

BOTANY-ZOOLOGY

# Science at the World's Crossroads

## Newly-Opened Forest Reserve and Experimental Gardens In Canal Zone Have Both Scientific and Economic Value

By FRANK THONE

PANAMA means, to most of us, two things. First and foremost, it means Modern Commerce—the merchant fleets of the world threading their way along a silver string of water lifted by the mighty magic of engineering over the tropic hills that separate two oceans. Back of that it means Old Romance—swarthy Dons guarding trains of slaves with backloads of treasure, or the slashing, cursing buccaneer crew of Morgan landed for rapine and pillage among the terrified towns.

But now, to the commerce of the present and the history of the past it is becoming necessary to add a new chapter. Science, which looks to the future, is finding at this crossroads of the New World a most excellent opportunity for new development. Here, where ships and aircraft of all nations converge to pass as through a narrow door, it is far easier for scientific men to come than it is for them to reach most other places in the tropics. For the same reason it is easier to bring in necessary laboratory equipment and supplies. For these reasons, and others, Panama is ideally situated for research in the problems of tropical plant and animal life, both general and applied.

Everybody has heard of Barro Colorado, the hill that was turned into an island, and was set aside as a great animal sanctuary; but only a few persons have ever set foot on it. In the nature of things, an animal sanctuary cannot be opened to crowds of visitors, so the only callers are the few scientists who have to meet the birds and beasts and plants "on business."

But strangely few have heard of two other more recent developments in the Canal Zone, which open to anybody who cares to come many of the privileges reserved to scientists alone on Barro Colorado.

These are the newly opened forest reserve, a dozen miles northwest of the city of Panama, and the Canal Zone Experiment Gardens, nearby. The first of these places is a beautiful slice of virgin

tropical jungle, the very existence of which was forgotten until a few months ago when the builders of a new road stumbled upon it. The experiment gardens were started originally as a plot of ground planted with trees, shrubs and other plants of possible economic or ornamental value in the American tropics. They have now had the study of plant diseases, plant breeding and other botanical problems added to their program, making the place a well-balanced botanic establishment with a strong slant toward the practical side.

### Endless Wonder

For the visitor from the United States or any other land in the temperate zone, pausing in his voyage down to the west coast of South America, or perhaps from New York to San Francisco, these gardens will be a source of endless wonder and delight. Here you will see, growing casually in the open, plants that you may have heard of but have never before laid eyes on.

You will see, for example, that tree of glamorous South Sea associations, the breadfruit—Heaven's gift of daily bread to the careless happy heathen, and first cousin to the thorny Osage orange.

You will see the famous Traveler's Tree from Madagascar, a beautiful huge fan of banana-like leaves that looks for all the world like an artificial ornament from the throne-room of some gorgeous black sultan of the Arabian Nights. It is called traveler's tree because it is almost always possible to find cupfuls of drinkable water in the angle between the hollow stem-bases and the trunk—good cool water too.

You will find there the mangosteen, a fruit so delicious that it might have grown on one of the trees of Paradise and one which will soon be familiar to all. The trees are just about to come into bearing and a method of transporting the fruit is now known.

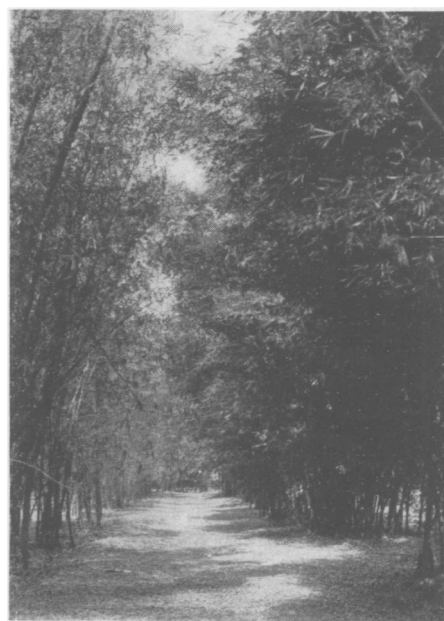
With these and a host of other exotic fruits and flowers, that are only names until you take a holiday in the tropics, there will be some more familiar things, that already figure largely in temperate-zone markets. Bananas are common-

place in the gardens. There are also experimental plantings of pineapples, for the big growers of Hawaii are hunting new lands to supplement their island holdings. Rubber trees, too; and sugar cane, rice, coffee—the list might be extended without end.

When you leave the experiment gardens and follow the short stretch of road that takes you to the forest reserve, you find the picture changing entirely.

