



## LIFE HISTORY OF THE COMMON POTOO

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The potoos are a small family, the Nyctibiidae, consisting of a single genus with five species, confined to tropical America. They are closely related to the goatsuckers, which they resemble in their mottled plumage, capacious mouths, and small bills, but from which they may be distinguished by their manner of resting with the body more or less upright, rather than horizontal, as is usual in goatsuckers. The most widespread member of this family is the Common Potoo (*Nyctibius griseus*), a large, wide-winged bird about 15 inches long. Its intricately patterned plumage is a blending of browns, buffs, grays, black, and white, producing a general grayish brown tone. There are blackish marks on the head and back, and black spots in a broken band across the breast. The long tail is irregularly banded with blackish and grayish. The large eye is bright yellow or orange. The sexes are too similar to be distinguished with certainty in the field.

### *Distribution*

The Common Potoo ranges over continental America from southern Mexico to Peru, northern Argentina, the Guianas, and Trinidad. In the Antilles it inhabits Jamaica and Hispaniola. We have little information on its altitudinal distribution, but older records from near Guatemala City and Tactic, Guatemala, indicate that from sea level it ascends to possibly 5,000 feet (Ridgway, 1914:592). Despite its name, this potoo is widespread rather than common and is by no means uniformly distributed in apparently suitable habitats throughout its vast geographical range. Easily overlooked by day, its nocturnal song, once heard, is unmistakable and unforgettable. In the more than 30 years since I became familiar with this song on Barro Colorado Island in the Panama Canal Zone, I have heard it in only two of the many localities where I have studied birds: near Pirapira in the Venezuelan state of Carabobo, and in the Valley of El General, Costa Rica. In the latter locality, I first became aware of the potoo, by sight rather than hearing, on 31 August 1959, nearly 24 years after I began to study the birds of this valley. Of late we have heard its voice at "Los Cusingos" in El General nearly every year, and found it nesting. My failure to discover the potoo in this valley during so many seasons in the field is the more surprising in that C. K. Underwood found it in El General on 26 July 1908 (Carriker, 1910:500). This suggests that the Common Potoo's distribution is spotty or discontinuous in time as well as in space.

### *Cryptic Behavior*

By day, the potoo rests in open or sometimes dense woods, often near the edge, from which it sallies forth in the dusk to catch insects over clearings or neighboring bodies of water. In the daytime, it is usually seen perching at a moderate height, quite upright, with its feathers compressed, its neck stretched up in line with its vertical body and tail, and its head inclined strongly upward. Some upstanding feathers above the eyes simulate low horns, and the auriculars are puffed out. The large eyes are closed to the narrowest slits, which from time to time widen slightly to reveal what is happening nearby. In this linear, vertical posture the potoo remains quite motionless as long as it knows that it is being watched. If one moves around beneath it, the bird does nothing except to turn its head, and occasionally to shift the orientation of its body, when the observer's eyes are turned away. If, as sometimes happens, the potoo is resting on the end of an upright gray stub of the same thickness as its body, it appears to be a continuation of the stub and is difficult to detect. On any perch it looks more like a piece of dead wood than a bird.

Although the potoo is usually seen, and pictured by artists and photographers, in this vertically elongated pose, it does not maintain this cryptic attitude all day long. If you can manage to see the potoo before it sees you, you will find it still perching vertically, but shorter and stouter, with its bill directed forward rather than upward. The moment it detects your presence it elongates its body, compresses its plumage, and raises its head, all so gradually that the movement is imperceptible. If you shake its support gently, it may open its great yellow eyes and lower its head to look around, without taking flight.

The potoo's flight is swift and direct, with regular beats of its long wings, which on a downward course it may set for a prolonged glide. Viewed in flight against the night sky, it resembles a large hawk, especially a *Buteo*.

As the evening twilight deepens, the potoo stations itself on the end of a stub, an exposed branch, a fence post, or even a cornstalk, from which it flies out to catch insects, often circling broadly around and returning to the same lookout. The potoo usually captures insects in the air, flycatcher-fashion, but sometimes it plucks them from foliage, the bark of a tree, or even low herbage. I have watched a potoo weave an intricate course through the open branches of a tree in pursuit of insects. Beetles seem to be the principal food in Jamaica (Gosse, 1847), and large fireflies (*Elyta*) are favored in Trinidad (Johnson, 1937). In Hispaniola, the remains of moths accounted for 83 per cent of the food of a potoo, which had also eaten 18 locustid eggs and seven beetles (Wetmore and Swales, 1931:247).

### *Voice*

Like its frequent neighbor, the Pauraque (*Nyctidromus albicollis*), the potoo sings chiefly in the morning and evening twilight, and by moonlight. The impression made upon us by the songs of birds, as by music of any kind, depends in large measure on the mood and setting in which we hear them. None could have been more favorable for the creation of a deep and lasting impression than those in which I first heard the potoo. Frank M. Chapman,

who had written so feelingly about the potoo's voice (Chapman, 1929:262-264), had promised that I would hear it if I spent the night with him at Fuertes House on Barro Colorado Island, where both of us were then residing. This one-room cabin for occasional occupancy was beautifully situated on an elevation between two forested ravines, whence it looked down to the head of a narrow inlet, whose placid waters wound away between low, wooded ridges toward Gatun Lake.

