(0.40); depth of bill at base, 0.22–0.25 (0.24); tarsus, 0.71–0.78 (0.73); middle toe, 0.49–0.55 (0.51); length of white spot on lateral tail-feather, 0.10–0.45 (0.30).

Arid plains from western Texas (west of 103° W. longitude) to coast of southern California (San Diego County, etc.), north to northern Nevada and Utah, south into Chihuahua and Sonora; Lower California?

Type, No. 98884, U. S. Nat. Mus., ♂ ad., Tuscon, Arizona, May 12, 1884; E. W. Nelson.

Amphispiza belli clementeæ. SAN CLEMENTE SPARROW.

Exactly like *A. belli* (Cassin) in coloration, but larger and with relatively larger bill. Length (skins), 5.20–5.70 (5.50); wing, 2.45–2.72 (2.61); tail, 2.30–2.68 (2.54); exposed culmen, 0.38–0.41 (0.39); depth of bill at base, 0.22–0.23 (0.22); tarsus, 0.79–0.85 (0.80); middle toe, 0.49–0.53 (0.52).

San Clemente Island, southern California.

Type, No. 117612, U. S. Nat. Mus., ♂ ad., San Clemente Island, California, Jan. 25, 1889; C. H. Townsend.

NOTES ON THE NESTING OF THE FORK-TAILED PETREL (*OCEANODROMA FURCATA*).

BY JOSEPH MAILLIARD.

AT NINE o'clock on the evening of June 17, 1896, our anchor was dropped at the island of St. Lazaria, a long, narrow rock lying in the mouth of Sitka Bay, Baranoff Island, Alaska. Landing at once, with my two assistants, we found ourselves upon a low bunch of rock between the two higher portions of the island. Here we shot some Glaucous-winged Gulls (*Larus glaucescens*), Violet-green Cormorants (*Phalacrocorax pelagicus robustus*), Black Oyster-catchers (*Hæmatopus bachmani*), and Tufted Puffins (*Lunda cirrhata*). About ten o'clock we discovered a way of reaching the top of the main portion of the island, and found the summit covered with peat in process of formation, out of which grew a rank sort of coarse grass and salmon-berry bushes, and in some places groves of fir and cedar trees. The highest portion is probably 200 feet above the sea, with perpendicular cliffs almost continuously around

it. As we were following a narrow Indian trail near the top a faint but distinct squeaking was heard directly beneath our feet. It was a foggy, rainy night, and as the light was commencing to fail we had not noticed the small holes which on closer inspection showed themselves under every bush and tuft of grass. Upon falling on our knees to investigate this unusual sound we discovered these holes and at once commenced digging in the soft peat with our fingers. A moment's work unearthed a Petrel, and almost simultaneously my two assistants sang out "I 've got a bird." My own catch was a Fork-tailed Petrel (*Oceanodroma furcata*), but one of the men captured a Leach's (*O. leucorhoa*). Being naturally somewhat excited at finding the eggs of the Fork-tailed Petrel we went to work rather wildly and frightened some of the birds from their eggs. As the two species were breeding in the same burrows the result was a feeling of despair about identification. However, we took a few eggs from under the parents, and as by this time it was growing too dark to see very distinctly we returned to the sloop and turned in for two or three hours. My two companions, stretched on the bottom of the boat, were soon sleeping audibly, fatigue having been a stronger factor than their intention to keep watch and watch in case our light rope cable should be cut by the rocky bottom. The uneasy jerking of the little craft and the danger of going ashore if the cable parted prevented me from sleeping.

About twelve o'clock my attention was attracted by the notes of the Petrels on the shore, some hundred and fifty yards distant. It It was too dark to see clearly, but there were so many of these birds moving about that it was possible to discern a sort of commotion along the rocks, and I arrived at the conclusion that the birds from the nests were meeting those coming in from the sea to exchange places with them. The twittering noise made on this meeting ground was something prodigious. It does not seem probable that the incubating birds left their nests until their partners came to replace them, but presumably the first ones to leave met and conversed with the later incoming ones. The noise we first heard under our feet was either made by birds getting ready to leave, or, more likely still, due to disagreement between the two species in the burrows.

Mr. J. Grinnell visited this island a day or two later and passed the night upon the summit. He said that it was impossible to keep a fire alight in the middle of the night as the Petrels flew into it in such numbers as to extinguish it. We went ashore again at 3 A. M., but not a Petrel was in sight. Their twittering had ceased about 1.30 or 2 o'clock, as it was getting rather broad daylight by that time. It would be interesting to know in the still higher latitudes, where there is no twilight, at what time this exchange of the duty of incubation takes place.

Sending the men on a tour of investigation around the island, I went at once to work on the Petrels, unfortunately with no implements but fingers. The burrows seemed to run in any and every direction except directly downwards. The area that I worked in was covered with bunch grass and low salmonberry bushes, the roots of the latter being greatly in the way. The peat was so loose and wet that it was difficult to clearly define the burrows, but it seemed certain that they frequently intersected when on the same level, and also that there were tiers of them on different planes and running diverse ways. I could, however, form no idea of the length of any particular one. Their depth varied from four to eighteen inches from the surface of the ground. The diameter of the burrows was from about $2\frac{1}{2}$ to $3\frac{1}{2}$ inches, but frequently they were hollowed out in the interior to a greater size. The nests were merely small hollows in slightly enlarged portions of the galleries, with sometimes a little dry grass on the bottom, and were placed at irregular distances apart,— frequently an *O. furcata* within a foot of a nest of *O. leucorhoa*, and then again perhaps several of one species in succession at varying intervals. It was difficult to discern much removed material at the entrances to the burrows, the same ones being in all probability used year after year, the excavated earth having in the course of time become assimilated with the surrounding surface. It seemed as if one could dig down and strike burrows anywhere, and in fact I gave up looking for the entrances proper, and simply dug up the peat in any spot that seemed likely to be free from roots. Unless violently disturbed each bird would be found sitting upon its egg, or, perhaps it would back away a few inches. In some instances the bird had been frightened, and leaving its egg had run along

the burrow and disappeared, in some of these cases being found on further excavation huddled up to its next neighbor. There was no difficulty in catching any number of the birds in one's hand, and after selecting all that could be used the balance were thrown into the air when they flew away in a dazed manner as if unused to the light. The eggs of *O. furcata* proved on comparison to be a little larger than those of *O. leucorhoa*, and were more spotted at the large end. While those of the latter were fresh or nearly so, the eggs of *O. furcata* were nearly all too far advanced in incubation to be saved.

Besides the inhabited burrows there were a good many old ones, principally in well-defined areas of a few yards across, that were for some reason unused. The minks, of which there must be a large number on the island, judging from the piles of Petrel's wings found in some spots, may have systematically cleaned out these unused areas; but as the mouths of these burrows looked old and neglected this hypothesis is a doubtful one.

LAND BIRDS OBSERVED IN MID-WINTER ON SANTA CATALINA ISLAND, CALIFORNIA.

BY JOSEPH GRINNELL.

I HAD the good fortune to spend the last eight days of December, 1897, on Santa Catalina Island, which lies about 25 miles off the coast of southern California. My ornithological observations were confined to the east end of the island in the vicinity of Avalon. Catalina Island consists of a range of hills rising 1000 to 3000 feet above the sea and very much resembling in formation some sections of the mainland Coast Range of which system it is evidently a part. These hills are furrowed by innumerable ravines and cañons, and are clothed more or less thickly with low brush and cactus. The shady north slopes generally present a heavy growth of larger bushes, which often reach the size of small trees.