a single red male among them; this rarely, if ever, occurs with *Loxia*, or *Carpodacus*. Of five breeding pairs seen in the season of 1920, only one was a red male. In the others the sexes were indistinguishable.

Okanagan Landing, British Columbia, March 3, 1922.

THE ALEUTIAN ROSY FINCH

By G. DALLAS HANNA*

WITH ONE PHOTO

THE RANGE of the Aleutian Rosy Finch (*Leucosticte griseonucha*) is rather extensive, since it has been found from Kodiak Island west through the Aleutian Islands as far as the Commander group, 1000 miles away. It is also found on the Pribilof and the Mathew groups, 200 and 400 miles, respectively, farther north. The species has always been extremely rare wherever I have met with it, except on the Pribilof, or Fur Seal, Islands. When I landed there in 1913 it was nesting in the village and on the cliffs in considerable numbers.

The beautiful song of the male was new to me then, and it seemed the most attractive feature of the desolate place. It is excelled by the song of no other species on these islands, and is rivalled there only by that of the Alaska Longspur and of the Pribilof Snow Bunting.

The annual cycle of the Aleutian Rosy Finch possesses considerable interest because of several unique features. A convenient starting point in an account of it would be August 31, when the last birds have hatched out and practically all have flown. The autumnal molt then begins, and with this the beautiful song is replaced by a rather commonplace chirp of ordinary finch character.

These birds gather in loose flocks, even in the height of the breeding season; in the fall the flocks become larger and more compact. It is no uncommon sight in fall or winter to find fifty birds feeding on a single patch of "poochkie" (*Heraculum*) heads, and during periods of especial abundance I have seen as many as a hundred at a time. Although the seeds of many plants are eaten, those of the "wild parsnip" compose by far the greater part their diet. These seeds are well filled with oil, being similar in that respect to sunflower seeds, and must provide much fuel, to enable the birds to withstand the vigorous Arctic gales so common in that latitude.

There is very little change in the coloration of the adults with the assumption of the winter plumage, and the young of the year are indistinguishable from the older birds by late fall. One of the most striking results of the change of season from summer to winter is in the color of the mandibles. In summer these are dead black, but winter turns them to a brilliant lemon yel-

*Contribution from the California Academy of Sciences.

low, the tips only retaining the dark color. No shedding of the horny substance of the mandible takes place; it is merely a matter of coloration; and for what reason?

I have been led to believe that there is an irregular migration—or perhaps it might properly be called a flight—of Pribilof Rosy Finches to the Aleutian Islands in winter. There appeared to be a fluctuation in the numbers of the birds which could be explained in no other manner. They do not all leave the Pribilofs at any season, regardless of severity of the weather, and weather conditions could not be correlated in any way with the variation in their abundance. While it is possible that these variations might be such in appearance only, due to flight to portions of the resident island rarely visited by man, careful study of the subject through several winters did not satisfy me that this was the case.

These birds continued to be abundant from 1913 up to the winter of 1916-17, when a terrible catastrophe befell them. The Pribilofs that winter were visited by a number of gyrfalcons, and these wreaked havoc among the resident land birds. Dr. Harold Heath has outlined the case of the Alaska Wren, as regards fluctuations in numbers (*Condor*, vol. 22, 1920, p. 49). The Rosy Finches, as these leucostictes are locally known, fared little better. The first gyrfalcons killed were examined, and in their stomachs was found unmistakable evidence of slaughter—the rosy feathers of their victims. Their prey was so easily captured on the barren Pribilofs that the falcons became extraordinarily fat. So oily were they that the preparation of specimens was exceedingly difficult. The offering to the natives of a bounty of one dollar for each capture was instrumental in securing thirteen of them, a greater number than the total which had been seen on the Pribilofs since observations commenced.

During the winter season the rosy finches remain in the immediate vicinity of the cliffs. This made them easy of capture by the gyrfalcons, which seemed to be especially at home in such surroundings. When the summer of 1917 came, scarcely a finch could be found. Only one pair nested on St. Paul, and one pair on Otter Island. A few more were left on St. George, but the species would have been classed as exceedingly rare even there. The total number was not over twenty-five, which is an optimistic estimate. How fortunate it is that the seal islands are normally free from such a scourge as these falcons proved to be!

Through succeeding years the rosy finches were watched with great anxiety, and it was gratifying to see their numbers gradually increasing. By 1920 there were, perhaps, a dozen pairs on St. Paul Island and a hundred on St. George, but even the latter was still underpopulated.

This circumstance serves as a fair illustration of the precarious existence led by island birds in general. In the short space of two or three months a species may be almost entirely annihilated by the sudden appearance of an enemy that is normally absent. The rarity of the Aleutian Rosy Finch elsewhere in its range is commonly believed to be due to the work of birds of prey there found. Singular to relate no hawk, eagle, or owl lives on the Pribilofs except as a straggler.

Two indicators of spring mark a point in the Aleut's calendar. One of these is the coming of the Least Auklets (Choochkies) with clock-like regular-

ity on April 15 of each year. The other is the first song of the Aleutian Rosy Finch, at about the same time. Catching the spirit of the birds the lethargic shackles of winter are shaken off by the human inhabitants of these islands, and the wheels of industry start. The awakening of spring brings much activity with it.

