RECENT LITERATURE

Edited by Edward H. Burtt, Jr.

NEW JOURNAL

(see also 52, 53, 54, 57, 58)

1. Wingtips. H. S. Lapham (ed.). 1984. 1:1–65. Wingtips, Box 226, Lansing, New York 14882. $10.—Wingtips is a new journal "for people interested in birds and who want to learn more than identification. It is an information source for what is happening in ornithology today." The journal seeks to bridge the growing gap between amateur and professional ornithologists by providing summaries and commentary on current ornithological research and by publishing serendipitous behavioral or ecological observations that may provide a data base for theorists. A third section of the journal will provide information on regional, national, and international ornithological organizations including ". . . purpose, description, publications, and membership information . . ."

The first issue is devoted largely to name changes resulting from the most recent A.O.U. checklist. The principles on which the checklist is based are briefly discussed, followed by a listing of new names and the equivalent names from major field guides.

The journal can fill an important gap. However, it will have to be carefully edited lest scientific information become muddled in translation. The journal also needs a crisp, grammatical style. The first issue contains many awkward sentences and grammatical errors that tend to discourage the reader despite interesting information. Perhaps these are the birth pains of a much needed effort at improved communication within the ornithological community.—Edward H. Burtt Jr.

BANDING AND LONGEVITY

(see also 10, 39)

2. Memorial to a Black Turnstone: an examplar of breeding and wintering site fidelity. R. E. Gill, Jr., C. M. Handel, and L. A. Shelton. 1983. N. Am. Bird Bander 8: 98–101.—Although 53 Black Turnstones (*Arenaria melanocephala*) were banded in this 5-year study, this article features a single male "Yellow-left." Breeding birds were banded in 1978–1982 on a 20 ha area of coastal meadow of the Yukon-Kuskokwhim River Delta, Alaska (61°15′N, 165°35′W). The wintering site where "Yellow-left" was observed was a 0.8 km segment of a 3 km mixed rock and beach area of Crystal Cove State Park near Laguna Beach, California (33°31′N, 117°50′W). For three years (1978–1980) he defended the same area of about 1.2 ha (breeding grounds) although he used "a different nest site within the territory" each year. Departure dates from wintering site, arrival on breeding grounds for 1978–1982 were: unknown, 10–13 May; 25 March–21 April, 10 May; 13–25 April, 10 May; 22 March–3 April, unknown; 10–24 April, not seen. Departure dates from breeding site, arrival on wintering grounds were: 11 June, 29 July; 27 June, 22–28 July; 29 June, 20 July–1 August; 21 June, 31 July; not seen in 1982. "Yellow-left" failed to fledge progeny during the study and his departure from the breeding grounds "well before those that were successful" in rearing young was characteristic of other individuals of this species.—Richard J. Clark.

3. Swiss ringing recoveries of Bramblings *Fringilla montifringilla:* A contribution to the problem of mass irruptions. (Schweizerische Ringfunde von Bergfinken *Fringilla montifringilla:* Ein Beitrag zum Problem der Masseneinflüge.) L. Jenni. 1982. Ornithol. Beob. 79:265–272. (German, English summary)—A comparison of Brambling band recoveries between winters with and without mass irruptions indicates that birds appearing in Switzerland originate between Finland and the Ob River east of the Ural Mountains. Part of the population regularly winters in southern Europe. Other parts winter north of the Alps, but change their wintering grounds each year and constitute the mass irruptions. Males tend to winter farther north than females.—Robert C. Beason.

MIGRATION, ORIENTATION, AND HOMING

(see also 2, 29)

4. The endogenous control of bird migration: a survey of experimental evidence. P. Berthold. 1984. Bird Study 31:19–27.—This review touches lightly on results from studies of migratory birds conducted by Berthold and his colleagues. Most literature summarized in this paper is in German. Circannual rhythms in birds, the detailed timing patterns occurring during bird migration, the innate directional responses of migration, the innate components of habitat selection during migration, and innate migration urges in species in which only some populations are migratory are subjects on which a limited amount of supportive data are presented. This paper is a good introduction for undergraduate students not familiar with this subject.—Stephen R. Patton.

5. The role of the geomagnetic field in the development of birds' compass sense. T. Alerstam and G. Hogstedt. 1983. Nature 306:463–465.—In an interesting twist to studies of geomagnetic orientation, juvenile Pied Flycatchers (*Ficedula hypoleuca*) were raised by parents in nest boxes fitted with Helmholtz coils that altered geomagnetic fields during incubation and nestling periods, then tested in orientation cages during autumn migratory restlessness. Juveniles reared in nest boxes at which coils deflected magnetic fields either 90°E or 90°W were compared with controls that had been raised in unmanipulated nest boxes. The expected orientation of Pied Flycatchers in southern Sweden is SW or WSW. In orientation cages under open sky around sunset, control juveniles tended to orient W, whereas experimental juveniles tended to orient N (geomagnetic field during incubation shifted 90°E) and S (geomagnetic field shifted 90°W). Alerstam and Hogstedt suggest that magnetic information may provide a primary and innate frame of reference (see review **6**), with which birds calibrate celestial compass systems via an imprinting-like process. This interesting integration of field manipulation and testing makes the findings all the more compelling for the field biologist and gives heart to those who believe in experimental imagination.—W. A. Montevecchi.

6. Magnetic orientation and magnetically sensitive material in a transequatorial migratory bird. R. C. Beason and J. E. Nichols. 1984. Nature 309:151–153.—Evidence is presented to support the contention that Bobolinks (*Dolichonyx oryzivorus*), unlike most other North American and European species that have been tested, use magnetic information as a primary orientation cue during migration (see review **5**). Fourteen wild-caught adults and 13 hand-reared juveniles, when tested at night in a planetarium, showed consistent preferred headings when celestial and geomagnetic north coincided, i.e., adults tested in spring oriented NNW and juveniles tested in fall oriented S. When the celestial and geomagnetic cues were opposed to one another, i.e., celestial north aligned with geomagnetic south, both age groups reoriented (after a 2–5 day lag) their headings relative to the geomagnetic field. The authors did not explain or speculate about the birds' 2–5-day delay in switching from celestial to geomagnetic cues when they were placed in opposition. Might the birds have formed a conditioned association between the sets of cues and then relied on visual information until they learned the incongruous nature of the celestial and geomagnetic cues? In view of this possibility it may be informative to test hand-raised juveniles in the absence of celestial cues initially and then introduce these cues in opposition to geomagnetic ones to see if they would disrupt any preferred headings that might have been established previously (see review **5**). If they did not, this might add another type of negative evidence in favor of the species' primary use of geomagnetic orientation.

Elaborate procedures were carried out in order to delineate the type and location of magnetically sensitive material in the Bobolink's head. Iron-rich material was found in concentrations around the olfactory nerve, in bristles that projected into the nasal cavity, and in a thin layer of tissue between the eyes near the olfactory bulbs. Beason and Nichols suggest that the Bobolink's olfactory innervation functions as a magnetic sensor. The implications of these findings for previous studies of the role of olfaction in pigeon homing are that physiological interventions such as transection, destruction, and local anesthesia may have also altered magnetic perception in the study animals.—W. A. Montevecchi.

7. **Independent fall migration of first-year and older wood warblers.** P. A. Stewart. 1983. N. Am. Bird Bander 8:153–155.—Examination of the records of 24,657 individuals of 30 species of wood warblers captured at Kiptopeke, Virginia in 1978–1980 "showed HY and AHY birds traveling independently from their breeding to their winter grounds. It is concluded that these birds inherit a fixation on their winter grounds, with fixation on specific sites by individual birds to come later." The author presents data to support his conclusion.—Richard J. Clark.

