A CRUISE TO THE CAPE SABLE REGION OF FLORIDA

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The "Barbee" at anchor in Card Sound, between Pumpkin Key (left) and Key Largo (right). Pumpkin Key is nearly circular in outline and differs from other keys inside the main line north of the Bay of Florida in being of well-elevated coral rock clothed with fine hammock. The other keys are mud-flats or sand-bars clothed with mangrove. Key Largo is the largest Florida Key.

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(WITH PLATES CLXXXIII–CLXXXVIII)

The early morning of March 28 found the writer on board the "Barbee" as she lay off Buena Vista in Bay Biscayne. All supplies were aboard and everything was ready for a cruise of exploration through the Cape Sable region of Florida.

The objects of the expedition were four, namely, studies in the distribution of tree-snails, studies in the distribution of plants, the securing of a cargo of living palms and orchids, and photography. The party comprised Messrs. C. T. Simpson, John Soar, Victor Soar, Captain Paul Matthaus, and the writer.

The "Barbee" is a motor boat of light draught, about thirty-two feet long, and twelve feet abeam. She is especially suited to navigating, for scientific investigations, in the waters that surround peninsular Florida and the Florida Keys. The "Barbee" was generously furnished for the cruise by Mr. Charles Deering, whose deep interest in the expedition was the foundation of its success.

Simultaneous with our departure was the advent of a "norther." The strong north wind stirred up a rough sea, and consequently a large part of the first day at sea was spent in keeping our food supply and collecting-outfit out of reach of the water which came in over the decks as we proceeded southward. The end of the first day found us in the shelter of Jewfish Creek, which is about midway between the northern and southern ends

of Key Largo. The strength of the "norther" continued, but during the second day we made our way southward through Blackwater Sound and Tarpon Basin and then entered the Bay of Florida. There we anchored between Lignum Vitae Key and Lower Matecumbe Key and in this shelter awaited the falling or the shifting of the wind.

During this delay we made collections on Lignum Vitae Key, where we discovered a prickly-pear new, apparently, to science, on Lower Matecumbe Key where we found a large cactus very closely related to the endemic *Cephalocereus* of Key West, and on Upper Matecumbe Key which yielded a shrubby marsh-fleabane heretofore known in the United States only from Key West.

When the wind abated slightly we decided to try to reach Long Key and Vaca Key, instead of going directly to Cape Sable. However, as soon as we had gotten behind the banks that extend northward from near Lower Matecumbe Key we found smoother water, and headed the "Barbee" in the direction of Cape Sable. Soon after land had disappeared to the southward, Sandy Key came above the horizon to the northward. When opposite Sandy Key the wind shifted to the northwest and we soon found ourselves in very rough water. This condition continued until we turned eastward just south of Cape Sable and headed in the direction of the settlement of Flamingo situated on the southern shore of the Florida peninsula about eight miles east of the cape. Flamingo is the southernmost settlement on the mainland of the United States.

Having anchored off the settlement we devoted the late afternoon to collecting in the hammocks and on the prairies in the vicinity, and in the evening arranged for the coöperation of Mr. John Douthitt with his small motor boat to help us penetrate into the interior of the southern end of the Florida peninsula. At daybreak next morning we weighed anchor and proceeded eastward to the limit of deep water where we cast anchor behind Joe Kemp's Key. There we transferred a supply of food and water to our fleet of three small boats, two of them with gasoline engines, and started for a point of uncertain geographical position known as Cuthbert Lake.

Small colony of saw-cabbage palm in hammock along Cuthbert Lake. Colonies of this palm are often composed of scores or hundreds of stems so closely set as to be impenetrable. The new stems are short and leafy throughout; the older stems are tall and very slender, and bear erect or ascending flower-stalks which project above the crown of leaves at the top, as may be seen in the above print.

After sailing eastward a short distance the water became very shallow, and as the tide went out our boats merely slid over soft mud covered with only a few inches of water. Having passed Shark Point* we entered a narrow bay and near its head one after another of our boats disappeared in the mangroves through a very narrow almost entirely concealed creek. There we were introduced into a strange world. Not only were there epiphytic orchids and bromeliads, but large cactus plants as well grew everywhere on the trunks of both dead and living trees. Although there was little showy terrestrial vegetation, many of the air-plants were conspicuously beautiful. The butterfly-orchid (*Cyrtopodium punctatum*) was in full bloom. Most interesting was the large cactus (*Harrisia eriophora*), with its erect, reclining, or climbing, hawser-like stems and branches, and large white flowers.

