

ABERRATION IN THE CLUTCH SIZE OF THE SEMIPALMATED PLOVER

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The Semipalmated Plover (*Charadrius semipalmatus*) normally lays four eggs, and three are not uncommon (Bent, U.S. Natl. Mus., Bull. 146:214, 1929; Gabrielson and Lincoln, Birds of Alaska; The Stackpole Co., Harrisburg, Penn., 1959, p. 323). However, on 29 June 1969 in the Tikchik Lakes area north of Dillingham, Alaska, the author, accompanied by E. J. Foster, discovered the nest of a Semipalmated Plover that contained five eggs.

The nest was located on the south shore of Nuyakuk Lake (59° 57' N, 158° 40' W). It consisted of a small

depression in the sand approximately 8 m from the water's edge and was situated several meters from the nearest vegetation.

A pair of adult birds standing on the beach first attracted us to the area. As we approached in an attempt to photograph them, one took flight while the other feigned injury as described by Gabrielson and Lincoln (op. cit., p. 324). When we had remained motionless for several minutes the adults returned and I was able to photograph one. Several minutes later one of the birds had returned to the nest, and when approached fled, again feigning injury.

The nest was photographed, but unfortunately no measurements of the eggs were made. It was impossible to return at a later date to determine the fate of the eggs. Semipalmated Plovers were not common in this area during the summer of 1969.

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HYBRIDIZATION IN NORFOLK ISLAND WHITE-EYES (*ZOSTEROPS*)

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The resident white-eyes, *Zosterops albogularis*, *Z. tenuirostris*, and *Z. lateralis*, of Norfolk Island off eastern Australia are a famous example of triple invasion of an oceanic island by white-eyes from the mainland (Mayr 1963:506). Mees (1969:116) re-noted an apparent hybrid (AMNH 701139) between *Z. lateralis* and *Z. tenuirostris* that was first mentioned by Stresemann (1931:229) and concluded in the absence of additional evidence that hybridization between these two species occurs only as a great exception. The purpose of this paper is to call attention to two additional hybrids of *lateralis* × *tenuirostris* and to suggest that hybridization between these two species resulted immediately after *Z. l. lateralis* colonized Norfolk Island in 1904, but has since diminished or even ceased.

These two additional hybrids, also included in the collections of the American Museum of Natural History, were found in a series of *Zosterops tenuirostris* taken by Roy Bell, the collector of the first-noted hybrid. The original labels contain the following information:

AMNH 701304:

♂ col. 23-12-12 Roy Bell No. 390 Norfolk Island, Dixey
Iris yellowish brown; feet light blue gray; bill light and dark gray.
Contents of stomach—fruit.

AMNH 701305:

♂ col. 23-12-12 Roy Bell No. 391 Norfolk Island, Dixey
Iris yellowish brown; feet blue gray; bill light and dark gray.
Testes are very large; body is in spirit.

Both specimens were collected on 23 December 1912 at Dixey, which is near Stockyard Creek. The note on the size of the testes of AMNH 701305 is unusual in the series of specimens taken by Bell, suggesting that the testes of this hybrid specimen were at least as large as those of specimens in normal breed-

ing condition, perhaps larger. The plumage of both 701304 and 701305 is slightly worn.

All three hybrid specimens are similar to *Z. l. lateralis* in upperpart coloration, having a yellow-green head and a sharply demarcated gray back. The gray back color, while near that of *lateralis*, is distinctly more olive than any *lateralis* from Norfolk Island and tends toward the brownish-olive back coloration of *tenuirostris*. All three specimens also have bright yellow throats and a distinct suffusion of yellow on the underparts, thus resembling *tenuirostris*. Their flank coloration is variable. The flanks of 701304 are brownish olive, resembling *tenuirostris*. In 701305 they are more brownish, similar to the brightest (brown) examples of *tenuirostris*, but decidedly duller than any *Z. l. lateralis* from Norfolk Island. The flanks of 701139 are bright rusty, similar to dull *Z. l. lateralis*, but brighter than any *tenuirostris*. In coloration, therefore, these specimens combine characteristics of both *lateralis* and *tenuirostris*.

Wing and tail lengths of 701304 and 701305 are within the range of *Z. tenuirostris*, while tarsus and culmen lengths of these two specimens are distinctly intermediate (table 1). 701139 is smaller than the other two hybrids and within the size range of *Z. l. lateralis*.

Zosterops l. lateralis has a pointed wing in which the second (outermost functional) primary is longer than the sixth. *Zosterops tenuirostris*, however, has a more rounded wing in which the second primary is shorter than the eighth. The primaries of two of the hybrids, 701304 and 701305, are worn but appear to be between the sixth and seventh in length, i.e., shorter than the sixth. As pointed out by Mees (1969), the second primary of 701139 is slightly longer than the sixth.

In summary, 701304 and 701305 are intermediate between *Z. l. lateralis* and *Z. tenuirostris* in size, coloration and wing formula. The third specimen (701139) does not differ appreciably from *Z. l. lateralis* in size but is distinctly intermediate in coloration.