8. **Geographic distribution of breeding season recoveries of adult and immature *Larus marinus, L. argentatus* and *L. fuscus* ringed in Finland.** M. Kilpi and P. Saurola. 1983. Ornis Fenn. 60:117–125.—The distribution of immature birds (less than 5 years) in the breeding season and site fidelity in adults were examined using 1533 recoveries from 1960–1981. All birds had been ringed as chicks from colonies on the south and southwestern coast of Finland. The authors found that the behavior of the immature birds during the breeding season varied with species and age-class. Recoveries were made from the southern portion of their ranges, some near the colonies and others north of the colonies. For gulls of 1–2 years, delayed migration was evident with young birds remaining in the southern portion of their range longer than adults; some probably did not migrate at all. From 46–76% of adult recoveries were found within 100 km of the natal site depending on species and age-class. Significant numbers of adults of all 3 species were recovered at localities greater than 100 km from the natal site and the authors suggest that either natal or breeding dispersal is a common reproductive strategy. This paper provided an informative demonstration of some of the basic tenets of avian migration.—Lise A. Hanners.

9. **Nocturnal activity and "homing" in the Black Redstart** *Phoenicurus ochruros.* (Nächtliche Aktivität und ⟨⟨Heimfinden⟩⟩ beim Hausrotschwanz *Phoenicurus ochruros.*) B. Bruderer and V. Neusser. 1982. Ornithol. Beob. 79:145–157. (German, English summary)—The post-breeding nocturnal movements and orientation of displaced Black Redstarts were observed visually (using Cynalume) and with tracking radar to investigate the homing (to the capture location) and migratory patterns. Two birds returned to their capture site when displaced in early September. These flights were made by adult birds, probably back to their former territories. Five (of 8 tested) birds showed a directional preference when tested in Emlen funnels. However, there was no relationship among the individual preferred headings, nor to the expected migratory direction. The authors interpreted this as "undirected premigratory" activity which may have been a manifestation of post-breeding dispersal. The motivation of nocturnally-released birds to fly increased as the season progressed. Most such flights were homeward oriented or followed the local topography. Birds released under overcast skies usually circled while climbing. Although the Black Redstart is unquestionably capable of nocturnal migration, the central European population appears to engage in diurnal "creep migration" during the early phase of its migration and switch to exclusively nocturnal migration later.—Robert C. Beason.

10. **Autumnal movements of House and Tree sparrows *Passer domesticus* and *P. montanus* in Switzerland.** (Herbstwegungen von Haus- und Feldsperling *Passer domesticus* und *P. montanus* in derschweiz.) L. Jenni and U. Schaffner. 1984. Ornithol. Beob. 81:61–67. (German, French summary)—This paper is based primarily upon the results of banding data (1958–1982) and systematic studies of bird migration (1958–1961, 1964–1965) at Col de Bretolet in the Alps, as well as all Swiss banding records and the open literature. The median time of daily movement (0900 for *P. montanus,* 1000 for *P. domesticus*) and seasonal movement (mid-October) was similar for both species, but *P. montanus* activity had less variation from the median. Most dispersing individuals were juveniles (91 4% for House Sparrow, 96.5% for Tree Sparrow), and more House Sparrow dispersers were female (70.8%). A significant proportion of Tree Sparrows dispersed beyond 50 km, while the largest proportion of House Sparrow recoveries were within 5 km.—Robert C. Beason.

POPULATION DYNAMICS

(see also 16, 74)

11. Line transect estimates of density and the winter mortality of Gray Partridge. J. T. Ratti, L. M. Smith, J. W. Hupp, and J. L. Laake. 1983. J. Wildl. Manage. 47:1088–1096.—During fall–spring 1979–1980, a recently developed line-transect sampling technique (Burnham, Anderson, and Laake, Wildl. Monogr. No. 72, 1980) was used to estimate density of *Perdix perdix* in South Dakota. Data collected for this method are total length of census lines traversed (L), number of coveys detected (n), perpendicular distances to coveys (x_i), and number of birds in coveys (c_i). An appropriate model (see Burnham et al. 1980) is fitted to the x_i's to evaluate the probability f(0) of detecting a covey, which is assumed to be a function of its distance from the transect line. Density estimates are calculated by the formula $D = nf(0)\bar{C}/2L$, where D is the density estimate and $\bar{C}$ is the average covey size. Winter mortality was estimated as $1-D_W/D_F$, where D_W is the estimated density in mid-winter and D_F the density in late fall.

Surveys on 272 transects yielded density estimates of 48 birds/km^2 in late fall, 21/km^2 in mid-winter, and 29/km^2 in early spring. Winter mortality was 56%, but average covey size differed by only 5% between late fall and mid-winter. The authors state that "covey mixing" can cause severe bias in mortality estimates that are based merely on reductions in average covey size. They conclude that since Gray Partridge are behaviorally compatible with the main assumptions of line transect sampling, their density and mortality can now be monitored "with accuracy and precision not previously available."—Richard A. Lent.

NESTING AND REPRODUCTION

(see also 2, 21, 26, 27, 34, 35, 56, 66, 74, 77)

12. Age, experience, and enemy recognition by wild Song Sparrows. J. N. M. Smith, P. Arcese, and I. G. McLean. 1984. Behav. Ecol. Sociobiol. 14:101–106.—The generality of the title is somewhat misleading because the article only deals with responses of Song Sparrows (*Zonotrichia melodia*) to models of Brown-headed Cowbirds (*Molothrus ater*), an interspecific nest parasite, and Dark-eyed Juncos (*Junco hyemalis*), a control. Yearling and older female Song Sparrows differ in their responses to the cowbird model. Older females called, changed perches, and flew toward or around cowbird models more than younger females. Younger females continued to incubate in the presence of cowbird models more frequently than older females. Curiously, these workers consider continued incubation a non-response to potential parasites; it seems to me to be a highly effective anti-parasite tactic. However, this reservation is a small consideration in the overall lesson and conclusion: Older females are more frequently parasitized than younger females, thus the authors suspect that Song Sparrows learn that cowbirds are potential enemies and have strong responses to them only after learning this. Because the incidence of responses to cowbirds is positively correlated with the frequency with which different-aged individuals are parasitized, it seems likely that strong responses by hosts may help female cowbirds to find nests of highly suitable hosts, namely, older females that are more successful breeders than younger females.—Patricia Adair Gowaty.

13. Timing of laying by the Pied Flycatcher in relation to age of male and female parent. P. H. Harvey, P. J. Greenwood, and B. Campbell. 1984. Bird Study 31:57–60.—Results from a 17-yr study of known-age Pied Flycatchers (*Ficedula hypoleuca*) demonstrated that pairs of older birds laid eggs earlier than pairs comprised of at least 1 first-year bird. Clutch size, number of young fledged, and proportion of young surviving to breeding age did not differ among pairs of different ages. The earlier nesting of older birds is not a result of mate retention from the previous year. Older birds may be able to nest earlier because they are in better physiological condition, are more familiar with a particular location, and are more experienced than younger birds. The advantages accruing to older Pied Flycatchers for nesting early are not evident in this study.—Stephen R. Patton.

14. Gadwall nest-site selection and nesting success. J. E. Hines and G. J. Mitchell. 1983. J. Wildl. Manage. 47:1063–1071.—Nesting success of *Anas strepera* in Saskatchewan was studied in relation to vegetation structure around nests in 3 habitats (artificial and natural islands, ditch banks, and upland). Nest densities over 2 yr were 1/ha in upland, 30/ha on ditch banks, 62/ha on artificial islands, and 74/ha on the 2.2 ha natural island. Corresponding nesting success was 0, 68, 65, and 82% respectively. Mammalian predation accounted for 45% of nest losses on uplands. Number of nests on artificial islands was significantly positively correlated with % canopy cover, vegetation height, and plant species richness; canopy cover and vegetation height combined explained 92% of the variation in nest density. Most nests were in habitat with canopy cover >25%, height >30 cm, and lateral nest concealment ratings of 3 or 4 (with 4 being all sides of the nest hidden from view). Islands with dense patches of western snowberry (*Symphoricarpos occidentalis*) or tall dense forbs (especially nettle, *Urtica gracilis*) were favored nest sites. Measurement of nearest-neighbor distances indicated a tendency towards nest clumping, which the authors interpret as a result of females aggregating in favorable nesting habitat rather than "colonialism." There appeared to be a minimum internest distance of 1 m, probably due to social intolerance. Habitat management for Gadwalls is discussed.—Richard A. Lent.

