

NESTING OF THE STREAKED FLYCATCHER IN PANAMA

BY ALFRED O. GROSS

ORNITHOLOGISTS who visit the high mountains of southern Arizona in summer are apt to see and hear the Sulphur-bellied Flycatcher (*Myiodynastes luteiventris*), a noisy, quarrelsome bird which seems to prefer sycamores to other trees (Bent, 1942: 99-106). This flycatcher is the most northward-ranging form of its genus. Another species of the same genus, *Myiodynastes maculatus*, the so-called Streaked Flycatcher, is not known to range farther north than the Río Sabinas, in southwestern Tamaulipas (Sutton, Lea and Edwards, 1950: 51). It has never been recorded in the United States. It ranges southward through eastern México, Costa Rica, Panamá, Colombia, and Ecuador to northwestern Venezuela and extreme northwestern Perú—and even farther east and south if the closely allied *M. solitarius* be considered conspecific with it. The Sulphur-bellied and Streaked Flycatchers are amazingly alike in size and color. There may be differences in behavior, nesting habits and call notes between them, but these differences have never been reported adequately. Since the Streaked Flycatcher nested commonly on Barro Colorado Island in the Canal Zone during my visits there in 1925, 1927, and 1949, a report of my observations may be of interest and value.

The usual nest-site of the Streaked Flycatcher is a natural cavity or old woodpecker hole (Aldrich and Bole, 1937: 101). At Barro Colorado these are often so far above the ground or water as to be virtually inaccessible to a human being. When, during the construction of the Panama Canal, the Chagres River was dammed and Gatun Lake formed, hundreds of great trees were drowned. In 1925 and 1927 many of these trees were still standing. The soft, decaying wood had been easy to excavate, and innumerable nest-holes had been dug by woodpeckers. The abandoned woodpecker holes were used by such cavity-nesters as the Streaked Flycatcher. The only Streaked Flycatcher nests I found those two seasons were in dead trees standing in the lake. In May of 1935 Alexander Skutch observed two such nests in the lake. As the trees have rotted they have fallen. Not many of them are still standing. In 1949 so few were left that the Streaked Flycatchers were obliged to nest elsewhere. At least one pair coped with the hole-shortage by nesting on a roof. This pair I observed repeatedly from June 28, the day of my arrival, to July 27, the day of my departure.

No one knows, of course, how long that particular pair had been nesting about the buildings. Twenty-four years before, in December of 1925, Frank M. Chapman (1929: 59) had observed a pair at an old woodpecker hole high in a dead tree near the laboratory. That tree had fallen and where it had stood a house

for visiting scientists had been built. In 1935 Mr. Skutch had watched a pair of Streaked Flycatchers trying to build a nest on a window-sill of that house, but the loosely piled material had continued to blow away or fall off, so he had put up a box for them. Here they had promptly built a nest, laid three eggs, and raised a brood. The partly completed nest which I found on June 28, 1949 was not the only visible evidence that Streaked Flycatchers had been nesting about the buildings. On the roof of a house not far from the one in which I lived I found the remains of a nest possibly a year old.

The new nest was on the gently sloping metal roof of a porch on the east side of the house, close against the wall and tucked in under the ample overhang of the main roof. The early morning sun reached the nest, but during most of the day it was shaded, and the overhang of the eave sheltered it from the frequent torrential downpours. When I first examined it, it was a small mass of scattered twigs—the mere beginning of the foundation. The two birds came and went together, but I noticed that I never saw both birds carrying material at the same time. The coloration and size of the male and female were exactly the same so far as I could see. Each time the carrier of material flew in, the other bird came also—but never quite to the nest. Instead it veered off, took a perch in a nearby partly-dead orange tree, and remained on guard while the other cautiously went to the nest and added the material. This accomplished, both birds flew off together. Rarely did one bird come to, or leave, the nest alone.

By July 1 the nest was a substantial mass of material. The top was horizontal but the bottom sloped with the roof, so the outer (east) side was somewhat higher than the inner. The cup was quite deep. The birds made trip after trip to a large tree growing about 75 yards from the house in a ravine. Here one bird gathered material while the other perched in the very top. The gatherer of material, assumed by me to be the female, worked at the ends of the branches, tugging at and pulling off slender curved stems, some of which may have been dry petioles. These she shifted about in her bill as the load grew. Sometimes, with mouth full, she waited a while before leaving the tree. Once more at the nest, she stood in the cup while arranging the material. Between 8 and 11 o'clock that morning material was brought to the nest once about every 15 minutes. In the middle of the day the birds took a recess. They did not resume their nest-building until late afternoon.