Once within the mangroves our course, for a distance of about six miles, lay through seven creeks and seven lakes. These are completely hidden one from another, and each is concealed from the traveler until he is actually upon them. The creeks are natural channels of deep water; their courses are tortuous and progress along them is much impeded by snags, beneath, on either side, and overhead.

For a great part of the distance we had either to lie down in the boats in order to save our heads or to get out and pull the boats over snags. The lakes are beautiful, shallow, irregular bodies of crystal-clear salt-water. Their soft mud bottoms are almost completely covered with the most matted masses of seaweeds I have ever seen. This "Brussels-carpet"-like growth of seaweeds comes to within about six inches of the surface of the water, and is so dense as to support a man walking.

Finally Cuthbert Lake was reached. This is a fine body of water completely surrounded by banks of beautiful green mangroves. There is some comparatively high land about the lake and there in the dense hammock we came upon the object of our incursion, namely the saw-cabbage palm (*Paurotis Wrightii*), the least known and most distinctive of the palms of the eastern

* Not to be confused with Shark Point of the western coast.

United States. This palm grows in small and large clumps or colonies. Sometimes between one hundred and two hundred stems stand closely together. The older stems, resembling stout fishing-poles, reach a height of over thirty feet, and around each clump of these, starting as suckers from their bases, arise new and shorter stems. After securing as many palms and orchids as we could carry in our small boats through the creeks and lakes we started on the way back to the "Barbee." Darkness fell just as we emerged from the mangroves into the Bay of Florida and before we were half way to our destination. After proceeding a short distance both of our engines began to show signs of breaking down. Consequently we tied the three boats together so that we would not lose each other in the darkness and so that we could at least be sociable in case we should have to spend the night on the open sea in our leaky boats. The salt-spray on the exposed iron-work short-circuited the spark of the engines. Sometimes neither engine would work, sometimes one or the other would work for a while. We made haste slowly, however, and after considerable speculation and search we located a boat at anchor before midnight. Urged to quick action by the chillness occasioned by the hours of the cold ride in wet clothes, every one boarded the craft, only to find that we had taken possession of the wrong boat! On discovering our mistake we disembarked with unanimous spontaneity. The occupants of the boat were perhaps as much surprised as we were, for no resistance was offered and no attempt at arrest for our apparent act of piracy was made. We could not escape as fast as we desired, for both of our engines now positively refused to work. However, we continued our search by rowing and poling, and in less than an hour we located another boat lying at anchor, and after making sure she was the "Barbee" we boarded her without further delay. Thus ended one of our most strenuous and exciting days.

Next morning at sunrise we went ashore, and with a horse and wagon in which to carry orchids, we set out for Coot Bay which lies in the wilderness about four miles northeast of Flamingo. This region is as different from that of Cuthbert Lake as any one could imagine; and the day turned out to be the greatest orchid-

Returning to Flamingo after a day's orchid hunt in the hammocks about Coot Bay, Cape Sable region. Prairie in foreground. Hammock in background. The two wagons are filled with living plants of epiphytic orchids. A small plant of the saw-cabbage palm may be seen in the rear wagon. It was found near Coot Bay.

