THE YOUNG OF THE CALIFORNIA GRAY SQUIRREL

The large arboreal nests of the California gray squirrel (*Sciurus griseus griseus* Ord) are not uncommon in the Transition Zone forests of California but the finding of young in one of these nests is a rather unusual event. In fact, I have not been able to find any published account of the young of this species except general statements relative to the number to a litter and approximate season at which they are dropped.

On April 13, 1919, while in the hills near Lake Lagunitas, Marin County, California, I examined a number of arboreal nests of mammals. Some of these were the work of the brown-footed woodrat, but the majority of those investigated had been made by gray squirrels as attested by their smaller and more rounded form, more compact structure, and greater height above the ground. In the Sierra Nevada nests of the gray squirrel are more often placed in conifers, but in the coast redwood belt the animals use the live oak, California laurel, and madrone. The nest discussed here was about 40 feet above the ground in a live oak, just within the crown of green leaves at the top of the tree. It came to attention only when the tree was examined from directly beneath. The nest tree was in a grove of live oaks on a slight rise of ground between two rather level small valleys.

This nest was about 50 centimeters in outside diameter. The form of the base of the nest suggested that it might originally have been constructed by a western crow, a bird which is common in many parts of Marin County. There were portions of several flight feathers of a crow in the nest but these could well have been picked up on the ground by the parent squirrel when gathering material for the nest lining. The central soft portion of the nest was about 25 centimeters in diameter. At the bottom it was made up of shredded oak bark prepared by the parent squirrel in the manner common to many rodents, and much of this material was in very short lengths. Above this was a soft mass of gray lichen, chiefly *Usnea florida* but with some *Evernia prunastri* and a slight amount of a moss, *Aisia longipes*. Over the moss and lichen were some live oak twigs cut green to which the leaves were still adhering. In the central soft part of the nest were the two young squirrels where they could easily keep warm while the female was away.

The young squirrels were packed in an "egg" box and taken to Berkeley where they were kept alive for a few days, being sheltered in a box lined with cotton. They were fed on "Carnation" condensed milk, diluted with three parts of water. This diet was obviously unsuitable as it caused a violent digestive disturbance, more or less constipation, followed by a profuse diarrhea, and so weakened the young that they had to be killed and preserved as specimens. Upon autopsy of one of the squirrels the caecum was found to contain much caseated milk and to be bloated with gas. Possibly cow's milk would have been more suitable. Instances have been reported where a cat whose young have been removed has acted as foster parent for young squirrels. Great difficulty was experienced in keeping the young squirrels sufficiently warm.

When the nest was first opened a finger thrust at the young squirrels was eagerly seized and sucked—an obvious feeding reflex. Later, in captivity, whenever they were touched, their forefeet would work around and eagerly

grasp a person's hand. On the evening of capture, warm diluted "Carnation" milk was offered in a glass medicine dropper. Little was taken then, but the next day they fed five times, and at one feeding each took about 10 cubic centimeters of the milk. The following day they were fed four times at intervals of approximately four hours, taking about the same amount at each feeding. Similar feeding was carried on for two days more but by the fifth day they showed little desire to feed, and their weakened condition caused abandonment of further attempts to keep them alive. Often a finger wet with milk would be seized and sucked on eagerly until all the milk had been drawn in. The tongue was held in a broad U-shape when sucking.

When feeding, the young pushed outwardly with their fore feet, and they suckled the medicine dropper contentedly only when their feet found a surface against which they could press. Presumably when feeding normally they massage the mammary glands of the female as do the young of domesticated animals. They squirmed a good deal while feeding but more than once upon having their hunger satisfied they fell asleep before being put away. Between feedings the young spent practically all of their time asleep. When first taken they twitched and twisted while asleep but this was less evident as they grew larger. When asleep they curled up with the nose toward the lower part of the abdomen and often with one hind leg thrown over the head. The young uttered low squealing sounds when taken from the nest and later, in captivity, especially if they became cold.

When first seen the skin of the young squirrels was loose and wrinkled. Three days afterward their bodies had filled out so that this condition had entirely disappeared. The hair, which at first was but a slight growth on the dorsal surface, had in the same period of time grown rapidly, and the white lateral fringing of the tail began to show. A brown spot appeared at the inner base of each ear and the black ended overhairs on the dorsum showed conspicuously. But there was only a very slight growth of hair on the belly during this time. The whole appearance of the young was substantially changed during this interval. When found, the disproportionate size of the head and feet suggested the young of a carnivorous mammal. This changed to a typical squirrel appearance within three days.

At no time were the eyes open, although to judge from their growth in captivity the squirrels must have been more than a week old when found. Forty-eight hours after being collected the male weighed 74.6 grams and measured (approximately) $205 \times 93 \times 34 \times 8$ millimeters. Three days later he measured $220 \times 100 \times 35 \times 8$. The female weighed and measured at the same time, was 80.4 grams and measured $225 \times 95 \times 37 \times 8$. Similarly, when prepared as a specimen, she measured $240 \times 102 \times 40 \times -$. Weights were not taken subsequently as the animals were much reduced by their enteritis and weights then would not have been significant.—TRACY I. STORER, *Museum of Vertebrate Zoology, University of California, Berkeley, Calif.*