

A SEA-CAVE NEST OF THE BLACK SWIFT

By KEN LEGG

The first reported nest and egg of the Black Swift (*Nephoecetes niger*) was found on a damp cliff above the sea near Santa Cruz, California. In Vrooman's account (1901) the nest which held the egg was described as "a slight depression in the mud" just behind a tuft of grass. Since Vrooman's discovery there have been published accounts of other nests, all of which have been in the mountains, usually in damp situations near waterfalls. The nests, unlike the first nest, were well-shaped cups constructed of the pinnae of five-finger fern (Michael, 1927), moss (Smith, 1928; Thompson, *vide* Bent, 1940: 260; Hall, 1948; and Murphy, 1951), or resurrection-moss (Dixon, 1935).

In July, 1955, Emily Smith told me that there was a Black Swift egg in a seaweed nest in a sea cave near Santa Cruz. Knowing, through the late Clark Streater, that Black Swifts had nested in the cave, she visited it on July 7. As far as can be determined, this is the first record of a nest in such a situation. The location did, however, correspond in certain respects with other nest sites. It was dark, no sunlight ever reaching the nest, and it was constantly moist.

The nest in the sea cave was a thick-walled, compact, well-built saucer of live, green seaweed (*Enteromorpha* sp.), an abundant plant in the area, growing upon both horizontal and vertical rocks; this plant comprised about 90 per cent of the nest. In the center and making up about 8 per cent of the bulk was *Phyllospadix*, with *Porphyra naiadum* epiphytic on it. These are both marine plants, the former a flowering plant, the latter a red alga. Another red alga represented by a fragment was *Plocamium pacificum*. Two kinds of moss were also used in the nest and together comprised about 2 per cent of the bulk: *Porothamnium bigelovii* and *Brachythecium*(?). The former is described in bryological works as growing on moist shaded rocks, sometimes in the reach of salt spray. The nest had a "cushiony" appearance. No saliva was used.

The complete clutch, consisting of one egg, was present in the nest at 7:00 a.m. on July 7. When Miss Smith visited the cave at this time there was no incubating bird present. Outside, she saw two Black Swifts circle by the entrance several times and then fly out of sight. Soon afterward there were four swifts present, two engaging in courtship behavior, but it was not long before all four were gone, none having entered the cave. The swifts were not seen again in the course of an hour's watch. It is possible that incubation had not begun on the 7th.

On July 14 I visited the cave, and, as I entered, the incubating bird flushed from the nest. On July 21 the adult was reluctant to leave. On the 24th I led a group of twenty naturalists to the cave and we entered as a group. While I held a flashlight beam upon the bird, the group stood some ten feet away, and although we watched and talked for some time, the bird sat tight.

A visit to the cave on August 4 revealed a black-skinned, naked, helpless little swift sprawled in the bottom of the nest. No adult was seen. Murphy (1951:449) gives the incubation period as approximately 24 days. If incubation was begun on July 8, as is suspected, and the egg hatched on August 3, this would give an incubation period of 27 days in this case.

On August 18, at an age of approximately two weeks, the nestling was completely covered with heavy down, and unopened feathers were present only on the wings and tail. By August 25 it had short tail feathers and the wings were feathering out. The bird was banded on this date.

On September 1 the nestling appeared to be nearly full grown and was observed

preening itself and scratching its head with its foot. The young bird completely ignored my presence. On September 2, at an age of four weeks, I took the bird in hand to check the band. It clasped the nest lining with one claw to resist being lifted from the nest, and it attempted to bite my hand.

It had been suspected that at least one of the parent birds was roosting in the cave with the young. Just before midnight on September 10, James Beck and I visited the cave. The night was exceedingly dark and a heavy, low fog shrouded the coast.



Fig. 1. Sea cave in which Black Swift nest was located near Santa Cruz, California.