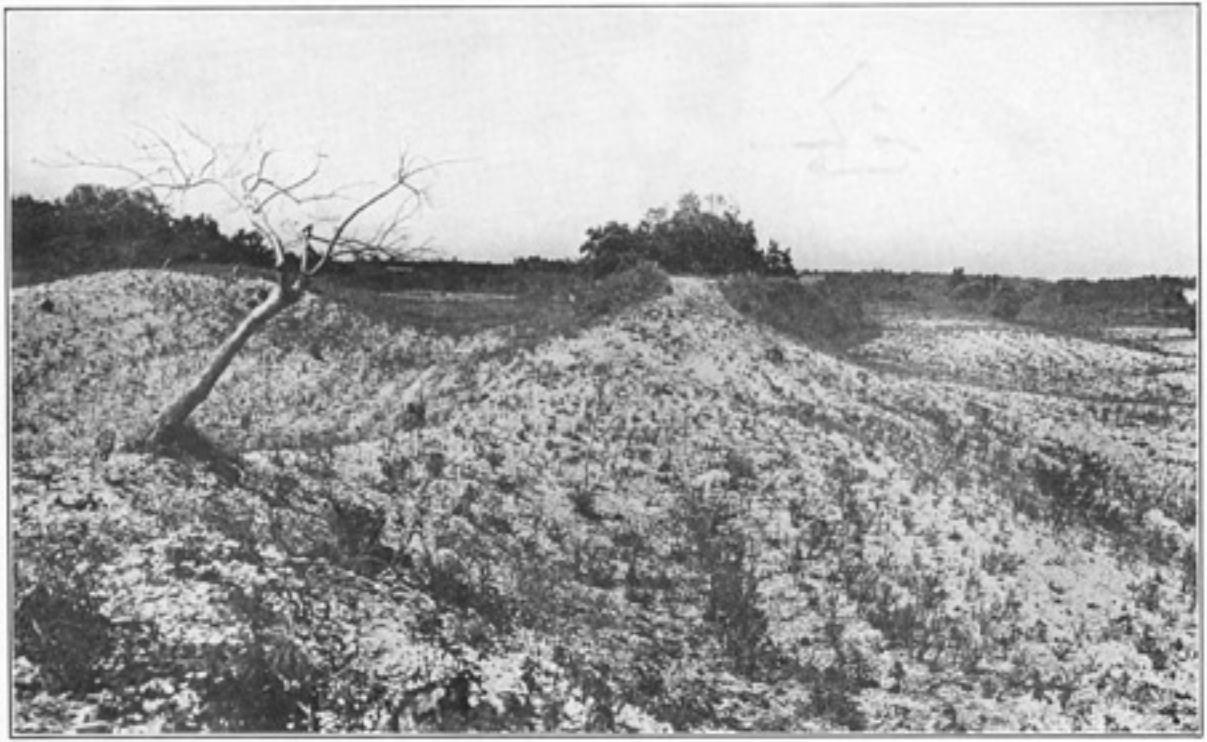
hunt in which any of us have ever participated. After passing through stretches of beautiful prairie and strips of hammocks we entered Snake Hammock which lies just south of Coot Bay. Unless some richer orchid locality is to be discovered in Florida, and this is possible, this hammock is the most marvelous natural orchid garden in the United States. All but one or two species of our epiphytic orchids grow there. They were not only there but grew in greater profusion and to greater size than I have ever seen them elsewhere. The most conspicuous orchid on account of size and flowers was *Oncidium undulatum*, which grew singly or in great masses; its leaves were 2–3 feet long and often over 8 inches wide. One plant of the butterfly-orchid (*Cyrtopodium punctatum*) was found with thirty-one flower stalks, each about four feet long and bearing scores of blossoms. Among other peculiarities in this hammock the poison-wood, *Metopium toxiferum*, is replaced by another poisonous tree of another family, namely the manchineel, *Hippomane Mancinella*. Numerous other species of botanical interest could be mentioned, but lack of space forbids. Before we reached Coot Bay we had gathered two wagon loads of living orchids. As we were about to send our wagon back to Flamingo and then have it return for a second load, a party of hunters appeared in the trail with a wagon-load of supplies for their boat brought into Coot Bay from the west coast. They kindly turned the horse and wagon over to us, and we proceeded back with two wagons filled with orchids. On the way back we temporarily deviated from the trail and penetrated the hammock to the westward towards Mud Lake. The further we went the more wonderful the hammock became and many interesting plants were gathered. It was late in the afternoon when we started westward and lack of time prevented us from pressing on further. Thus forced to return we reached Flamingo after sundown and stowed our orchids in a shed.

Early the following morning we made a start for our course up the western coast. The day was devoted to exploration on Cape Sable. The cape consists of three blunt projections: namely East Cape, Middle Cape, and Northwest Cape. These

points are about five miles distant from each other and are distinctive. East Cape, which projects southward, is the most southern spot on the mainland of the United States, reaching almost to latitude 25° north. Here the sand-dunes are narrow, and back of these are considerable areas of hammock. The hammocks have grown up on old sand-dunes and the low hills have never been leveled. On the higher portions of the hills large trees occur, while in the depressions are numerous shrubs, and thickets of vicious cactus plants far more difficult to penetrate than barbed-wire fences and entanglements. The sand-dunes proper at East Cape are narrow and have a line of cocoanut trees along their edge near the beach. It may be interesting to note here that there is a five-foot, or six-foot tide about Cape Sable and northward on the western coast, while there is only about half as much on the opposite side of the peninsula. The tide, too, runs around the cape like a mill-race. When we cast anchor at East Cape, the "Barbee," under the influence of the tide, stood with the stern against a gale so strong that we were puzzled before learning the reason. The rushing of the tide past the cape doubtless accounts for the deep water close to the shore.

