Busman's Holiday on a Tropical Island -- Barro Colorado

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As we came down the jungle trail to the clearing in the late afternoon a band of howling monkeys was feeding in the top of the huge *cuipo* tree growing at the edge of the clearing near the boat landing. We had come to Barro Colorado Island in the Panama Canal Zone that March morning for a week's stay and almost the first sound that greeted us was the astonishing howls of these great monkeys perhaps a quarter of a mile away. Now all were quiet as they browsed on the leaf buds swelling on the bare limbs nearly opposite our vantage point of the dining hall porch and hardly more than a hundred feet from us. It was unbelievable that these shaggy black animals, appearing almost as big as humans, could move about so freely on slender branches that sagged perilously but never broke beneath their weight.

Here a mother, with newborn baby clinging to her, hung head down by her tail while snatching buds with either hand, taking a bite and letting the rest fall. Other mothers had older babies, one large enough to make sallies of his own but holding to his mother when she changed branches. The old males, largest of the band, looked particularly fearsome but we watched them all with fascination until the light began to fade and they moved into the forest for the night.

The island we were on was once a tremendous hill in the lower Chagres Valley but, with the building of the Panama Canal and the damming of the Chagres River, the rising waters of Gatun Lake, which was thus formed, surrounded and isolated it from the mainland. Sometime after this happened it was given the name of Barro Colorado in reference to the red clay soil composing most of it.

When the need arose for an easily controlled and accessible wildlife research area in the American tropics, the efforts of many scientists, particularly Dr. Thomas Barbour and Mr. James Zetek, resulted in having the Governor of the Canal Zone designate Barro Colorado Island a wildlife preserve in 1923. Since then it has been maintained as a biological study area in as nearly a natural state as possible, and from 1946 has been administered by the Smithsonian Institution through which scientists obtain permission to use the island and its facilities for their investigations in natural history subjects. Probably there is no area of like size or larger in tropical America wherein the various phases of the endemic plants and animals are so well known and have so many publications devoted to them.

The island can be reached by railroad and launch from either side of the isthmus in about 90 minutes. It is very irregularly circular in outline; rises sharply from the shore to the highest point near the center, about 430 feet above the lake; is approximately three miles across and contains nearly 4,000 acres covered by jungle of which the second growth is old enough that it cannot readily be distinguished from the virgin forest.

Beneath the jungle canopy, often a hundred and fifty feet or more above one's head, run some 25 miles of well-marked trails by which nearly every part of the island, including over a dozen

points on the shore, may be reached. The names of the trails read like a roster of naturalists and indicate a few of the famous people who have tramped along them. Commemorated in this fashion are Allison V. Armour, Thomas Barbour, Frank M. Chapman, David Fairchild, Barbour Lathrop, Raymond Shannon, Paul Standley, William Morton Wheeler, James Zetek, and a number of others.

The only permanent habitations on the island are those of the Resident Naturalist and the staff of laborers who act as guides, boatmen and woodsmen in addition to maintaining the grounds, laboratories and quarters. A dormitory-dining hall and several small cabins provide living facilities for visiting workers while a well equipped laboratory and library also are available. The buildings are concentrated in a small clearing on the northeast shore overlooking the canal; the principal ones being on the shoulder of a ridge more than a hundred feet above the lake and reached by stairs beginning at the boat landing.

Our own cabin, a few steps below the dining hall, was in itself a tropical experiment as its woodwork and compressed wallboards had been impregnated with a chemical mixture to repel termites, the worst enemies of wooden buildings and furniture in the tropics. A note on the door named the compound and warned against removing or replacing any part of the building or otherwise interfering with the test without special permission.

As our bags were brought into the cabin, a family of bats under the eaves, and clinging to the screen ventilator at the top of the wall, was disturbed and fluttered further down the roof with much squeaking. They never became accustomed to our presence but still could not bring themselves to give up this cool dry shelter for the undersides of palm leaves in the forest where their wilder relatives lived.

Because the writer has been interested for many years in both millipeds, commonly known as "thousand-legged worms", and palms, our visit to Barro Colorado had a two-fold purpose in addition to celebrating his retirement from years of plant work with the Federal Government. First was the hope of collecting more specimens of a tiny pill-like milliped of which a single female, thought to represent an undescribed species, genus and family, was found there in 1923. Our second objective was to gather fresh seeds of its palms for planting in Florida as only a few of them had been introduced there.

