

THREE NOTABLE NESTING COLONIES OF THE
CLIFF SWALLOW IN CALIFORNIA¹

WITH THREE ILLUSTRATIONS

By TRACY I. STORER

THE AMERICAN Cliff Swallow (*Petrochelidon albifrons albifrons*) is so common and ubiquitous a member of the lowland and foothill avifauna in California as scarcely to arouse more than passing interest, even from the amateur bird student. Originally the Cliff Swallow nested upon rocks (as its generic name indicates), but the species has largely changed its habits with the advent of human occupancy of the country and builds now mostly upon barns and similar buildings with sheltering eaves. Indeed, so extensively has the bird changed its habits that beginning students are often confused by the appellations "cliff swallow" and "barn swallow" as applied to *Petrochelidon* and *Hirundo*, and more than once it has been suggested that these two swallows should be designated respectively as "barn swallow" and "bridge swallow", better to indicate their present-day ecologic tendencies. With this shift in its customary nesting site, our "cliff swallow" has profited greatly as a species. Nesting supports are available in many plains localities which formerly lacked such facilities and this has actually increased the local area which the species occupies. Agricultural development also may possibly have augmented the potential food supply for swallows, although this feature is less capable of satisfactory demonstration than the preceding.

During the summer of 1925 three unusual nesting colonies of the Cliff Swallow in "natural" locations came to the writer's attention. One of these was notable by reason of its large size, the other two because of the high altitudes at which they were situated.

In the bed of Putah Creek, on the Yolo-Solano County boundary, about three miles southwest of the town of Winters, there stand several irregularly rounded masses of basaltic rock. These rocks, by reason of artificial damming of the creek, are practically surrounded by water throughout the year. In winter the rocks are washed and occasionally completely covered, with the advent of torrential rains in the upper cañon. The stream-facing side of the largest rock in this group is the site of a very extensive colony of Cliff Swallows (fig. 39). Mr. Louis A. Sackett, whose ranch fronts on the creek at this place, states that the birds have nested there for many years (as long as he can remember) and the place is known locally as the "Swallow Rocks". Other possible sites are available to the swallows in the vicinity, on other rocks of the same group and on various outcrops in the surrounding hills; but the local population, save for a few pairs nesting on a closely adjacent similar rock, all place their nests on this one large rock, which, to the writer, seems to be the safest location available within a radius of a mile or more. The base of the tenanted rock touches the adjacent shore, but the overhanging slope and texture of the surface on which the nests are located precludes attack by terrestrial enemies.

This colony is, apparently, completely rebuilt every year. On June 17, 1925, when the accompanying photographs were taken, there were, so far as could be determined, about 400 nests in the colony. On March 14, 1926, when the site was revisited, not a single nest remained, flood waters from the stream, and winter rains having scoured the rock bare. The area occupied by the main colony in 1925 was approximately 10 by 10 feet in extent. No nests were closer than about three feet to the

¹ Contribution from the Zoological Laboratory, College of Agriculture, University of California.

water, suggesting that late spring freshets had washed off any lower nests to an even line. The nests were placed so closely together that in a number of instances the wall of one nest served as a starting place for another later nest. A few nests were built entirely upon others, not reaching the rock at all. There was a general tendency toward a retort shape, best seen in isolated nests, but the congested condition of the colony resulted in many departures from the conventional form. One nest was bowl-shaped, open at the top, suggesting the nest of a Barn Swallow. A few were placed at right angles to the rest, the entrance then being against the rock surface. The entrance aperture tended to be about 40 millimeters ($1\frac{5}{8}$ inches) in diameter, but slightly broader than wide. The circle of attachment at the back varied from 120