At Middle Cape, which projects southwestward, there are wide sand-dunes behind a fringe of cocoanut trees and the hammock is quite remote from the beach. There we were successful in finding Garber's-spurge (*Chamaesyce Garberi*) which was discovered there nearly half a century ago and apparently never collected there since. Another interesting find was the tuber-bearing prickly-pear (*Opuntia austrina*) discovered at Miami some years ago.

The Northwest Cape projects westward. It has a rather steeply sloping beach and wide prairie-like sand-dunes behind the treeless beach line, and then a narrow strip of hammock before the swamps are reached. On the sand-dunes occur grasses and sedges and considerable saw-palmetto, and cabbage-palmetto, while in the hammock thatch-palms are exceedingly abundant. There is good evidence that the silver-palm (*Coccothrinax argentea*) once grew at this cape; but recent hurricanes have washed away large areas where it probably occurred. How-



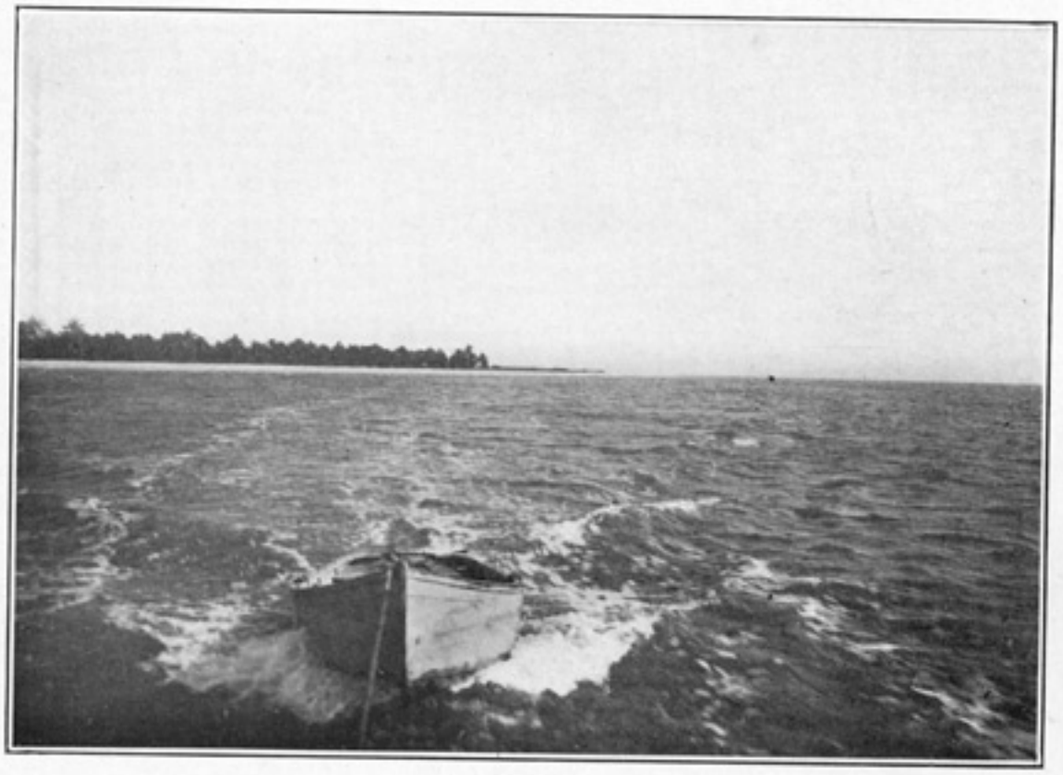
On Chokoloskee Island. White surface of island is composed of weathered oyster-shells, clam-shells, and conch-shells. Gumbo-limbo tree, devoid of leaves on account of drought, in foreground. Hills, each twenty-eight feet in altitude, in background. Groves crowning hill-tops are of Avocado-trees.

ever, further exploration may yet bring it to light. One of the numerous interesting features of the Cape Sable region is the mingling of the flora of the Everglade Keys and that of the Lower Florida Keys. The cape is on a direct line between Miami and Key West. There is good evidence that there was once a land connection from the Miami River region, which represents the northern end of the Everglade Keys, southwestward to Key West. Towards the upper part of this cape we found a beautiful black-mangrove swamp back of the hammock. This swamp resembles the one we found later back of Saw-fish hole, and it may be that the two points are extremities of a continuous line of swamps. Just above Cape Sable the red-mangrove swamp comes to the water's edge and at the mouth of Shark River about ten miles northward the Ten Thousand Islands begin and extend as far as Cape Romano, a distance of about fifty miles. It seems to be the unanimous opinion of all who have been among these islands that instead of bearing the name they have, it should be the "Ten Million Islands."

