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NOTES ON THE BREEDING HABITS OF *PANYPTILA CAYENNENSIS*

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Panyptila cayennensis, known as Cayenne, Lesser Swallow-tailed, or Scissor-tailed Swift, is a wide-ranging species of the lowland tropics, recorded from Veracruz, Mexico to southeastern Brazil. Its remarkable tubular nest has been often described, but there seems to be no published account of the method of constructing the nest nor of the bird's breeding and roosting habits. These aspects of behavior I have recently had an opportunity to observe.

In Middle America occur two species of *Panyptila*, similar in form and color but differing greatly in size, *P. sancti-hieronimi* and *P. cayennensis*. Only the smaller species, *P. cayennensis*, is found in South America. This swift, between four and a half to five inches long, is velvety black, with a contrasting white throat and collar around the neck, a white patch on each side of the rump, and a whitish spot in front of each large black eye. The tail, though very deeply forked, is kept closed during ordinary flight in my experience, the fork becoming visible only when the bird turns. Twice I caught at the nest a living bird (possibly the same individual), which weighed 28 grams.

STATUS IN SURINAM

In Surinam (Dutch Guiana), where my observations were made, *Panyptila* appears to be not uncommon in the coastal area and the interior savanna region. It has adapted itself to man, for it now breeds freely on shade trees of coffee plantations and on buildings, even in the middle of the city of Paramaribo and elsewhere in settlements. Yet this swift seems to be rather secretive, for I have never observed one at a distance from the nest site, though even during the breeding season it spends hours at a time away from the nest. I do not know where it passes the day or where it feeds. I am skeptical about Beebe's state-



LESSER SWALLOW-TAILED OR CAYENNE SWIFT (*Panyptila cayennensis*). Southern Mexico to southeastern Brazil. Original drawing by George M. Sutton.

ment (1910) as to British Guiana that *Panyptila* was "common on all the Guiana rivers, hawking with swallows over the water." I suspect there may have been confusion with the swallow *Atticora fasciata*, which is somewhat similarly colored and is typical of forest fringed rivers.

THE NEST

Panyptila, like other swifts, nests in a hole, but "the hole is of its own construction" (Lack, 1956a). It is one of the most wonderful bird nests I know. The nest has been known for more than 150 years. A rather crude, but recognizable, picture, dating from 1806, forms part of the unpublished collection of watercolors of Cayenne and Surinam birds, now at Haarlem, Holland, made by the French artist, Ogier de Gombaud from 1803–1817 (Haverschmidt, 1957). Lack (1956a) lists much of the literature on the appearance of the nest, and additional notes with photographs have been published by Sick (1955) from Brazil and by me (1954) from Surinam. The description and drawing in Lack (1956b) appear to represent a nest of the larger *P. sancti-hieronymi* from Guatemala, depicted by Salvin (1863:191–192), and only partly agree with my observations of nests of *P. cayennensis*. A brief account of the nests I have seen is worth repeating. The nest is a long tube of felt-like material, composed almost wholly of feathery tufts of plant seeds, with a very few bird feathers, among which I have recognized the barred breast feathers of a hawk, *Buteo magnirostris*, and the yellow breast feathers of tyrant flycatchers, *Pitangus* and *Myiozetetes*. The nest material is felted together with the birds' saliva. The nest tube may be over two feet long, though it varies greatly in length; it is open at the bottom, which forms the entrance. The tube has a fawn color. Somewhere within the tube—not necessarily near the top (in contrast to Lack's statement and drawing)—there is on one side a small shelf or pocket, on which the eggs are laid. In the nests I have seen there was no "wider chamber at the top" and no gradual narrowing of the inside of the tube towards the nest shelf, as depicted on the drawing in Lack (1956b).