As we entered the cave, our light beams stabbing the darkness, an adult swift fluttered helplessly to the sand floor, then clung to my companion's trouser leg and remained there until he caught it. He deposited the bird on one of the low ledges, but it flopped down again, this time catching my trouser leg and pulling itself up nearly to my waist.

I took the bird in my hand, examining it carefully. The tail was spread and it was quite discernable that the tail feathers were pointed, much like those of a creeper. In contrast to the juvenile still on the nest, which had a silvery forehead, the head of this adult was brown. A size comparison was made and the adult was found to be noticeably smaller than the young. We extinguished the lights, and I placed the bird at arms-length back upon the highest ledge which I could reach. We then departed hastily into the darkness. Although this adult was completely confused in darkness, these birds apparently leave the nest site quite early if it is a moonlight night. On an earlier visit, on September 2, I was at the cave at 5:30 a.m. This was twenty minutes before any hint of dawn. The parent had departed. At 5:50, just as dawn was starting to show the first faint signs, the parent returned, presumably from a foraging trip. This particular morning, however, was an exceptional one. There was no fog; it was clear and warm, and a full moon was shining. Even as one stood in the darkened cave and looked toward the mouth, considerable light could be seen above the ocean.

At 6:00 p.m. on September 16 the young was still on the nest. On September 17 at 4:30 p.m. the fully developed young had left. Probably the bird was hatched on August 3. If so, it was in the nest for the long period of forty-four days, leaving sometime on the forty-fifth day.

Koskimies (1950) gives the nestling period for the European Swift as from forty to forty-three days and states that when the young leave the nest they are completely independent and probably start on migration immediately.

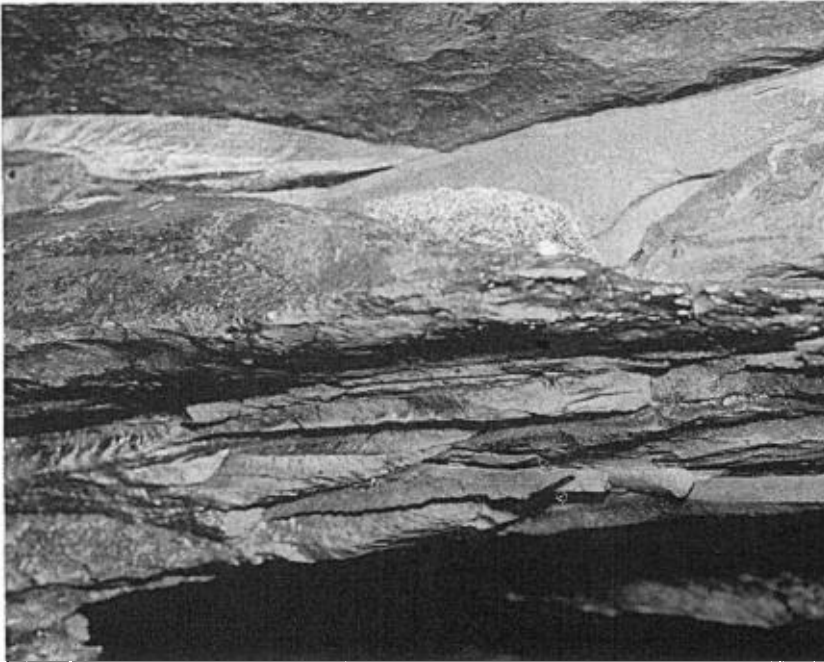


Fig. 2. Seaweed nest of Black Swift on shelf in sea cave.

We were interested in the heavy covering of down on this swift at two weeks of age. The down that the nestling swift acquired after hatching appeared as heavy as the natal down of a precocial bird. The young of the Chimney Swift (*Chaetura pelagica*) are without down (Bent, 1940:275), but we have no information on the other two North American swifts.

