Instead, it adjusted the other to the characteristic head-first "carry," flew to a dead tree and, after looking all about, began its meal.—JOHN E. CUSHING, JR., *California Institute of Technology, Pasadena, California, October 9, 1940.*

Waterfowl Breeding Records from San Bernardino and Riverside Counties, California.—*Butorides virescens anthonyi.* Anthony Green Heron. Although the Anthony Green Heron has been recorded as breeding in a number of places in southern California, it may be worthwhile to record two more regular breeding stations. Green herons have bred commonly at Lake Elsinore, Riverside County, for at least the last three years. On June 20, 1938, a nest with five eggs and another with three eggs were found. On July 6, 1939, a nest with five young was found, three of which were banded (nos. 39-522905—39-522907). On June 13, 1940, two nests were located. One nest held four half-grown young which were banded (nos. 39-522922—39-522925); the other nest we were unable to reach. There were undoubtedly some nests each year which we did not find.

A nest with five small young was found at a pond about ten miles from Redlands on June 3, 1938. Four of the young ones were subsequently banded (nos. 37-502918—37-502921) on June 11. The birds have been present at this same place during the summers of 1939 and 1940, but no effort was made to find the nest.

Botaurus lentiginosus. American Bittern. This species was seen twice near Chino, San Bernardino County, on June 16, 1940. It is probable that the birds were breeding, as Mr. Charles Bradford of Pomona, who showed me the birds, has in his collection a set of three American Bittern eggs which he collected at this place on April 14, 1934. This species has been recorded previously as breeding in southern California at three places near the coast (Willett, Pac. Coast Avif. No. 21, 1933:24).

Ixobrychus exilis hesperis. Western Least Bittern. Has been observed during the summers since 1935 at a group of small tule-bordered ponds near Redlands. As many as five individuals have been seen at one time. While the birds' actions at times indicated that they were breeding, no definite proof was obtained until 1940. Two young birds out of the nest, but unable to fly and with juvenal down still on their heads, were captured and banded (nos. 40-413153 and 40-413154) on June 24. On July 5 Herbert Hill found a nest with four eggs. No bird was on the eggs when they were discovered but a Least Bittern was seen to return to the nest.

Mr. Charles Bradford collected a set of four least bittern eggs in a marsh near Chino April 16, 1931. This set (no. 4947) is now in the collection of Mr. Wilson C. Hanna. The birds are still present in this marsh, as one was seen here July 17, 1940, by Herbert Hill.

Although the species is recorded in Willett's distributional list (*loc. cit.*) as a fairly common summer resident, only two nesting localities are given: Nigger Slough, Los Angeles County, and San Jacinto Lake, Riverside County. Neither of these marshes still remain.

Charadrius nivosus nivosus. Western Snowy Plover. Three eggs were found in a slight depression in the sand at Lake Elsinore on July 6, 1939. The birds nested here again in the summer of 1940, one downy young and the parents being found on June 13. There are a few inland breeding records for this species, as for example at Salton Sea.

Recurvirostra americana. Avocet. A pair of Avocets was seen on July 6, 1937, and several were seen July 6, 1939, at Lake Elsinore, but the birds were apparently not breeding, being indifferent to our presence. However, on June 13, 1940, three pairs were found which became very excited at our approach. We were able to locate two eggs in small hollows on the bare sand, each probably the first of a clutch.

The heavy rains in the spring of 1937 flooded much of the old San Jacinto Lake bed, Riverside County, and on July 4 there still remained in one place a body of water about three-fourths of a mile long. Here there were thirty or forty Avocets which gave every indication that they were nesting. One bird repeatedly dove at us and many of them were much disturbed by our presence. We actually found no nests, the deep mud and intense heat making it almost impossible to reach the small sand bars in the center of the pond. The birds, however, could not have had a successful breeding season, as we found the pond completely dry and all the birds gone when we returned on August 8. The only other recent breeding records for Avocets in southern California are from Del Rey, Los Angeles County (Willett, *op. cit.*, p. 68).

Himantopus mexicanus. Black-necked Stilt. In the spring of 1937 Lake Elsinore greatly increased in size, creating conditions which were apparently very attractive to stilts. On July 6 of that year we found about forty birds breeding there. We located only eight nests with eggs, but two nests held only one egg and there were several nests still empty, indicating that the birds had not all laid. We probably also failed to find some nests. On August 8 we returned and were able to capture and band five nearly-grown young stilts (nos. 295131 and 295133—295136) and we found one nest still with

eggs. This unusually late set of four eggs was collected by Mr. Wilson C. Hanna and is now in his collection (no. 5939). On July 6, 1939, two nests were found, and on June 13, 1940, one nest was found and two or three pair of birds were seen. There is one previously published record of stilts breeding at Lake Elsinore. Florence Merriam Bailey records finding three pairs and three half-grown young on July 26, 1907 (Condor, 19, 1917:157).