Nests vary to a great extent. Some are pendant tubes, fastened only at the top, either to the underside of a tree branch or to the ceiling of a porch. In such nests the tube is completely circular, forming a pipe hanging down freely in the air. Other nests are built against the main trunk of a tree, or against a stone, concrete, or wooden exterior wall of a building under the roof (Plate 8, fig. 1). In these nests the entire length of the tube, from entrance to top, is fastened against the vertical supporting surface, so that the felted material forms only about half the tube and the bare tree-trunk or wall to which the nest is attached forms

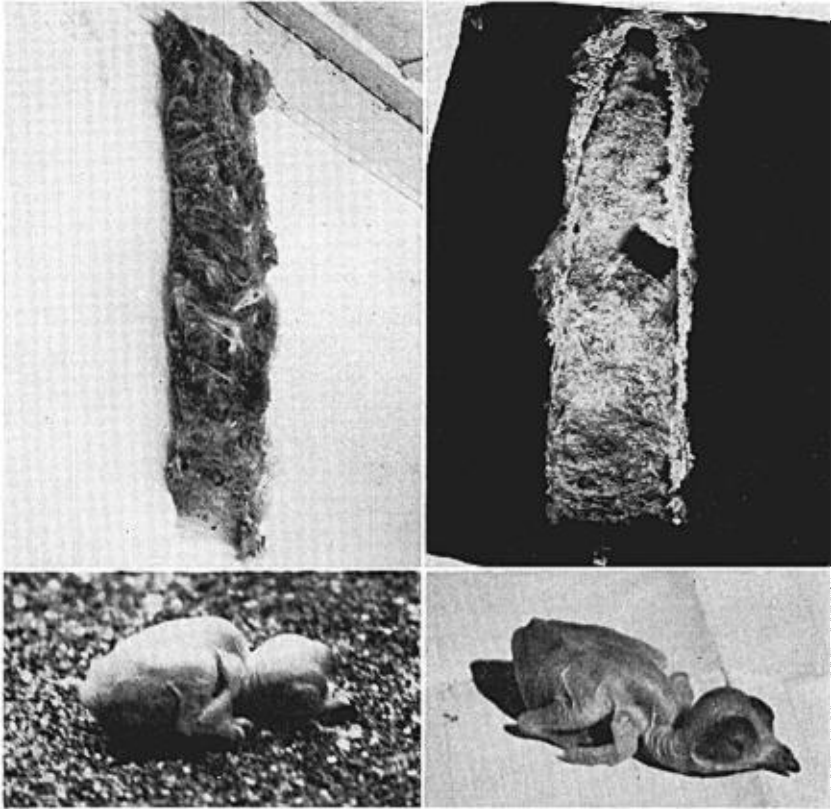


Figure 1 (*above left*) nest of *Panyptila cayennensis* against a building wall, just under the roof, Paramaribo, Surinam, March 26, 1957. Photo. by W. Haverschmidt. Figure 2 (*above right*) Inside of same nest, after it had fallen. Nest is intact (not cut open); the open side was plastered against the wall. Dark area at right indicates egg shelf. Figure 3 (*below left*) Nestling *Panyptila cayennensis* at the age of 2 days, April 2, 1957. Figure 4 (*below right*). Same nestling at the age of 10 days, April 11, 1957. Photos. by F. Haverschmidt.

the other half. This bare surface is not plastered with nest material on the inside of the tube.

Nests may be used for years, and may be enlarged; but even when first built the tube can be of great length. The nest of which I record my observations in this article had a total length of 66 cms. (over two feet). The nest shelf was located about midway in the tube, 28 cms. from the top (Plate 8, fig. 2). In another nest, which was partly broken off, the shelf was only 9 cms. from the top. The nest shelf is small, hardly providing room for the eggs, and even less for the nestlings. In the nest here discussed, the shelf dimensions were 5 x 5 cms. In another nest they were 4 x 6 cms.

THE BUILDING OF THE NEST

As nothing seems to have been published about the method of constructing the nest, I was very lucky in August 1956 to find a pair beginning a nest against the stone front wall of my house just outside of Paramaribo.

On the morning of July 31 I observed two *Panyptila* flying in front of my house and dashing several times against the front wall without settling. I had noticed this a few days earlier without paying much attention. After a while both swifts left, and I did not see them again during the rest of the day. This apparently was some kind of prospecting of a possible nest site. On August 11, for the first time, I noticed that a few tufts of feathery plant seeds were attached to the wall, just under the roof, at a height of about 8 meters. Work continued steadily, until by the end of the month a short felted pipe had been formed.