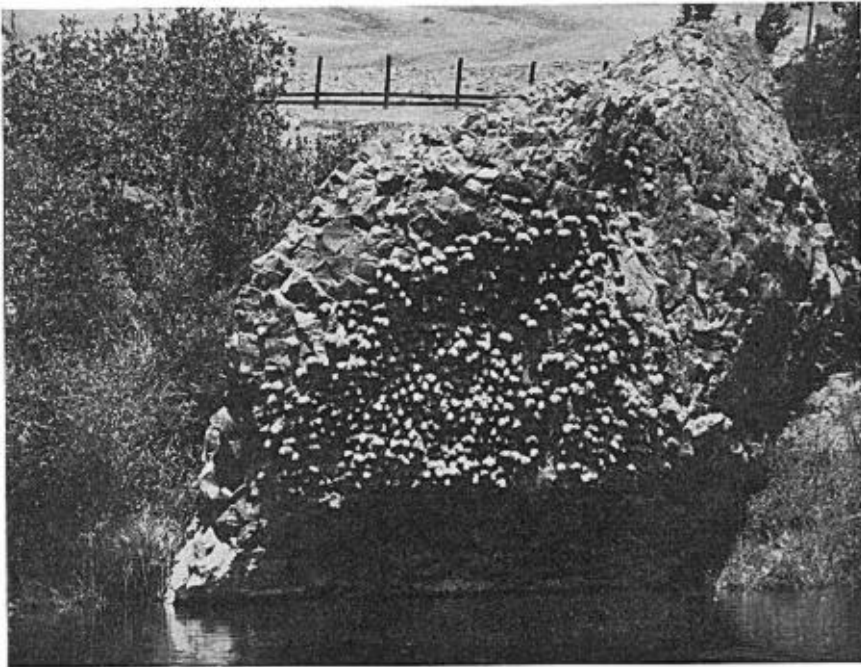


Fig. 39. NESTING COLONY OF CLIFF SWALLOWS ON ROCK IN PUTAH CREEK, THREE MILES SOUTHWEST OF WINTERS, YOLO COUNTY, CALIFORNIA. PHOTOGRAPHED JUNE 17, 1925.

to 140 millimeters (about 5 to 6 inches) in diameter. The mud used was in general free of organic material, but occasionally it included a few fine grass stems. Much of the material was secured at a point about a mile from the colony, there being no suitable material closer to the site. The construction of each nest therefore involved flight aggregating several hundred miles upon the part of the parent builders. Many of the pellets showed an impression of the broad weak bill of the adult, used finally to push the tiny rounded "brick" into its place in the structure.

The lining in each nest was a shallow pad of fine dry grass stems. Fields above the creek on either bank over which the swallows were foraging afforded an abundance of this grass. Extension and repair of nests were continued even until large well-feathered young were present in the nests. A tendency to keep the entrance to a constant size was evident.

On May 31 there were both eggs and young birds in the nests, but no young were seen abroad. Of four nests opened on June 1, three held two, three and four eggs, respectively, and the last had five well-fledged young together with a single unhatched egg. Five other nests on another rock close by included two nests each with three eggs, one with four eggs, one with no eggs but showing signs of fresh repair, and a fifth with two small young, the partially mummified body of a third, and two eggs. Examination of six nests in the main colony on June 17 showed all to contain young, some ready to fly, others with down feathers, and the definitive feathers in the sheaths.

On the two earlier dates mentioned there was a large and constantly changing population of Swallows going to and from the colony. Each adult upon approaching the site seemed to have a sense of the exact location of its nest. Almost without