Although we cannot prove any adaptive value, it is interesting to speculate on the advantage of down to the Black Swift nestling. In the literature already cited the nest sites are described as dark, cool, and with one exception, damp. Smith and Michael both found that the young bird was alone in its chilly nest for long periods between feedings. Furthermore there is a possibility that the Black Swift undergoes torpidity at times.

Udvardy (1954) in his analysis of the summer movements of Black Swifts in relation to weather cites Koskimies' experimental study which proved that the nestling of the European Swift (*Micropus apus*) can survive starvation by reversible torpidity while its parents are away during the passage of a storm. Because the two swifts are closely related and have similar habits, as Udvardy points out, it is possible that the lone Black Swift nestling, in times of stormy weather, can wait for several days in a torpid state for the return of its parents. Under these chilly conditions a covering of

down would have its advantages. However, we saw no evidence of torpidity in the nestling and the adults apparently had regular and daily food schedules.

On August 18 insect remains were collected at the nest. The young ejected feces over the nest rim onto the sand below, but just outside the nest and on the nest rim were found fragments of insect remains. One of these bits of material had the form of a regurgitated pellet.

Examination revealed this to be a mass of ingested material. The bulk of it consisted

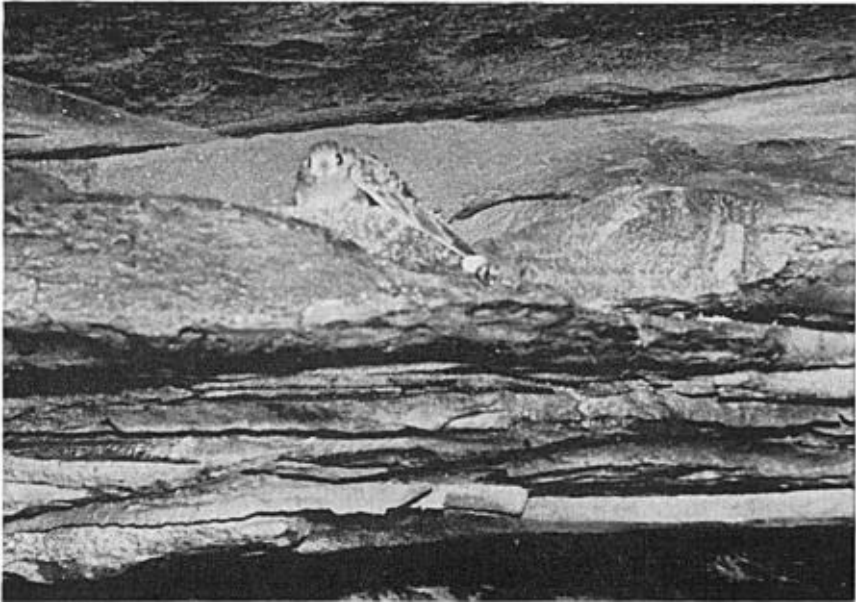


Fig. 3. Nestling Black Swift on September 2, 1955.

of portions of ants, pieces of the wing veins being found to establish this fact. In addition, the remains included one crane fly, one damsel fly, and five dipterous larvae (family Anthomyiidae).

Other insect remains found near the nest included remains of beetles and flies. Among recognizable ones were represented the beetle family Carabidae and fly families Chironomidae and Tipulidae.

Koskimies (1950) mentions "food balls" (insect masses) being brought to the young of European Swifts. The adults travel great distances and capture large quantities of insects which are carried in the throat during transport to the young. The material collected at the Black Swift nest, however, showed that it had been ingested. We can speculate that the Black Swift, like certain of the flycatchers, regurgitates indigestible insect parts.

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SUMMARY

A Black Swift nest constructed of fresh green seaweed and containing one egg was found in a sea cave. An approximate incubation period of 27 days and a nestling period of 45 days were recorded. The nestling, at the age of two weeks, was heavily down-covered. Insect remains collected at the nest consisted mainly of ants, but one crane fly, one damselfly, and five dipterous larvae were identified.

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