On the morning of September 1 I noticed one of the birds hanging motionless at the nest. The whole nest tube was out of order and the bird seemed to be dead. I removed the nest with the bird. Upon examination it became clear that nest material had entangled the swift around the neck, one wing, and one foot. I disentangled and weighed the bird. Although exhausted, the swift recovered and flew away normally. Next day—September 2—there were again a few tufts of plant seeds on the same spot on the wall. From then on began my regular watching, as far as time permitted.

Participation by both sexes in nest construction. As the sexes are alike, it was difficult to learn whether both birds took part in the nest construction. On October 14 I determined for the first time that both birds participated. At 10:15 one swift was at work at the entrance of the tube. After a few minutes it flew out, flying, as usual, low over the ground, before gradually ascending. Then I noted that the other swift was at work higher up in the nest tube, gradually working downwards

until it was licking and striking on the inside of the entrance. Later during the same morning, at 11:10, both birds were working in exactly the same way. Afterwards I repeatedly noted the two birds working together, i.e., October 18 from 16:30–16:40; October 23 at 10:00; October 24 at 17:15; November 4 10:15–10:20.

Method of Construction. The nest was started by the plastering of some tufts of feathery plant seeds in the form of a small arc like \cap . More tufts were added at the top and sides of the arc till the sides grew forward to form what reminded me of whiskers. The "whiskers" grew thicker and longer till at last they met in front, forming a short closed tube. The lengthening of the nest pipe downwards was achieved in exactly the same way. From the very beginning nest material was plastered only on the *inside* of the arc and "whiskers." I never saw material added on the outside, although I watched the construction of the tube daily for months in succession. This explains why the nest tube of *Panyptila* has its exterior rough and untidy, with feathery plant seeds protruding everywhere, while the interior is extremely smooth, being kept so by the constant plastering with saliva.

A bird at work could be observed easily, for it never took notice of me even when I stood right under the nest. As the tube grew in length downwards the bird could be seen best when working at the entrance. Then it hung across, head downwards, opening and closing the bill, with which it steadily made long striking movements reminiscent of a cat licking itself. The striking alternated with quick chewing movements of the nest material on the inside of the tube. Then it would stop suddenly for a while, with its bill inserted in the wall of the tube. I interpret this stage as the adding of saliva.

Work went on in a very leisurely way. Hours passed without a bird being present. This made watching *Panyptila* at the nest a difficult task for an observer whose available time was limited. On September 16 I spent the whole day from dawn to dusk watching the nest, and the bird worked only three times during this period. First it came at 9:55 A.M. and worked till 10:04, then it arrived at 12:25 and left at 12:33. For the third and last time it came at 14:20 and worked till 14:26. On this day the arc with which the nest had been begun was not yet closed but the "whiskers" were just touching each other in front. The whole structure was still very loose and transparent. When the bird was at work in the short tube its head protruded at the top, its back was partly visible through the thin tube, and its tail protruded below. On September 19 the structure was closed but still very loose and transparent. On September 23 I watched from 9:00 to noon. During this period the bird worked twice, from 9:32–9:38, and from 10:50–11:00. On October 9

I observed from 14:00–16:00; again it worked twice, from 15:02–15:10 and from 15:35–15:38. When a bird arrived at the nest it worked mostly from 3–15 minutes at a stretch.

I was unable to distinguish any nest material in the birds' bills when they arrived. This is not surprising in view of the terrific speed with which the birds approached the nest. They flew at first low over the ground, then suddenly shot upwards towards and into the nest tube, which was only 13 cms. wide. Moreover the swift always arrived quite unexpectedly without uttering a note. Only after a bird was within the nest tube did I hear a soft *rrreeteetee*.

