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THE CONQUEST OF CERRO SANTA BARBARA HONDURAS

Paul H. Allen

WITH A FINAL spine-jarring lurch and a swirl of late dry season dust our truck topped the last long rise on the highway beyond the turnoff to El Jaral, and we saw before us in the late afternoon light the burnished, silvery sheen of Lake Yojoa. Beyond, a stately company of Liquidambars framed the barren, shadowy bulk of the Sleeping Giant, and to our right towered the far, blue massif of Cerro Santa Bárbara.

This great peak, presumed to be the most elevated montane area in Honduras differs strikingly in its floristic cover from the relatively arid central highlands, which are largely in pine. Magnificent hardwood forests cover Santa Bárbara's extensive flanks, and merge imperceptibly at the lower levels with the deciduous monsoon woodlands of Amapa. In the course of our explorations we had come to regard the mountain, which dominates every conscious moment of the days spent in this enchanted valley, with a mixture of awe and affection. On its often exceedingly rugged limestone ridges are towering stands of oak, liquidambar, María and Spanish cedar which ascend in a triumphant company to and beyond the bleached ramparts which bound the main ridge on its eastern face.

But the highest slopes and summit of Santa Bárbara we had long known to be profoundly different in plant population, since shadowy groves of gigantic conifers are silhouetted against the sky, clearly visible in good weather from the highway.

These, and their associates were our objective, in a plan developed by Dr. V. C. Dunlap, Director of Tropical

Research of the United Fruit Company and Mark Trafton of the same organization, both ardent and informed naturalists deeply interested in the conservation of irreplaceable natural resources in Honduras. Our party consisted of Alphonse Chable, who had made an unbelievable flying ascent of the peak during the previous year, Robert Armour of the Lancetilla Experiment Station and the writer, borrowed for the occasion from the staff of the Compañía Bananera de Costa Rica.

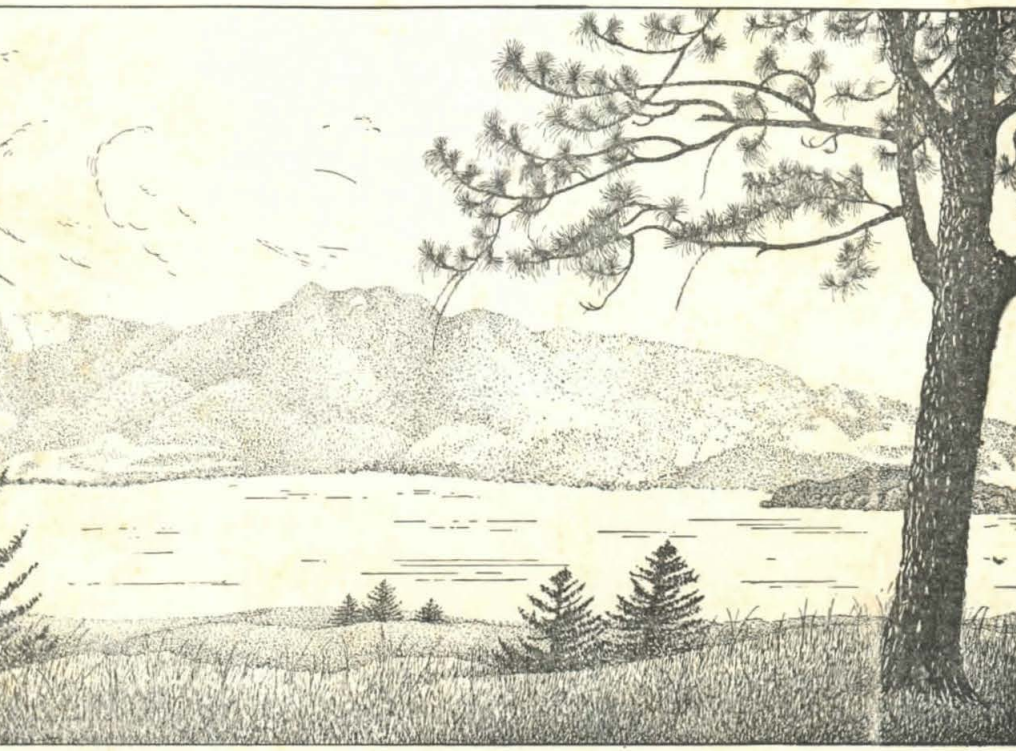
Our previous visits had shown the Lake Yojoa area to be of exceptional interest, since it would seem to be a meeting ground for radically differing floras. It has become amply evident that neither the Río San Juan on the frontier between Costa Rica and Nicaragua, nor the so-called Honduras depression forms enough of a barrier to provide a "Wallace's line" for the separation of the North and South American floras, which meet in this part of north central Honduras in a most bewildering manner. Tracts of broadleaf woodland are to be found in close proximity to stands of pine and oak, and might perhaps be compared to a gigantic projection both in size and relief of the Florida Everglades, with each hill and depression a sort of Gargantuan "Hammock" which may support either a basically North American or South American flora, the margins of which may be separated from one another by only a few yards.