On July 2, work started at 7:15 a.m. In addition to coarse twigs for the walls, finer twigs and tendrils for the lining were being gathered. At 8:43 a.m. the bird I assumed to be the female alighted on the edge of the roof with 6 or 7 long fibers in her bill. Apparently scrutinizing her surroundings, she stood there for two minutes, then flew directly to the nest, alighting in the bowl itself. Here, instead of dropping her load, she moved her head from side to side, letting the dangling fibers fall between her body and the nest wall. She made no attempt, so far as I could see, to adjust their position with her bill. Now, lifting her wings and tail, she pressed the fibers into the nest with her breast. Shifting

and turning, sometimes going about in a complete circle, she forced them into place. Then, with wings folded and tail stuck upward so that it touched the overhanging roof, she rested, panting hard. The heat must have been intense, for at that hour the roof was not shaded in the slightest. Five times that morning I observed this pressing into the lining of a load of fibers. The procedure was essentially the same each time. About noon nest-building stopped for the day.



Streaked Flycatcher (*Myiodynastes maculatus*) on favorite perch near nest. Photographed on Barro Colorado Island, Panama Canal Zone, in July, 1949, by Alfred O. Gross.

On July 3 the sky was cloudy and the weather cooler. Possibly as a result of this, the birds were very active. I first saw a bird at the nest at 7:46 a.m. Observing continuously from that time on, I recorded arrival with nest material at 8:15, 8:19, 8:24, 8:27, 8:34, 8:40, 8:46, 8:52, 8:59, 9:06, 9:14, 9:22, 9:30, 9:38 and 9:45. The average time-lapse between these 16 recorded visits was about 8 minutes. After 10 o'clock that morning visits were less frequent, but they continued even during a light shower. The birds did not seem to be disturbed in the least by workmen who walked in front of the house, nor did they

pay much attention to a group of White-faced Monkeys (*Cebus capucinus*) which fed and frolicked in a tree not far away.

I noted no striking courtship behavior of any sort that day. While the female was coming in with nest material I did see the pair copulate, however. Thus I ascertained that the female was doing the nest-building *at that time*. I saw the male lift his crest after copulating, revealing the usually concealed bright crown-patch, but this hardly seemed to be a definite display. I failed to note any individual peculiarity through which I might hope to be able to distinguish the male from the female thereafter. Occasionally, that day, one bird arrived at the nest without an escort. I assumed this bird to be the female. Evidently ill at ease, she flitted about calling nervously until her mate appeared and took his usual position in the partly-dead orange tree.

Nest-building continued on July 4 and 5, but trips for material seemed to be less frequent. The only material now being brought was long, fine, reddish brown plant fibers. These the female (?) continued to press into place with her body (possibly to some extent with her feet), making no attempt to weave or interlace them with her bill. She turned and shifted a great deal, molding the cup to exactly the right shape. As a whole, the nest was rather flimsy. It was spread over an area about 18 by 20 inches. Its greatest actual over-all depth (not allowing for the slope) was $4\frac{1}{2}$ inches. The cup or bowl was $3\frac{1}{8}$ inches deep and $3\frac{1}{4}$ inches in diameter at the rim. The only lining materials were long, thin plant fibers. The wall and foundation materials seemed to slip out of place easily. Had the nest been in a cavity it probably would have remained more compact.

On July 6 the birds were in the trees and shrubbery about the laboratory, but I did not see either of them at or near the nest. During a heavy rain in the afternoon I saw them perched together in a blossoming *Isertia* bush with their plumage plastered down and their bills directed upward toward the falling drops. After the shower they flew up to an electric cable where, side by side, they dried and preened for 25 minutes. They paid no attention to persons passing only a few yards away. They seemed to be half-domesticated.

At 7 a.m. on July 7 the female was on the nest and the male was in a tree not far away chirping and singing. In his bill was a long fiber. He did not, however, fly with this to the nest. This was the only time I saw what I felt reasonably sure was the male carrying nest material. The female remained on the nest all morning. When I visited the nest after her departure it held one egg.