15. Observations on the Red-footed Booby on Mabualau Island, Fiji. N. P. Langham. 1984. Notornis 31:23–29.—A colony of Red-footed Boobies (*Sula sula*) on a small, almost inaccessible island nested year-round in 1980–1982, but with apparent peaks 7–8 months apart. Fledging success was estimated at 55% in 1980 and 24% in 1981, with adverse weather being suggested as the main cause of the "poor" performance. Annual breeding seasons are the norm in this species, but another short cycle has been reported on Christmas Island.—J. R. Jehl, Jr.

16. Nestling growth in the Great Tit *Parus major* and the Willow Tit *P. montanus*. M. Orell. 1983. Ornis Fenn. 60:65–82.—This study investigates differences in nesting success as reflected in nestling growth for two species of tits nesting in Finland in 1969 and 1977–1981. Body weight, wing, tail, and tarsus lengths were measured for 404 Great Tit (36 broods) and 36 Willow Tit (5 broods) nestlings. Weight data were fitted to a logistic equation and asymptotes and growth rates were compared within species between years and between species. Young of both species reached their asymptotic weights at 13–14 d although Great Tits tended to grow proportionately faster (not significantly) and intra-brood weight variation was higher than for Willow Tits. Asymptotic weights and growth rates varied markedly for both species by year.

The author investigated the effects of hatching asynchrony on the size of nestlings. In 1980 the hatching period for Great Tits was significantly longer in second ($n = 2$) than in first clutches ($n = 22$). Willow Tits ($n = 5$) had a shorter hatching period than Great Tits. The effects of hatching hierarchy on nestling survival was tested by dividing the chicks into early and late hatchlings; chicks lighter than the average weight of the brood were designated "late" and the rest were "early." Mortality was higher among late hatchlings than early hatchlings; this he proposes is a brood reduction strategy. Orell suggests that Willow Tits use a clutch size adjustment strategy in first broods based on the prevailing conditions in combination with brood reduction, while Great Tits use primarily brood reduction. Great Tits attained 90% of adult weight by fledging and Willow Tit fledglings attained the same weight as their parents. Both species had fully developed tarsi at fledging, wing lengths were 76–77% of adult size, and tail lengths were 51% of adult size. From these data the author concludes that Willow Tits leave the nest at a more advanced stage than Great Tits.

This lengthy paper provides a fine data base for 4 years of nestling growth in Great Tits. For Willow Tits only one brood was studied per year, from which only one fledgling was produced in 1977 and 4 were produced in 1978. These sample sizes are too small to support the broad conclusions drawn. The Great Tit data include first, second, and repeat broods which probably increases the variances about the growth parameters. The investigation of hatching asynchrony relies on categorization of chicks as early or late based on weights, which may bias the results toward higher mortality in late hatching nestlings. Interesting data are presented for Great Tits in this paper, but one must be careful to check the text and tables to separate "trends" from statistically significant differences.—Lise A. Hanners.

17. Peculiarities of colonial nesting in Ross's Gull *Rhodostethia rosea*. (Ocobennosti kolonial nogo gnesxovaniya rozovoi chaiki.) V. A. Zubakin and V. O. Avdanin. 1983. Zool. Zh. 62:1754–1756. (Russian)—Colonial nesting in larids appears primarily in two forms: dense masses of readily visible occupants, and diffusely dispersed nests with cryptically colored eggs and offspring. Generally, species using the second form are more aggressive towards potential predators than the others who rely on group attacks for defense. In the summer of 1978, the authors observed 12 breeding colonies of Ross's Gull in the Yakutsk tundra—a notable event by itself, given the paucity of information on this species. They found several details in the nesting ecology and behavior that separate this species from the rest of the family.

The average nearest neighbor distance for this species (n = 85) was 43 m—some nests were separated by more than 100 m. Colonies never exceeded 20 breeding pairs; the usual number was 2–8 pairs. Territorial behavior was absent, as were pair bonding and nest shift ceremonies characteristic of larids. Incubation shifts were accomplished without much contact between adults. Both parents spent on average only *2 min* per 24 h on the ground together at the nests. After about 5 days of life, chicks were visited by the adults only for feeding; by 15 days of life, chicks were fed only 4 times a day. From this time to fledging (at about 20 days), the colony appeared to be deserted: the adults were absent, foraging elsewhere, and the chicks were camouflaged, hiding in the undergrowth.

The colonies were unusually quiet since vocal calls are given only in defense against predators. Ross's Gulls, as do most larids, use dives, threatening calls, and blows with the feet in active defense. In contrast with most other larids, distraction and imitative displays are commonly used as a predator defense. The distraction display appears to be similar to that observed for *Larus pipixcan,* but there is not much detail to compare with other observations. The imitative displays are curious variants of the "broken-wing" display seen in some charadriiformes, but the authors believe it not to be feigning injury, but more as an attraction behavior. A few other species, such as *Larus maculipennis,* sometimes use similar behavior, but comparative details are lacking.

Ross's Gulls nest on the treeless tundra of the far northeastern Siberian plain, and are likely to have only wild canids and occasional humans as potential predators. The authors hypothesize that the above peculiarities in colonial nesting are adaptations that minimize the attraction of mammalian predators. Given the absence of trees and dense shrubbery, and the startling color of adults, minimizing the chance of being noticed by a hungry fox would assume a very high priority. A translation of this article has been deposited in the Josselyn van Tyne Library of the Wilson Ornithological Society.—Douglas Siegel-Causey.

BEHAVIOR

(see also 4, 10, 12, 17, 64, 65, 73, 74)

18. Are communal Pukeko caught in the prisoner's dilemma? J. L. Craig. 1984. Behav. Ecol. Sociobiol. 14:147–150.—Among communally breeding Pukeko (*Porphyrio porphyrio*), group breeding birds are at a reproductive disadvantage compared to pairs. Why then does communal breeding arise? An iterated game of prisoner's dilemma provides a possible solution. Territories are defended by adult males and costs associated with defense are related to the length of defended boundaries and the number of adult males in adjacent territories. Loss of territory is correlated with loss of breeding opportunity; thus, it is expected that any recruitment by neighbors would be immediately matched. Annual reproductive output was used to establish the pay-off matrix for two Pukeko. If both remain in pairs, the reward, R, for both = 2.0; if one yields to temptation to become communal while the other remains in a pair, the payoff, T greater than 2, is a possibility. If both males become communal, the payoff is $P = .6$; if a neighbor becomes communal, while the other does not the payoff to the pair male is S about equal to 0. Therefore, by definition for prisoner's dilemma $T > R > P > S$ and $R > (S + T)/2$.—Patricia Adair Gowaty.

19. Territorial behavior and the migration of the Crested Tit *Parus cristatus*. (Territorial noye povedeniye i migratsii khokhlatoi sinitsy.) A. V. Bardin. 1983. Comm. Balt. Commis. Stud. Bird Migr. 14:43–69. (Russian)—A 10-year study reveals populations with individuals of two different social ranks: territorial and non-territorial. Territorial individuals formed permanent pairs on areas averaging 9 ha. Non-territorial individuals were usually young birds who acquired territorial status upon the death of one of the paired members. Cases of non-territorial pairs establishing new territories were very rare.—Douglas Siegel-Causey.