It would appear probable, however, that much of the pine may be secondary, and the result of clearing and burning of the original broadleaf forest, some of the damage probably dating from late colonial or even Maya times. It is quite interesting to note that the broadleaf forest tends to invade and eventually suppress pine wherever fire can be controlled. *Pinus, Pteridium, Conostegia* and *Calea* form a fire-tolerant association, and their presence in an area clearly indicates its past history.

During the course of our investigations possible ways to reach the summit of Santa Bárbara had been discussed in considerable detail, and it had been decided to follow as nearly as possible the route taken by Chable on his first ascent. To facilitate the movement of collecting equipment and other supplies, it was hoped that labor might be found in the area willing to cut a primitive "trocha" to the upper slopes and to establish at least one, and if possible two camp

sites near sources of water. Provisional arrangements had been made with the management of the Mochito mine for the recruiting of such personnel, and it was with high hopes that we set out on the morning of April 4, 1951, after spending a comfortable night at the United Fruit Company Research Camp.

The day was perfect and we had beautiful views of the lake, incomparably blue in the morning light. Most of the area adjoining the highway near the Research Camp has been cut over for lumber and extensive tracts are in scrubby second growth, the roadsides often dominated by thickets of small, bushy trees, characteristic and common



Cerro Santa Bárbara seen from across Lake Yojoa. — Sketch by Dorothy O. Allen.

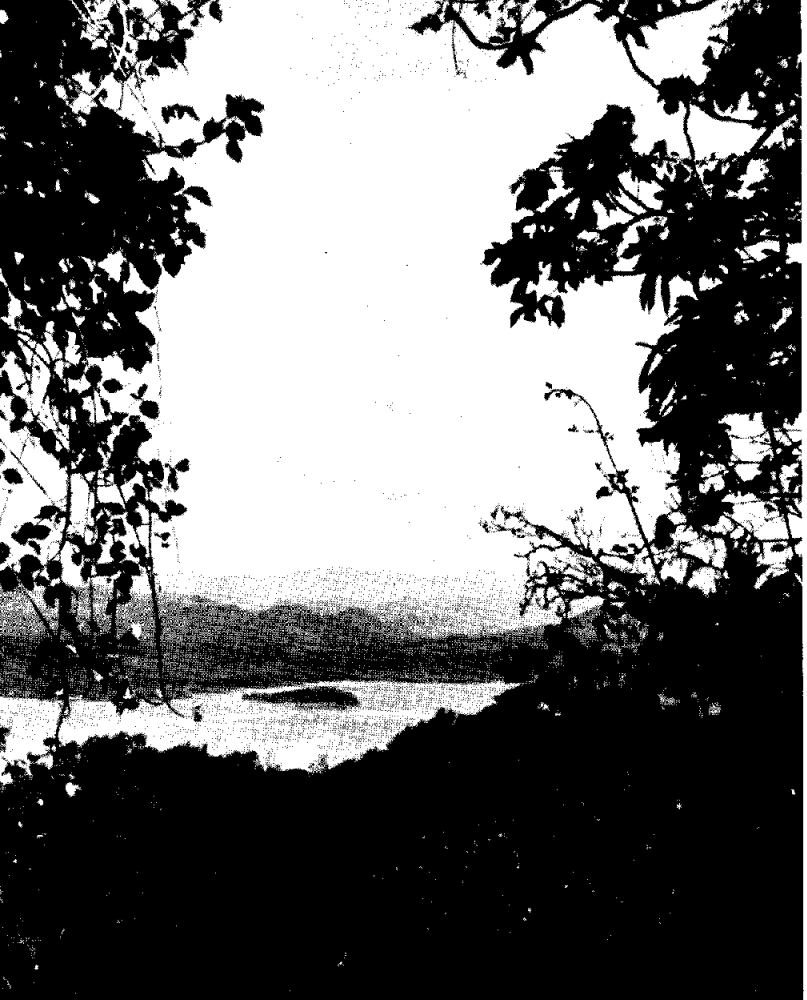
species being *Nectandra Gentlei, Alchornea latifolia* and the famous "Jucucuao", *Mosquitoxylon jamaicense,* whose almost indestructible wood is favored throughout the area for fence posts and dock timbers.