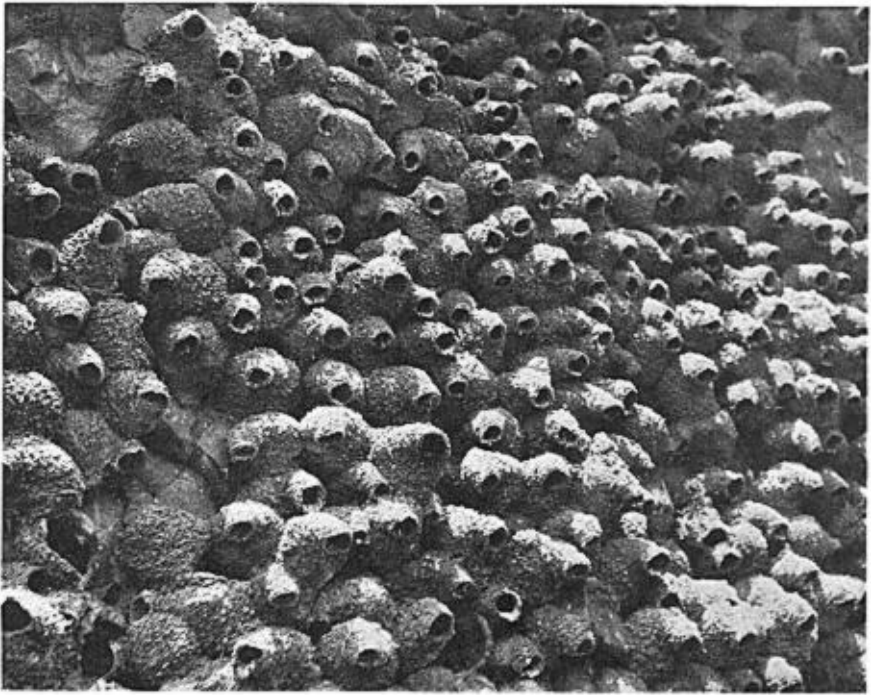


Fig. 40. CLOSE VIEW OF CLIFF SWALLOWS' NESTS IN PUTAH COLONY, SHOWING DENSITY OF PLACING, WITH SOME NESTS EVEN BUILT UPON OTHERS.

exception an arriving bird coming in low over the water would check its flight by a nicely gaged upward sweep which brought it to the proper entrance with but little fluttering. Each bird stayed but a short time (ten seconds or so) and then departed toward the forage places again. One adult, shot near the colony, disgorged two *Coccinellid* beetles, a house fly, a large (stable?) fly and numerous smaller flies, an indication of the food then being supplied to the young.

By June 17 adult activity had increased apace with the greater percentage of young; the adults were abroad more, the number of arrivals per minute was larger, and when frightened away the parent swallows returned more quickly than they had earlier. No young were actually detected in flight about the colony; but one young bird which was taken from a nest, upon being released, made off on steady wings and was soon lost in the cloud of birds in front of the colony.

The sanitary condition in the individual nests varied according to the length of time during which they had been occupied. Excrement was often dropped by some of the adults just as they departed from the colony, as a nearby rock held many white splatterings. A few droppings littered the front of the colony. Nests containing eggs were relatively clean; but those tenanted by a well-fledged brood often were fouled to a depth of more than an inch.