20. Niche establishment and interspecific territoriality among wintering Wheatears (*Oenanthe isabellina, O. oenanthe, O. pleschanka*) in Kenya. (Einnischung und interspezifische Territorialität überwinternder Steinschmätzer (*Oenanthe isabellina, O. oenanthe, O. pleschanka*) in Kenia.) B. Leisler, G. Heine, and K.-H. Siebenrock. 1983. J. Ornithol. 124:393–413. (German, English summary.)—Wintering wheatears occupied individual territories and defended them against conspecifics as well as interspecifically. Interspecific encounters among wheatears revealed a dominance hierarchy: *O. isabellina* over *O. oenanthe* over *O. pleschanka*. African resident species tended to dominate interspecific encounters with migrants. When compared to resident wheatears (*O. pileata* and *O. lugens*), migrants spent less time on the ground and tended to have shorter intervals between prey captures. *Oenanthe isabellina* and *O. oenanthe* had the greatest niche overlap with the African residents, and *O. pleschanka* the least. Interspecific competition is postulated based on morphological similarities and agonistic interactions. As with most studies of this type, the effects are inferred without any experimental manipulations.—Robert C. Beason.

21. How do Arctic Skuas *Stercorarius parasiticus* search for diver eggs? M. Enquist. 1983. Ornis Fenn. 60:83–85.—A field experiment was conducted to determine what methods skuas use to locate Red-throated Diver [=Loon] (*Gavia stellata*) nests. A km^2 area of marshland dotted with small ponds was used for 15 experimental sets of 3 nests each containing a painted gull egg. For one nest on the shore of a pond, a papier mâché dummy was placed nearby for 24 h preceding the test; another nest was placed in a similar location without a dummy; a third was placed at least 25 m from a pond. Nests on pond shores were robbed by skuas before inland nests; nests with dummy loons were robbed before those without. The author concluded that hunting skuas use environmental cues (shorelines) and memorized information on the location of incubating loons to increase feeding success. The author considered the influence of disturbance, human or otherwise, on the likelihood of skua predation on loon nests, a detail often ignored in studies of this type.—Lise A. Hanners.

22. The accuracy and efficiency of territory mapping tested on Willow Warblers *Phylloscopus trochilus* and Chiffchaffs *Phylloscopus collybita*. J. Tiainen and H-V Bastian. 1983. Ornis Fenn. 60:112–116.—Populations of Willow Warblers and Chiffchaffs in a 200-ha study area in southwestern Germany were color banded and their territories determined by playback experiments and other observations. This "real population" (16 Willow Warbler and 32 Chiffchaff territories) was compared to the number of territories identified by mapping (16 versus 31). The mapping efficiency, or mean number of visits to the interpreted territories expressed as a percentage, was 75% for the Chiffchaff and 77% for the Willow Warbler. These results compare favorably with other similar studies.—Lise A. Hanners.

23. The ontogeny of the acoustic and visual mechanisms of the natural behavior of *Ficedula hypoleuca*. (Ontogenez slukhovykh i zritel nykh mekhanizmov, obespechivayushchikh yestyestvenoye povedeniye ptentsov mukholovki-pestrushki *Ficedula hypoleuca*). S. N. Khayutin and L. P. Dmitreiva. 1983. Zool. Zh. 62:1838–1850. (Russian)—The patterns of maturation of the auditory and visual systems of immature Pied Flycatchers were investigated through use of evoked potentials (EP) in field L (acoustic) and Wulst (visual) systems paired with behavioral observations. Significant sensitivity to feeding calls was observed in the EP in late embryogenesis, but behavioral responses were difficult to ascertain until a few days after hatching. Significant EP in response to parental alarm calls were not detected until 2 days after hatching. The behavioral response to parental alarm calls could only be observed after 5–6 days of life. The visual system did not indicate any significant EP to visual feeding stimulus until about 2 days of life; visually directed feeding behavior was first noticed at day 4. These findings follow those observed for Japanese Quail (*Coturnix coturnix*) and Konishi's pioneering work. The authors believe that the refractory delay between EP and behavioral response is due primarily to deficits in motor control of peripheral muscles rather than cortical disorganization. Rather detailed figures are given for the display of EP and behavioral phenology.—Douglas Siegel-Causey.

ECOLOGY

(see also 20, 30, 49, 61, 63, 73)

24. Contribution of river-created habitats to bird species richness in Amazonia. J. V. Remsen, Jr., and T. A. Parker III. 1983. Biotropica 15:223–231.—The special habitats created by rivers totally support 15% of the non-aquatic avian species on the Amazon Basin. The high amplitude (8–15 m) fluctuation of the water level produces the specialized habitats. Because it is predictable, most species are adapted to, and many dependent upon, the seasonal flooding. The number and percentage of avian species which are restricted to the specialized habitats along the rivers are greater for Amazonia than for any other river system of the world. The distinctness of the avifauna appears to be the result of historical and ecological factors. There is a great deal of difference in habitat structure between the riparian habitat and that of the forest. Species adapted to one habitat would not be suited to the other, except habitat generalists. The hypothetical refugia during the Pleistocene glaciation may have been isolated from the large rivers, encouraging differentiation. Closely related species pairs that replace one another between habitats lend support to the importance of historical factors. The tendency to show geographic variation is significantly lower in riparian birds and may reflect a higher dispersal rate and increased gene flow. The habitat preferences of the species studied include data on species whose preferences were previously unreported. Alteration of the river flow could reduce the Amazonian avifauna species richness by as much as 13%. Such alteration is underway in the form of deforestation, which increases the amplitude of the fluctuations; and by damming, which prevents or reduces fluctuations. This paper presents an important message in light of the habitat alteration occurring in the Amazon Basin. If the specialized habitats are not preserved, a large portion of the avifauna could be lost. Unfortunately, comparable data on other taxa (plant or animal) are not available, despite the great need (Salati and Vose, Science 225:129–138, 1984).—Robert C. Beason.

25. Predation by shorebirds, fish, and crabs on invertebrates in intertidal mudflats: an experimental test. M. L. Quammen. 1984. Ecology 65:529–537.—Quammen used three types of predator exclosure cages to quantify the effects of predation by shorebirds, fishes, and crabs on the intertidal invertebrates in southern California. She found that the importance of these predators varied seasonally and with composition of the substrate. Shallow-feeding shorebirds (Short-billed and Long-billed dowitchers, *Limnodromus griseus* and *L. scolopaceus*; Western Sandpipers, *Calidris mauri*; Avocets, *Recurvirostra americana*; and Dunlins, *Calidris alpina*) significantly reduced the abundance of the prey only in the winter when the birds were most abundant and only at the muddiest site (8% sand). Higher proportions of sand at the other sites, 42% and 79% respectively, apparently precluded effective predation because the sand grains are of approximately the same diameter as the dominant polychaete and oligochaete prey. Fish predation did not significantly reduce prey densities at any time or any place. Crab predation was significant only at the sandiest mudflat in the summer. Higher concentrations of mud apparently clogged the gills of the crabs at the muddier sites and the combination of predation on the crabs by the Willet (*Catoptrophorus semipalmatus*) and cold weather limit their seasonal importance. The study provides useful data both on the effects of the birds on the invertebrate populations and on the food habits of the shorebirds as determined by both fecal and stomach analysis.—A. John Gatz, Jr.