Broad marshes flank the shoreline from Pito Solo to El Sauce, composed mostly of the common tropical cattail, *Typha angustifolia,* but almost universally backed by long lines of old, gnarled, round-topped specimens of the attractive orange-flowered *Erythrina glauca,* each loaded with epiphytic cacti, orchids, bromeliads and other vegetation. There is every evidence that these marshes owe their origin to sheet erosion following the destructive lumbering operations, since both the island near the Research camp and the old docks at Pito Solo were surrounded by deep water within the memory of living persons.

After turning off toward El Sauce, our road continued through hilly, broken country, much of which has been cut over for agriculture and has grown up in brush, with occasional rather sad, shabby cane or slab houses set in tiny clearings. The steepest of the rugged and often precipitous limestone hills have defied the efforts of these migratory farmers, and are still in evergreen or semi-evergreen forest, dominated by species such as *Spondias mombin, Stemmadenia Donnell-Smithii, Laplacea fruticosa, Miconia argentea, Terminalia lucida, Ocotea veraguensis, Guarea longipetiola, Dracaena americana, Schizolobium parahybum* and *Cedrela mexicana,* with occasional giant specimens of *Swietenia macrophylla* in the more inaccesible situations. One bold hill is surmounted by a relic colony of pines, probably *Pinus pseudostrobus,* which are confined to the summit, and tower far above the surrounding hardwoods.

LEGENDS FOR THE PLATES ON THE TWO FOLLOWING PAGES.

1. The Sleeping Giant, seen from the Research Camp on Lake Yojoa.
2. From about five thousand feet on the slopes of Santa Bárbara Lake Yojoa appears as a jewel set in emerald green.
3. Specimen trees of *Abies guatemalensis* on the summit of Cerro Santa Bárbara.



On many steep slopes, in rich contrast to the dark greens of the foliage are strikingly beautiful trees, particularly outstanding being the blood red flowered *Bernoullia flammea,* the orange crowns of the equally handsome *Erblichia xylocarpa,* or the wonderful gold of *Vochysia hondurensis* or *Vochysia aurifera.* Magnificent vistas often opened before us, with nearly pure stands in the far distance of giant liquidambars standing gray and ghostly at this season when they are completely bare of leaves.

Upon our arrival at the mine we discovered that local complications had prevented fulfilment of our plan and we were faced with a motley crew of seven men recruited minutes before our arrival, all apparently without the remotest idea of what was expected of them. After a hasty conference Claudio Moreno, brother of the Comandante at Mochito was appointed foreman and it was decided to continue, since nothing would be gained by retracing our steps. Food, plant presses and other gear were hastily made into approximately equal packs and we set out across dry, abandoned fields, dominated by mixed, tick-infested stands of *Vernonia patens, Conostegia xalapensis* and the blue-flowered *Wigandia caracasana.* In the midst of this dreary expanse, with the high-pitched wail of the cicadas ringing in our ears one of the younger porters decided to inquire where we were taking him and promptly dumped his load in the dusty trail when we pointed to the awesome ridge before us.

