

containing a complete four-egg clutch) and sent south in two batches by airplane, for release at either Bettles or Fairbanks, Alaska, on the day following capture. They were transported in 4-compartment cartons, allowing release of a single bird at a time.

One of the pairs died before release, owing to airline delay. Two of the four remaining pairs returned to their territories at Barrow, as summarized in Table 1. Pair 2 actually resumed normal incubation of their nest, the four eggs of which had not been disturbed in the 10-day interval between capture and return. No single birds of the remaining two pairs of birds were seen to return, but separation of mated male and female, in time or location of release did not necessarily hinder their returning. The only difference between returning and non-returning pairs that we can detect is that the former averaged slightly heavier at capture. Differences in physiological condition at release probably also account for the longer time taken by pair 1 to return: the birds of batch 1 were held captive at higher temperatures, and without food or water for several hours longer than those of batch 2.

This study demonstrates the tendency of displaced *C. pusilla* to return to their nests or territories from considerable distances, and suggests the feasibility of using this homing tendency in an expanded systematic study of orientation and navigation.—David W. Norton, Institute of Arctic Biology, University of Alaska College, Alaska 99701, and Uriel N. Safriel, Department of Zoology, Hebrew University, Jerusalem, Israel.

Sexing Western Sandpipers By Bill Length.—To facilitate migration studies of the Western Sandpiper (*Ereunetes mauri*) in central California we found it important to determine the sex of the Western Sandpipers that we band. Although there do not appear to be any distinctive plumage differences between the sexes, there is a mensural character, bill length, from which the sex of a large proportion of the Western Sandpipers can be determined.

The bill length, from the tip of the upper mandible to where the feathers meet the upper mandible, was measured by both authors on 140 Western Sandpipers in the collection of the Museum of Vertebrate Zoology, University of California, and on 77 thawed carcasses of Western Sandpipers killed on Bolinas Lagoon during the 1971 spring migration. Measurements were taken to the nearest 0.1 mm using dial calipers calibrated to 0.05 mm. To decrease the probability of including museum specimens that were incorrectly sexed, only adult birds collected between April 1 and August 5 were considered. The sexes of the Bolinas Lagoon birds were determined from dissection and inspection of the gonads by R. Jurek or by one of the authors (G. P.). To determine the usefulness of the bill measurement as an indicator of sex in the Western Sandpiper, the means and the standard deviations of 70 males and 70 females from the museum were calculated. From these data (see table) normal frequencies of male and female bill lengths were established (Sokal, R. R. and F. J. Rohlf, 1969. *Biometry*, W. H. Freeman and Company, San Francisco: 114-115).

Sex	Sample Size	Range	Mean \pm and -2 Standard Errors	Standard Deviation
Male	70	20.4 - 25.5	22.58 - 22.83 - 23.08	1.03
Female	70	22.5 - 30.1	26.19 - 26.51 - 26.83	1.34

From the normal frequencies of the male and female bill lengths, we found that 93% of the males and 5% of the females have a bill length < 24.2 mm., 90% of the females and 2% of the males have a bill length ≥ 24.8 mm and 5% of each sex have a bill length between 24.3 and 24.7 mm. If all birds with a bill length < 24.2 are considered as males and ≥ 24.8 as females in 100 Western Sandpipers with a male to female ratio equal to unity, 46 birds will be sexed correctly as males and 45 correctly as females. Of the remaining nine birds, three will be sexed incorrectly as males, one incorrectly as a female, and five will remain unsexed.

To test whether the bill lengths of the museum specimens differed from those of the Bolinas birds, the bill lengths of 70 males from Bolinas (mean = 22.7,

standard deviation = 0.91) were compared with the 70 males from the museum. The preparation of Western Sandpipers as museum specimens apparently did not influence the measurements of their bill lengths since the means and variances of the two groups of males did not differ significantly ($P > 0.05$).

Both authors measured every bird and when their measurements for an individual differed by 0.5 mm or more (± 5 birds) remeasured the individual to reduce the error. Following this procedure the variation between the 217 pairs of measurements had a mean of 0.01 mm and a standard deviation of 0.17 mm. The mean variation between our measurements was not significantly different from 0.0 ($P > 0.05$) indicating that there was no apparent bias for one author to record longer measurements than the other.

From the above data it appears that bill length is a useful measurement for determining the sex of a high proportion of Western Sandpipers.

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Unique Burrowing Owl Pellets.—While investigating Burrowing Owls (*Speotyto cunicularia*) the summer of 1970 in the Albuquerque, New Mexico vicinity I found two rather odd pellets (Fig. 1). The larger pellet measured 3.5 x 1.6 cm and weighed 5.41 g. It was composed of 0.08 g arthropod remains, 0.23 g horse manure, 0.54 g glass, and 4.5 g stone. The stone ranged in size from that of sand to 1.6 x 0.5 cm pebbles. Total inorganic material by weight was 94.4 per cent. The smaller glass spiked pellet was 3.3 x 1.3 cm and weighed 1.87 g including the glass. The glass spike protruding along the long axis of the pellet was 3.2 x 0.4 cm. Due to its uniqueness this pellet was not dissected and remains in the Museum of Southwestern Biology at the University of New Mexico. Superficial examination revealed that the pellet contained remains of a small rodent, arthropods, small stones and one piece of glass. The owls responsible for these pellets remained healthy, but on subsequent visits similar pellets were not found.

FIG. 1. Two glass and stone laden Burrowing Owl pellets.