In the forest reserve everything stands as it did when the startled Indians peered through the trees at Balboa's hardy explorers in their clanking armor. The towering trees are the native lords of the land, rich in their own green robes and in the splendor they borrow from the armloads of orchids and airplants and cable-like vines with which their limbs are burdened. Birds like moving jewels flash through their tops and an occasional clan of monkeys travels along aerial highways a hundred feet above ground. In the deep shade beneath a quieter ground life dwells, sometimes frolic and gamesome, sometimes sinister and desirous of blood.

Athwart the fine new road that the American engineers have built, there runs another, 500 years old, constructed in the name of a Spanish King as the old roads of Spain were built in older days in the names of Roman Emperors. This



### WHISPERING AISLES

*Of bamboos await the traveler who stops off at Panama to see the botanic gardens.*

is the Camino Real, the King's Highway, and once it knew the tread of many patient feet, human and hoofed, bearing heavy loads of the wealth of the Indies from a laden galleon on the South Sea to a waiting galleon on the Spanish Main, while their guards looked to their matchlocks and muttered bits of prayer to the saints for protection against possible lurking English marauders.

If you want so see anything of the wild life in the forest reserve, you will have to go silently. For the wild things hear voices and see movement at astonishing distances, and if you do not hush they will, and you will pass them by, seen yourself but unseeing.

What the patient and speech-forbearing visitor may see in the newly accessible forest is well and richly foretold in the many scientific studies that have been conducted on Barro Colorado by such naturalists as Dr. Frank M. Chapman and Dr. Frank Lutz of the American Museum of Natural History, Paul R. Standley, botanist at the Field Museum and Dr. Thomas Barbour of the Museum of Comparative Zoology at Harvard. Dr. Chapman has caught some of the flow of his enthusiasm in a book which he calls "My Tropical Air Castle."

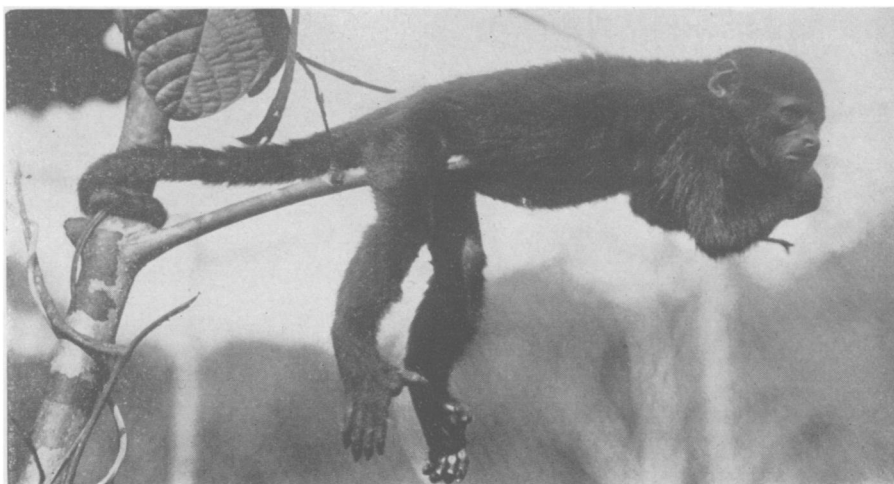
### Trees Full of Birds

If you walk circumspectly, and (preferably) carry a good pair of field glasses, you will be able to see much of the interesting life of the jungle. Parrots you will hardly avoid seeing—and hearing. If they take alarm and fly from one treetop to another, they will advertise their going with the ear-splitting din that makes every zoological garden's parrot house a Bedlam.

You may have the luck to find a nest-tree of the oropendola, a great builder of hanging nests that put even the workmanship of our Baltimore oriole to shame. The oropendola is a fairly big bird—the male some fifteen inches long—dark-colored, marked with yellow, very social in its habits. A whole colony of them will build in the same tree, making it look as though the children of some extraordinarily long-legged family of giants had hung up their stockings on Christmas eve.

With rare luck you may see a specimen of the beautiful white hawk, that seems to let other birds pretty much alone and feeds mainly or wholly on snakes.

Toucans you are likely to see, though again you will have to use your field-glasses, for this bird that is mostly beak is another hunter of the tree tops. Dr.



### IL PENSEROSO

*Young howling monkey, in a Barro Colorado treetop, studies men while they study him.*

Chapman discovered the only known use for this apparently overgrown organ. It is a grand help to a lazy bird, for a toucan can sit on a branch and merely by turning his head—hardly even stretching his neck—gather in fruits and berries from a wide radius around him.

