THE PRIBILOF SANDPIPER

By G. DALLAS HANNA

WITH ONE PHOTO

THE DATA upon which this study is based have been secured during seven years of acquaintance with the species. Valuable information on nesting habits has been furnished by Messrs. C. E. Crompton and P. C. Partch, formerly of St. George Island.

The Pribilof Sandpiper (*Arquatella ptilocnemis*) is chiefly of interest because of the fact that it has an exceedingly limited breeding range and probably the shortest migration route of any northern shore bird. It is known to breed only upon St. George, St. Paul, St. Matthew and St. Lawrence islands, all located in Bering Sea within an area not over 400 miles in greatest dimension. The winter range of the species is practically unknown, the only records being from Portage Bay, southeast Alaska (Hartlaub, Journ. für Ornith., 1883, p. 280), and Lynn Canal (Ridgway, Birds of N. and Mid. Am., VIII, 1919, p. 246), between Alaska and British Columbia. The appearance of the birds at the former locality in flocks in spring (if identifications were correct) indicates that they wintered farther south, probably on Vancouver and other islands of British Columbia. They could hardly have come from beyond these localities and have remained undiscovered. The species has been reported in fall migration about Unimak Pass, Alaska (McGregor, Condor, VIII, 1906, p. 119), and in spring on the Bristol Bay coast (cf. Palmer, The Avifauna of the Pribilof Islands, in Fur Seals and Fur-Seal Islands of the North Pacific Ocean, III, 1899, p. 403, and Osgood, N. Am. Fauna, no. 24, 1904, p. 62).

If the specimens taken by McGregor (*ibid.*, p. 119) on Unimak Island on August 14 (printed August 4 in Ridgway, Birds of N. and Mid. Am., VIII, 1919, p. 247), and on Tigalda Island, August 5, were correctly identified it is possible that the species breeds there and was not migrating. No indication of migration has been noted so early as that on the Pribilofs, although a few early breeders may have left. In 1920 I made persistent and thorough search for the species about Unalaska, September 7 to 18, and at Woody Island, September 21 to 23, but with only negative results.

There is apparently but one record of the bird breeding on St. Lawrence Island. Nelson (Rep. Nat. Hist. Coll. Alaska, 1877-1881, Wash. 1887, p. 105) found a single pair on the south shore in June, 1881. Elliott (Monog. Pribylov Group, U. S. Dept. Int., 1881, p. 129, footnote) had previously stated distinctly that he did not find it there.

In 1916 I found it on St. Matthew Island (Auk, XXXIV, 1917, p. 409) just as abundantly as Elliott (*ibid.*) had described. It is, if anything, a more common bird there than on the Pribilof Islands; and furthermore it breeds on the lowlands, in many cases just back of the drift wood lines, while farther southward it resorts to the uplands. Fresh eggs and downy young were found on St. Matthew in early July and this would indicate that the nesting season was somewhat later there than on the Pribilofs.

I strongly suspect that the birds have some other extensive breeding ground than St. George, St. Paul and St. Matthew islands, because in September and October large flocks come to the two former islands; these appear to

contain many more individuals than are in existence on all three. Whether St. Lawrence Island supplies the extra number or not remains for future determination.

Spring migration takes place the latter part of April and the first half of May. My earliest record for St. Paul Island is April 15 (1915) when a flock appeared at Northeast Point. The height of migration is a little later than that date and may usually be expected from the first to the fifteenth of May. Birds are almost invariably paired upon arrival. Very few spring flocks have been seen on the Pribilofs, and they do not tarry by the beaches but go directly to the upland nesting sites. It seems to be uncommon for more than the resident population to land upon an island in spring. The birds seem to go directly to the chosen breeding grounds wherever they may be. This fact is of wide application among the northern shore birds. Only rare stragglers of such species as golden plovers, turnstones, and Pectoral and Sharp-tailed sandpipers stop at the Pribilofs on their way north, but large numbers of some of them come in fall.

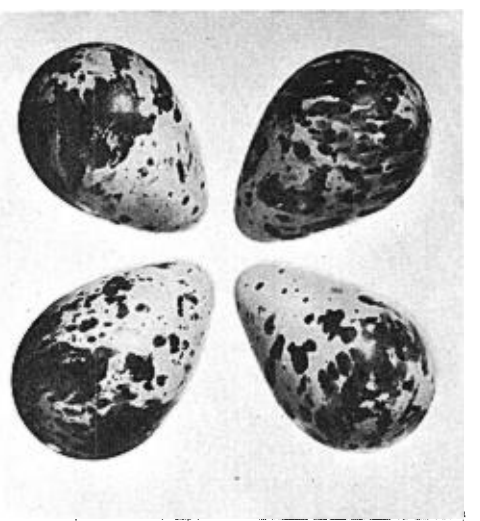

Fig. 13. AN AVERAGE SET OF EGGS OF THE PRIBILOF SANDPIPER. SLIGHTLY LESS THAN NATURAL SIZE.

