1136*).

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BERMUDA TAN-BARK (*Elaeodendron Laneanum*) NEAR CASTLE HARBOR, BERMUDA. AN ENDEMIC BERMUDA SPECIES.

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13. **Dryopteris bermudiana** (Baker) Gilbert, Bermuda Shield-fern, nearest to *Dryopteris asplenioides* (Sw.) Kuntze, of Jamaica, and perhaps not specifically distinct from it.
14. **Dryopteris Speluncae** (L.) Underwood, Ten-day Fern, apparently nearest related to *Dryopteris ampla* (H. & B.) Kuntze, of the West Indies and tropical continental America.
15. **Campylopus bermudianus** R. S. Williams,* Bermuda Campylopus, nearest to *Campylosus tortuosus* (Hampe) Paris, of the West Indies.
16. **Tortula bermudiana** Mitten. The affinity of this presumably endemic Bermuda moss has not yet been satisfactorily determined.
17. **Crossotolejeunea bermudiana** Evans, Bermuda Hepatic, nearest to *Crossotolejeunea paucispina* (Spruce) Steph., of Brazil and Guadeloupe.

The following species have been described from Bermuda specimens and supposed to be endemic:

1. **Rynchospora domuccensis** A. H. Moore is *Rynchospora distans* (Michx.) Vahl, of the southeastern United States and Cuba.
2. **Limonium Lefroyi** (Hemsl.) Britton is *Limonium carolinianum* (Walt.) Britton, of the eastern United States.
3. **Euphorbia bermudiana** Millsp. is *Euphorbia Blodgettii* Engelm., of Florida, Bahamas, Cuba and Jamaica.
4. **Galium bermudianum** L. is the same as *Galium hispidulum* Michx. of the Southeastern United States and the Bahamas.

The native species of flowering plants, ferns and mosses, other than the endemic ones, all exist on the American mainland or on West Indian islands. About eighty per cent. of them grow in Florida or the West Indies, or in both these regions. The greater portion of the native land flora has, then, come to Bermuda from the southwest.

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* **Campylopus bermudianus** R. S. Williams, n. sp. Forming dull green tufts about 4 cm. high, smaller than *C. tortuosus;* leaves 6 mm. long or less, about one-third as long as those of *C. tortuosus*, the costa only about one-half as wide. Paget Marsh, Bermuda (*Stewardson Brown, No. 651*).

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I reject, as merely fanciful, the theory that Bermuda area of land and shoal has ever had land connection, either with the continent or with the West Indies.

An analysis of the native flora excluding the thallophytes, indicates that the transportation of all its species may reasonably be referred to one or the other of three methods.

1. All the halophytic (salt-loving) species, and those with fruits which can retain vitality in salt water have floated to Bermuda. These number 41. All the marine algae have come in the same way.
2. Hurricane winds sweep all light objects in the course of the storm to great heights in the atmosphere, from which they slowly fall over very wide areas. To this transportation through the air may confidently be referred spores of all land cryptogams, and seeds and fruits of flowering plants appended so as to float readily in the air, such as those of some grasses and composites. In this category some 83 species are to be included.
3. To migratory birds, carrying seeds and fruits swallowed by them for food, or mechanically attached to their bodies and thus transported in flight, are to be referred the function of bringing the smaller-seeded species of the native flora, other than those transported by water or wind. These number about 97.

N. L. BRITTON,
Director-in-Chief.

CONFERENCE NOTES.

The November conference of the scientific staff and registered students of the New York Botanical Garden was held in the laboratory on the afternoon of November 4, with Dr. Murrill presiding.

Mr. F. D. Fromme gave a report of the studies which he made during the past summer under a scholarship granted by the New York Botanical Garden. In the collection and study of parasitic fungi particular attention was given to the rusts. Collections

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BERMUDA PALMETTO (*Sabal Blackburnianum*), PEMBROKE MARSH, BERMUDA. AN ENDEMIC BERMUDA SPECIES.

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were made in the vicinity of New York City, at several points in New Jersey and at Woods Hole and the nearby islands on the coast of Massachusetts. Some fifty species of rusts in all were collected on seventy hosts. All forms were collected in duplicate. One set will be added to the herbarium of the New York Botanical Garden and the other will be sent to Professor Arthur. Some of the forms obtained are especially interesting and will prove a valuable addition to the collection in the herbarium.

There was also given by Dr. A. B. Stout a summary of his observations during the past year on bud variation in *Coleus Blumei*. In these studies two plants which produced bud sports during the autumn of 1911 were used as parents and cuttings from both the parent stock and from the bud sports were grown to determine the constancy of the leaf coloration and the tendency to produce new bud variations.

The leaves of the parent plants have a color pattern of green, red, and yellow with the yellow strongly developed toward the margins of the leaves. On these plants, and on plants grown from cuttings, several branches appeared with the leaves lacking the yellow blotches. One parent plant has produced two bud sports, one with no yellow in the leaves and one with the leaves almost entirely red in color. This plant now possesses three different kinds of branches in regard to leaf coloration.