At this time the birds soon seek out nesting sites, and building begins in May. The earliest full set of eggs of the Rosy Finch that is recorded was taken in May. I have never been able to convince myself that the male bird rendered any assistance at all in building the nest, incubating the eggs, or rearing the young. However, the sexes are so nearly alike that a mistake as to their identity could easily be made by an observer of their actions around the nest, and the subject needs further study.

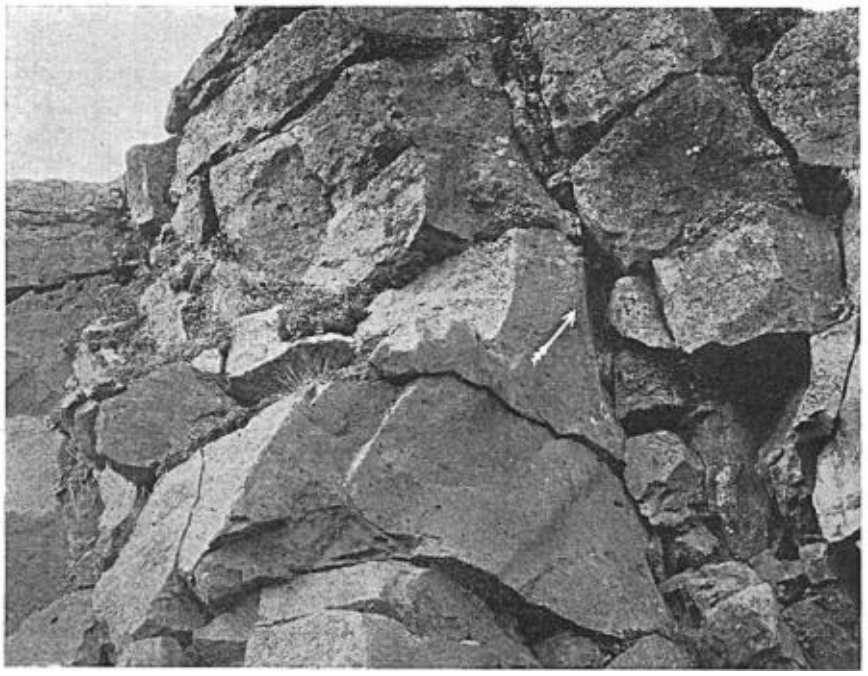

Fig. 32. TYPICAL NEST AND NESTING SITE OF ALEUTIAN ROSY FINCH ON ST. GEORGE ISLAND, ALASKA.

The males spend the greater part of the summer in fighting each other. In fact the moral code of this species seems to be drawn up somewhat upon Turkish lines, only reversed. Often a female may be seen pursued by half a dozen suitors. When the female is off her nest, her mate (or, at least, some mate) is constantly close beside her, and, if rosy finches are abundant, many is the battle he has to fight. Or, as she feeds along some narrow ledge, two contestants for her favors may now and then come tumbling down to the beach line, flapping and pecking at each other, their places as attendants being soon taken by a third party.

While nests have been found in old buildings, the favorite site for nest building is in some crack or crevice of the precipitous cliffs on the shores of

the Pribilofs. Some of these rise to a height of a thousand feet and form incomparable bird rookeries. Although there is almost no zoning of the eleven species of sea birds nesting there, the lowermost nests are, in almost every case, those of the kittiwakes. In some instances the fulmars, murres and cormorants are equally low, but not often. The lowermost of these do not usually approach the beach line closer than twenty-five feet, and it is in the space from there down that the Rosy Finches most often build. On rare occasions the nests of the latter may be reached by hand, but the birds are seldom so injudicious as to run such risks. The nest is neatly constructed of the dry grasses most accessible, and the lining is of similar material, but softer and finer than that used for the body of the nest. Seldom are roots or feathers used in nest construction.

The length of time a female remains off her nest depends, of course, upon the state of incubation of the eggs; when she returns to it, the male settles on some favorite nearby rock and pours forth his beautiful song, repeating it time and time again. The serenity of the scene is interrupted only by some wandering finch which must be chased away most vigorously.

The normal set consists of five eggs, but four and six are not infrequent. While the color is usually pure, immaculate white, in some cases there are faint reddish or yellowish brown spots or, more often, specks, many of which are almost microscopic in size.

Two broods of young are raised each year under normal conditions, and hence this species increases rapidly in numbers if free from enemies. The period of incubation is not definitely known, but the second sets are laid by August 1 in the majority of cases. It is believed that the same nest is used for both sets, or at least the same location. Sometimes it appears that a portion of the old nest is torn out and then reconstructed. The young of summer plumage are uniform grayish brown, and show no trace of the brilliant rose and pink colors of adults in breeding plumage.

The Aleutian Rosy Finch has endeared itself to all those who have come to know it, and being one of the most beautiful of the sparrows it is a misfortune that it is so isolated in habitat.

San Francisco, March 23, 1922.