We watched the full moon float up above the crest of the high forest and listened expectantly, but only the loud, liquid notes of a chorus of frogs broke the stillness of the night. Around ten o'clock, overcome by drowsiness, I fell asleep. In the small hours of the morning, Dr. Chapman woke me. Sitting up on my narrow cot, I looked out the window upon a night flooded with the yellow light of the declining moon, reflected in a myriad glistening points from the foliage all around us, wet from a passing shower. The frogs continued their chorus; and from the distance came, subdued yet clear, the most melancholy utterance I had ever heard from bird or beast. Although plaintive, the potoo's soft, soprano notes were so beautifully modulated that they brought to mind a phrase from Shelley's *Adonais*, "most musical of mourners." It was easy to imagine, in such a setting, that out there through the moonlit forest wandered a maiden whose lover had been snatched away by death, or, as Waterton the Wanderer had fancied long before, Niobe stood wailing for her children before she was turned to stone. *Poo-or oh oh oh oh*, the voice seemed to cry, the notes strongest at the beginning and falling away toward the end. Again and again the Poor-me-one, as the potoo is called in Trinidad, repeated its plaint. Presently, we noticed that two of them were answering each other in the distance.

More than thirty years passed before I actually watched a potoo as it sang, while sitting on its nest on the hillside behind our house at Los Cusingos. Oddly enough, although the potoo was so rare in this region and I had first heard it here only two years earlier, our cook ascribed its song to the *perico ligero* or sloth. In many other parts of tropical America, this utterance is attributed either to a sloth or an anteater. As I have heard it in Costa Rica, Panama, and northcentral Venezuela, the potoo's song varies little and has everywhere the same melancholy charm. In other parts of the Common Potoo's range, quite different calls have been ascribed to it, a matter well discussed by Smithe (1966:87). A recording by Paul Schwartz reproduces well the sweetly plaintive character of the song, and likewise how loud and piercing the opening note may sound when not mellowed by distance.

As is to be expected, the potoo sings chiefly in the drier part of the year, when it nests. On Barro Colorado, Chapman (1929) heard it almost nightly from 21 December until 3 March. After his book was published, I heard the song, with him, on 20 March 1935 and, alone, sparingly until 21 May of the same year, when the wet season had set in. In Trinidad, Johnson (1937) heard the potoo during the 10 or 15 minutes before dark on almost every evening from February until the beginning of August. At Los Cusingos, I first heard the potoo at the beginning of March 1966, six and one-half years after I first saw the bird in this region. Early the following December, it sang sparingly at nightfall, and by the middle of that month it was singing more frequently. In

mid-October of 1967, when the wet season was far from ending, we heard the potoo sing at daybreak, and by early November it sang in both the morning and evening twilight. By the beginning of December, as drier weather approached, a pair was nesting close to our house. My records of the potoo's singing in this locality since 1966 are fragmentary, because of my prolonged absences.

### *Nest Site and Egg*

In the drizzly evening twilight of 9 November 1967, I heard the song of a potoo. Then a large, dusky bird, evidently the one I had heard, alighted in an aguacatillo tree (*Persea Skutchii*) in the hillside pasture behind our house at Los Cusingos. It rested on a thick, nearly upright branch at a point where it bent to one side, so that the bird, holding itself quite erect, appeared to be a broken-off stub. After a minute or so, the potoo flew to a dead guava tree higher on the slope and perched upright on the end of an ascending stub about as thick as its own body. In the dim light, I could hardly distinguish it from the broken-off branch; until the bird flew away and the branch suddenly grew shorter, I was not sure it was there. While the potoo rested on this stub, another flew up and tried to alight beside or upon it but, not succeeding, continued over the brow of the hill and out of sight.

These potoos were evidently selecting a nest site. On 1 December, and again on the following day, a potoo was resting in the aguacatillo tree every time I looked. I did not disturb it, and when it spontaneously left in the evening twilight of 2 December, I saw that it had been covering an egg, in the exact spot where the potoo had alighted three weeks earlier. The single large egg rested, at a height of about 30 feet above the ground, in a depression so shallow that more than half the egg was exposed above the rim. This knot-hole was situated at a sort of elbow in the thick, almost vertical main branch, which bent to the other side, then curved upward again, so that it did not interfere with the incubating bird.