One of the plants grown from the first series of cuttings has produced several branches bearing leaves with the green at the margin and the yellow in the center. The color pattern has been reversed. Two other plants have produced branches showing the color pattern arranged in the stem and leaves as a sectorial chimera.

Living plants showing these different kinds of variation were exhibited.

Pedigreed cuttings of these plants will be grown for a continued and a more intensive study of the phenomena of bud variation.

A. B. STOUT.

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NATURE-STUDY LECTURES TO PUBLIC SCHOOL CHILDREN.

The nature-study lectures, with accompanying demonstrations, to the pupils of 4B and 5B grades of the Public Schools of the Bronx were given in the lecture hall of the Museum Building of the Garden during October and November.

The course included ten lectures which were delivered by Dr. N. L. Britton, Dr. H. H. Rusby, Dr. M. A. Howe, Mr. G. V. Nash, and Dr. F. J. Seaver, assisted by six teachers as demonstrators.

With the exception of the lecture on the afternoon of November 7, which was abandoned on account of inclement weather, two lectures were held on each lecture day, the first commencing at 10:15 A.M. and the second at 1:45 P.M.

The accompanying table of attendance was prepared by Principal Stevens of Public School 44.

4B Lectures.						5B Lectures.					
A. M. Lectures.		P. M. Lectures.		Total.		A. M. Lectures.		P. M. Lectures.		Total.	
Teachers	Pupils	Teachers	Pupils	Teachers	Pupils	Teachers	Pupils	Teachers	Pupils	Teachers	Pupils
14	403	26	634	40	1037	9	241	16	436	25	677
13	255	00	000	13	255	11	349	18	465	29	814
						11	329	13	312	24	641
				53	1292					78	2132
Grand total, both grades										131	3424

NOTES, NEWS AND COMMENT.

Dr. Ezra Brainerd, of Middlebury College, Vermont, spent several days at the Garden in November in continuation of his work on violets.

Dr. C. F. Millspaugh, curator of botany in The Field Museum of Natural History, Chicago, spent several days at the Garden in November compiling notes for a second edition of his "Flora of West Virginia."

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The BULLETIN of the New York Botanical Garden volume 8, number 28, was issued November 23. This number contains the following papers: "New Species from Bolivia Collected by R. S. Williams," by Dr. H. H. Rusby; "The Polyporaceae of Mexico," by Dr. W. A. Murrill, and "Additions to the Paleobotany of the Cretaceous Formation on Long Island," by Dr. Arthur Hollick. This number contains the descriptions of 143 species previously unpublished.

The regular annual meeting of the American Association for the Advancement of Science was held in Cleveland, Ohio, December 31, 1912, to January 3, 1913. Representatives from all of the leading scientific institutions were in attendance and participated in the reading and discussions of scientific papers.

Meteorology for November.—The total precipitation recorded for the month was 2.47 inches. Maximum temperatures were recorded as follows: 65° on the 6th, 74° on the 12th, 68° on the 21st, and 52° on the 30th. Minimum temperatures were recorded of 25° on the 4th, 32.5° on the 10th, 26° on the 19th, and 22° on the 28th. The first killing frost of the season was on November 3.

ACCESSIONS.

MUSEUMS AND HERBARIUM.

1 specimen of *Herpotrichia nigra* from Colorado. (By exchange with Dr. F. D. Kern.)

75 specimens, "Fungi Dakotenses," fascicles 5, 6 and 7. (Distributed by Dr. J. F. Brenckle.)

1 specimen of *Nectria Ipomoeae* from New Jersey. (By exchange with Dr. M. T. Cook.)

1 specimen of *Tubercularia vulgaris* from Indiana. (By exchange with Dr. F. D. Kern.)

4 specimens of fleshy fungi from Staten Island, New York. (Given by Dr. B. O. Dodge.)

1 specimen of *Hydnum Caput-ursi* from Staten Island, New York. (Coll. by Mrs. N. L. Britton.)

30 specimens of fungi from Marshfield, Oregon. (By exchange with Dr. H. D. House.)

15 specimens of fleshy fungi from New Jersey. (By exchange with Mrs. F. M. Pearse.)

2 specimens of fungi from Indiana. (By exchange with Dr. F. D. Kern.)

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1 specimen of fungus from Porto Rico. (By exchange with Dr. F. D. Kern.)

150 specimens of fungi from New York. (Collected by Dr. F. J. Seaver.)

1 specimen of *Porodisculus pendulus* from Pennsylvania. (By exchange with Mr. Paul J. Anderson.)

34 specimens of fungi from Washington. (By exchange with Mr. S. M. Zeller.)

4 specimens of fleshy fungi. (Collected by Professor R. A. Harper.)

36 specimens of fleshy fungi from Yellowstone National Park. (By exchange with Dr. W. J. Robinson.)

22 specimens of fungi from Seattle, Washington. (By exchange with Mr. S. M. Zeller.)

960 specimens of flowering plants from Jamaica, West Indies. (Collected by Mr. William Harris.)

18 specimens of fungi from Porto Rico. (By exchange with Brother Hioram.)

6 specimens of *Drepanocladus* from Montreal, Canada. (By exchange with Professor H. Dupret.)