On St. George Island the high upland tundra has been chosen for breeding ground. Here, among the reindeer "mosses" and light gray, lichen covered rocks the sandpipers reign supreme in the fog. Some speculating may be indulged in to find a reason for so unusual a choice of locality. Elevations up to 500 feet are sought. Perhaps they shun the sea coasts on account of the presence there of large numbers of foxes. During all history this has been a greater fox island than either St. Paul or St. Matthew. On the latter island in June and July the birds may be found in large numbers around and back of the drift wood piles. If it were not for this fact being known we might suspect that on St. George the light gray tundra was selected for protective purposes, the birds themselves being distinguished chiefly by their light colors.

St. Paul Island for some unaccountable reason is not chosen as a breeding

ground except by a very few pairs. In 1919 not over a dozen were found during the entire nesting season, when almost all of the available areas were seen. The country about Northwest Point is the chief site, but birds have been found near the coast on low land by Polovina seal rookery and on Telegraph Hill. There are large tracts of apparently suitable tundra which are left unoccupied. I know of but one set of eggs having been taken on that island (and it was by a native), so the scarcity cannot be attributed to the industry of egg hunters. Birds are even more abundant on St. Paul in fall than on St. George and but few of them are shot for food at either place.

If a person climbs to the sandpiper country on St. George during May or June, one of his first surprises will be a series of notes very much like those of the flicker, a full deep whistle repeated in the same pitch about a dozen times in quick succession. The bird utters this while on the wing, most likely when it is coming toward the intruder with great speed. When close by it wheels and settles lightly on a nearby hummock or "niggerhead". One wing will be held vertically extended for a few seconds after alighting and may be flashed at short intervals thereafter. Another note for which I have no descriptive language always reminded me of the sound of tree frogs. It is the note usually given when the birds are on the ground. While neither can be called a song, they are very attractive and pleasant to the listener and most surprising to one familiar only with the "peep peep" of sandpipers in winter.

The elevating of one wing is an action for which no logical reason can be given. It is indulged in by both male and female and at times when it cannot be considered a signal. Nor can it be taken as a warning to intruders because it is often seen when one's presence is to them unknown. It is not seen after the breeding season is over and is no more explicable than the comparable "fiddling" of our familiar crabs. Palmer (*ibid.*, p. 401) noticed that the near wing was elevated first and might be followed by the other, but this does not seem to be the rule except when the bird is manifestly endeavoring to attract attention. For instance when one is lying concealed and the birds are following their own inclinations either wing may be elevated first.

On the breeding grounds of St. George and St. Matthew the birds are very common, and from one to a dozen are in almost constant attendance upon the visitor. They sight him from afar and fly to meet him. Some bird will almost always try to lead him astray. If followed, it flies from knoll to knoll, often not more than twenty yards away. It remains in front of the visitor regardless of the direction he may take; whether toward or from the nest, makes no difference. After several minutes of this a sudden flight, with the familiar "song", is taken to some distant hill and the searcher for a nest is left confused and confounded.

A search for the nest will exhaust the patience of any except the most persistent collector. Messrs. Crompton and Partch have been more successful than any one else in locating them and all of us agree that when a bird flies to meet the visitor, as just described, it is a pure waste of time to watch or follow it. Every method known to us of locating nests by watching the actions of the parents has failed. We have located nests and then endeavored to establish rules for guidance with others, but no definite facts could be determined. It was finally agreed that it was useless to watch a bird under any circumstances more than fifteen minutes. If the location of the nest is not disclosed in that time it is safe to assume that the mate is on it and it might be

hours before the guard would go there. In the meantime it may fly half a mile away and forget to come back, even to tease the hopeful collector lying concealed in the mist and fog behind some cheerless rock. No definite range can be ascribed to any one pair of birds because those off the nests mingle indiscriminately. Very often a bird will fly completely out of the range of vision in the fog.

The best plan to follow in the search for nests seemed to be to just walk and hunt, and several factors combine to make the task difficult and discouraging. In the first place the incessant fog and mist settle on the lenses of those obliged to wear spectacles and vision is clouded very quickly; the same thing prevents the use of field glasses to any but a very limited extent. The nesting sites are from two to eight miles from the habitations and the intervening country is very rough and difficult to traverse. Moreover, "hiking" is not always enjoyed when one must be encumbered with hip boots, oil-skin and sou'wester, the only means of keeping dry.