The nest tube continued to grow in length downwards during November, December and January. I regularly examined the nest at night with a flashlight, as this was the only way to distinguish details of the interior. Until February the nest was just a long tube, and there was no egg shelf inside. On February 7 I noticed for the first time the beginning of a small projection about midway in the tube, and on February 25 the egg shelf seemed to be complete, at least as seen from the ground. Yet I saw a swift working on the underside of the shelf on March 3, 9:50–9:55 and March 7, 16:00–16:03. The construction of the egg shelf started by the making of a thin loose projection from the left wall, after which new material was plastered on its underside, making the shelf thicker. Later, when I examined the nest in the hand, I found the egg shelf to be strongly made and lined with a thick layer of very soft plant down. The egg shelf was constructed after the completion of the nest tube. Actually work at the nest of *Panyptila* seems never to be completed, for the nest has to be kept constantly in good shape. During my daily observations through the incubation period, as well as during the rearing of the young, the adults continued to lick and plaster at the inside of the tube. I am sure that new nest material was also constantly added. I obtained proof of this on March 25 when the nest was examined and found to contain eggs. One of the birds tried to enter the tube when we were busy at the nest, and tumbled to the ground. I was able to catch it, and found a long tuft of plant seed in its bill. This provided my second opportunity to weigh an adult.

ROOSTING

On the evening of September 26 at 18:00, when the nest was still only a very short tube, I saw the two birds attempting to enter the nest, but they left without doing so. On September 28 at 17:15, in the afternoon, the pair were circling in the air in front of my house. This proved to be the only time of day during which I was certain to see the birds flying leisurely around in each other's company. Only when turning did the

forked tail become noticeable, the wings, although long and curved in typical swift fashion, seemed rather broad, giving the bird more or less the aspect of a martin (*Progne*). At 17:29 one of the birds made a dash towards the nest tube; it entered but left immediately. At 18:20 (when already rather dark) one tried to enter again, shooting repeatedly upwards towards the tube, but missing the entrance every time. At 18:29 it tried once more, missed the entrance but clung to the outside of the nest. The swift left almost immediately, and I did not see it again that night. After dark I examined the nest with a flashlight but found it empty. On September 29 exactly the same thing happened. One bird entered the tube at 17:11 calling "rrreeteetee" when inside. At 17:19 it left. At 18:10—when already pretty dark—both birds tried repeatedly to enter the tube; at last one succeeded in entering and stayed inside, while the other left. Inspecting the nest after darkness I noticed only one clinging within. Early next day it was still inside at 5:30 A.M. but it had left by 5:50. From October 2–October 10 the nest was used as a dormitory by only one bird. On October 11 I noticed for the first time that both birds spent the night in the nest. Again only a single bird roosted in the nest on October 12 to 15. On October 14 and 15 I noticed that after the entrance of the first bird, the second bird repeatedly missed the opening of the nest and finally gave up and left. From October 16 onwards both birds spent the night together in the nest without a break. From these observations I conclude that in the beginning the birds had some difficulty in making a perfect upward landing right into the tube during the falling darkness and that this had to be learned by trial and error.

Entry into the nest for roosting always occurred a short time before darkness fell—at about the same time as the first bats left their hiding places for their evening flights. The birds always entered only a few minutes apart; for example, on October 28 the first went in at 18:03 and the second at 18:05. Later on in the season when darkness fell about half an hour later the birds also arrived about a half hour later; for example, on March 28, 1957 the first bird entered at 18:32 and the second at 18:36; and on April 6 the first entered at 18:31, the second at 18:32. Just after entering the tube a soft "rrreeteetee" was uttered which was repeated when the second bird went inside. The position the birds took when sleeping differed, sometimes one of them clung above the other, but at other times one hung at each side of the nest wall.

Often during darkness I went outside to take a look at the nest with my flashlight and discovered that sleep was not continuous. I frequently surprised one of the birds licking and striking at the inside of the tube, and even at the entrance, for example, on October 26 at 20:00,

January 28, 1957 at 19:00, February 27 at 20:15. On March 22 as late as 22:10 I watched one of the swifts hanging across in the entrance with its head downwards, busily licking and striking with its bill at the inside of the tube. It worked for 5 minutes, then it turned and crawled upwards along the inside of the tube and remained motionless.

Roosting of the pair within the nest continued all through the following months, as well as during the incubation period (with the non-incubating bird clinging just under the nest shelf), and during the rearing of the young. After the loss of the last nestling the pair spent every night in the tube till the nest fell down on June 3.