1 specimen of *Papillaria nigrescens* from Florida. (By exchange with Mr. Severin Rapp.)

7 specimens of mosses from South Dakota. (By exchange with Mr. S. S. Visher.)

4 specimens of mosses from Pictou, Canada. (Given by Dr. C. B. Robinson.)

68 specimens of flowering plants from Porto Rico. (By exchange with Brother Hioram.)

2,500 specimens from Cuba. (Collected by Dr. and Mrs. N. L. Britton, Mr. John F. Cowell and Miss Harriet L. Britton.)

93 specimens of flowering plants from Porto Rico. (By exchange with Agricultural Experiment Station, San Piedras, Porto Rico.)

53 specimens of flowering plants from Cuba. (By exchange with Brother Leon.)

120 specimens of mosses from North America. (From the herbarium of J. H. Hart.)

2 specimens of *Atriplex* and *Eriogonum* from the western United States. (Given by Dr. E. L. Greene.)

353 specimens of flowering plants from Nevada. (Collected by Dr. A. A. Heller.)

1 specimen of *Phlox subulata* from New York. (Given by Professor J. F. Kemp.

2 specimens of mosses from Quebec, Canada. (By exchange with Professor H. Dupret.)

40 specimens of flowering plants from Colorado. (By exchange with Mr. George Osterhout.)

1 specimen of *Linaria Linaria* showing spurred and spurless peloria. (Given by Mr. John Macallum.)

3 specimens of *Chamaesyce* from Louisiana. (Given by Mr. E. C. Wurzlow.)

2 museum specimens of *Holacantha Emoryi* from Arizona. (Given by Dr. R. E. Kunze.)

1 specimen of *Juniperus bermudiana* from Harrington Sound, Bermuda. (Given by Dr. N. L. Britton.)

6 specimens of drugs. (Given by Dr. H. H. Rusby.)

1 specimen of *Melochia corchorifolia* from Louisiana. (Given by Mr. E. C. Wurzlow.)

85 specimens, mostly *Cacti*. (By exchange with the Smithsonian Institution.)

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12 specimens from Stockbridge, Massachusetts. (Collected by Dr. N. L. Britton.)

350 specimens of *Cacti*. (Collected from plants under cultivation in the greenhouses, mostly by R. S. Williams.)

3 photographs of *Macleania insignis*, *Thibaudia laurifolia*, and *Vaccinium cordatum*. (From the Botanical Garden, Brussels, Belgium.)

1 specimen of *Sophoclesia nummularifolia*. (By exchange with the Botanical Garden, Berlin, Germany.)

5 specimens, with photographs, of *Cavendishia glutinosa*, *C. Graebneriana*, *C. Wercklei*, *C. costaricensis*, and *C. Hoffmanni*. (By exchange with the Botanical Garden, Berlin, Germany.)

6 specimens of flowering plants from Russia. (By exchange with the United States Department of Agriculture.)

1 specimen of *Eugenia uniflora* from Harrington House, Bermuda. (Given by Dr. N. L. Britton.)

1 specimen of Japanese plum. (Given by Dr. H. H. Rusby.)

1 specimen, with photograph, of *Vaccinium fissum*. (By exchange with the Royal Botanical Museum, Munich, Germany.)

2 photographs of *Vaccinium eriocladum* and *V. micranthum*. (From the De-Candolle Herbarium.)

1 photograph of *Vaccinium Myrsinites*. (From the Museum of Natural History, Paris, France.)

2 specimens, with photographs, of *Vaccinium angustifolium* and *V. angustifolium glaucescens*. (From the Royal Gardens, Kew, England.)

7 specimens of mosses from North and South America. (By exchange with Mr. Jules Cardot.)

5 specimens of Hepaticae from Maine. (By exchange with Miss Annie Lorenz.)

10 specimens of marine algae. (By exchange with Mrs. A. Weber-van-Bosse.)

14 specimens of ferns from America. (By exchange with the Bonaparte Herbarium, Paris, France.)

4 specimens of lichens from Washington. (By exchange with Mr. A. S. Foster.)

1,500 specimens from Bermuda. (Collected by Dr. and Mrs. N. L. Britton, Mr. Stewardson Brown, and Fred J. Seaver.)

100 specimens "Uredineen," fascicles XLIX and L. (Distributed by H. & P. Sydow.)

25 specimens "Phycomyceton et Phycometen," fascicle VII. (Distributed by H. & P. Sydow.)

35 specimens "Ascomycetes," fascicle 51. (Distributed by Dr. Heinrich Rehm.)

6 museum specimens from Bermuda. (Given by Dr. N. L. Britton.)

280 specimens of flowering plants from Texas. (Distributed by Mr. Albert Ruth.)

2 specimens of peat from the Everglades and Miami River, Florida. (Given by Mr. C. F. Sulzner.)

1 root of *Ficus aurea* from an open well near Miami, Florida. (Given by Mrs. Russell H. Nevins.)

2 museum specimens from Cuba. (Collected by Mr. Percy Wilson.)

114 specimens of flowering plants from Tobago, West Indies. (Distributed by Mr. W. E. Broadway.)

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