Ten or fifteen stilts were observed at San Jacinto Lake, July 4, 1937, with the Avocets and their actions indicated that they were also breeding here.—HAROLD M. HILL, *Redlands, California, September 17, 1940.*

The Buccal Food-carrying Pouches of the Rosy Finch.—Carrying of food in quantity by adult birds engaged in feeding their young ordinarily is facilitated by a crop, by expansion of the undifferentiated oesophagus, or by simple distention of the floor of the mouth. A special food-carrying device in the Rosy Finch (*Leucosticte tephrocotis*) appears to be highly unusual, if not unique, among birds, and to my knowledge it has not been figured before. The only author whom I have found mentioning it is A. K. Fisher (N. Amer. Fauna, 7, 1893:82). He reported E. W. Nelson's observations on breeding leucostictes in the White Mountains of California as follows: "He noticed when skinning the birds that they had a double craw. One located in the usual place [presumably a distended oesophagus] and the other in the form of a double gular sac divided by a median constriction. The latter when full hangs down like a lobe of bare skin outside of the feathers."

Knowledge of this observation led me to look for sacs in breeding leucostictes taken in the Wallowa Mountains of Oregon in 1938. Although one female possessed sacs, the mouth region was not in a condition that would permit exact determination of the plan of the structures. A female *Leucosticte tephrocotis littoralis* (Mus. Vert. Zool. no. 76205), taken on Mount Shasta, California, on July 15, 1939, provided the opportunity to dissect the gular sacs carefully. The accompanying figure is based on notes and measurements made of this individual.

The two sacs are well formed chambers, with definite openings connecting to the buccal cavity, and are not merely fissures or open pockets in the mouth lining. There is an opening on either side of the tongue and glottis in about the region of the median mandibular gland (see Anthony, Zool. Jahrb., Abt. für Anat., 41, 1920:573, fig. H a). These lead downward, each to its own sac which is lined with moist buccal epithelium. The two sacs are loosely joined anteriorly by connective tissue in the median plane but there is no communicating passage between as might be inferred from Nelson's account. Each sac extends backward and laterally between the external integument and the floor of the mouth. When fully distended, it presses against the infra-auditory region of the skull and the posterior part of the ceratobranchial bone. The distended pouches measured from orifice to posterior end about 1½ cm. and were ½ cm. in diameter. The sacs resembled the cheek pouches of kangaroo rats when they were first encountered in skinning over the bird's neck and head.

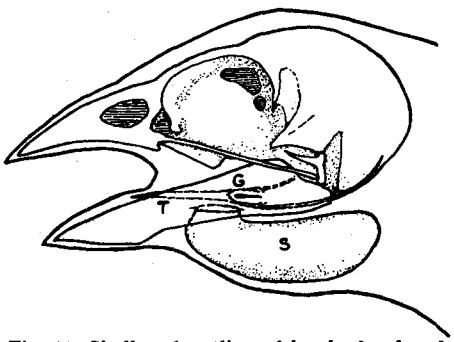

Fig. 23. Skull and outline of head of a female Rosy Finch (*Leucosticte tephrocotis*) showing gular sac (S) of left side with opening in floor of mouth lateral to tongue (T) and glottis (G). The tongue apparatus is shown in broken lines, in its position behind (medial) to ramus of lower jaw.

Nelson's statement that the sacs hang down as a lobe of bare skin outside the feathers is misleading. There could at times be distention coupled with loss of feathers such that the skin of the throat might be visible, but the sacs could not themselves protrude externally. A bird with filled sacs does show a bulging throat and the feathers may stand erect as a result.

The gular sacs that I have examined have been packed full with insects; there may have been small amounts of other types of food that were unnoticed. Obviously, the food was being carried to young birds. Only females with brood patches and ovaries in post-laying condition have thus far been found with gular pouches. I do not know that males develop them although I think they may.

In surveying the breeding habits of leucostictes, the adaptive value of this special device for carrying large quantities of food becomes apparent. The nests which are always placed in alpine cliffs or rock slides often are far from feeding places. A concentrated supply of food at a distance may be utilized without expending time and energy in numerous long trips to and from the nest. Howard