26. Influences of territory composition and interspecific competition on Red-tailed Hawk reproductive success. S. W. Janes. 1984. Ecology 65:862–870.—Janes reports the results of a 10-yr study of reproductive success of Red-tailed Hawks (*Buteo jamaicensis*) nesting in north-central Oregon. In this area, territory boundaries are extremely stable from one year to the next, no matter what particular pair of Red-tailed Hawks nests on the territory. Hence, mean annual reproductive success rates for given territories (not pairs of hawks) could be examined for correlations with physical descriptors of the territories. Janes found positive correlations between reproductive success on territories and abundance of ground squirrels, number and dispersion of perches or cliffs, mean topographic relief of the territory, and size of the territory only insofar as large size meant many widely-spaced perches or cliffs. Behavioral observations indicate that hawks flew more on territories having more perches and more widely dispersed perches than hawks on territories with fewer and less spaced perches. The flights tended not to be foraging flights; Red-tailed Hawks are primarily perch foragers. Janes synthesizes these latter observations to suggest low flight rates on territories with few perches lead to depletion of prey in the vicinity of the few perches occupied and consequently the observed lower reproductive success of hawks on these territories. Interspecific territoriality with Swainson's Hawks (*B. swainsonii*) does not reduce reproductive success of the Red-tailed Hawk. Janes' work nicely shows the large number of features that contribute to the quality of a territory for Red-tailed Hawks in Oregon.—A. John Gatz, Jr.

27. Nest ecology separation of European fringillid species in orchards. (Nistökologische Sonderung mitteleuropäischer Fringillidenarten im Biotop Streuobstwiese.) E. Glück. 1983. J. Ornithol. 124:369–392. (German, English summary)—This study details nest sites for 6 species of finches (Hawfinch (*Coccothraustes coccothraustes*), Goldfinch (*Carduelis carduelis*), Greenfinch (*Carduelis chloris*), Linnet (*Acanthis cannabina*), Serin (*Serinus serinus*), and Chaffinch (*Fringilla coelebs*)) breeding in the Limburg region. Hawfinches began breeding first, but left the orchards after their first brood. Goldfinches were the last to begin breeding and had the longest period of breeding activity. Glück found differences in finch nest-sites similar to the differences MacArthur (Ecology 39:599–619, 1958) reported for wood warblers. Chaffinches and Hawfinches placed nests closest to the trunk, with Hawfinch nests mostly on the south and east sides. The other species subdivided the tree in the sequence of Greenfinch, Serin, Goldfinch going peripherally. Linnets nested in lower shrubbery. Over 70% of nests were located in pear (*Pyrus communis*) and apple (*Malus silvestris*) trees. The Greenfinch nested in the broadest range of species (8) and the Hawfinch and Linnet the narrowest (3). Discriminant factor analysis produced separate centroids for each species, but a great deal of overlap for individual nests. The author interprets his results as indicating niche separation among the species studied. This is one of the few comparative studies on niche separation that is not based on food and foraging. More research of this type, when coupled with comparisons of food and foraging behavior, will greatly enhance our knowledge of species' niches.—Robert C. Beason.

28. Characteristics of Bald Eagle communal roosts in the Klamath Basin, Oregon and California. G. P. Keister and R. G. Anthony. 1983. J. Wildl. Manage. 47:1072–1079.—Forest characteristics of 5 *Haliaeetus leucocephalus* communal winter roosts near the Oregon-California border are described. Roost size (8–254 ha), forest stand characteristics, and eagle use (determined by number of castings) varied among roosts. Mean values of stand variables for the 5 roosts were: density, 53.1 trees/ha; diameter of trees, 54.3 cm; height of canopy, 26.4 m; % dead trees, 7.2 The largest roost was also the most heavily used on a per-area basis. Tree height and structure varied from short trees with a closed structure to large, open-structured trees. Tree density and height in the largest roost contributed significantly to a multiple regression equation, but only 27% of the variation in number of eagle castings was explained. This suggests that too few habitat variables, or inappropriate variables, were measured. Four roosts were pure stands of ponderosa pine (*Pinus ponderosa*), but in the fifth roost Douglas fir (*Pseudotsuga menziesii*) was the preferred roost species. Forest stand variables, and proximity of the roost to food sources are important criteria for management of Bald Eagle communal roosts.—Richard A. Lent.

29. Habitat selection, flocking and feeding behaviour of Hooded Crows *Corvus corone*. A. P. Moller. 1983. Ornis Fenn. 60:105–111.—A population of crows in Denmark was studied for 27 months to determine the effects of the winter invasion of migrants on the residents. Surveys were conducted along a 6.1 km route to determine habitat use and feeding parameters (number of pecks and steps per unit time). Residents stayed on or near their territories throughout the year and were better able to use familiar feeding areas. Migrants used ephemeral food sources. None of the birds in this study were color marked, and therefore it is difficult to understand how the behaviors of residents and migrants were separated.—Lise A. Hanners.

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

(see also 11, 14, 28, 75, 78)

30. Effects of habitat patchiness created by a Ruffed Grouse management plan on breeding bird communities. R. H. Yahner. 1984. Am. Midl. Nat. 111:409–413.—This study compares breeding bird communities of 2 types of forests; a mature uncut aspen and mixed-oak forest (the control forest) and a similar adjacent treated forest that had a mosaic of 1-yr and 5-yr old 1-ha habitats within a mature uncut aspen and mixed-oak forest. Results from the strip-transect line censuses indicate that the treated forest exceeded the control forest in species diversity, species richness, and the total number of individuals. Not surprisingly, densities of some species which occur in early successional habitats were greater in the treated forest than in the control forest. These basic results are a crude measure of the effect forest fragmentation may have on breeding bird communities in these habitats in central Pennsylvania when using the prescribed Ruffed Grouse (*Bonasa umbellus*) management plan cited in this note.

The author used pre-existing transect lines for censusing Ruffed Grouse without direct comparison of distinct habitats. Unfortunately, habitat information obtained cannot be used to directly compare bird species densities among control and treated forests. An appropriate procedure should have been used to discriminate among the 4 habitats of the treated forest which could then be compared to the 2 habitats of the control forest. In particular, comparisons of breeding bird communities of the aspen and mixed-oak forests among control and treated forests of equal area could have clearly shown the effects of forest fragmentation on breeding bird densities, especially of sensitive forest interior species. The present note, for example, cannot explain why forest species such as White-breasted Nuthatch (*Sitta carolinensis*) and Ovenbird (*Seiurus aurocapillus*) increased in the treated forest compared to the control forest, despite a 36% reduction in forest habitat in the treated forest. I suspect that these anomalous results have occurred because of the sampling method used, which failed to adequately discriminate among the different habitats censused.—Douglas B. McNair.

31. Spring and summer age separation techniques for the Mallard. R. C. Gatti. 1983. J. Wildl. Manage. 47:1054–1062.—Discriminant function analysis was used to develop a quantitative method for separating adult and yearling *Anas platyrhynchos.* Gatti used 423 wings from Mallards shot in the fall on the Mississippi flyway ("flyway sample"). Wings were aged by a *qualitative* method using a key developed by S. M. Carney (U.S. Dep. Inter. Fish and Wildl. Serv. Spec. Sci. Rep. Wildl. 82, 1964). This sample was used to develop the discriminant functions using feather measurements from the sexed birds. Although the flyway sample was aged by 3 independent and experienced observers, I question the accuracy of the original, qualitative classification. Gatti then uses his discriminant equations to test the validity of the qualitative aging method on another data set taken from 594 wild Mallards captured in Manitoba ("Manitoba sample"). These birds were aged in the field, again using the same qualitative method. It is not stated whether the same 3 people who aged the flyways sample aged the Manitoba sample. Thus the discriminant functions were generated from a qualitatively aged sample, then used to test the validity of the same aging technique that was used to generate the discriminant functions.

However, the Manitoba sample included (1) 50 known-age wild birds that had been marked in previous years, and (2) 46 known-age, pen-reared birds that had been released in the study area at 4–5 weeks of age. The discriminant functions successfully classified these known-age birds. Although the discriminant function technique eliminates observer bias inherent in the qualitative method, its accuracy depends on the accuracy of the qualitative technique it was intended to replace.—Richard A. Lent.