As the sun was setting we started up the western coast, and as darkness fell we anchored back of Shark Point for the night. During the night the wind shifted to the northwest and the temperature fell. The forenoon of the next day was cloudy and misty as well. After a rough passage of over twenty miles northward, we located Chokoloskee Pass and found our way into Chokoloskee Bay about noon. We were fortunate in reaching this point at high-tide. In fact, we were fortunate in finding the pass at all without the help of a pilot. The entrance to the pass is very obscure, and the winding narrow channel leading from the ocean to Chokoloskee Bay is quite shallow and obstructed with oyster bars. However, we sailed directly into the bay and surprised the natives, some of whom came aboard and kindly directed us to a safe anchorage. We at once went ashore to investigate Chokoloskee Island. The island is a kitchen-midden. It is nearly circular, comprises a hundred and five acres, and has several elevations reaching twenty-seven feet and one altitude of thirty-one feet. It consists, from about the

water-level to its maximum altitude, of shells, mainly oyster-shells, clam-shells, and conch-shells. Most of the hammock that once clothed and adorned the island has been partially or wholly cut off. What hammock there is, is rather stunted, partly on account of the lack of finely disintegrated soil and partly due to its exposed and wind-swept situation. The island, both in the condition of the natural vegetation and in the settlement consisting of about one hundred people, is unique. We were surprised to find a number of tropical plants there. The island and Cape Romano, a few miles further north, represent the limit of most of the tropical vegetation on the western side of the Florida peninsula. One West Indian plant, a relative of our poke-weed, is known to occur in our flora only on Chokoloskee Island.

On the following day the region about the headwaters of the Chokoloskee River was our objective. After crossing the bay our first stop was Turner Island, which is another kitchen-midden situated at the mouth of the Chokoloskee River. Here among other interesting plants we found one of our rarer lip-ferns, *Cheilanthes microphylla*, growing in the heaps of oyster-shells. As we ascended the river, stops were made at several small kitchen-middens on the banks. The most conspicuous plant in bloom at that season was a kind of ragwort, or *Senecio*, with very bright-yellow flower-heads. It occurred in great masses at many points on both sides of the river. The smallest kitchen-midden, and that nearest the head of the river, is known to the inhabitants of Chokoloskee and to hunters as Mt. Pleasant. It is a few inches above high-water and about large enough for pitching a small tent. The river flows through prairie, hammock, and mangrove-swamps. Near its source the channel narrows down to a stream only a few feet wide and is almost hidden by the tall cat-tails. The source is a basin-like pond, at low water only about two rods wide. Here we left our boats and made our way by an Indian trail across the prairie to the Tommy "Cypress," an area so called from an Indian named Tommy who once lived in the region. The "cypress" consists of areas of pine, palmetto, cypress, and of hammock. We passed through



Rounding Cape Sable. View from the stern of the "Barbee," while under way, looking southward. East Cape, the most southern point of the mainland of the United States, in the distance.

Source of the Chokoloskee River, with Seminole Indian canoe in foreground. Prairie, covered with saw-grass and cat-tail, in background.

one after another interesting phytogeographic area until we entered a very large and dense hammock, where we were surprised to encounter many of the shrubs and trees common in the more northern portion of the Florida peninsula. We were then in a floral region wholly different from that we had left in the morning. At this point our party separated into two; the one followed the length of the hammock in one direction and the other went through prairie, pineland, and deep cypress-swamps in the other direction and finally encountered an Indian camp in the pine-forest. After several hours of interesting and profitable exploration and collecting, both parties met near the source of the Chokoloskee River where we had left our boats.

Upon returning to the "Barbee" we weighed anchor and went several miles northward in order to investigate the kitchen-middens at Sand-fly Pass. The place is evidently well-named, for the sand-flies soon found us. At sunset we returned to Chokoloskee Island and prepared for our homeward journey.

