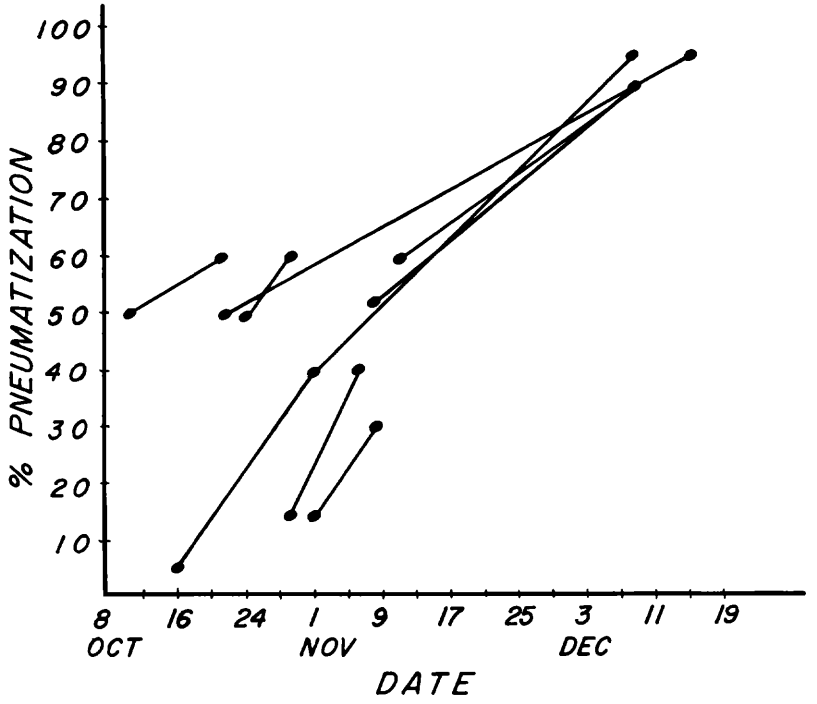

FIGURE 2. Pneumatization rates calculated from percent pneumatization of recaptured birds.

The most pneumatized skull of a first-year bird caught during the first 2-week period was 60% on 20 October. Using the slow, terminal rate of pneumatization of 1.2%/day, this individual would not be fully pneumatized until 33 days later on 22 November. Even if the mean rate for all individuals is used, 100% pneumatization is not reached until 14 November. With these facts in mind, it seems clear that Field Sparrows can be aged by skull pneumatization at least into November, much later than generally recognized.

I wish to thank Henry Horn and an anonymous reviewer whose criticisms improved this paper. The Princeton Pinheads made helpful suggestions and Hannah Suthers and David Willard taught me a great deal about bird banding.—KATHRYN J. SCHNEIDER, *Department of Biology, University of Richmond, Richmond, VA 23173.* Received 1 May 1979; accepted 24 Nov. 1980.

Head-scratching and yawning in Black Skimmers.—Several hypotheses have been advanced concerning the functions of avian head-scratching, including preening of the head plumage, spreading of uropygial oil on head feathers, and relief of local irritations on the head (Burt & Hailman, Ibis 120:153–170, 1978). A fourth hypothesis holds that head-scratching may help to alleviate pressure differences in the middle ear or eustachian tubes. This idea derives from Andrew's (Br. J. Anim. Behav. 4:85–91, 1956) observation that head-scratching often is directed at the external opening of the ear, and that it sometimes is associated with yawning. However, since Andrew's study I have found no published data that confirm this relationship between head-scratching and yawning.

On 20 Mar. 1978 I watched 15 to 20 Black Skimmers (*Rynchops niger*) head-scratching

(by bringing one foot directly up to the head, under the wing) and yawning (by opening the bill for 1–2 sec) as they stood on a beach by Lake Okeechobee, Florida. If one of the functions of head-scratching is to help clear the eustachian tubes, as yawning presumably does, then one would expect yawning to be associated only with head-scratches that contact the head near the external ear opening; scratches that contact the head in other areas, such as near the bill or on the top or back of the head, would presumably be in response to other stimuli and should not be associated with yawning. I observed 26 different bouts of head-scratching among these Skimmers: 10 of 15 scratches (67%) that contacted the head near the ear were followed within a few seconds by yawning, but none of 11 scratches that contacted the head elsewhere were followed by yawning. This relationship of ear-directed scratches with yawning is significant ($\chi^2 = 11.92$, df = 1, $P < 0.001$), and although it does not prove the internal pressure hypothesis, it is consistent with the hypothesis and Andrew's original observations, and suggests that hidden internal changes may affect the occurrence of head-scratching.

I thank J. P. Hailman, S. A. Kolmes, and K. L. Robinson for their comments on an earlier draft of this manuscript.—Scott R. Robinson, *Dept. of Zoology, University of Wisconsin, Madison, WI 53706* (present address: *325 SE Alexander, Corvallis, OR 97330.*) Received 5 Aug. 1980; accepted 28 Nov. 1980.

Fall Migration of Peregrine Falcons Along the Rhode Island Coast.—Migrations of Arctic Peregrine Falcons (*Falco peregrinus tundrius*) along the Atlantic Coast are well documented (Shor 1970, Ward and Berry 1972, Bull 1974, Leck 1975). However, specific data concerning coastal Rhode Island are lacking. This paper documents the occurrence of Peregrines at the Ninigret Barrier Beach Conservation Area, Charlestown, Rhode Island, and discusses the possible local migration pattern.

During the fall of 1975, 1976, and 1977, we looked for migrating raptors a total of 455 h at the Ninigret Barrier Beach Conservation Area (Fig. 1). All raptors were counted and for Peregrine Falcons the behavior and flight direction of each bird were recorded. Wind speed, direction, and other weather conditions were noted at one-hour intervals.

We recorded 3705 raptors in the three years. Twenty-six Peregrines (24 HY, 2 AHY) were observed. Fourteen Peregrines were noted on southerly winds (120° to 260°); ten were noted on northerly winds (300° to 45°); two were noted during calm conditions. Of all raptors seen, 3241 (87%) were recorded during northerly winds and 344 (9%) on southerly winds.

Correlations between weather condition and northerly winds, and fall hawk migration are well-known (Brown 1951, Mueller and Berger 1961); and the effect of localized weather conditions on Peregrines has also been discussed (Berry 1971, Ward and Berry 1972). As expected, most raptors migrating at this location were observed on northerly winds. However, our data show more Peregrines on southerly winds than on northerly winds. We suggest that this is a result of a shift in the local migration route in response to wind direction and the visibility of Block Island from the mainland.

All birds observed on south winds flew parallel (usually low) to the beach in a westward direction. Often, due to weather generally associated with south winds (fog, drizzle, cloud cover, etc.), these birds were unable to see Block Island. Three birds on northerly winds could not see Block Island due to heavy haze over the sound and also flew west along the beach. Both birds observed under calm conditions were in a heavy fog and continued along the beach towards the west. Seven birds on north winds were assumed to have flown to Block Island which was generally visible from the observation point during weather conditions associated with north winds. Three of these were observed flying towards Block Island, while the other four were last seen to the east and were never observed passing the observation point.

Based on these observations, we suggest that: (1) south winds and poor visibility hold Peregrines on the beach, and that under these conditions they migrate west towards the Connecticut coast, possibly reaching Orient Point, Long Island, via Fisher's Island; and