After this first and only defection we pressed on, all in apparently better spirits in spite of our newly apportioned loads, reaching the welcome shade of the high, unbroken forest at about 3750 feet. Beyond this point we lost all sight of the peak and were swallowed up in the depths of the arborescent sea.

A lumber road, a rough track with many branches penetrated upward for a distance of several miles through magnificent stands of *Quercus Skinneri, Quercus trichodonta, Liquidambar styraciflua, Laplacea grandis, Calophyllum brasiliense* var. *Rekoi, Guarea longipetiola, Pithecolobium arboreum,* various gigantic species of *Ficus* and *Cedrela mexicana.* Exploitation of the latter species probably explains most of the lumbering activity and the road. Mossy trunks and branches were everywhere, covered with a wealth of orchids and other epiphytes, particularly

abundant being the rare *Chysis laevis,* together with *Brassia verrucosa, Lycaste virginalis, Lycaste lasioglossa,* a sterile *Stanhopea,* and *Trichopilia tortilis,* as well as common but less showy species such as *Maxillaria vagans, M. variabilis, M. uncata, Epidendrum neurosum* and *Epidendrum polyanthum.* Shrubby epiphytic Ericaceae, especially *Macleania insignis* and *Sphyrospermum majus* were frequent, the former with very attractive clusters of red or pink tubular flowers. The bromeliads most in evidence were probably *Tillandsia usneoides* and *T. vicentina.*

Frequent partial clearings had often been taken over by species of rapid growth, particularly attractive being the golden yellow flowers of *Senecio arborescens,* a common, flat-topped tree 15-20 ft. in height and the considerably larger *Ardisia breviglandula* whose branches at this season were loaded with masses of small but charmingly handsome red and white blooms. A slender, arching shrub or small tree displayed amazing pendulous scapes of large and improbable-looking reddish or purplish brown flowers. This eventually proved to be *Louteridium Donnell-Smithii,* an exceedingly curious member of the Acanthaceae. Limestone boulders were frequently covered with thriving colonies of *Philodendron radiatum, Peperomia obtusifolia* and *Begonia stelligera. Begonia glabra* and *Hoffmannia lineatiflora* were among the more common of the trailside herbs.

Our road finally came to an abrupt end where a tractor had churned a circle in the mud, and we were on our own, striking the crest of the first major ridge nearby. Here we found the forest relatively open, with many Chamaedorea palms, so that little chopping was needed to make our way. Dusk found us at a good camp site at about 6800 feet with adequate wood and water nearby, so we hung up our hammocks and prepared for the night, cooking supper over a roaring fire.

It now became apparent that the pack rolls carried by most of our men were hopelessly inadequate for sleeping out at such an elevation, and we began to have grave misgivings as to whether they would or could continue to the top. Mosquitoes also materialized in disagreeable numbers, which liberal applications of repellant failed to completely discourage. Those of us with standard army jungle hammocks, which have built-in mosquito netting

and waterproof roofs spent a fairly restful night, but many of the men slept little, stirring the fire and talking together in low tones.

The light of a cold, misty dawn gave us a somewhat better idea of our position, which was almost directly below the tremendous cliffs which bound the central part of the eastern face of the range. Crowns of dark, gigantic conifers could be dimly seen at a terrific height, almost straight above our heads.

After breaking camp and loading water in all available containers, we began the slow climb upward through dense, tangled thickets of shrubs and vines, Claudio taking the lead and chopping almost every step of the way up the rocky, 45 degree slope. Blocks weighing several tons would often be found lodged at a high angle against some sturdy tree, terminating a long path of shorn and mangled vegetation, obviously recently dislodged from the face of the escarpment above us.

By about 10:00 A. M. we were working along the lower edge of a sheer rock face, surrounded by gay colonies of the blue-flowered *Eupatorium cilioliferum,* with unstable talus below us composed of huge boulders and criss-crossed with broken and mossy trunks of fallen trees. By this time we had of course realized that we had gotten completely off the route previously taken by Chable, but since it was impossible to judge our position accurately it was thought best to continue as long as we could, particularly since we all felt encouraged by occasional glimpses of the great conifers far above us in the fog.