32. Correction coefficients for line transect censuses of breeding birds. O. Jarvinen and R. A. Vaisanen. 1983. Ornis Fenn. 60:97–104.—The Finnish model for line transect censusing of breeding birds records (1) pairs detected within 25 m of the transect, or the main belt counts and (2) pairs beyond the 25 m as far as they can be detected, or the supplementary belt. This paper presents a method using correction coefficients for converting supplementary belt counts to values corresponding to the main belt data. The authors suggest that their coefficients may be most appropriate for arctic, boreal, and temperate environments.—Lise A. Hanners.

CONSERVATION AND ENVIRONMENTAL QUALITY

(see also 24, 48, 68, 75, 78)

33. The Mute Swan (*Cygnus olor*) on Lake Luknajno (North-eastern Poland). R. Mackowicz, R. Klarowski, K. Slawinska. 1984. Acta. Zool. Cracov. 27:187–206.—The largest wild population of Mute Swans (*Cygnus olor*) in Europe occurs on Lake Luknajno. This population is important because most of Central Europe's populations have been derived from introduced pairs. The number of breeding pairs (average ca. 20 pairs) on Lake Luknajno appears to be increasing. However, there has been a decrease in non-breeding flocks (1756 individuals in 1968) which has been attributed to a recent change in preference for the littoral shallows of the Baltic Sea.—J. M. Wunderle, Jr.

34. Effects of heptachlor on American Kestrels in the Columbia Basin, Oregon. C. J. Henny, L. J. Blus, and C. J. Stafford. 1983. J. Wildl. Manage. 47:1080–1087.—Eggs of *Falco sparverius* collected from 217 nest boxes (261 eggs) were analyzed for heptachlor epoxide, a chemical used to treat seeds for control of wireworms (*Ctenicara pruinina*). Heptachlor was found in 63% of the eggs in 1978, 78% in 1979, 43% in 1980, and 29% in 1981. Geometric means of heptachlor residues (ppm dry weight) for those years were .20, .44, .14, and .10 respectively. The use of heptachlor-treated wheat seeds was banned in the region in 1979. This caused the immediate decrease (significant at $P = .05$) in heptachlor residues observed in the 1980 eggs. Heptachlor did not cause eggshell thinning. Productivity of nests decreased with heptachlor residues >1.50 ppm in the eggs; below this level there was a negligible effect. Eggs were also tested for DDE and other contaminants; no confounding influences on productivity were found. The authors conclude that heptachlor has contaminated food chains in the Columbia Basin region and has adversely affected kestrel productivity.—Richard A. Lent.

35. The Bonelli Eagle, *Hieraaetus fasciatus*, in Languedoc-Roussillon. (L'Aigle de Bonelli, Hieraaetus fasciatus, en Languedoc-Roussillon). J.-M. Cugnasse. 1984. Nos Oiseaux 37:223–232. (French, English summary)—The population of Bonelli Eagles in Languedoc-Roussillon (South France) has declined 42% in the last 10 yr and is now endangered there. Of an estimated 43 original territories in the Departments of Gard, Hérault, Aude, and the Oriental Pyrénées (22,590 km^2 in total area), only 24 are still in use. In 1983, the population consisted of 17 pairs, 4 solitary adults, and 1 solitary immature eagle. The decline is a local problem, as it is at Ardéche, rather than a change taking place throughout the species' range.

Because Bonelli Eagles are sexually immature for at least 2 yr after fledging, the danger to the population in the *short term* is the illegal shooting and other human disturbance of territorial (nesting) adults. At least 6 eagles were shot in the past 7 yr. The importance of the disturbance factor is difficult to evaluate, although it commonly causes eagles to abandon their nests: it was responsible for the desertion of 8 nests (9% of 86 observed nests). Nonetheless, some pairs tolerate tourists, hikers, climbers, and sportsmen using deltaplanes near the nest, whereas others do not. The danger in the *long term* is destruction or modification of the birds' habitat and reductions in their food supply. Mining; building roads, dams, and homes; clearing forests for firewood and pastureland;

and blazing trails through forests have all contributed to declines in the number of prey available to the eagles and increased the amount of disturbance to which the eagles were exposed. Hunting pressure, which is very high locally, has also made such dietary staples as rabbits and partridge less abundant. As a result, eagles are forced to hunt at greater distances from their nests and their chicks are consequently more vulnerable than previously. Each pair's home range (70–294 km^2) is larger now than it was 20 yr ago, presumably to compensate for this scarcity of food. Eagles commonly hunt 10 km from their nests, but are now observed 20–38 km away.

In addition to stressing the plight of Bonelli Eagles at Languedoc-Roussillon in the last 10 yr, Cugnasse presents information about the age structure, reproductive performance, and mortality of the population in this 10-yr period and describes the birds' major foods. Eighty-five percent of the territorial pairs laid eggs; 95% of those fledged young; 51% of successful nests fledged 1 chick, 49% 2 chicks (broods of 2 chicks are not rare for Bonelli Eagles in spite of what was written in the past). These data would be reasons for optimism about the eagle's status were it not for the recent alarming decline in number of fledged young: 16 chicks in 1981, 8 in 1982, but only 4 in 1983! The average productivity of Bonelli Eagles at Languedoc-Roussillon was 1.06 fledgling per territorial pair; and reproductive success was 1.24 fledglings per pair that laid eggs. Reproductive failure after hatching was 11% (9 of 52 nests). Mixed pairs of eagles (consisting of one adult and one immature or subadult bird) were especially prone to failure: only 2 of the 8 mixed pairs fledged young. Limited data suggest that earlier nests fledge more young.

Mortality rate of adult Bonelli Eagles was 8.8% over the last 7 yr or 1.25% annually. Both sexes were affected equally. No data are available for juveniles and immature birds.

Birds and mammals are the major foods of Bonelli Eagles, although they occasionally eat reptiles (especially the lizard *Lacerta lepida*). Red-legged Partridge (*Alectoris rufa*) are the most important avian prey; others are domestic pigeons (*Columba livia*), Magpies (*Pica pica*), Jackdaws (*Corvus monedula*), Jays (*Garrulus glandarius*), and Ring-necked Pheasants (*Phasianus colchicus*). Squirrels (*Sciurus vulgaris*), rabbits (*Oryctolagus cuniculus*), and Norway rats (*Rattus norvegicus*) are the most important mammalian foods.—Michael D. Kern.

36. Protecting birds on electric power lines. (Okhrana ptits na provodakh.) V. Flint and A. Grazhdankin. 1984. *Okhota Okhot. Khoz.* 3:22–23. (in Russian)—Electrocution on high-voltage electric power lines, a major factor in the decline of rare raptors in the Soviet Union, is becoming even more of a problem as such lines are strung across more and more of the country and as ferro-concrete poles replace wooden ones. The short circuits made by, and fatal to, the birds cause power failures and concomitant emergencies, and financial losses not only to power customers but also to the utilities, which can be fined for the death of the birds (30 rubles for an eagle).

Shorts are caused when a bird touches both a live wire and a metal cross-bar (grounded through the ferro-concrete pole) by stepping from one to the other or when standing on one and wiping its beak on the other. The proposed solution is to put a perch above the uppermost wire, which will attract birds such as eagles that like to perch as high as possible, and to put another insulator, not connected to any wire, on each end of the cross-bars supporting lower wires. The birds will harmlessly wipe their beaks, or step, on the insulator instead of metal.

This design, devised by the authors and colleagues at the USSR Ministry of Agriculture's Research Institute for Conservation and Reserves, has been approved by the Ministry of Energy which, the authors claim, is being inexplicably and lamentably slow to introduce it. They urge that wildlife protection authorities step up their enforcement; that fines be increased; and that fines become the individual responsibility of power company directors, not of their companies, which can bear them more easily. This is in contrast to other countries, like the USA; my local power company said, "No, we would not be responsible" for the death of a wild bird on our lines.—Elizabeth C. Anderson.