Conspicuous among the treetop inhabitants are the monkeys—principally two, the active, acrobatic Capuchins and the slower, more deliberate but very decidedly noisier howlers. The howling monkey does not exactly howl; his call

is more like a half-yelping bark, and he utters it very abundantly, especially just about dawn and when a rain roars upon the leafy roof of his trees.

The dominant dwellers of the forest floor are of course the furred and footed closer kindred of man, the mammals. Some of these are not hard to find. The coati, for example. If you hear a pattering, a rustling, a mild crashing in the underbrush, stand still and a little flock of coatis will very likely come to you.

The coati is a relative of the familiar raccoon, and looks (*Please turn page*)

ASTRONOMY

## Most Distant Visible Nebula Seen by Palaeozoic Light

A "PALAEOZOIC PICTURE," a photograph made with light which is supposed to have started toward the earth 300,000,000 years ago, has been shown by Dr. Edwin P. Hubble, of the Mount Wilson Observatory in a lecture at Princeton University.

It was a photograph of the most distant nebula yet studied by astronomers and it was made with light that left the "island universe" on the fringe of known space at about the time when coal was in the making here on earth.

The achievement of a giant telescope in amplifying our knowledge of the material universe was depicted by Dr. Hubble in the Vanuxem lectures on "The Exploration of Space." Observational astronomy, once concerned chiefly with the solar system, then with the stars in

our Milky Way or galaxy, is now, he declared, entering upon a third phase—the accurate description of the extragalactic nebulae.

Thirty million of these, he estimated, lie within 300,000,000 light years of our own galaxy. These thirty million nebular "neighbors" are scattered through this vast space more or less at random; but on the whole their distribution is homogeneous and isotropic, according to the careful statistical study he has been conducting at Mount Wilson. The hundred-inch reflector there can penetrate no farther into the depths of space, and speculative conjectures are our only guide at present when we consider what lies beyond the observational frontier, farther away than 300,000,000 light years.

*Science News Letter, December 12, 1931*

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very much as a raccoon might look if its nose and tail were stretched out to about four times their usual length. The coat is quite fearless, and like the raccoon exceedingly curious. He will investigate anything, making off through the forest at surprising speed if it looks suspicious upon closer examination.

Another forest-floor beast you may find, wandering in small droves, is the peccary, or wild pig. Though there is never any freezing weather on the Isthmus, this creature is always as independent as the traditional hog on ice. It is a formidable fighter when necessary, and doesn't yield the road to anybody.

But many of the creatures that are in the forest you will never see by daylight. Either they see you first, or hear, or smell you, and quietly keep out of your way, or they do not roam abroad by day at all.

To get records of these nocturnal prowlers, the Barro Colorado scientists have resorted to "trapping by camera"—setting up a camera with a big charge of flash powder and a string-and-trigger arrangement for firing it when an animal touches the string. This has obtained superb photographs of such rarities as the tapir, that strange animal that looks like the Elephant's Child before the Crocodile pulled his nose; the puma and the ocelot, the two big cats of the region; and the trouser-legs and shoes of a night-wandering man, a trespasser who hadn't any business on the island. If that chap didn't know what a camera-



### SUPERBLY BEAUTIFUL

*Yet this white hawk of the Panama jungle feeds almost entirely on snakes.*

trap set-up is, he must have thought a whole battery of artillery had opened on him when that big flash went off. He never came back to report his reactions.

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PHOTOGRAPHY

## Ultraviolet Light Used In New Photographic Process

**P**HOTOGRAPHIC plates sensitive to ultraviolet light will shortly be made commercially by a new process, Dr. C. E. K. Mees of the Eastman Kodak Company has reported.

"Schumann" plates used for this purpose till now were difficult to make and had to be prepared by hand. They had a coating either entirely free from gelatine or containing only a small trace of gelatine to bind the silver bromide.

In order to avoid the use of Schumann plates, two Frenchmen, Duclaux and Jeantet, suggested the treatment of ordinary plates with a fluorescent substance which glows when exposed to ultraviolet light, and they employed petrol-

eum oils to paint it on the plates. Satisfactory results have been obtained by many workers with petroleum, but it is difficult to apply the oil uniformly and to remove it before development.

R. E. Burroughs of the staff of the Kodak Research Laboratories tested a large number of organic substances and found the most suitable to be ethyl dihydrocollidine dicarboxylate, which fluoresces strongly in the ultraviolet. This substance can be applied in organic solvents, from which it crystallizes in microscopic crystals over the surface of the plate, these crystals being easily removed before or during development.

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