As in all reported nestings of potoos, only one egg was laid. It seemed so precariously lodged in its shallow depression that I did not try to reach it. Viewed from the hillside above the nest tree, where I was not far below it, the egg appeared white, with faint markings. According to F. Haverschmidt (*in* Thomson, 1964:662), the eggs of *N. griseus* are oval and white, without much gloss, and are sparsely marked with rather small lilac and brown spots. Eggs from Trinidad measured 41.5 by 32.0 millimeters, from Brazil 36.2 by 29 mm, and from Surinam 35.9 by 26.1 mm. Eggs have been found in Trinidad in April and August, in Surinam in April, and in Brazil in November and December. A nest, 60 feet up in the forest on Trinidad, was reported by Johnson (1937). There appears to be no previous record of a nest of the Common Potoo in Central America, but Van Tyne (1935:20) published a photograph of a juvenile found on the leafy floor of high forest in El Peten, Guatemala, on 5 May 1931.

The nest I found in the very open crown of a medium-sized tree growing on a grassy hillside was clearly visible from 100 yards away. From the back of our house we could see the potoo sitting on it, even with the naked eye, while

through field glasses we could follow its movements. By night, in the beam of a flashlight, its brilliant orange eye-shine revealed its presence from afar. For nearly three months we watched this nest, sometimes from our dooryard, sometimes while standing or sitting on the hillside close by it, and during several night-long vigils. Our near approach, whether by day or night, appeared to have no effect upon the potoos other than to send them into the elongated alarm posture, from which, if we watched quietly, they soon relaxed. Throwing the beam of a flashlight upon them in the darkness of the night did not interfere with their activities, such as feeding the nestling.

### *Incubation*

We could count upon seeing a potoo covering the egg at any hour of the day or night, except for a brief interval at dawn and a longer period at the beginning of the night. Although we made no day-long watch, we spent much time in view of the nest without witnessing a change-over or ever seeing a second potoo anywhere in the vicinity in full daylight. I have no doubt that the same individual remained continuously on the egg all day long. I watched through the night of 16–17 December, when the moon was full, but unfortunately hidden much of the time by clouds, which before dawn covered the whole sky darkly. Since the nest tree was silhouetted against the sky, I believe that I should have noticed a change-over even while the sky was overcast, but I saw none. Evidently the nocturnal session, like the diurnal session, was continuous.

In the earliest light of dawn, while the stars still shone brightly, the potoo which had incubated through the night flew from the nest, usually going down the hillside toward the river. This morning departure occurred from 05:00 to 05:06 on nine mornings between 3 and 18 December; but when I resumed observations at the beginning of January, toward the end of the incubation period, it took place, on three mornings, between 05:12 and 05:18. The egg remained exposed, in the dim light, for from 0 to 15 minutes; for 11 mornings, the average period was 7.6 minutes. While the brighter stars still shone and the first tints of dawn were suffusing the eastern sky, a potoo flew up and settled on the egg. Since the sexes were indistinguishable, I could not tell whether this was the bird that had left a few minutes before or its mate. The brief interval of neglect, sometimes only one to four minutes and evidently too short for a potoo to satisfy its hunger after an all-night fast, favored the view that the other had come to take charge of the egg. This was certainly the case on 2 January, when at 05:14, standing only 50 feet away in full view, I witnessed the only change-over that I saw during the period of incubation. On this occasion, the sitting potoo did not leave until its mate, flying up swiftly through the twilight, was almost on top of it. The egg was left uncovered for only an instant, the newcomer settling on it the moment the other departed, never wavering in its swift, smooth approach until it came to rest on the egg.

It was certain, then, that both sexes incubated, one sitting by night and the other through the day. The daytime shift began at times ranging from 05:04 to 05:23 and lasted from 12.50 to 12.75 hours. The potoo that incubated

all day nearly always flew from the egg in the rapidly fading light between 17:45 and 17:50, rarely a few minutes earlier or later. With two exceptions, the hour of departure on 29 evenings fell between 17:42 and 17:54. One of these exceptions occurred on 11 December, the first clear afternoon and evening in many days. Then the potoo left its egg, enticed away by a passing insect, at 17:38. After catching the insect, it continued to a neighboring stub, where it stretched and preened. It returned to the egg at 17:45, and 10 minutes later it left again for a longer absence. On 12 December, a dark and drizzly evening with flashes of distant lightning, the potoo remained incubating until 18:22. On the rainy evening of 17 December, the potoo did not leave for its customary crepuscular outing, but evidently remained until its mate replaced it in the darkness. On a number of evenings, I noticed that the potoo left its egg from one to eight minutes after the Pauraque began to sing.

After the evening departure, the egg remained exposed for 45 to 95 minutes, usually for about an hour. On 27 December, when the potoo left at 17:47, the egg was already covered by 18:32. At the other extreme, on 4 December the diurnal session ended at 17:48 and the nocturnal session did not begin until 19:23. At the nest studied by Johnson (1937) in Trinidad, the egg was left exposed for "many hours" after darkness fell. Usually, especially during the latter half of the long incubation period, the potoo taking the night shift at our nest arrived before 19:00. The return to the nest displayed admirable control of flight. With amazing precision, the potoo flew right into the incubating position, folding its wings as it alighted. After it came to rest, no further adjustment to the egg seemed necessary.