Our course became increasingly steep and difficult, mostly along narrow shelves, often with sheer drops of 30-50 feet on our left hand and made doubly unpleasant by our bulky packs. I was much less heavily burdened than most, yet I found my plant press and photographic equipment decidedly embarassing when trying to scramble over or under logs, or to negotiate footholds sometimes consisting of a single hardy specimen of *Clusia Salvinii* rooted into crevices in the bare stone. Often our creeping procession would come to an almost complete halt while we one by one clung gingerly to semi-epiphytic mats of vegetation, inching across and eying the tree tops and rough, broken rockfalls below.

I would emphasize of course that by now we were convinced of the obvious fact that this was a classic example of how not to climb Santa Bárbara, but we were too far comitted to our task to return, and we were, furthermore, persuaded to a man that there simply must be some easier way down.

Occasionally, when our breath and spirits reached what seemed like a breaking point we would find a brief respite on one of the pocket-like benches, which though only a few yards across and pitched at an uncomfortably steep angle, would afford us a resting place, and one from which we could plan further strategy. Here in the shade of small trees and arching shrubs such as *Saurauia villosa, Bocconia glaucifolia* or *Holodiscus argenteus* would be found the broad, plicate leaves of *Calanthe mexicana,* mostly sterile at this season, and the glossy foliage of the attractive pink-fruited *Smilacina flexuosa.*

At about 7500 feet we had again reached another almost perpendicular wall, broken here and there by steep boulder slides, up which we scrambled through shrubby tangles of *Holodiscus* and *Vaccinium poasanum,* enlivened by beautiful semi-scandent herbs such as *Salvia Karwinskii, Kohleria Deppeana* and *Lobelia parvidentata.* It was also at about this elevation that we reached the first gigantic specimens of our long sought conifer, which proved to be *Cupressus Lindleyi* (better known as *C. Benthamii*) the familiar Guatemalan cypress, yet almost unrecognizable when compared to the much smaller size usually attained by the same species when grown in hedgerows or gardens. To our immense relief this last, and in many ways most difficult part of our climb was put behind us and we stood secure on the crest of the long, relatively low saddle in the center of the range.

This hard-won vantage point proved to have an elevation of 7725 feet and supported a magnificent stand of mossy cloud forest which we were to examine in greater detail on our return. Following this narrow ridge, which frequently dropped away sharply on both sides, we pushed on through wet, spiny-leaved thickets of what appeared to be some species of *Pitcairnia* which averaged about 6 ft. in height. Low points in the saddle were usually dominated by tree ferns and a slender, semi-scandent *Arthrostylidium*-like bamboo, growing in the moist, deep shade.

We had begun to congratulate ourselves that we could continue thus easily to the very top, but we were soon brought up short at the base of still another sheer, or even in some places overhanging rock face, with huge, semi-detached fragments poised above us, the wet stone supporting very beautiful plants of the blue-flowered *Pinguicula moranensis*.

To bypass this insurmountable obstacle we took a very steep course to the left, reaching the main ridge at about 3:30 P. M. after a long period of almost steady chopping. Our barometer showed that we had reached an elevation of appoximately 9000 feet and we made camp under stately trees of *Abies guatemalensis* in the confident realization that the absolute summit could not be far distant. Strangely enough, Bob Armour found that the temperature did not fall below 50 during the night, which is unusual in my experience at such an elevation.

On the following morning we realized that we must make the most of our time, since we were running dangerously short of water, and no further sources had been found above 6800 feet. Scouting parties moved ahead led by Chable and Armour, cutting narrow trails along the summit to the highest point, a rocky ridge in heavy, bromeliad and hepatic-covered forest which Armour found to be 9125 feet above the sea, and hence the highest known mountain in Honduras. Due to the difficulties of our climb, Alphonse Chable had been forced to undergo a good deal of sceptical ribbing from Bob Armour and myself as to whether he had actually reached the top on his previous venture, but

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LEGENDS FOR THE PLATES ON THE TWO PRECEDING PAGES.