On July 8 there were two eggs in the nest at 11 a.m., and I assumed that the clutch was complete when none was added the following day. On each of my visits to the nest I made a point of waiting until the birds were out of sight, but by the time I climbed to the roof both had returned. They attacked fiercely, swooping at me and striking my head with their wings. As soon as I left the nest and got down from the roof, however, they seemed to pay no attention to me or to other persons who walked about the building.

On the morning of July 10 I was surprised to find a third egg in the nest.

The female made short visits to the nest that morning and early afternoon, but she did not seem to settle down to actual incubation until late afternoon. She was on the nest at dusk and remained there during the night.

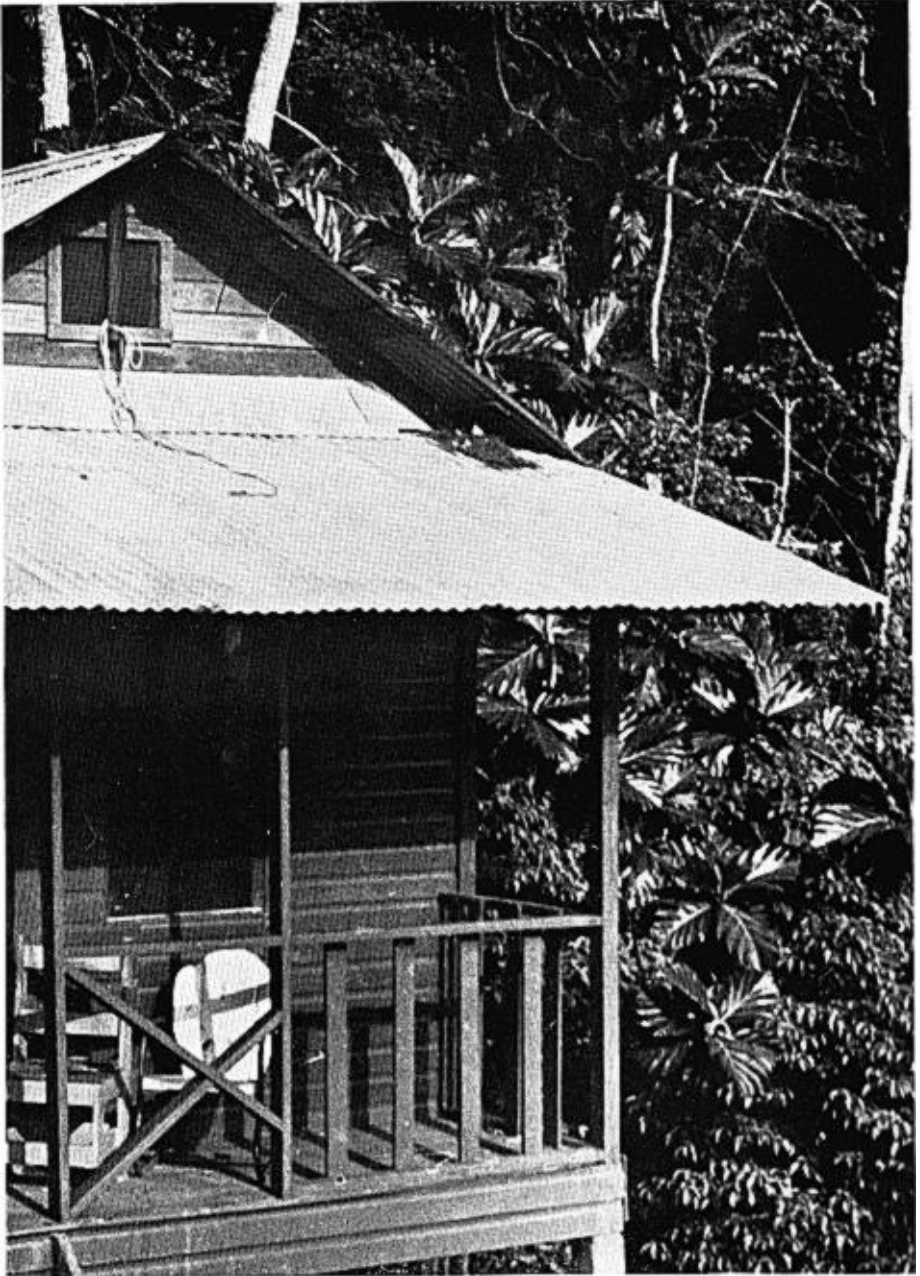
On July 11 the female was on the nest (so far as I know) continuously until 10:30 a.m., at which time she left the nest with the male and went off to feed. The day was warm. The birds did not return until 1 p.m. The *female* went to the nest almost immediately and settled down to incubating. The *male* remained in his favorite orange tree, perching near the top and preening vigorously. At 4 o'clock the female left the nest, returning presently with several