The potoo always incubated facing into the supporting branch, with the long axis of the body vertical, the base of the abdomen covering the single egg, and the end of the long tail touching the branch below (Figure 1). When the bird was at ease, its body was contracted, with the feathers fluffed out making it appear stout, the head horizontal, and the minuscule bill inclined somewhat downward. At times the potoo fluffed out its ventral feathers so far that I was sure they hid a nestling, although the egg had not yet hatched. The potoo's eyelids moved continually, like those of an incubating Pauraque, opening the merest slit, then closing tightly for a moment, then opening a trifle, rarely revealing much of the large yellow eye. Evidently a scarcely discernible opening was quite wide enough for the potoo to see what approached. The sparsely foliated tree afforded scant shade, and much of the time the incubating potoo sat in strong sunshine. Sometimes it panted with its huge mouth slightly open. Or sometimes it assumed a more inclined posture, its long tail slanting outward from the trunk, its wings half-spread laterally, apparently sunbathing, after which it sometimes preened. Beneath a hard shower, the potoo sat with its body contracted and plumage fluffed out.

The visible approach of anything larger than a small bird caused the incubating potoo to compress and elongate its body, at the same time raising its head until it inclined strongly upward in alignment with the body and tail. The eyes were closed to the merest slits. The change from the plump resting posture to the slender alarm posture was slow and steady rather than abrupt, taking about 10 to 15 seconds. Since rapid movement is always revealing, a too hasty change of attitude would have defeated the very function served by the



Figure 1. A Common Potoo incubating in full alarm posture in an aguacatillo tree at El Quizarra, Valley of El General, Costa Rica, December 1967. Photograph by the author.

cryptic posture. The bird's readiness to assume the alarm posture while incubating varied greatly with circumstances. In full daylight it reacted most readily to the sight of any moving object: a man walking at a distance, a Turkey Vulture (*Cathartes aura*) or a Broad-winged Hawk (*Buteo platypterus*) flying overhead, would cause it to stretch upward to its full length. In the morning or evening twilight, the potoo often stretched upward only partly, or not at all, when I approached; and in the beam of a flashlight at night, it often retained the contracted posture. However, there were exceptions, and on moonlit nights my approach to the base of the nest tree might make the sitting bird elongate itself fully. Once, after the nestling hatched, I saw the brooding parent suddenly stretch upward into the alarm posture at 03:00. My flashlight beam picked out the eye-glow of some small animal, probably an opossum, in the roadway 50 or 60 feet below the nest. As the animal moved farther along the road, the potoo sank down to the resting posture, which it maintained when, a little later, a skunk rummaged on the slope below the nest.

As the potoo was most ready to assume the alarm posture in full sunlight, so it then took longest to resume the resting posture. When, after walking beneath the nest to make the bird stretch up, I watched through binoculars from a distance of 50 yards or so, it might require nearly a quarter of an hour to return to the resting attitude. In the evening, if I stood close beneath the nest, perhaps waving my arms to make the potoo elongate itself fully, it might resume the resting posture in as little as 2.5 or 3 minutes, while I sat watching in full view on the hillside scarcely 50 feet away. Even when most rapid, the contraction of the elongated body was imperceptibly slow.

Sometimes at sunset I found the potoo drowsing on the egg in a very contracted posture, seeming about two-thirds as long, and twice as fat, as when in the full alarm posture. As the light faded, it became active, opening its big yellow eyes, turning its head from side to side to look around, yawning cavernously, stretching its broad wings alternately sideways or both together above its back, spreading its tail, preening, perhaps giving once or twice a subdued version of its song, consisting usually of not more than four notes. Tempted by some insect that flew past or crawled over a neighboring branch, it sometimes darted out to seize the creature that I could not see, then returned immediately to its egg—a momentary absence that I did not consider to terminate the long diurnal session. The potoo did not perform all these activities every evening, but a selection of them.

Finally, as the twilight deepened, the bird left, falling away from the egg. Often it went to alight on a neighboring dead stub of a cecropia tree, into which a female Red-crowned Woodpecker (*Centurus rubricapillus*) had already retired for the night. Here it occasionally repeated some of the activities that had preceded its departure from the egg, such as stretching, preening, and calling briefly, or it performed other activities that it had omitted to do at the nest. Soon it flew off beyond sight, toward the forest or the river. Rarely its mate appeared at this time; but it was exceptional to have two potoos in view at any hour of the day or night, until after the egg hatched. Throughout the nesting, I scarcely heard any song from either parent, except the few notes uttered just before its departure at nightfall or daybreak.



I never saw a potoo turn the egg, or even touch it with its bill. To do so might have dislodged the egg from the shallow depression. Toward the end of the incubation period, I noticed a conspicuous dark spot on the shell — either dirt or a marking — that was always in the same orientation. I never chased the potoo from its nest in order to see whether the egg had hatched. Indeed, to do so might have been difficult, for later, when the nestling was a few days old, a parent continued to brood it, in the full alarm posture, while we encircled the trunk with a wide band of sheet metal to prevent predatory animals from climbing up. Driving nails through the resounding metal was necessarily a noisy operation.