Sometimes a bird will leave the nest when one is ten or even fifteen feet away, but usually it must be almost stepped on before it will fly. Being the same color as the tundra it is almost invisible until it moves. Partch located a nest with three eggs in 1920 and carefully marked it by placing two piles of moss in range with the nest. Upon returning later we were unable to locate it although we knew within ten feet the exact position. We decided to give it up, but later in the day when we were passing close by we decided to take another look. This time the bird was flushed when we were several feet away and there we saw our tracks from the earlier search not twelve inches from the nest.

The action of a bird leaving a nest is unmistakable and can always be recognized, once it is learned. It is a quick, excited, jerky flight, very close to the ground, and the bird goes but a very few yards until it feigns injury in its endeavor to entice the intruder away. It will always flutter in front of a person, even though he walk directly toward the nest.

When the bird is seen to fly the eggs are even more inconspicuous and difficult to find unless the exact spot from which it flew be located. Crompton thus flushed a bird which he knew had a nest, but he was at a loss to find it. At last he left his cane as nearly as possible where the nest should have been and repaired to a nearby rock to watch and wait. In a few minutes the bird returned to the eggs, which were located about a yard from the stick. When a bird is flushed from a nest it seldom happens that the other parent is near.

The nest is a mere depression about three and a half inches wide by two and a half inches deep. Most of the material is removed, but it is evidently packed down to a certain extent. No foreign material is carried at all. The nest is usually, but not necessarily, on some very slightly elevated ground and among the lichens called "reindeer moss". Some nests have been found where there was an admixture of *Hypnum* moss and again where the dwarf willows creep, root-like, beneath the surface.

The normal set of eggs consists of four. A greater number has never been found and a less number only when it was uncertain if the full set had been laid. As much as three days may intervene between egg laying, but usually the four are deposited on successive days. When one set of eggs is taken another will be laid. But the same nest is not used the second time, the conten-

tions of some natives to the contrary notwithstanding. A set of eggs found as late as July 24, 1917, certainly indicated that two may be laid in the same season on rare occasions. One set is the rule.

The color of the eggs is, as would be expected, somewhat variable. The lightest set examined in connection with this report has the ground color greenish glaucous (Ridgway, Color Standards and Color Nomenclature, 1912). From this there is perfect gradation through court gray and light olive gray to deep olive buff in the darkest set. Variation in any particular set is very slight. Spots are large and bold as a rule. They vary in size from 15 millimeters to less than one and they are usually massed about the larger end. In one case the eggs are uniformly spotted with small spots all over. In none is the spotting heaviest on the smaller end (reversed eggs). Spots are usually inclined to be round but occasionally they are in the form of streaks arranged roughly in spiral form. Only rarely are they banded about the larger end. In two cases a narrow black line was produced spirally on the larger end. The coloration of the spots varies from snuff brown to sepia and from cinnamon brown to mummy brown. In some cases they are raw umber. The darkest shades occur where the spots overlap and some deep-seated ones are pale aniline lilac or pale to deep quaker drab. Only rarely is the outline of a spot not sharp.

The description by Coues (in Rep. upon the Condition of Affairs in Alaska, by Henry W. Elliott, 1875, p. 186) of the first set of eggs collected has been copied many times and represents an average nest. The measurements of the four eggs as given by Palmer (*ibid.*, p. 404) are: (converted to millimeters) 39.2x27.3, 38.5x26.6, 37.9x27.3, 37.4x26.6.

The following table gives the measurements of 18 fine sets. They have been taken very carefully with vernier calipers and show more variation than would perhaps be suspected.

MEASUREMENTS OF EGGS OF PRIBILOF SANDPIPER

ALL TAKEN BY G. DALLAS HANNA

Orig. No.	Length	Breadth	Orig. No.	Length	Breadth
1028	39.9	28.4	1849	39.6	27.9
	42.0	28.3		40.4	27.5
	41.2	27.8		40.5	27.7
	41.0	28.2		39.2	28.0
1208	40.9	27.5	1850	41.5	28.6
	39.5	27.0		41.3	26.8
	41.7	27.5		38.4	28.1
	39.0	27.4		40.1	28.4
.....	37.9	28.5	1851	38.9	26.9
	39.7	28.2		38.8	27.1
	40.0	28.6		37.4	27.0
	39.1	27.9		38.8	27.0
1843	38.9	26.8	1852	39.1	26.4
	41.8	26.4		40.6	27.3
	37.9	27.3		40.8	27.0
	40.3	26.9		38.5	28.4
1844	39.0	27.8	1853	38.2	27.4
	39.8	27.3		39.5	27.1
	39.9	26.5		39.2	27.5
	40.1	27.0		38.8	27.3