4. (Left) Alphonse Chable with a typical specimen of *Anthurium Schlechtendalii*.
5. (Center) Alphonse Chable at the base of a typical specimen of *Quercus Skinneri*.
6. (Right) Robert Armour with epiphytic plants at summit of Cerro Santa Bárbara.
7. Highway approaching Lake Yojoa from the north, showing barren Liquidambar trees, cutover country around the lake, and the ridge of the Sleeping Giant in the distance.
8. The expedition after having completed the climb to the summit of Cerro Santa Bárbara.
9. *Calanthe mexicana* is abundant on Santa Bárbara.

Photos 2-9 by the author; photo 1 by Louis O. Williams.

he was more than vindicated and established in our estimation as a sort of super-man of the mountains when we stumbled on to a tree at the highest point bearing old machete marks and broken branches where he had climbed in an attempt to get a view of the lake. In a mock ceremony we founded a fraternal order, to be henceforth known as the Santa Bárbara Club, with the three of us as charter members and with Chable unanimously voted into the presidency in recognition of his feat. Since Mr. Verne Fox, head of the Electrical Department of the United Fruit Company in La Lima had made the first, and only other known ascent in 1924, he was elected vice-president. Further members may be admitted upon presentation of an authentic fragment of the Guatemalan Fir *(Abies)* from the mountain. We feel that we may have instituted one of the world's most exclusive organizations.

Many trees were felled for specimens and it was established that the dominant species in this strange, relic community were conifers, *Abies guatemalensis, Cupressus Lindleyi, Pinus pseudostrobus, Pinus ayacahuite* and *Taxus globosa* making up the bulk of the stand, but with many broad-leaved, mostly understory elements such as *Quercus costaricensis, Persea gigantea, Oreopanax xalapensis, Senecio cobanensis, Drimys granadensis* var. *mexicana, Ternstroemia sp.* and *Chiranthodendron pentadactylon.* Some of the largest trees were found to be perched on limestone blocks 5-8 ft. in height which would seem to indicate that this apparently solid stone is actually almost as soluble as rock salt, and that the trees, probably in no instance more than a century or two old may have begun life when the tops of these pedestals were at the level of, or below the soil.

Branches of many trees, particularly the oaks, were expanded to four or five times their normal diameter by hosts of epiphytes, mostly hepatics, and strap-leaved Elaphoglossums but with many bromeliads and orchids and often broken by the sheer weight of this accumulation. Orchids were actually quite limited as to number of species, *Arpophyllum giganteum, Isochilus linearis* and *Pleurothallis Tuerckheimii* making up about 90 percent of those found, but with all of them exceedingly abundant.

In the course of these explorations two perpendicular shafts were found in the forest floor, evidently leading to caves below and explaining the lack of any surface water. After we had convinced ourselves that we had made specimens of all identifiable material from the summit, we began a slow descent through thickets of *Mahonia glauca, Fuchsia microphylla, Deppea grandiflora* and *Myrrhidendron Donnell-Smithii,* following our original path, and with the intention of establishing a camp on the saddle at about 7,800 feet. This in many ways was the most beautiful part of the upper forest, with trees 120 feet or more in height, covered with spectacularly handsome bromeliads, particularly *Tillandsia ponderosa* with brilliant scarlet scape bracts and rich royal purple, prominently exserted flowers. These Al Chable and several of the men began opening systematically, looking for salamanders and other small fry, carefully saving any semi-potable accumulations of water. The balance of the afternoon, and until about 10:30 of the following morning were spent in collecting and pressing plant specimens, after which we returned under heavy packs down the sheer cliffs and past the scenes of so many of our previous misadventures, reaching our first night's camping place shortly after noon, an unbelievable performance when considered that it had taken nearly a full day to make the ascent. It had been our intention to spend another day and night at this level, adding to our collections, but we found the gang rather understandably unwilling to spend another cold and uncomfortable night in the open.