These three hybrids superficially resemble certain yellow-throated races of *Z. lateralis*, in particular the large *Z. l. tephropleura* of Lord Howe Island. Their measurements, including tail, tarsus, and culmen lengths as well as tail/wing and culmen/wing ratios, are similar to *Z. l. tephropleura* (table 1). However the wings of 701304 and 701305 are larger than those of *Z. l. tephropleura*. The suffusion of yellow

TABLE 1. Comparison of hybrid white-eyes from Norfolk Island with *Z. tenuirostris*, *Z. l. lateralis* (Norfolk Island series), and *Z. l. tephropleura*.^a

| Character | n | \bar{x} | Range | SD | SE |
|----------------------|----|-----------|-----------|------|-------|
| Wing length (arc) | | | | | |
| hybrids | | | | | |
| 701304 | 1 | 65.0 | | | |
| 701305 | 1 | 64.0 | | | |
| 701139 | 1 | 61.0 | | | |
| <i>lateralis</i> | 20 | 61.0 | 58.5-63.0 | 1.33 | 0.297 |
| <i>tenuirostris</i> | 22 | 67.2 | 64.0-70.0 | 1.74 | 0.371 |
| <i>tephropleura</i> | 12 | 59.1 | 57.0-61.5 | 1.36 | 0.393 |
| Tail length | | | | | |
| hybrids ^b | | | | | |
| 701304 | 1 | 49.0 | | | |
| 701305 | 1 | 50.0 | | | |
| 701139 | 1 | 48.0 | | | |
| <i>lateralis</i> | 10 | 45.3 | 42.5-47.3 | 1.66 | 0.525 |
| <i>tenuirostris</i> | 10 | 50.6 | 48.7-52.7 | 1.24 | 0.392 |
| <i>tephropleura</i> | 9 | 47.2 | 45.6-48.7 | 1.38 | 0.460 |
| Culmen length | | | | | |
| hybrids | | | | | |
| 701304 | 1 | 17.2 | | | |
| 701305 | 1 | 17.3 | | | |
| 701139 | 1 | 15.4 | | | |
| <i>lateralis</i> | 19 | 14.2 | 13.1-15.4 | 0.78 | 0.358 |
| <i>tenuirostris</i> | 25 | 19.5 | 18.5-20.5 | 0.67 | 0.134 |
| <i>tephropleura</i> | 11 | 16.2 | 15.1-17.1 | 0.58 | 0.175 |
| Tarsus length | | | | | |
| hybrids | | | | | |
| 701304 | | | | | |
| 701305 | 1 | 18.9 | | | |
| 701139 | 1 | 18.2 | | | |
| <i>lateralis</i> | 21 | 17.3 | 16.3-18.3 | 0.46 | 0.101 |
| <i>tenuirostris</i> | 24 | 21.1 | 19.8-22.2 | 0.65 | 0.132 |
| <i>tephropleura</i> | 10 | 18.3 | 17.1-19.3 | 0.54 | 0.172 |

^a Samples are of adult males in the collections of the American Museum of Natural History. These specimens were taken throughout the year by Bell in 1912 and 1913 and in May 1926 by Correia. Worn specimens were excluded. All measurements are in mm.

^b Measured by Wesley E. Lanyon.

on the underparts and brownish cast to the back color of the hybrids are unlike any *tephropleura*, and the rusty flanks of 701139 are brighter than in any other race of *Z. lateralis*.

According to Mees (1969:325), *Z. albogularis*, the first white-eye to colonize Norfolk Island, is apparently derived from *Z. l. lateralis*, whereas *Z. tenuirostris* has evolved more recently from a yellow-throated race of *Z. lateralis*, perhaps *Z. l. familiaris*. *Z. l. lateralis* colonized Norfolk Island a second time in 1904 (North 1904), and must have rapidly increased its numbers, because by 1910 it was more common on Norfolk Island than *Z. tenuirostris*, which itself was a common bird (Mees 1969:114). Bell's collection of specimens taken in 1912 and 1913 includes 37 *lateralis*, 35 *tenuirostris* and three hybrids. Even if Bell selected the hybrids purposefully, the fact that three of these 75 specimens are conspicuous hybrids leaves little doubt of sporadic hybridization between the newly arrived *lateralis* and the endemic *tenuirostris*. *Z. lateralis* and *Z. tenuirostris* now co-exist with no evidence of continued hybridization (Mees 1969:116).

Hybridization upon initial contact of closely related species followed by diminished interbreeding has been reported for two species pairs on continents, e.g., *Dendrocopos syriacus*-*D. major* and *Parus caeruleus*-*P. cyanus* (see Short 1969:91), but such

evolutionary phenomena are rarely noted because of their brief duration. The case reported here for Norfolk Island *Zosterops* appears to be the first involving island colonists.

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LITERATURE CITED

- MAYR, E. 1963. Animal species and evolution. Belknap Press of Harvard Univ. Press, Cambridge, Massachusetts.
- MEES, G. F. 1969. A systematic review of the Indo-Australian Zosteropidae (Part III). Zool. Verhandl. 102:1-390.
- NORTH, A. J. 1904. Ornithological notes. Rec. Austr. Mus. 5:337-338.
- SHORT, L. L., JR. 1969. Taxonomic aspects of avian hybridization. Auk 86:84-105.
- STRESEMANN, E. 1931. Die Zosteropidae der indo-australischen Region. Mitteil. Zool. Mus. Berlin 17:201-238.

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