1845	39.3	27.1	1854	40.6	27.9
	40.3	27.5		40.8	27.7
	41.4	27.4		39.6	27.4
	40.0	26.9		40.8	27.5
1846	39.9	27.0	1855	38.6	27.0
	38.7	26.8		37.6	27.3
	39.0	27.9		35.0	27.4
	40.1	27.8		39.1	27.3
1847	39.0	27.5	1885	39.8	26.8
	38.6	27.3		37.7	26.8
	38.3	27.6		37.5	26.9
	36.5	27.0		38.7	27.5
1848	37.6	29.0	2104	41.2	27.0
	37.7	28.6		40.9	26.9
	38.5	28.6		42.0	26.8
	38.1	28.4		40.0	26.4

The average dimensions derived from the above series of 72 eggs are: Length, 39.473 and breadth, 27.468. Those which showed the extreme measurements were 42.0 by 27.8; 35.0 by 27.4; 37.6 by 29.0; and 39.1 by 26.4.

Through the courtesy of Mr. Chase Littlejohn I am permitted to make comparisons of the eggs of the Pribilof Sandpiper with a set of four eggs of the Aleutian Sandpiper he collected on Sanak Island, Alaska, in 1882. One egg of this set is precisely like the average set of Pribilof eggs illustrated in fig. 13. Coloration, method of spotting, size, and shape are the same. The other three eggs are quite different. They lack the olive or greenish tinge to the background and the spots are not massed about the larger end. They tend, however, to form an irregular zone about the greater diameter. There is also a greater profusion of small spots mixed with the larger than in Pribilof eggs. Mr. Littlejohn states that the considerable series of eggs collected by him conformed to the coloration and pattern of these three, and that the single dark egg of this set is the only one he ever saw. The average measurements of the four eggs are 39.0 by 27.2 and of the three which are considered typical of the species, 38.7 by 27.0.

The measurements of the eggs of the Aleutian Sandpiper have been given by Oates (Cat. Birds' Eggs Brit. Mus., II, 1902, p. 57) as varying from 38.2 to 35.4 in length and from 25.3 to 24.0 in breadth (measurements converted to millimeters). The figure which he gives (*ibid.*, pl. II, fig. 10) does not conform to his description of coloration, and the spots contain considerably more reddish than those of the eggs collected by Mr. Littlejohn. This figure referred to measures 39.4 by 25.0. These are proportions differing considerably from actual measurements of eggs. The tipping of an egg in photographing it might cause more or less shortening in the resulting print but could not account for all the discrepancies in the figure in the British Museum Catalogue. Some doubt is therefore cast upon the authenticity of what appears to be the only illustration of the egg of the Aleutian Sandpiper.

The eggs of the Purple Sandpiper, according to Oates (*ibid.*, p. 56), vary in length from 39.2 to 34.2, and in breadth from 27.8 to 25.8 (measurements converted to millimeters). Thus the eggs of the Pribilof Sandpiper appear to be larger than of either of the other species of the genus, a fact which would be expected from the size of the bird.

It will be interesting to enumerate the sets of eggs of the Pribilof Sand-

piper known to be in existence at this date, because they remain sufficiently rare to attract attention among collectors. In making up the following list it is realized that omissions have probably occurred, but all of the information I possess on the subject is recorded.

U. S. National Museum	2 sets	One from Elliott, one from True and Prentiss. (See Palmer, Avif. Prib. Is., etc., p. 404.)
Calif. Academy Sciences	14 sets	From G. Dallas Hanna
Harold Heath	2 sets	
J. Hooper Bowles	1 set	From Dr. Heath
A. C. Bent	1 set	From H. P. Adams
H. P. Adams	1 set	
G. Dallas Hanna	2 sets	Held temporarily
Total	23 sets	

The young birds leave the nest very soon after they have hatched, and their coloration matches that of the tundra so exactly that they are almost invisible. It is only when they are frightened suddenly that they move and thereby can be seen. They then run away with a plaintive "cheep, cheep," the mother bird at the same time frantically feigning injury to attract the visitor to herself. She is much more solicitous of a young bird than of her eggs. The male at such times may usually be seen perched on a "niggerhead" not far away spreading one wing to the breeze.