For an entire week almost every waking moment was spent on or near the trails searching for palms or millipeds or sitting silently absorbing the sights and sounds of the unspoiled jungle. Among our first impressions were the height of the trees about us, their diversity and the varied plant life they supported on roots, trunks and branches. While many of the smaller plants were unknown, a surprising number were familiar as the house and patio decorations of the north, but with what a difference! Here in their natural home grew bromeliads, monsteras, anthuriums, philodendrons and other aroids of a lushness and size not equalled in cultivation. Another of the interesting and attractive plants frequently seen almost appressed to the ground had its iris-like leaves spread in a single plane, the whole plant resembling a fan palm leaf, probably accounting for its common name of *palmita.* A second name given us, and one we liked was *mano de Dios* — God's hand. Botanically the plant is called *Xiphidium caeruleum.*

The vines, usually referred to as lianas, hanging leafless or nearly so from great heights were a novel sight,

especially one belonging to the genus *Bauhinia* that was broad and flat, curiously bent and twisted and perforated with holes of different sizes. Except for these holes it reminded one of the ribbon candies we found in our Christmas stockings as children.

Everywhere we looked were literally scores of plant species. A botanist would have little trouble in counting over a hundred kinds within a radius of a few rods if he could see and include the epiphytes on the trees above him. Most of these air plants are invisible in the crown of leaves of the forest giants but fallen branches bring down a sampling of these upperstory treasures and make one envious of the birds and monkeys that pass so freely among them.

And the palms! Members of this family seemed more numerous than of any other single family and several kinds usually were to be seen by looking in any direction, beginning as tiny seedlings and progressing through various ages and sizes to the imposing *Scheelea zonensis*, with clean two-foot-thick shafts rising thirty or more feet to the beginning of the leaf crown which adds at least as much again to the height of the palm. From the crowns of these palms, which also gave footholds to ferns, vines and other small plants, hung great clusters of tightly packed egg-shaped fruits; those of the ripe clusters being dull orange in color. Not only is this the largest palm of Barro Colorado but also in Panama. It was described by L. H. Bailey in *Gentes Herbarum* 3:32-116, 1933, wherein were listed 16 other palms native on the island, the number not having been increased in the last 25 years.

The most striking of the island palms, however, is *Socratea durissima*, the stilt palm, of which mature specimens rear their heads 70 or 80 feet in the air at the tops of smooth, relatively slender trunks beginning eight or ten feet above the ground from supporting cones of rigidly straight spiny roots. This palm is scattered throughout the woods, seemingly not favoring damp locations, although the curious root system has been thought an adaptation to allow growth in such places. The numerous broad pinnae with irregular tips project from the rachis at several angles and are a rich dark green. The finest individual of this palm we saw was on the Shannon Trail where also was found the largest *Geonoma decurrens*, the beautiful little deep shade species seldom exceeding six feet in height with all leaf pinnae completely united to form a continuous blade nearly a foot wide and several times as long, deeply cleft at tip and gracefully arching.

The morning spent on this trail was otherwise noteworthy. It showed that our choice of palms and millipeds for collection was a happy one, as Mrs. Loomis discovered, in a decaying palm inflorescence on the ground, the only two specimens of the much desired pill millipeds we found on our visit. Shortly after this find we spotted a band of white-collared peccaries, or wild hogs, rooting along the opposite side of a ravine. We watched them until they moved out of sight while several of the marvelously iridescent blue morpho butterflies tittuped along in apparently aimless flight below us. As we came back up the trail the treetops were alive with white-faced monkeys objecting to our presence by shaking the branches and breaking others to drop on us, but for sanitary reasons we were too smart to get directly beneath them. When they finally swung off we continued on our way.

Another handsome palm we saw frequently, and generally growing in clumps of a dozen or more smooth slender ringed trunks, was *Oenocarpus*

Fig. 61. Typical root system of large stilt palm (*Socratea durissima*). Even small seedlings of this palm have the trunk supported above the ground on a similarly formed cone of roots.

Fig. 62. An unusually large plant of *Geonoma decurrens* with young stilt palm (*Socratea durissima*) behind it.

panamanus, the largest specimens reaching a height of 70 feet. The inflorescences, resembling the modern pony-tail hair-do, are cream-colored at first but turn to burnt orange as they grow older and when mature bear nearly globular black fruits larger than marbles. The freshly expanded new leaves of the young plants in the understory have a beautiful autumn coloring of light reddish brown which presents a striking note in an otherwise green world.