Nest and eggs of Streaked Flycatcher. Photographed on Barro Colorado Island, Panama Canal Zone, in July, 1949, by Alfred O. Gross.

fibers in her bill. She alighted near the male and, without any courtship or display that I could see, the pair copulated. Still holding the fiber in her bill, the *female* now flew to the nest, placed the material somewhat casually on the rim, and settled upon the eggs, resuming her incubation.

At 4:45 a Ghiesbrecht's or White Hawk (*Leucopternis albicollis*) flew low across the clearing, heading for a stump just south of the laboratory. The male Streaked Flycatcher instantly left his perch in the orange tree and dashed at the hawk, causing it to change its course completely. It alighted in a cecropia tree. Here, shrieking in protest, the smaller bird continued for about twenty minutes to give battle. Finally, nagged and badgered to the edge of the clearing, the



Nesting site of Streaked Flycatcher on metal roof, Barro Colorado Island, Panama Canal Zone. Photographed in July, 1949, by Alfred O. Gross.

hawk left, and the flycatcher returned to his post in the orange tree. Despite all the commotion, the female flycatcher had remained on the nest. The male's attitude toward the hawk surprised me somewhat, for he had paid no attention to the many tanagers, honey creepers, cotingas and other birds which visited his orange tree from time to time. I had seen even a Tropical Kingbird (*Tyrannus melancholicus*) alight only a few inches from him on his favorite branch without causing an altercation.

On July 12, while I was measuring the eggs on the roof, the flycatchers attacked me more fiercely than usual. One of them dashed at my hand, striking the metal calipers so hard that a mass of feathers was dislodged. No great harm was done, however, and the attacks of both birds continued unabated. The excitement died down completely as soon as I left the roof.

On July 12 and 13 there were only three eggs in the nest, so I judged the clutch to be complete. The eggs were strikingly and beautifully marked. Their ground-color was very Pale Olive-buff¹, almost white. Over their entire surface, but especially at the larger end, they were streaked and blotched with reddish brown. The shade of most of the markings was about Van Dyke Red. At the larger end, where the ground-color was almost completely obscured, the markings varied from Hays Maroon to Diamine Brown. The eggs measured (in millimeters) and weighed (in grams) as follows:

	Longest diameter	Shortest diameter	Weight
1	23.0	19.1	4.65
2	22.8	18.9	4.59
3	24.2	19.5	4.72
Average.....	23.3	19.2	4.65

Skutch (1945: 19) gives the average measurements of three eggs as 27.7 × 18.6 mm. These were the eggs of Costa Rican or Panamanian birds. Three *Myiodynastes luteiventris* eggs collected along the Río Sabinas in Tamaulipas averaged 25.5 × 18.6 mm. (Sutton, Lea, and Edwards, 1950: 51).

On July 16 (the eggs had now been incubated 5 full days), the female left the nest at 1:45 p.m. and, accompanied by her mate, flew to the trees bordering the farther side of the clearing. I saw neither bird again until 5 p.m., when both returned to the partly-dead orange tree. Presently the female went to the nest. The eggs had been uncovered for over three hours, but to say that they had not been incubated at all during that time would be to disregard the heat of the day and of that particular under-the-metal-roofing nest-site.

On July 17 the female was away from the nest from 10 a.m. to 2 p.m. and again from 4:15 to 5 p.m. On July 18 she was away from the nest from 6:30

¹ Capitalized color-names used in this paper are from Ridgway's *Color Standards and Color Nomenclature* (1912).

to 9:10 a.m. and from 10:30 a.m. to 1:30 p.m. A heavy rain from 3:05 to 3:30 p.m. did not seem to disturb her in the slightest.

