

Perhaps the cowbirds were pressured by their own population density (Lewis (ibid.) records his instance in an area "of especially high cowbird abundance," as is my region). The fact that they are relatively new colonists here and that some of their most important traditional hosts, the flycatchers and warblers (except the Orange-crowned Warbler, *Vermivora celata*), have become "noticeably fewer" in this region over the same time period (Larrison ibid.: 215) may have led them to experiment with new host species. In this case an increasing number of records of local cowbirds using previously uncommon hosts may be expected. In addition to the three White-crown records, I watched a pair of Orange-crowned Warblers feeding a single cowbird on 1 August 1973, also on Samish Island. Friedmann's 1971 study records only three previous records for this host, two of them just north of here in British Columbia. On 2 August 1973 I saw a Golden-crowned Kinglet (*Regulus satrapa*) feeding a young cowbird near Bellingham, Washington. Friedmann records only two previous records for *M. ater artemisiae* using this host, both from British Columbia.

As a point of methodology, cowbirds and their hosts are discovered easily once one has tuned his ear to the young cowbird's loud and characteristic food-begging note.—NORMAN LAVERS, 873 Samish Island Road, Bow, Washington 98232. Accepted 26 Sep. 73.

**Homing experiments with Audubon's Shearwaters.**—Audubon's Shearwater (*Puffinus lherminieri*), a pantropical species, is recorded as nesting on islets in the Caribbean, the Bahamas, and in very small numbers on Bermuda. Outside the breeding season the shearwaters from the Caribbean probably disperse widely, for in late July, August, and September individuals are seen off the east coast of North America, following the Gulf Stream almost as far north as the North Atlantic Drift (Post 1967, Bird-Banding 38: 278). No evidence exists for extensive migration (Palmer 1962, Handbook of North American birds, New Haven, Yale Univ. Press).

For homing experiments adult shearwaters were taken from their nests at two breeding colonies in the southern Caribbean: Little Tobago (11° 17.5' N, 60° 30' W) and Espenqui in the archipelago of Los Roques (11° 50' N, 66° 45' W). During the releases of birds from Little Tobago (studied 13 February–4 March 1968) the breeding adults had eggs in burrows in the soil; 21 birds were taken for release on other islands in the Caribbean (two birds were released twice). During the releases from Espenqui (studied 12–24 April 1969) most of the breeding adults had chicks in crevices between lumps of coral; 26 adults were released at coastal and inland sites in Venezuela. Shearwaters selected for the homing experiments were, so far as possible, those that had just started a bout of incubation (these usually last several days). Each bird was banded and carried to the release site in an individual compartment of a cardboard box. For the 1968 releases the intervals between capture and release were 24–40 hours; in 1969 the corresponding intervals were 8–14 hours. The shearwaters were released singly in daylight and watched through binoculars as long as possible. At least 5 minutes elapsed between last sight of one bird and release of the next. Burrows or nesting crevices were checked thereafter for up to 17 nights. Initial headings of the 10 shearwaters released under sunny conditions at the only inland release site (Anaco, Venezuela 78 km from the coast) were approximately homeward ( $P < 0.01$ , Watson and Williams test) but perhaps of greater note is the fact that 5 of the 10 birds circled to great heights before being lost to view after at least 3 minutes. Birds released at or near the coast appeared to head out to sea without reference to home direction.

TABLE 1  
RETURNS OF DISPLACED AUDUBON'S SHEARWATERS

Release points	Distance (km) and bearing of home		Date	No. <sup>1</sup> of birds	Returned on nights													
					1	2	3	4	5	6	7	8	9	10	11	12	13	14-17
LITTLE TOBAGO					1968													
Guadeloupe	530	169°	16 Feb.	5	-	-	1	x <sup>2</sup>	x	x	-	1	-	2	x	x	1	-
Barbados 1	209	210°	16 Feb.	3	-	1	2	x	x	x	-	-	-	-	x	x	-	-
Barbados 2	209	210°	28 Feb.	5	1 <sup>3</sup>	1	-	1	-	-	-	-	-	-	-	-	-	-
Antigua	645	168°	28 Feb.	5	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Tobago	24	60°	28 Feb.	2	-	-	-	1	1	-	-	-	-	-	-	-	-	-
LOS ROQUES					1969													
Anaco (inland)	368	317°	17 Apr.	8	-	-	-	-	-	1	-	-	-	-	-	-	-	-
San Juan (coastal)	194	67°	20 Apr.	9	-	2	2	2	-	-	-	-	-	-	-	-	-	-
Isla Pelona	16	45°	21 Apr.	3	1	2	-	-	-	-	-	-	-	-	-	-	-	-

<sup>1</sup> Excluding shearwaters that lost egg or chick and were not recorded, or could not be extracted from deep crevices.