The potoo's departure at dawn on 4 January revealed the egg still intact; the evening departure on the same day disclosed a downy nestling. Since I had first noticed the egg on 2 December, the incubation period at this nest was 33 days or more. Johnson (1937) found that the incubation period of an egg in Trinidad was 29 or 30 days.

The downy nestling faced inward, toward the ascending branch, and behind it lay the larger part of the empty shell, with a very jagged edge. Could the shell have been glued to the stub, perhaps with saliva, so that the egg would not fall? By the following evening, the shell had vanished from the nest, and I looked in vain for fragments on the grass beneath.

## *The Nestling*

### Development

The newly hatched potoo was everywhere densely covered with short, whitish down. It already rested facing inward, as the parents did when they incubated or brooded, an orientation that it rather consistently maintained through nearly all of the long nestling period. It soon developed a decidedly prognathous physiognomy, with a tiny bill at the end of a conically projecting mouth covered with whitish down, like the rest of its body.

On 15 January, when the nestling was 11 days old, I first noticed its eye-gleam, which was still faint. At this age, too, I became aware of its voice, a sort of hoarse buzz, uttered when it was fed. On 20 January, when 16 days old, I first saw it flap its stubby wings in the twilight. The nestling now showed more brown on the back and wings, and dark shaft streaks on the ventral feathers. The next day, when for the first time I found it alone in full daylight, it sat upright, with its head drawn in, in much the same posture as the parents assumed when drowsing on the nest. It did not change its attitude at my approach; but when I stood directly below the nest and made a noise, it stretched up its body and elevated its bill to an angle of about 30 degrees from the horizontal, foreshadowing the alarm posture of the adults but not assuming it fully. It maintained this posture for only a brief interval. When the nestling was 19 days old, I found it resting in front of its parent on the nest. As I came near, the parent stretched up in the alarm posture and the young bird did the same. Its rudimentary tail now projected over the edge of the stub.

On 30 January, when the nestling was 26 days old, its wing coverts and tail feathers were appearing through the abundant down that still covered its body. Feathers were forming "horns" above its eyes. It assumed the alarm

posture only in response to a stronger stimulus—a closer approach or a noise—than the adults reacted to, and it did not elongate itself so pronouncedly. On this day, I first saw it away from the knothole where it hatched. It had climbed about one foot up the thick ascending branch beside the nest and rested there in its customary upright posture. In the evening, it returned to its usual place. When it stretched and flapped its wings in the evening twilight, I noticed that its remiges were expanding, but when the wings were folded they were concealed by the downy covering of the body.

By 8 February, when 35 days old, the nestling was well feathered with a juvenal plumage similar in pattern to that of the adults—even to the dusky malar stripes—but much lighter in general tone. The “horn” above each eye was now quite prominent. I had not again seen it climb up the branch beside its nest. By night it was inactive, except at mealtime.

By 18 February, the 45-day-old nestling was becoming more active. Late in the morning it rested on the ascending branch about two feet above the nest—higher than I had seen it before—and it stayed there all afternoon. As it grew dark, the young potoo stretched its wings alternately, flapped them a little, then sidled down the branch to the nest. Here it flapped its well-developed wings vigorously. It repeatedly seemed to pick something, perhaps bits of bark or lichen, from the branch and eat it. When a parent came with food, it made the harsh buzz. Two days later, it took its first short flight.

### Brooding

For the first two weeks of its life, the nestling was brooded most of the time, day and night. It was left alone chiefly during the first hour of the night, when the egg had been left uncovered, and more briefly as the night ended. Thus on 4 January, the day it hatched, the nestling remained exposed for 34 minutes, from 18:13 to 18:47. In the next few nights, when both parents were bringing food, the nestling was left alone for periods rarely exceeding 15 minutes.

My son and I watched continuously through the night of 14–15 January. The moon was full, but the sky overcast much of the time until midnight. At 18:01 the parent who through the day had brooded the 10-day-old nestling left for the first time. From then until 19:05 the nestling was brooded only twice, for 2 minutes each time, and left exposed three times, for 2, 22, and 36 minutes. Then, from 19:05 until 05:12 next morning, or through the greater part of the night, it was brooded continuously. In the early dawn the nestling was left exposed for 3 minutes, brooded for 5 minutes, then left exposed for 4 minutes, after which a parent settled on the nest for the day, at 05:24. From the beginning of activity by the potoos at 18:01 on 14 January to its cessation in the waxing daylight on 15 January, the nestling was left uncovered only 67 minutes, during which it was frequently fed. Both parents brooded, and in the course of the night we saw them change-over five times. Spells of brooding by one parent ranged from 2 to 234 minutes. Johnson (1937) believed that the young potoo was “never left exposed” during the first three weeks of its life.