On July 22 (the eggs had now been incubated 11 full days) I decided to observe the nest continuously all day. I started at 6 a.m. At that time the female was on the nest. My log for the day is shown in Table 1.

During the tabulated 12 hours and 45 minutes (see Table 1) the female was on the eggs a total of 5 hours 43 minutes, off them a total of 7 hours 2 minutes, this on the 12th day of incubation. Incubation continued July 23 and 24. On both these days the female was off the nest for considerable periods, but I did not record her comings and goings. Throughout the entire 15-day incubation period she was, so far as I know, on the nest continuously each night.

TABLE 1
ATTENTIVE AND INATTENTIVE PERIODS AT NEST, TWELFTH DAY OF INCUBATION

	On Nest	Off Nest
6:00 a.m.- 6:20 a.m.....	20 min.	
6:20 a.m.- 9:30 a.m.....		3 hrs. 10 min.
9:30 a.m.-10:35 a.m.....	1 hr. 5 min.	
10:35 a.m.-10:40 a.m.....		5 min.
10:40 a.m.-10:42 a.m.....	2 min.	
10:42 a.m.-11:15 a.m.....		33 min.
11:15 a.m.-11:19 a.m.....	4 min.	
11:19 a.m.-11:45 a.m.....		26 min.
11:45 a.m.-11:57 a.m.....	12 min.	
11:57 a.m.-12:22 p.m.....		25 min.
12:22 p.m.-12:56 p.m.....	34 min.	
12:56 p.m.- 3:00 p.m.....		2 hrs. 4 min.
3:00 p.m.- 6:26 p.m.....	3 hrs. 26 min.	
6:26 p.m.- 6:45 p.m.....		19 min.
6:45 p.m.....	returned to nest for night	

Each time I paid the nest a nighttime visit the female was there and I was surprised at her staying on the nest despite the noise, the considerable vibration of the roof, the flashlight, and the flash-bulbs used in photography.

On July 25 I went to the nest at 8 a.m., finding one egg hatched (the shells had been removed) and another pipped. The parent birds seemed to be more excited than they had been at any time during the incubation period. Until about 9 o'clock the sun struck the nest directly. During much of this early morning period the female stood on the nest-edge shading the young bird and hatching egg. At 9:23 the male brought food (presumably soft-bodied insects), fed the young one directly (i.e., without passing it first to the female) in several small installments, and returned to his orange tree, there to utter *cheer-o-wee-wee*, one of the more musical of his cries. The female now settled on the nest.

The heat was intense. As she panted I noticed the deep red color of her tongue and the yellow of her mouth-lining. Having brooded her eggs and young one a few minutes she hopped up to the nest's rim, peering at the young one and poking her bill among the eggs and young as if expecting a fecal sac to appear. At 10 o'clock both flycatchers flew off for a short time. On coming back, they took turns in feeding the young one. The male now flew to his orange tree, but the female stayed at the nest. From noon until 2 p.m., rain fell. During this time the female was on the nest, brooding closely. At 2:15 I saw her removing some egg-shells. The second egg had hatched. The male flew to the nest with food. Between feedings he uttered curious gurgling notes. These were faint, but quite distinct, and very different from his song and usual call notes. The third egg did not hatch. On examining it later, I found that no embryo had developed in it.

The down of the young birds was Blackish Slate on the top of the head, between Mouse Gray and Deep Mouse Gray on the upper part of the body, and virtually white below. I noted that there were two tufts in the middle of the crown as well as one above each eye; tufts on the nape, and scapular, humeral and femoral regions in addition to the extensive spinal tracts, and an elongate tract on each side below. The naked parts were Flesh Color, the tarsus and toes Pinkish Vinaceous, the claws Cartridge Buff and the gape Pinard Yellow. Skutch (in Bent, 1942: 102) described the natal plumage of the closely allied *Myiodynastes luteiventris*, as he had observed it in Costa Rica, as "rather copious, long, dusky down."

Unfortunately I had to leave Barro Colorado on July 27, so I could not continue my observations of the nestlings. Dr. James Zetek and his assistants continued to watch them however, ascertaining that they left the nest at 11 a.m., on August 12, when they were 18 days old. Skutch (1945: 19) gives the nestling period as "at least 21" days. The Barro Colorado birds may have left the nest somewhat prematurely.