Richmond (1898) stated that *Panyptila* apparently takes shelter in its nest during heavy rain. I cannot confirm this, for I never saw it in my pair. Whenever a bird was in the nest during the non-breeding periods it was invariably at work, plastering and licking at the nest walls.

FOOD

I never was able to detect by direct observation what the birds' food was. But from the time when they began to roost regularly in the nest two heaps of excrement lay every morning on the terrace under the nest, consisting of chitin remnants. Dr. D. C. Geyskes of Paramaribo identified them as belonging chiefly to Hymenoptera: mainly flying ants, Formicidae (Myrmicinae), and a few Ichneumonidae; also a few were Coleoptera: Bostrichidae.

BEHAVIOR DURING INCUBATION

During daylight the bright light made it impossible to distinguish details within the dark nest tube even when standing right under the nest. Though it was likely that the incubation period might start at any moment, I was fearful of disturbing the birds by making an opening in the tube to examine the nest contents.

On March 24, at noon, when I looked into the tube I saw movement on the nest shelf, and then saw the bird turn downwards and start licking and striking at the underside of the shelf with its head downwards. Within a few minutes it turned upwards again and disappeared on the nest shelf. It seemed likely that incubation was already in progress. On March 25 my wife and I made our first examination of the nest contents. When we placed a long ladder against the wall, the incubating bird left the nest. With scissors we cut a small slit in the upper part of the nest wall, inserted a small mirror and discovered two white eggs on the shelf. My expectation that the clutch was still incomplete was not confirmed, for on March 26 and 28 there were still only two eggs. It is known that *Panyptila* sometimes lays 3 eggs (Belcher and Smooker, 1936), and there is a clutch of 3 eggs in the Penard oölogical collection

from Surinam (Hellebrekers, 1942). In the nest under observation I would have noticed had any egg fallen out of the nest and smashed on the stone terrace below it.

It is possible that the eggs are plastered to the small nest shelf with saliva, for, on March 31, when my wife carefully touched the eggs with her fingers, she found them sticky. As a result of our examination a curious fact came to light: the small slit cut in the nest wall was fully closed at the next inspection! In fact every day we inspected the interior we had to make a new slit, for the birds promptly repaired the nest.

I have no certain evidence whether both birds took part in incubation. Probably they did, because I saw one bird enter the nest while the other was inside, and after a while I saw one of them leave the nest. Further I noticed that the incubating bird took a break in incubating every day just before roosting. As was true during the building period, both birds entered the nest for roosting in quick succession.

On April 1 at 16:30 one of the eggs had hatched, the egg shell was still on the nest shelf, the other egg was intact. Both birds had left the nest when my wife climbed towards it. On April 2 at 15:00 the bird left the nest at the moment my wife made the slit in the nest wall; the second egg had hatched. The two nestlings could be heard peeping when one stood under the nest. As incubation had already begun when I first examined the interior, the incubation period was not determined.

THE NESTLINGS

The nest shelf felt sticky, and my wife had some difficulty lifting the newly-hatched nestlings on April 2 (Plate 9, fig. 3). There was excrement on the rim of the shelf. The egg shells were gone. Either they had been eaten or carried away, for there was no sign of them on the terrace under the nest.

The nestlings were entirely naked, of a pink color with a dark bill. Their weights on this and the following days are given in Table 1, from which it is clear that development was extremely slow. In order to re-

TABLE I
WEIGHT OF NESTLINGS IN GRAMS

Date	<i>nestling 1</i> hatched on April 1	<i>nestling 2</i> hatched on April 2
April 2, 1957	1.7	1.4
April 4	2.9	1.3 (died)
April 6	4.2	
April 9	3.2	
April 11	3.9	
	died on April 13	
	12 days old	