Sending the men on ahead, Chable, Armour and myself spent about an hour trying to locate a better route to the top, and concluded that a much easier way, and probably that taken by Chable on his first trip would be by following a long, inclined forested ridge somewhat beyond this point which seemed to lead to the very summit. We were again impressed by the size and majestic aspect of the trees in this area, many of the larger oaks and Perseas being more than 150 feet in height and up to five or six feet in diameter. Rather regretfully we retraced our steps and soon caught up with the men, who had reached the logging road and were not to be halted by our interest in the bright yellow flowered shrubs of *Jacobinia umbrosa,* or the pendulous Columneas or gorgeous pink-flowered Epiphyllums seen high in the branches overhead. So on,

and ever down we went, past the tiny, dusty huts thatched with corn stalks, past the little sludge-laden stream, the lines of frame cottages, and at last to the mine, and the highway, and all of the everyday, familiar surroundings. These were fine men, in every way typical of the cheerful, resourceful, self reliant people of Honduras, and as each received his handful of silver coins and started in little groups down the long road toward El Sauce we felt that we were parting with friends.

It might be fairly asked perhaps just what we had accomplished. We had climbed the mountain, but we had also done much more than that. During the course of our investigations in the Lake Yojoa area we had accumulated records of more than three hundred species of plants. Nearly one hundred and fifty of these were from Cerro Santa Bárbara, and about half of that total from above 7500 feet. A gratifying number of these have been found by Dr. Louis Williams and Dr. Paul C. Standley to be new to science.

The information that we obtained on Santa Bárbara is of course far from complete. Much still remains to be done, yet what we have forms part of the broad picture of plant distribution and relationships that is gradually emerging as a result of hundreds of such collections from all parts of Central America. The first requirement has been an inventory of the available assets, but many other basic problems are involved. What are the limits of range and elevation at which some of the more valuable timber species are found? Where do they grow best? Which are confined to limestone, which to clay? Are insect pests a limiting factor in commercial plantings of individual species? We need to be able to determine the normal forest succession, involving recognition of at least the economically important types in their juvenile stages to determine which need breaks in the canopy and abundant sunlight for development, and which will tolerate heavy shade. Far from being ivory tower theorizing such information is basic to further progress in the intensely practical art of reforestation.

Anyone who has planted Burmese Teak *(Tectona grandis)* knows that success with that valuable species depends on full sun both for germination and growth. Most species of Lagerstroemia and Terminalia, on the other hand, will develop best as timber trees in heavy shade. Honduras

mahogany *(Swietenia macrophylla)* has demonstrated its worth for reforestation projects on the Caribbean littoral of Honduras and Nicaragua, but has been a complete failure in the Quepos and Golfito areas of Costa Rica due to disastrous shoot borer damage.

In general we may say that the success of inexpensive reforestation projects will depend on preserving the balance of nature in the area in which the work is to be done. The most promising types for plantings will either be species from the Old World tropics, such as Teak, some species of Eucalyptus or Burmese Rose Wood, which have been introduced into this hemisphere minus their natural pests and diseases, or native timber trees which have been selected on the basis of their potential ability to grow under plantation conditions. Most forest trees produce an abundance of seed, yet some are comparatively rare, while others are very common. This comparative infrequence or abundance is not the result of accident. In a given region it is a sure sign of the comparative biological success or failure of the species. Rare or infrequent timber wood species are probably so because they are biologically comparatively unsuccessful for one reason or another, no matter how valuable or useful their commercial products may be. In dense, artificially established plantings they can be expected to be potential sources of trouble and expense. Common species, particularly those which occur in dense or nearly pure stands have the hallmark of success on them. It costs no more per unit to propagate and plant an exotic species presumably less subject to local pests and diseases or a manifestly successful local species than it does to produce a potential failure.

All too often we lack the most elementary information about such potentially valuable local species. Collection of tree seeds from wild sources, for example, would not seem to present an insurmountable obstacle, yet no records exist of the fruiting season for individual countries. Some years past a serious attempt was made to assemble such information from data on dried specimens deposited in the various major herbaria in the eastern United States. It was found that many species are as yet so poorly represented that it is difficult or impossible to clearly outline the flowering and fruiting seasons for restricted localities. It would appear probable that the flowering and fruiting of many species is determined by the onset of the dry or rainy season,