PARASITES AND DISEASES

(see also 12)

37. A study of hippoboscid flies on House Finches. M. Wood. 1983. N. Am. Bird Bander 8:102.—The finch louse-fly (*Ornithomyia fringillum*) was studied in conjunction with the mist-netting and banding of 10,000 House Finches (*Carpodacus mexicanus*) at State College, Pennsylvania. Of 271 finches examined with flies "63% of the flies were on the abdomen, 34% on the rump and 3% were on the head." Copulation of the flies was observed on 17 July and "on into August." The female produces one egg which hatches in the larval stage "in the uterus"; it passes through three instars and then "is laid alive." It soon pupates and apparently overwinters as a pupa. The adult flies begin emerging in May and seek the avian host for food (blood) and shelter. The average survival time for 132 adult flies taken from the host was 55 h.—Richard J. Clark.

PHYSIOLOGY

(see also 6, 23)

38. Torpor and food utilization in 4 species of Mousebird (Coliiformes). (Torpor und Nahrungsausnutzung bei 4 Mausuogelarten (Coliiformes.) R. Hoffmann and R. Prinzinger. 1984. J. Ornithol. 125:225–237. (German, English summary)—During periods of fasting, all 4 species (*Colius striatus, C. castanotus, Urocolius indicus, U. macrourus*) entered torpor at night. Their metabolism decreased to less than 10 J/g-h, compared to 40–50 J/g-h during non-torpor sleep. The longer the fast continued, the lower the night-time metabolism became. Diurnal metabolism also was lower during a fast, but not as markedly. The trigger for entering nocturnal torpor appears to be a minimum body mass for all 4 species. Weight loss during fasting occurs as a result of catabolic metabolism of body mass. The energy obtained from such catabolism ranged from 19.7 to 21.0 kJ/g. The efficiency of energy metabolism of food (bananas) ranged from 30% to 70%, with higher values occurring during periods of reduced food availability.—Robert C. Beason.

MORPHOLOGY AND ANATOMY

(see also 46, 56, 60, 70)

39. Changes in the eye-lid colour of Long-tailed Tits *Aegithalos caudatus*. P. W. Greig-Smith. 1984. Bird Study 31:35–38.—The bare eye-lids of Long-tailed Tits range in color from red to yellow. Tits mist-netted during winter were scored with respect to eye-lid color (red-5, yellow-1). The proportion of mist-netted tits with yellow eye-lids increased from Sept. to Feb. with mean eye-lid color scores falling from 3.78 to 1.86. These data support the hypotheses that eye-lid color changes from red in juveniles to yellow in adults, and that the juvenile mortality rate exceeds the adult mortality rate. Observations of eye-lid color in birds held for up to 15 min indicated that temporary changes in color occurred, most frequently in the direction of red, in about half of the captured birds. Birds with red eye-lid color were more likely to give distress calls than birds with yellow eye-lids. Greig-Smith suggests that eye-lid color may reflect the internal "mood" of the individual. Eye-lid color may be associated with age, dominance status, body condition, and individual recognition in this communally nesting species.—Stephen R. Patton.

40. Adaptation to frugivory of Mediterranean avian seed dispersers. C. M. Herrera. 1984. Ecology 65:609–617.—Herrera compared bill morphology, gut passage time (GPT), and gross anatomical features of the digestive tract among scrubland-dwelling passerines of southern Spain that belong to 3 dietary groups. Nonfrugivores had slender bills with weak bases and long GPTs. Seed dispersers, birds that eat fruits whole and eliminate the seeds unharmed, had large bodies, flat, broad bills, big gapes, and short GPTs. Fruit predators, birds that eat fruits destructively by concentrating on either the pulp or the seeds, had small, deep bills, narrow gapes, and long GPTs. None of these groups differed from one another in the anatomy of the digestive tract—length of the intestine, mass of the liver, or mass of the gizzard. Herrera interprets the bill and gape morphology seen in seed dispersers (all muscicapids) as preadaptations to frugivory that evolved originally as adaptations to insectivory. In contrast, he interprets the low GPTs in this same seed disperser group as a specific adaptation for frugivory; fast passage times are necessary for the rapid processing of large volumes of low nutritional content food. Herrera also emphasizes the difference in degree of morphological specialization for frugivory one sees between the birds of Spain he studied and year-round frugivores of the tropics. With fruit being superabundant only seasonally in southern Spain, the evolution of specific adaptations is rare as such adaptations, e.g., low GPTs, become detrimental during those times of the year when the diet shifts to insects. The paper thus contributes both to identifying ecological-morphological correlates in birds and to defining the conditions under which evolutionary responses occur.—A. John Gatz, Jr.

41. Adaptations of the mandibular apparatus of *Euristomus orientalis* to the capture of flying insects. (Adptatsii chelyustnogo apparata shirokorota k skhvatyvaniyu letayushchikh nasekomykh) L. P. Korzun. 1983. Zool. Zh. 62:1851–1857. (Russian, English summary)—The author describes in detail the skull and associated musculature of the Broad-billed Roller and reveals the specific adaptation of the mandible to aerial capture of large insect prey. The kinetic energy of the insect moving back into the palate is transformed by action of the suborbital aponeurosis on the quadrate hinge into an upward closing of the mandible. At the same time, the cartilaginous disc anchoring the lower eyelid is brought up through the action of the superficial aponeurosis, closing the eye. Deep dissection of the suborbital aponeuroses show there to be a synergistic connection between the associated muscles, ensuring an automatic bill closure in high velocity prey capture. This study continues Korzun's high quality investigations into the musculature and structure of avian crania, and is recommended for its lucid account of the dynamics of prey capture and the generally clear figures of anatomy.—Douglas Siegel-Causey.

PLUMAGES AND MOLT

(see also 56, 59, 60)

42. Comparative study of the molt of Emberiza in Leningrad. (Sravnitel naya kharakteristika lin ki ovsyanok Leningradskoi oblast) T. A. Rymkevich. 1983. Comm. Balt. Commis. Stud. Bird Migr. 14:85–112. (Russian)—Five species were examined: *Emberiza citrinella, E. schoeniclus, E. hortulana, E. rustica, & E. aureola.* In general, the longer the migration route, the shorter the duration of autumn molt and the earlier it starts. Young birds were able to increase the rate of plumage change, accelerate initiation, and diminish the duration of molt. Adults, however, are strongly controlled by the photoperiod and are less flexible. Prenuptial molt also seems to be controlled by the photoperiod in every species studied except *E. hortulana,* which is most likely affected by its equatorial wintering sites.—Douglas Siegel-Causey.

43. The onset of primary moult in breeding *Charadrius* plovers. J. Walters. 1984. Bird Study 31:43–48.—Some individuals of *Charadrius hiaticula, C. dubius,* and *C. alexandrinus* begin molting primaries during breeding, especially during years when the breeding season is prolonged. Males were more often advanced in molt than females and the difference was significant for *C. hiaticula.* Suspension of primary molt during hatching was suspected in several cases, but the evidence for this is weak.—Stephen R. Patton.

ZOOGEOGRAPHY AND DISTRIBUTION

(see also 3, 8, 24, 33, 52, 69, 71, 72, 76)

44. Material on the breeding avifauna of the People's Democratic Republic of Korea. T. Tomek. 1984. Acta. Zool. Cracov. 27:19–46.—From 18 May–14 July 1980, the author observed 88 avian species in North Korea. She provides an annotated list of these species that includes a description and some photographs of nests and nest sites for 12 Korean species. Many species were captured with mist nets and their standard measurements and weights are provided. The author states that a large number of birds were not identified due to poor knowledge of vocalizations of Asian birds.—J. M. Wunderle, Jr.