The following morning, on a low tide, we decided to go to sea. After proceeding for a mile through the channel we ran on an oyster-bar. After several attempts to find a way through and around this bar we decided to defer our departure until high tide. When the tide came in we made our way to the Gulf of Mexico where we were greeted with a strong westerly gale and a sea so rough that we were compelled to eat our dinner off the floor of the boat instead of off the table.

Our next harbor was Lossman's Key, which is about half way between Cape Sable and Chokoloskee Pass. We made a landing on the island and searched for a reported hammock with royal-palms, but were unsuccessful in our quest. Returning to the "Barbee" we tried to locate the channel leading into Rodgers River. This river rises in the Everglades and flows through the Ten Thousand Islands into the gulf at the southern end of Lossman's Key. Darkness overtook us before we found the channel, so we anchored off shore for the night. The following morning before sunrise we started in one of our small boats for Rodgers River. This river is one of the outlets for the waters that flow from the Everglades and surround the Ten Thousand

Islands. Once above the mouth of this, as of similar rivers, one finds a confusing maze of channels winding among myriads of mangrove-clad islands, altogether a labyrinth of the first order. We ascended the river to a point where, instead of mangrove, the higher land supports hammock. There stately royal-palms rise to heights of over one hundred feet, conspicuously overtopping all other vegetation. The channels there are filled with myriads of oyster-bars which furnish an inexhaustable supply of oysters.

About noon we returned to the "Barbee" and started for Flamingo. After rounding the cape we were soon at our destination. There we delayed just long enough to readjust our cargo and load the large collection of orchids we had stored at Flamingo the previous week. When the cargo was made secure from damage by sun or salt-spray, we headed for Cape Sable again and before sunset cast anchor for the night in Saw-fish Hole about three miles east of the cape. An hour was devoted to collecting on shore in the black-mangrove hammock, where more orchids and other interesting plants were found. The following forenoon we started across the Bay of Florida, heading in the direction of Vaca Key. A short stop was made at Sandy Key for collecting. This key, an isolated sand-bar about seven miles south of Cape Sable, supports considerable hammock. Among the interesting plants we found quantities of our rarest dew-flower, the tropical *Commelina elegans*. Vaca Key we reached in due time. The next island on our course was Bamboo Key,* and, when darkness found us, we were in a small bay behind Lower Matecumbe Key, from a point near which ten days previously we had left the keys for Cape Sable. The following morning we landed on Lower Matecumbe Key and secured quantities of the rare cactus we had located there during the earlier part of our cruise. This plant, a species of *Cephalocereus*, with garlic-scented flowers, is nearly or quite similar to the one heretofore definitely known only from Key West. It was observed but not collected in a hammock on Lower Mate-

* This island was visited by the writer on a cruise earlier in the year, and its vegetation will be described in a subsequent report.

Carrying out plants of the saw-cabbage palm from Madeira Hammock. Many colonies of this palm inhabit the northern shore of Madeira Bay. Colony of palm with close-set stems in foreground on right. Dense jungle of hammock with various vines in background on left. Personae, left to right: Charles T. Simpson, conchologist; John Soar, horticulturist; Paul Matthaus, Captain of the "Barbee."

cumbe Key several years ago by a member of our party, Mr. John Soar. Having devoted as much time as could be spared to this locality we moved on to Umbrella Key (Windlys Island) and Long Island. The former island is higher than the other keys, and most of it in the form of rock has gone to build the larger part of the Key West Extension of the Florida East Coast Railway. The main object of our visit to this island was to search for one of our rarest trees, the white-ironwood, *Hypelate trifoliata*. We were successful in finding a few trees in the small remnants of the once beautiful hammock. Some of these trees had a maximum trunk-diameter of fully two feet. Proceeding northward we reached Jewfish Creek about sundown and spent the night there. The next morning we started for Miami and Buena Vista, reaching our destinations without incident except for the breaking away of one of our small boats in a high sea in Barnes Sound and the consequent excitement of capturing it. For a long time this small boat defeated, with almost human intelligence, our attempts to lay hands on it.