At first, the brooding parent always sat facing inward, as it had incubated, with the nestling in front, covered by its abdominal feathers. As the nestling

grew larger and stood erect, it formed a bulge in front of the parent that was especially abrupt and noticeable when the adult became tall and slender in the alarm posture. When the nestling was 12 days old, I noticed its head protruding from the parent's feathers for the first time in full daylight. Through much of the following day, the parent brooded facing sideways, having rotated about 90 degrees from its usual position, and the nestling had turned the same way, since it usually faced in the same direction as its brooding parent. Now its ventral surface as well as its head was exposed, but feathers of the parent's abdomen covered its sides.

Early in the afternoon of 21 January, I saw the nestling, now 17 days old, alone for the first time in full daylight. During the next week, however, I always found a parent on the nest in the daytime, often with the young bird resting in front rather than within the adult's plumage. On 28 January, a parent accompanied the nestling much, if not all, of the day; but on 29 January, when 25 days old, it was alone, as thenceforth we always found it, except when it was fed, until its departure nearly a month later. The last time we saw a parent brooding in darkness was on the night of 22-23 January. Long before diurnal brooding ceased, the nestling seemed to have enough plumage to keep it warm on mild January days. Probably the chief service rendered by the attendant parent was to shield it from the strong sunshine, for the aguacatillo tree was rapidly shedding its foliage. Moreover, the parent had better protective coloration than the nestling, whose plumage was too pale to match the bark of the nest tree, although it was scarcely lighter than some of the dry lichens that encrusted it.

### Feeding

I first saw the nestling when, in the evening twilight of 4 January, the parent which had covered the nest through the day flew out to seize a passing insect in the air, then at once returned. Twice more the parent flew out to catch insects, once from the air and once from the foliage of the nest tree, each time returning to the nest. After its third return, it bent over to feed the nestling, which stuck its head out from its parent's abdominal feathers to receive its first meal. The parent made jerky movements with its neck, as though regurgitating, and seemed to feed the nestling several times more. Between feedings, the nestling mostly stayed out of sight, although occasionally the tip of its bill projected from the parent's abdominal feathers.

At 18:13, much later than while it incubated, the parent flew away through the dusk. The nestling remained alone until 18:47, when a parent flew up and brooded it. At first the adult seemed to be disturbed by the beam of my flashlight, but soon it moved its neck as though regurgitating and bent down to feed the nestling, which stuck its head out as before. The feedings continued for about five minutes, but in the flashlight's beam I could not see the details as well as I wished. After the series of feedings, the parent sat quietly brooding in the light of the crescent moon.

Next morning I resumed watching at 05:00, when the east was brightening, and continued until 05:35, when there was much daylight. One parent stayed continuously on the nest, save for three momentary sorties to catch

insects. After the last, it fed the nestling once, then settled down to brood through the day.

That evening, as daylight faded, the nestling, not yet a day and a half old, stuck its head through the feathers of the brooding parent's abdomen, as though expecting a meal. A day later, it could stretch up so far that the parent, standing erect in the brooding attitude, needed to bend down little to reach its mouth. The nestling turned its head sideways to receive the food. Until the end of the nestling period, the young potoo was always fed while standing in front of the parent on the nest and facing in the same direction as the parent. At first only its head projected from the parent's feathers. As it grew, its whole body was exposed.

During the succeeding days, the delivery of a meal became more rapid. Although on the first evening a feeding had continued for about five minutes, from the second until the ninth evening it lasted only about two to four seconds. When the nestling was 10 days old, the delivery of a meal rarely took as long as a second or two. From the nestling's second to sixteenth day, a parent returning with food occasionally delivered it in two or even three installments; but during the second half of the nestling period, the meal was always delivered all at once. Alighting on the nest with the nestling in front of it, the parent alternately stretched and contracted its neck, regurgitating what appeared to be a large mass of compressed insects. To pass this to the nestling took only an instant, after which the parent flew away, a fraction of a minute after its arrival.

From at least its eleventh day onward, the nestling uttered a hoarse buzz at mealtime, often beginning as its parent approached and continuing after it had received the food and retired into the parental feathers or, at a later age, until after the parent left. The hungrier the nestling appeared to be, the more it buzzed. This sound helped us to detect the feedings on dark nights, since we did not keep the flashlight beam trained on the nest continuously, but only occasionally and at mealtime.

During the nestling's first 10 days, it received from three to six meals during the parents' first hour of activity at the beginning of the night, and as many more in the 15 or 20 minutes between the first dim light of dawn and fairly bright daylight. After this, the number of feedings in each of these intervals was reduced to one or two. On the night of 14–15 January, when the moon was full but unfortunately obscured by clouds much of the time until midnight, the parents fed the nestling 15 times between sunset and sunrise, delivering eight meals before midnight, seven after midnight. During the night of 8–9 February, when the waxing moon set at about 01:30, the nestling received only 10 feedings, eight before midnight and two after midnight, when beneath a clear, starry sky the air had become uncomfortably chilly. We had abundant evidence that both parents fed the nestling, although it was impossible to learn their separate roles.