So far as known, the food of both old and young consists of beetles and flies while the birds remain on the highlands; when they move to the ponds and sea shores they eat copepods, amphipods, etc. The United States Biological Survey has been supplied with a large series of stomachs from which it is hoped a report as to the exact nature of the food may soon be forthcoming.

The action of Ridgway (Birds of N. and Mid. Amer., VIII, 1919, p. 244) in considering the Pribilof Sandpiper a distinct species as originally designated, and not a subspecies of the Purple Sandpiper as was done by the A. O. U. Committee, seems entirely justifiable so far as field observations are concerned. No difficulty has been experienced in differentiating it from the Aleutian bird (the nearest counterpart of the Purple Sandpiper on the west coast) when the two are found together in the same flock. The dark colors, small size, and apparently much more rapid flight of the Aleutian would seem to indicate that it even should be considered specifically distinct and not a subspecies of the Pribilof bird.

As soon as the young birds are well able to fly they resort to the tide pools and small ponds near the sea. Later the older birds join them and the flocks increase in size to several hundred in favorable places. This takes place in August and September in such localities as the Salt Lagoon of St. Paul Island. The moult of the breeding plumage takes place slowly, and winter dress is not completely assumed until the birds are about ready to leave for the south on the fall migration. This takes place slowly and gradually during the latter part of September and October.

The birds possess some economic importance to the natives of the Pribilofs and they have occasionally been eaten in the officers messes. Their habit of congregating in fairly compact flocks and their fearless unassuming nature make them easy targets. For this reason close watch should be kept of the numbers returning annually and should any noticeable diminution take place

strict protective measures can and should be invoked. This is possible because the islands are under strict governmental control as regards all wild life. Because of its limited range it would not be a difficult matter to completely exterminate the species. Special protective measures at this time, however, are not believed to be essential because there is even less hunting now than there has been for fifty or more years. The introduction of live stock and reindeer for fresh food removes in large measure the necessity for shooting and the native is ordinarily too indolent to hunt unless he has to do so for food.

It should be added that the Pribilof Sandpiper has an esthetic appetite, which should appeal to most people. Unlike the other common shore birds, the turnstones, phalaropes, pectorals, sharp-tails, and even that much flaunted prize, the golden plover, they do not visit the carrion fields of rotting seal carcasses for fly larvae. These other birds feed there in large numbers and assume a rank fishy taste from the seals.

San Francisco, California, December 24, 1920.

NOTES FROM SOUTHERN ARIZONA

By H. H. KIMBALL

ALTHOUGH the season of 1918 was the second of two exceptionally dry years in southern Arizona, bird life was fairly abundant in suitable localities and a number of interesting birds were taken by the writer during that year and subsequently. Four localities are involved.[1]

VICINITY OF TUCSON

Glaucidium phaloenoides. Ferruginous Pigmy Owl. In the foothills of the southern slope of the Catalina Mountains, a single specimen was taken on May 9, 1918, a female which would have laid its first egg in a few days. The bird was in a mesquite tree, where it was taking advantage of the first warming rays of the morning sun, after the manner of pigmy owls. Evidently quite rare in that vicinity.

Peucaea cassini. Cassin Sparrow. Probably uncommon near Tucson since only one was seen. (H. C. O.)

Petrochelidon lunifrons melanogaster. Mexican Cliff Swallow. A single specimen, the only one seen, was taken April 10, 1918, from a mixed flock of Cliff, Rough-winged, and Violet-green swallows, the latter predominating.

Petrochelidon lunifrons hypopolia. Gray-breasted Cliff Swallow. Two specimens, April 15 and 18 (H. C. O.), 1918.

Riparia riparia. Bank Swallow. The only one observed was taken from a mixed flock of swallows April 15, 1918. (H. C. O.)

Hylocichla guttata sequoiensis. Sierra Hermit Thrush. Two specimens were taken near the Santa Cruz River, ten miles south of Tucson, March 18 and April 18, 1918. (H. C. O.)

CHIRICAHUA MOUNTAINS

Sayornis phoebe. Phoebe. A strange, clear, pleasing note heard October 6, 1918, was ascribed to a *Sayornis*, but the bird was not taken until October 8, when it was discovered on a fence post a short distance below Paradise, on the east slope (H. C. O.). Another was secured near the same place August 16, 1919.

[1]Acknowledgment is due to Dr. H. C. Oberholser for identifying such of the specimens recorded in this article, as are indicated by "(H. C. O.)", and to Mr. J. Eugene Law for rewriting this article from notes furnished.