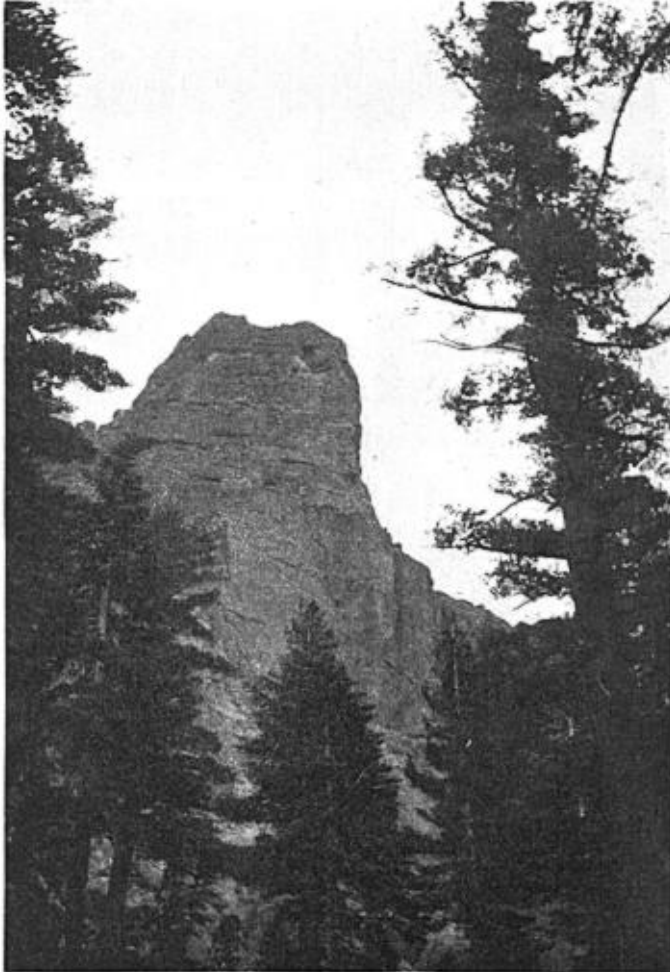


Fig. 41. NESTING SITE OF CLIFF SWALLOWS NEAR ROUND LAKE, EL Dorado COUNTY, CALIFORNIA, AT AN ALTITUDE OF 9000 FEET. THE NESTS WERE LOCATED IN A NICHE NEAR THE TOP. PHOTOGRAPHED IN JULY, 1925.

The forage range of the (800, more or less) adults belonging in this colony was for the most part within a radius of two miles of the colony. A few were seen to go farther away beyond the hills forming the cañon, but certainly a large part of the population secured its forage within the limits indicated. Some individuals foraged over the creek, others over dry grass pastures or fruit orchards, and often a considerable percentage of the whole population gave attention to a single one of these forage areas.

In such a location the Cliff Swallows probably were able to bring forth a relatively high percentage of their young with success. The nest material held together well, so that none of the nests dropped off, as sometimes happens in swallow colonies elsewhere (for example, at Stanford University). Terrestrial enemies could scarcely reach the site. Occasionally a precocious fledgling fell victim to fish in the water close below the colony. But the really limiting factor in the size of this colony would seem to be the availability of nesting places (few parts of the big rock are unused), and the extent of the food supply available during the breeding period.

The above described colony was located in the heart of the breeding range of the Cliff Swallow. The other two colonies which I wish to mention are well above any previously described station for the species. Heretofore the Cliff Swallow has been recorded at 7000 feet in the San Bernardino Mountains (Grinnell, Univ. Calif. Publ. Zool., vol. 5, 1908, p. 106) in the Transition Zone. The records now to be set down pertain to the middle element of the Boreal region, namely the Hudsonian Zone.

On July 12, 1925, at Silver Lake, Amador County, altitude 7200 feet, a single Cliff Swallow was seen carrying mud for nesting. The nest site was not learned. Five days later, upon climbing to the southern rim of the basin surrounding Silver Lake, in rocks at an altitude of 8400 feet, I found a colony of about 30 nests of this species. Many adult birds were flying to and from the colony at frequent intervals. On this same ridge as associated species were the Mountain Bluebird, Clark Nutcracker, Audubon Warbler and Mountain Chickadee. Trees close by were the Mountain Silver Pine (*Pinus monticola*) and Alpine Hemlock (*Tsuga mertensiana*).

Again, on July 31, near Round Lake, about 15 miles south of Lake Tahoe, another colony of Cliff Swallows was observed in a niche in andesitic rocks at an altitude of 9000 feet. Several nests were seen and at least three birds were flying about the rock, while others were heard out over the nearby lake. Mountain Silver Pine, Lodgepole Pine and Alpine Hemlock were the associated trees, while on the slopes adjacent were noted the Mountain Quail, Clark Nutcracker, Mariposa Fox Sparrow and Audubon Warbler.

Ecologically, these three sites were strictly similar; each afforded safe nesting places and abundant food for adults and young, although the daily heat quotient of Putah Cañon is far in excess of that of the upper Sierra Nevada. Temperature *per se* can scarcely be called to account for the absence or presence of the Cliff Swallow in a particular locality. Rather does its immediate *local* distribution rest upon the ecological factors named.

Davis, California, April 5, 1926.