duce disturbance as much as possible, nestling examination was limited to every other day. On April 4, a couple of hours after our nest inspection, the smallest nestling lay dead on the terrace under the nest. On April 8 (age of nestling 7 days) when we were on the point of examining the remaining nestling, it could be heard peeping loudly. It was not on the nest shelf, but somewhere under it, so we left it there without removing it. Again on April 9 at 13:30 the chick was peeping loudly. On opening a slit, the nest shelf was found to be empty. The nestling was clinging right at the top of the nest, which was 28 cms. above the nest shelf! The chick was very lively and peeping when we took its weight. On April 11 it was back on the nest shelf when we made our examination and again it peeped loudly. Thus it is clear that the nestling, at this early age (10 days), weighing only 3.9 grams, and with eyes still closed, wandered about along the nest walls (Plate 9, fig. 4). My wife found it difficult to loosen it from the nest wall and nest shelf, for it clung with its feet. On April 13 at 16:00 (there had been no nest inspection on that day) I found the nestling dead on the terrace, but not right under the nest. Apparently it must have fallen out of the nest alive. It was at that time 12 days old, still naked, and with *closed eyes*! The nestling is now preserved in alcohol in the Leyden Museum.

SUBSEQUENT USE OF NEST

Roosting of the pair in the nest continued nightly. On the morning of May 12 there lay a broken, fresh egg on the terrace under the nest. Nest examination was started again, but no more eggs were laid. On June 3 the nest fell down. Although we plastered it with tape against the stone wall it fell again during the night. Apparently the weight of the two roosting birds was too much for it.

On the morning of June 6 I watched the pair dashing a few times against the wall of my house, as they had when prospecting for a possible nest site ten months before. But after that date they did not return.

SUMMARY

The nesting of a pair of *Panyptila cayennensis* against the stone wall of a house in Paramaribo, Surinam is described.

After the destruction on September 1 of a partly built nest begun in August 1956, nest building began again on September 2 and continued steadily until eggs were laid in March, 1957.

The nest was a felted tube 66 cms. long attached on one side to a vertical wall. It was smooth on the inside and rough on the outside, composed of feathery tufts of plant seed glued together by saliva. The egg shelf inside the tube was built after the tube was finished.

The method of building the tube and shelf is described. Both sexes participate.

When the nest tube was only partly built both birds began to roost in the tube at night and continued to roost within the tube during incubation and fledging of the young.

Originally the birds had difficulty entering the nest tube at dusk to roost.

The clutch consisted of two eggs, apparently laid in March. The young hatched on successive days, April 1 and 2.

The nestlings were regularly weighed until each died, apparently by falling out of the nest. The nestlings were found dead under the nest, the smaller on April 4, the larger on April 13. Although 12 days old, the oldest nestling was still naked with closed eyes at the time of its death.

The adults continued to roost in the nest, and on May 12 a broken fresh egg was found below it. No more eggs were found, though the adults continued to roost in the nest until it fell on June 3.

LITERATURE CITED

- BEEBE, W. 1910. Our search for a wilderness. New York.
- BELCHER, C. and G. D. SMOOKER. 1936. Birds of the colony of Trinidad and Tobago. *Ibis*, 13th Ser. **6**: 28.
- HAVERSCHMIDT, F. 1954. Notes on the nesting of the Cayenne Swift in Surinam. *Wilson Bull.*, **66**: 67-69.
- HAVERSCHMIDT, F. 1957. Ogier de Gombaud, peintre inconnu des oiseaux de Guyane. *L'Oiseau*, **27**: 172-178.
- HELLEBREKERS, W. PH. J. 1942. Revision of the Penard Oological collection from Surinam. *Zoologische Mededeelingen*, **24**: 254.
- LACK, D. 1956a. A review of the genera and nesting habits of swifts. *Auk*, **73**: 1-32.
- LACK, D. 1956b. Swifts in a tower. London.
- RICHMOND, C. W. 1898. The Cayenne Swift (*Panyptila cayennensis* (Gmelin)). *Auk*, **15**: 7-10.
- SALVIN, O. 1863. Descriptions of thirteen new species of birds discovered in central Guatemala by Frederick Godman and Osbert Salvin. *Proc. Zool. Soc. London*, **1863**: 186-192.
- SICK, H. 1955. Nistweisen brasilianischer Segler. *Acta XI Congressus Internationalis Ornithologici* 1954. Basel: 618-622.

Paramaribo, Surinam, July 15, 1957.

PLATE OF *Panyptila cayennensis*

The picture in this issue was contributed by George M. Sutton, who generously painted it at the editor's request.