After a period of five days, during which our living and dried specimens were cared for, a cruise to Madeira Bay was proposed and undertaken. This, as had been the cruise just completed, was partly for the purpose of finding the saw-cabbage palm (*Paurotis Wrightii*). An early start on Saturday, April 15, and a continuous run, without a stop of the engine, brought us to the mouth of Madeira Bay at the southern end of the Florida Peninsula about an hour before sunset. This hour was devoted to exploring a hammock island near the mouth of the bay. There, as in all the neighboring hammocks, the mahogany or Madeira-redwood (*Swietenia Mahagoni*) is exceedingly common. At sunrise the following morning we started in two row boats for the western end of the bay about two miles distant. It was not long before we located the palm we sought, and found it growing in great clumps, its fishpole-like stems commonly over thirty feet in height. The day we spent digging palms and exploring the Madeira hammock. Much of interest was encountered. It is a pleasure to report the rediscovery of our rarest, and a showy, passion-flower (*Passiflora pallens*). It grew

in great quantities. This plant was once found in the now extinct Caldwell Hammock on the Everglade Keys. While in the Madeira hammock, as nearly as we can calculate, we were not over three or four miles distant from one point near Cuthbert Lake we had reached several weeks previously. Having secured and gotten aboard as many palms as could be carried across the bay in our small boats, we returned to the "Barbee" with some difficulty against a strong east wind which had freshened during our absence.

When, during the afternoon of the previous day, we were approaching Madeira Bay we had noticed that the hammock was on fire; indeed the following morning we had actually crossed smoldering areas. The rising east wind was now fanning into flame the smoldering embers, and, as we departed homeward across the Bay of Florida, we saw miles of hammock rolling clouds of black smoke skyward. This calamity was not confined to the neighborhood of Madeira Bay, but in the Cape Sable region three or four vast forest fires were to be observed, and we could see clouds of smoke drifting for many miles over the Gulf of Mexico and the Bay of Florida. Forest fires, perhaps, were more frequent in southern Florida this year than usual, as, beginning with the end of last year, there had been a prolonged drought. Little or no rain had fallen and the hammock both on the keys and on the mainland presented an unusual appearance. Shrubs and trees, that during normal seasons are never devoid of leaves were completely bare; others had dropped a large proportion of their leaves, and of those still clinging nearly all instead of standing in their normal positions, were wilted and drooping. The floor of a hammock in tropical Florida is usually quite clean, as normally the trees drop their leaves gradually, and only after new leaves have developed. Last April was the first time I ever saw those tropical hammocks so much resemble our northern woods in early winter, when fallen leaves lie a half foot deep on the ground.

The following itinerary will show our movements during the cruise:*

*Localities printed in small capitals indicate points where collections of plants were made.

March 28. Miami to Jewfish Creek.

March 29. Jewfish Creek to Lignum Vitae Key, to Upper Matecumbe Key, to Lower Matecumbe Key.

March 30. Lower Matecumbe Key to Flamingo.

March 31. Flamingo to Cuthbert Lake, and return.

April 1. Flamingo to Coot Bay, and return.

April 2. Flamingo to Cape Sable, East Cape, to Middle Cape, to Northwest Cape, to Shark Point.

April 3. Shark Point to Chokoloskee Island.

April 4. Chokoloskee Island to Turner Island, up to head of Chokoloskee River, to Tommy Cypress, Pineland, Prairie, Hammock, to Sandfly Pass, to Chokoloskee Island.

April 5. Chokoloskee Island to Lossman's Key.

April 6. Lossman's Key to Rodgers River, to Flamingo.

April 7. Flamingo to Cape Sable to Sandy Key, to Vaca Key, to Bamboo Key, to Lower Matecumbe Key.

April 8. Lower Matecumbe Key to Umbrella Key, to Long Island, to Jewfish Creek.

April 9. Jewfish Creek to Pumpkin Key, to Sands Key, to Miami.

Supplementary Cruise

April 15–17. Madeira Bay and Madeira Hammock, southern end of peninsular Florida.

The purposes of the expedition were satisfactorily accomplished. Notwithstanding the prolonged drought which seriously affected vegetation, we secured large collections of living plants and of herbarium specimens. A number of West Indian plants were found for the first time in Florida, and the geographical ranges of some of our rarer native plants were more thoroughly worked out.

Our hurried examination of Cape Sable showed it to be a region where the flora of the Everglade Keys and the flora of the Lower Florida Keys, to some extent, mingle, and also to be a locality for some West Indian plants not yet known to grow on either of those areas.

The geographical position of Cape Sable in itself clearly indicates

the necessity of thorough exploration in connection with our studies on the flora of southern Florida and its relation to the flora of the West Indies.

JOHN K. SMALL.