CALL NOTES OF *Myiodynastes maculatus*

The Streaked Flycatcher has been described as a noisy bird (Todd and Carraker, 1922: 345), but what I observed on Barro Colorado did not substantiate this concept except when I climbed to the nest. Excited by my presence there, the pair uttered loud screaming notes. The usual call notes were chirps not unlike those of the Song Sparrow (*Melospiza melodia*), but louder and with a distinct metallic quality. Both the male and female gave this call note. When one gave it the other usually answered with the same note. Occasionally I heard them give a loud *witchy, witchy*.

The song, which is sometimes preceded by 'sparrowlike chirps', and which probably is given only by the male, was so unlike what I had expected that for some time I could not believe *Myiodynastes maculatus* was giving it. It was a

series of subdued, pleasing, rather high-pitched notes which I wrote down as *cheer-o-wee-wee*, *cheer-o-wee-wee*, *cheer-o-wee-wee*. I heard this song throughout the period of my observations of the roof-nest in 1949, and I heard it at various times of day. It was usually given from a high perch. Skutch, in unpublished MS notes pertaining to a song of the species he heard on Barro Colorado in July 1931, says: "the bird perched on the top of a tall tree in a clearing, and at dusk began to sing. It was a pleasing, simple melody, clearer and softer than possessed by most flycatchers: a half-whistled, sweet *Right-here-to-me*, *Right-here-to-me*, *Right-here-to-me*." An early morning *Myiodynastes* song reported from the Río Sabinas, in Tamaulipas, and El Salto, San Luis Potosí, was four-syllabled, as were the *cheer-o-wee-wee* and *right-here-to-me* songs just described (Sutton, Lea, and Edwards, 1950: 49).

FOOD HABITS OF *Myiodynastes maculatus*

In mid-July, 1949, I noted repeatedly that the Streaked Flycatchers whose nest I was observing seemed to ignore the clouds of small brown dragonflies which were all about them. They centered their attention, apparently, on smaller, more delicate insects.

On July 24, 1949, I saw a Streaked Flycatcher kill and eat a three-inch-long lizard. Holding the struggling reptile in its beak, the bird struck first the head-end, then the tail-end of its victim against the branch on which it was perched, ran the numbed lizard rapidly through its bill, transferred it to its feet, dealt it several blows with its bill, and started swallowing it. With the lizard half-swallowed, the flycatcher rested momentarily, letting the limp tail protude. Finally, with a violent shaking of its head, it got the lizard down.

These lizards were numerous in latter July. I often saw them on the screens of the buildings. On July 25, while making observations at the nest of a Hicks' Seedeater (*Sporophila aurita*), I saw a Streaked Flycatcher alight on the ground under the nest-tree, capture a lizard, fly to a low dead branch and batter the animal to death. Killing or numbing the lizard sufficiently for ingestion required four minutes. Twenty minutes later I saw the same bird catch and eat another lizard in the same way.

SUMMARY OF NIDIFICATION DATA

A Streaked Flycatcher nest, started on or about June 28, was not entirely finished on the evening of July 5, but very little work was done on it the following day and the first egg was laid July 7. Time required for building: about 8 days.

One bird seemed to do all the gathering of material and actual building and I believe this was the female. On one occasion I witnessed copulation and the female had nest-material in her bill at that time. On another occasion, however, when the supposed female was on the nest, the other bird had a fiber in its bill. The other bird did not add this fiber to the nest.

The first egg was laid July 7, the second July 8, the third July 10. Incubation apparently did not start until the afternoon of July 10, but it may have started earlier. I am not sure that a bird spent the night on the nest during the egg-laying period. On the evening of July 10, however, a bird was on the nest and it spent the night there.

On July 11 (her clutch was complete) the female added a billful of material to the nest. I believe the female did all the incubating. I never saw the incubating bird being fed at the nest by the other. I never saw two birds at the nest together during the period of nest-building, egg-laying, or incubation.

Only two of the eggs hatched. They hatched July 25. Incubation period: at least 15 days, possibly more, since it may have been the egg laid July 10 that did not hatch.

Both parent birds fed the newly hatched young directly—i.e., the food was not passed from one parent to the other before being given to the young. The young remained in the nest until August 12, being fed by both parents throughout this period. The young may have left the nest prematurely. Fledging period: at least 18 days.

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