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A Record of the Successful Breeding of the Quetzal (*Pharomachrus mocinno costaricensis*) in Captivity.

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In March, 1942, I had the good fortune to meet in San José, Costa Rica, Señora Amparo Zeledon, widow of the well-known ornithologist who died a few years ago.

At that time I was starting on a collecting trip having as its objective the capture of the Bare-necked Umbrella Bird (*Cephalopterus ornatus glabricollis*) and other rare birds for the New York Zoological Society.

It was with considerable elation that I noticed at Señora Zeledon's home a large, well-planted aviary, approximately 30 × 15 × 10 feet, in which was a pair of Costa Rican Quetzals, *Pharomachrus mocinno costaricensis*, in superb condition. The male trailed behind in its flight a pair of upper tail coverts nearly a yard long. Subsequently I was able to purchase this pair and the birds are now (February, 1943) on exhibition in the New York Zoological Park, together with several other Quetzals.

The most interesting part of my discovery was that Señora Zeledon told me that the Quetzals had reared young successfully on two occasions and that she had made notes of these events at the time. She was kind enough to lend me her notes, which I have translated and reproduce herewith:

SEÑORA ZELEDON'S NOTES ON THE BREEDING OF THE QUETZAL.

"We noticed the young bird peeping through the entrance hole on August 8, 1940, and on the 12th it left the nest.

"Both male and female were feeding it as long as it was confined to the nest, but once outside, only the mother cared for it, feeding it earthworms (Of all things—Translator) in the morning, and fruit (By which is meant cut-up little plantains known locally as "guinea"—Translator). On the 16th of the same month it fed itself for the first time. I suppose the birds started nesting at the end of June.

"The tree trunk in which they nested had been in the aviary for more than two years, exposed to the weather, before they showed any interest in it, the male preferring to enter a bigger, irregularly-shaped hole in the wall forming one side of the aviary. The

female, however, would only reluctantly go near it, the entrance hole probably being too wide. Fortunately they decided on nesting in the tree trunk after two long years, the wood having become soft enough to be worked on by them.

"The male moulted at the end of August and lost its long tail coverts at the end of September.

"The plumage of the young bird at the moment it left the nest was uniform coffee-color, except the wing coverts which were green.

"Both parents had been kept for three years in the big aviary and previously for two years in a much smaller aviary in which they would get very wild as soon as approached. In the big enclosure they are quite steady and take no notice of visitors. The pair was composed of a young male and an adult female purchased from the natives.

"February, 1941: The male, already in good plumage, started to enter the nest in the middle of February and to clean it out, carrying loads of dust in his breast feathers which he would shake out, once outside. Both started uttering their calls and the female entered the nest some days later, mornings and afternoons. Both adults started chasing the young Quetzal from the vicinity of the nest and stayed continuously near it, even in March.

"On March 31, 1941, I noticed the female coming out of the nest to let the male get in. Shortly afterward the male came out and the female re-entered.

"April 19: Today I had the gardener trim the trees in the aviary and he noticed two young birds in the nest, maybe 8 days old.

"Five days later we found a dead young Quetzal on the ground. One side showed signs of having been injured. Possibly the birds got frightened when the gardener worked in the aviary and threw one of the nestlings out.

"The young Quetzal, reared the previous nesting season, is still being relentlessly persecuted by its parents. On Friday, May 2, they bit it almost to death. I took it out, did my best to cure it, but found it dead the

following day. I had made the mistake of putting it back in the aviary. Even when it was lying dead on the ground, the female would swoop furiously down on it.

"On May 12, 1941, this season's young Quetzal could be seen at the nest hole. It left the nest on May 18, early in the morning. Male and female re-entered the empty nest several times that day."

FURTHER OBSERVATIONS IN THE FIELD.

On discussing the birds' performance, Señora Zeledon said she believed she knew why the Quetzals waited two years before nesting. She thought the wood in the tree trunk was too hard and they could not work it and shape it to their liking. In 1942 she had the old tree trunk replaced but no attempt at breeding was made, the wood probably again being too hard.

I measured the old trunk and found it to have a diameter of about 12 to 13 inches. The nesting hollow was approximately 9 inches in diameter. At the bottom was a shallow cup hollowed out, leaving a rim all around of a width of about 2 inches. The lower rim of the entrance hole, almost 5 inches in diameter, was about 6 inches from the rim of the cup.

Any future attempt at breeding should take into consideration the condition of the log, which should be so well rotted throughout that bits can be pried off with the fingernail, and should have an entrance hole and nesting cavity smaller than the measurements given above. The birds will accommodate it to their liking themselves. It would also be a good plan to wet the log thoroughly from the outside, with a hose, daily, to reproduce natural conditions.

Quetzals breed in cloud forests which are

dripping wet almost the year around. While in Costa Rica I found two nests at an altitude of 4,000 feet. One was located deep in the cloud forest in a tree stump about 15 feet tall, so rotten that it swayed when a finger was pressed against it. The diameter of the stump was at most 9 inches, which goes to show that occasionally the Quetzal takes to cramped quarters. The entrance hole was about 12 feet from the ground. I caught the male, who was brooding inside, by walking noiselessly up to the nest and covering the hole with a butterfly net on a short pole. This was in the month of June.

The second nest was situated in an enormous tree trunk, charred by fire and standing in a clearing. The entrance hole was a good 20 feet from the ground. The native who climbed up to it risked his neck by doing so. The nest was deep. He brought up two eggs, the size of pigeon's eggs, uniformly blue in color. He replaced them but the birds abandoned the site. The natives said that they invariably do this when the eggs have been touched.

At first I thought the Quetzal lives in association with the great woodpecker, whose abandoned nest he would take over and accommodate to his liking, but later I was not so sure of this. Quetzals breed up to 10,000 feet and at the higher levels the big woodpecker is not found, being replaced by a medium-sized woodpecker, so that the Quetzal would have to accommodate a much smaller nest.

Despite the Quetzal's diminutive feet and short bill, he must be a good carpenter. I once observed in Guatemala a Red-bellied Trogon hollowing out, with feet and bill, an occupied termite nest, and these are quite hard.



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