Conspicuous throughout the woods was the viciously spiny *Astrocaryum Standleyanum* rising straight and tall on a six-inch-thick trunk ringed by broad naked leaf scars but with the intervals between them closely beset with deflexed double-edged spines to eight inches long. The leaves, petioles and flower spathes also are protected by closely placed spines but still we thought the palm a thing of beauty, especially when the densely clustered fruits on the long drooping inflorescences had turned from green to bright orange at maturity.

Walking along any of the trails we were constantly halting to look at smal-

Fig. 63. *Geonoma procumbens.* A spicate inflorescence reaches the top of the picture just left of center.

Fig. 64. *Synechanthus Warscewiczianus.* Extremely variable in leaf character as shown by palm the writer touches and another far left which have groups of united pinnae in contrast to that immediately behind the writer and another at right.

ler palms such as the quite similar *Chamaedorea Wendlandiana* and *Synechanthus Warscewiczianus* that were easily distinguished when old or new inflorescences could be found. Seldom were we where one or several of the spiny, cluster-stemmed bactrids could not be seen and we were happy that previous collectors had prepared the specimens from which they had been identified. *Bactris coloniata,* with canelike stems widely separated on underground runners, is said to be the most common palm on the island and although we saw several other species it was the only one we found in fruit.

Largest of the geonomas, *G. binervia,* is not met with too commonly but it is well worth the search to stand beneath the evenly spaced pinnae of its curving fronds fifteen or more feet above one's head. It differs further from the other two species on the island by having a large much branched infloresence hanging below the leaves instead of a simple slender spike projecting upward above them.

Dr. Bailey had reported the American

oil palm, *Corozo oleifera*, as growing along the shore of Barro Colorado but we did not find any on the short walks we took there. Instead, the only specimen seen was in a swampy spot near the highest point of the island and, while the palm had the typical reclining trunk, it bore neither flowers nor fruit. We passed this palm as we followed the Armour Trail to view the largest of the island's trees, a *Bombacopsis Fendleri* estimated to be nearly 200 feet tall with huge buttress roots. A related giant species seen on various trails was *Bombax Barrigon*, lacking buttresses but with a distinct swelling of the trunk a little above the roots, which accounted for the similar specific and common name, meaning big-bellied. The bark of the trunk is quite bright green and surprisingly smooth for so large a tree.

Along some of the trails the tall, single-trunked fan palm, *Cryosophila Warscewiczii*, was met with. It is the only fan-leaved palm of the island or, for that matter, of the Canal Zone and is further noteworthy for having spine-like roots or specialized projections growing abundantly from the trunk, those near the base of the stem being longest and usually with supplementary branches. Ripe fruit the size of marbles are white.

One of the pleasantest times on Barro Colorado comes after a day on the trails when, following an early dinner, everyone gathers on the terrace in front of the dining hall to discuss the day's finds and adventures and, with binoculars and telescope poised, to watch the evening flight of birds, ships of the world passing by in the canal or to gaze into the mysteries of the treetops on the hillsides at either hand. Thus we saw a five-foot-long bright green iguana lying along a limb; a hawk-eagle preening on a dead stub; watched parrots and parakeets in pairs or flocks chopping the air with rapid wing beats while keeping up a constant chatter; and marvelled at the beautiful colors of the toucans hopping about in the upmost branches or in lilting flight when they appeared to be "pushing a banana" as one of our friends said in referring to their oversized bills. Here also, silhouetted against the sky on the ridge to our left, a group of several leafy stems of the climbing palm, a species of *Desmoncus* not yet accurately determined, swayed above the treetops with the backwardly spined prolongations of the leaf rachis ready to fasten upon any branch they touched. We had found few of these palms in our wanderings but their very slender stems could easily be overlooked in the welter of trailside vegetation. Still, two of those we saw had stems that reached further above the jungle floor than the tallest of other palms and their tops were hidden in the crowns of the supporting trees.

A week in such a storehouse of interesting plants and animals speeds all too quickly and before we realized it the morning of our departure was upon us. The family of bats, returned from a night's foraging, squeaked and changed position as our cases, heavier now with our collections, were carried from the cabin and stowed aboard the launch. As we pulled away from the dock, backward looks at the clearing and buildings left us with regrets but happy memories also; and the rapidity with which plants grow in the tropics was manifest when we saw that the *cuipo* tree that had been barren a week before when the howling monkeys feasted in it now was fully decked in a new season's foliage.