#### Sanitation

We never saw a parent remove a dropping, which it could hardly take in its bill without hovering beside the nest. Some deposits on the herbage and fallen leaves beneath the nest tree suggested that the nestling shot its drop-

pings free of the supporting trunk, probably while the parents were absent, but we never saw this act.

### Departure

On the afternoon of 20 February, the young potoo, now 47 days old, climbed up the slanting branch above the nest. As it grew dark, the young bird alternately stretched each wing broadly, then sidled down to the nest, where it again stretched its wings and flapped them vigorously. It seemed to pluck things from the bark, and it looked around much, as though seeking a place to which it could fly. Then, at 18:07, in deep twilight, it launched forth on its first recorded flight. After going only a few yards, it circled around and alighted on a neighboring upright branch with a lateral projection, in a site quite similar to that of the nest and only a few feet distant from it. Here it plucked lichens, liverworts, or bits of bark and swallowed them, as was evident from the movements it made. It did this again and again, as though hungry. Ten minutes after the juvenile's flight, a parent silently arrived and alighted on the nest. The young potoo set up its hoarse buzz and continued until the parent flew across and fed it while standing behind it, in the usual manner, then flew away. A few minutes after this meal, the first we saw it receive away from the nest, the juvenile flew back to the nest, where it flapped its wings vigorously while clinging to the branch, then settled down to pass the night there. Its eye-shine was now only slightly less brilliant than that of the adults', but somewhat more yellow, less orange.

Each evening the young potoo became more active and took longer flights. On the evening of 22 February, it made six flights before receiving its first meal. All were between branches of the nest tree itself, the longest about 20 feet, from one side of this tree to the other. Sometimes the young potoo headed outward, as though to begin a longer journey, but after going a few yards it circled around and returned to its natal tree.

After passing the night of 22–23 February on the nest, the young potoo flew at dawn to the similar site a few feet away. Here it passed the day. This was the first time I saw it in full daylight away from the branch on which it had hatched.

On the evening of this day, the juvenile made 14 flights in the 15 minutes before it was fed. Some of these flights were short, between the nest and the branch just a few feet away where it had passed the day – two points of attraction between which it now frequently alternated. But at times the fledgling flew far out from the crown of the tree, 40 or 50 feet, only to veer around and alight on a branch of the nest tree. Once it flew halfway around the tree's crown, to enter it from the opposite side. It never alighted anywhere except in the aguacatillo tree in which it grew up. I could not learn whether it caught insects on any of these flights. At the various points where it alighted, it plucked many things from the bark, as on previous evenings. There was the usual stretching, shaking itself, and preening. Finally, the young potoo settled on the nest for its last night there.

As the first promise of dawn brightened the sky above the eastern horizon on 24 February, the young potoo became active, sidling up the branch beside the nest and appearing to pluck things from it. At 05:04 a parent fed it on

the nest. As the undersides of the eastern clouds became tinted with rose, it flapped its wings and picked more things from the bark. After another meal, it flew to the next branch, then made three long, circling flights, out from the nest tree and back again. Finally, at 05:30, it flew out once more. Now for the first time it did not turn back, but continued across the road and down the hillside into light second growth woods, where it vanished. After breakfast I spent a long while vainly seeking it.

The young potoo flew away while the parents were out of sight. How would it establish contact with them? Would it return to the nest to be fed? That evening I watched in a slow drizzle. In the gloaming at 18:17, a parent alighted on the nest, as though expecting to find its offspring there. After delaying a short while, it flew to the nearby cecropia stub from which it had often caught insects. Then it went to other exposed perches, and twice more it came to the nest. Several times it called in its soft, melodious voice. Finally, 10 minutes after its arrival, it flew down into the woods where the young bird had disappeared at daybreak. Possibly it had heard the juvenile's voice, although I failed to detect it.

Soon a potoo, probably the other parent, alighted on the nest. After flying around a while, but not calling, this one also flew to the woods to which the fledgling had gone. So it probably received its supper — or, more properly, its breakfast — despite its departure without its parent's knowledge. I never saw it again.

If we count from hatching to the first time the young potoo was seen elsewhere than on the nest or the branch beside it, the nestling period was 47 days (4 January to 20 February). If we count from hatching to its departure from the nest tree on 24 February, the nestling period was 51 days. Adding at least 33 days for incubation, the period of occupancy of the nest becomes no less than 84 days. This is a long time for a vulnerable bird and its defenseless young to remain on an exposed stub or branch of a tree in or near tropical woodland where predators abound; it speaks eloquently for the protective value of the potoo's "dead stub" pose. With the exception of the Black Vulture (*Coragyps atratus*), no other land bird that I have studied in tropical America, not even excepting hole-nesters, has such long incubation and nestling periods. The young potoo studied by Johnson (1937) in Trinidad remained on the nest tree only 40 days.

Since this nesting had terminated successfully so early in the year, long before most birds had started to reproduce, I thought that it might be followed by a second brood. Although we have checked carefully, we have never seen a potoo sitting in the nest tree again, either in that season or the following years.