<sup>2</sup> No checks for these nights (x).

<sup>3</sup> This bird had already homed from Guadeloupe during the 8th night.

Table 1 shows the release sites and homing performances. Of the 23 releases of birds from Little Tobago, 3 are excluded from the analysis because the egg disappeared and the birds were not found (under such circumstances returning birds are less likely to remain in the burrow). Of the 26 birds from Espenqui six were excluded because a chick was lost and/or a shearwater in the nesting crevice could not be caught for definite identification. More "homers" would probably have been found if the nests had been checked for longer periods. Birds that home rapidly are likely to be most relevant to studies of navigation and it is useful to compare the present results with those obtained with Manx Shearwaters (*P. puffinus*). Matthews (1964, Auk 81: 132) reported that homing is faster by Manx Shearwaters taken early in the incubation period than by those taken late or with chicks. Also individuals show a marked improvement in performance with repeated releases in subsequent years. The Audubon's Shearwaters from Little Tobago were approximately equivalent to Matthews' "early" birds, and those from Los Roques to his "late" birds. Table 2 compares the homing performance of the two species: for the given nights following release, the frequency of returning per night is given by

$$\frac{\text{number of returns in that period}}{\text{number of birds} \times \text{number of nights checked}}$$

This statistic permits comparison of the present short experiments with the Manx results. The 3-night period without checks in the midst of the Little Tobago observations is included in the computations, because it is unlikely that any experimental birds came and went during that period. The performances are similar, but the early Audubon's did less well on the first 2 days (the group most relevant to studies of navigation). Detailed comparisons are not worthwhile, not only because of the differences in release sites (Matthews' were mostly inland), but also because the Manx summary is of a selected sample of good homing birds, limited to those that homed not only on the first but also on the second release (i.e. excluding those that did not home). Two Audubon's from Little Tobago were released again after homing from

TABLE 2  
 FREQUENCIES OF HOMING BY AUDUBON'S SHEARWATERS AND MANX  
 SHEARWATERS IN RELATION TO STAGE OF BREEDING

	Number <sup>1</sup>	Night of return		
		1-2	3-4	5-10
Manx, early <sup>2</sup>	50	0.160	0.110	0.017
Audubon's, Little Tobago	16	0.063	0.125	0.071
Manx, late <sup>2</sup>	50	0.040	0.070	0.077
Audubon's Los Roques	17	0.059	0.118	0.024

<sup>1</sup> The numbers of Audubon's are for first releases more than 100 km from home and exclude 6 birds that lost egg or chick or could not be extracted from deep crevices (as well as 2 birds released for the second time).

<sup>2</sup> The figures for Manx are calculated from the percentages given in Table 7 of Matthews (ibid.) for the first sorties of birds that later returned from at least one additional release.

Guadeloupe; one returned from Barbados on the first night (i.e. better than 10 km/hour), the other did not get back from Antigua before the end of checking on the 5th night. Overall, the late Audubon's from Los Roques performed better than the late Manx, although those released inland (at Anaco) did least well of all the releases. Any further work on Audubon's Shearwaters at these sites must take account of the two impediments of (unexplained) egg loss and the inaccessibility of some of the nesting crevices.

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**The Skylark in Washington.**—Skylarks (*Alauda arvensis*) were introduced to the Pacific Northwest in 1902 or 1903 when about 100 birds were released on Vancouver Island's Saanich Peninsula north of Victoria, British Columbia (Sprot 1937, Godfrey 1966). An additional 49 birds were released in the same vicinity about 10 years later (Scheffer 1935, Godfrey 1966). The species had become established by the mid-1930s when Grinnell (1936) reported finding 40 birds on an abandoned airfield north of the city. Sprot (1937) estimated the population as 219 Skylarks where he found the birds most commonly in farm fields in the fall of 1936. Scheffer (1955) noted that Skylarks were common in appropriate habitats adjacent to Victoria, and he stated that the population apparently had not fluctuated over the preceding years. Godfrey (1966) reported an estimate of about 1,000 individuals present on Saanich Peninsula in March 1962.

The Saanich Peninsula lies about 18 km west of San Juan Island, Washington (see Figure 1) where the species was first reported by Bruce (1961) and then by Wahl and Wilson (1971) who reported locating two nests in the meadows bordering the island's south coast. We collected two adult male Skylarks on 15 and 17 March 1972, 9 km south of Friday Harbor, Washington in San Juan Island National Historical Park, some 500 m southeast of Pickett's Redoubt in the American Camp Unit. These specimens are in the National Museum of Natural History (NMNH