### *Summary*

By day, the nocturnal Common Potoo (*Nyctibius griseus*) often rests on the end of a stub, from which it is difficult to distinguish in its thin, vertically elongated alarm posture. When at ease, it assumes a shorter, stouter figure.

Its food consists of moths, beetles (including fireflies), and other insects, caught in its great mouth on flycatcher-like sallies from an exposed perch, to which it often returns.

The song, consisting of a descending series of soft, plaintive notes, is heard in the evening and morning twilight, and by moonlight, chiefly in the drier part of the year.

At the beginning of December, in the Valley of El General in Costa Rica, a single whitish egg was laid in a knothole 30 feet up on a stout upright branch of an open-crowned tree growing on an exposed hillside. The egg rested in a depression so shallow that the greater part was exposed above the rim.

Both parents incubated, covering the egg continuously except for an interval not exceeding 15 minutes at daybreak and a longer interval of 45–95 minutes at the beginning of the night. The only observed change-over occurred at dawn, and both the long nocturnal session and the even longer diurnal session appeared to be continuous, and by different parents. They apparently never turned nor touched with their bill the precariously situated egg. The incubation period was at least 33 days.

The newly hatched potoo was densely covered with whitish down. From the first, it rested facing the supporting branch, just as the parents did when they incubated or brooded. At the age of about 17 days the young bird assumed, imperfectly, the vertically elongated alarm posture, but it did not display the full alarm posture until some days later. At the age of 26 days, it was first seen resting on the branch above its "nest," and thereafter its excursions over the neighboring boughs gradually became longer. When 35 days old, it was well feathered, much in the color pattern of the adults, but in a lighter tone.

During its first two weeks, the parents brooded the nestling most of the time, leaving it alone chiefly during the first hour of the night and more briefly at dawn. The brooding parents changed over five times in the course of a night. Nocturnal brooding ceased when the young potoo was 19 days old; but, with rare exceptions, a parent attended it all day until it was 25 days old, after which it was always alone, except when being fed.

The nestling was fed by regurgitation. Its first meal lasted about five minutes, but gradually the time devoted to transferring food shortened, until, during the second half of the nestling period, the parent took only an instant to deliver what seemed to be a large mass of compressed insects. When 10 days old, the nestling was fed 15 times, by both parents, between nightfall and daybreak on a night when the moon was full. When 35 days old, it received 10 meals in the course of a night when the moon was waxing. From about its eleventh day onward, the nestling always uttered a hoarse buzz when a parent came to feed it.

The severance of the nestling's ties with the nest was gradual. During its last days in the nest tree, it climbed over neighboring limbs, stretched and flapped its wings, flew from branch to branch, and even took short circling flights out from the nest tree and back again. These exercises took place chiefly in the evening twilight, when, before its first meal, it frequently plucked and seemed to swallow lichens, liverworts, and fragments of bark. The nestling's first recorded flight of a few yards occurred when it was 47 days old. Before sunrise on its 51st day, it finally flew from the nest tree to the neighboring woods and was not seen again.

From the laying of the egg to the young potoo's departure, at least 84 days elapsed. The survival of the exposed "nest" for so many days convincingly

attests the protective value of the potoo's dead-stub pose. While incubating or brooding undisturbed, the parent sat in the rotund contracted posture; but a man approaching, a large bird flying overhead by day, or a small mammal prowling beneath the nest in the night, made it stretch up into the slim alarm posture. After the disturbance had passed, the resumption of the contracted posture took as long as a quarter of an hour in bright sunshine, but only two or three minutes in the evening twilight. Although the movement of elongation was much more rapid than that of contraction, it was nevertheless imperceptibly slow.

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*LITERATURE CITED*

- CARRIKER, M. A., JR.  
1910 An annotated list of the birds of Costa Rica including Cocos Island. *Ann. Carnegie Mus.*, 6:314-915.
- CHAPMAN, F. M.  
1929 *My tropical air castle*. D. Appleton and Company, New York.
- GOSSE, P. H.  
1847 *The birds of Jamaica*. John van Voorst, London.
- JOHNSON, R. E.  
1937 Hunting for the "Poor-me-one." *Illustrated London News*, March 13.
- RIDGWAY, R.  
1914 *The birds of North and Middle America*. Part 6. *U.S. Natl. Mus. Bull.* 50.
- SMITHE, F. B.  
1966 *The birds of Tikal*. Natural History Press, Garden City, New York.
- THOMSON, A. L., Editor  
1964 *A new dictionary of birds*. McGraw-Hill Book Company, New York.
- VAN TYNE, J.  
1935 The birds of northern Petén, Guatemala. *Univ. Michigan Mus. Zool. Mis. Publ. No.* 27:1-46.
- WETMORE, A., and B. H. SWALES  
1931 The birds of Haiti and the Dominican Republic. *U.S. Natl. Mus. Bull.* 155.

EL QUIZARRA, SAN ISIDRO DEL GENERAL, COSTA RICA