45. The avian fauna of the zone designed for a landscape reserve in the valley of the River Bug. (Awifauna projektowanej strefy krajobrazu chronionego w dolinie

Bugu.) B. Jablonski. 1984. Acta Zool. Cracov. 27:73–106. (Polish, English summary)—A survey of the birds of the Bug Valley was made in 1976–1978 and compared with quantitative data obtained in 1973–1974. This study describes the number of species observed in different habitats (river, old river bed, meadows, woodland, parks and garden) and their use of each habitat type. Also included are the number of individuals per habitat and population changes over the census periods.—J. M. Wunderle, Jr.

46. Sexual dimorphism in size, moult and movements of Cetti's Warbler *Cettia cetti*. C. J. Bibby and D. K. Thomas. 1984. Bird Study 31:28–34.—Males of the polygynous Cetti's Warbler are significantly heavier and have significantly longer wings than females. Adults had longer wings and were heavier than juveniles collected from the same locality. Juvenile birds of both sexes were mist-netted at equal rates in July and early August. By mid- to late August, juvenile females were caught at a significantly higher rate than males. Juvenile sex ratios of 2.1:1 and 8.2:1 were reported from 2 sites in Portugal. Post-fledging dispersal patterns of the sexes apparently differ and may be associated with differential survivorship.—Stephen R. Patton.

47. Some observations on the southern subspecies of the New Zealand Pipit. M. N. Foggo. 1984. Notornis 31:1–5.—Fulvous morphs (or races?) of the New Zealand Pipit (*Anthus novaeseelandiae*) exist (or existed) on some of the major islands near New Zealand; viz, Auckland Is., Antipodes I., and Campbell I., but not on the Chatham Is. Recently, the abundance and distribution of the fulvous birds have changed, and they now seem to survive only on two islands in the Campbell group. Whether this change is the result of invasion and local extinction ("turnover"), is the consequence of some environmental shift selecting against fulvous birds, or is due to some other event cannot be known. The lack of a thorough appreciation of variation in earlier populations coupled with a general lack of hard data (i.e., museum specimens) makes it impossible to analyze a potentially interesting situation. Worse, the paucity of recent specimens from the islands will make it impossible to track and understand any future changes.

This paper illustrates, yet again, that sound taxonomy is the cornerstone of all other studies. Unfortunately, the reluctance of "modern biologists" to preserve material for future generations will insure that many fascinating problems will remain unresolvable.—J. R. Jehl, Jr.

48. The changed distribution of stilts in New Zealand. R. J. Pierce. 1984. Notornis 31:7–18.—The Black Stilt (*Himantopus novaezelandiae*), endemic to New Zealand, was fairly common on North and South islands in the 19th century. But in the 1870's to early 1900's, the Pied Stilt (*H. leucocephalus*) increased dramatically, perhaps in association with the clearing of forests and the creation of new wetlands that were not along fast-flowing streams. At the same time, Black Stilts declined, and the species is now on the verge of extinction, partly as a result of hybridization with the pied species. Presumably Black Stilts were present in New Zealand for a long time. When the pied birds arrived is not clear, but there is some evidence that it must have been prior to the 1860's.—J. R. Jehl, Jr.

49. Summer distribution of Antarctic seabirds in relation to water masses. (Raspredelenie morskikh ptits v Antarktike v sviazi s razmeshcheniem vodnyky mass v letnii period.) L. V. Batyskaya and N. A. Shurunov. 1983. Zool. Zh. 52(5):755–760. (Russian, English summary)—Surface water masses in the Pacific and Indian Ocean sectors of the Antarctic differ in temperature and salinity. During the breeding season, different seabird species predominate in the several water masses: the greater the difference in temperature and salinity, the greater the difference in species composition.

The water masses differ also in the taxonomic and quantitative distribution of the macroplankton on which seabirds feed, and this too influences their distribution. However, it does not appear to be the only factor. It has been shown that birds of certain ecological types—birds using a certain feeding strategy: swimming underwater, hovering to pluck food from the surface, diving from a height, feeding by day only, feeding by night only—predominate in certain zones of the Antarctic sea, although their usual prey may be found elsewhere as well. Thus species that exploit a food source (such as krill) by different strategies may not be found together, even if closely related.

I may have missed something in this article, but the conclusions seem so obvious [birds are found where their food is], and previous investigators are quoted so much, that it's hard for me to know what new data or insights are presented. Perhaps the species distributions have never been so carefully catalogued. The article does not explore the question of why a food species is not sought by different strategies in one area—would this not lessen competition between the birds?—Elizabeth C. Anderson.

SYSTEMATICS AND PALEONTOLOGY

(see also 1, 24, 47)

50. Bird remains from an early mediaeval settlement at Stradów. (Szczatki ptaków z wczesnośredniowiecznej osady w Stradowie.) T. Tomek. 1984. Acta. Zool. Cracov. 27: 121–126. (Polish, English summary)—An early medieval site (7th–11th century) in Stradów, Kiece Province, Poland contained 69 fossil bone remains of 5 avian species (*Anser* sp., *Tetrao tetrix, Gallus gallus* f. *domestica, Grus grus,* and *Crex crex*). All except *Crex crex* were common birds in Poland in the Middle Ages.—J. M. Wunderle, Jr.

51. Middle Pleistocene remains of birds from Kozi Grzbiet in the Swietokryskie Mts. (Holy Cross Mts.-Central Poland). Z. Bochenski. 1984. Acta Zool. Cracov. 27:177–186.—Bone fragments of *Tetrao* cf. *praeurogallus, Lagopus lagopus, Bonasa* cf. *praebonasia, Falco tinnunculus atavus* and *Turdus* sp. were found in a karst fissure dating to the Mindel I/Mindel II interglacial period. The genera represented suggest a temperate climate at that time.—J. M. Wunderle, Jr.

52. The Great Plains hybrid zones. J. D. Rising. 1983. Curr. Ornithol. 1:131–157.—For the last 30 yr, there have been extensive and repeated studies of cases of hybridization and introgression across the Great Plains of the U.S. and Canada. In this paper, Rising reviews current knowledge concerning the 14 species pairs of birds involved. In some cases, such as the contact between the Eastern and Western Screech-Owls (*Otus asio*), little is known. Others, such as the orioles and flickers, have been repeatedly studied by several groups of systematists. In his synthesis, Rising finds that there is not a general concordance of position of these hybrid zones, as, for example, the idea of suture-zones might predict. Also, evidence suggests that some geographical shifting has taken place, over this 30-yr period, in the hybrid zones of the orioles and buntings, but not in others, such as that of the flickers.

In spite of all the work that has been done, much remains to be learned about these birds. For example, as Rising points out, it is not even known whether the two species of each of the 14 pairs are each other's closest phylogenetic relative; some Mexican forms must be examined in that regard. With respect to species' status, Rising makes the bold suggestion that the members of all 14 species pairs be recognized as distinct species (see review **53**). This would raise the status of such birds as the eastern and western Rufous-sided Towhees (*Pipilo erythrophthalmus*) to full species rank. While it will be controversial, the proposal has the advantage of eliminating the current subjectivity associated with decisions about how much gene flow is "allowable" before populations with separate evolutionary histories must be lumped into a single species.—George F. Barrowclough.

53. Species concepts and speciation analysis. J. Cracraft. 1983. Curr. Ornithol. 1: 159–187.—In this paper Cracraft points out that the application of the biological species concept to birds often results in the uniting of 2 or more natural evolutionary units into a single species. That is, strictly allopatric populations that do not appear "too dissimilar" and parapatric hybridizing populations frequently are lumped even though they may possess diagnosable characteristics that suggest the populations have had separate evolutionary histories. Thus, in Cracraft's view, such applications of the biological species concept can obscure evolutionary patterns and biogeographic analysis. Cracraft proposes that a "phylogenetic species concept" would eliminate these problems. His proposed concept equates species' status with diagnosability of a cluster of organisms that presumably have a pattern of common ancestry and descent. This proposal would lead to the recognition of many more species of birds, but—by emphasizing differentiation rather than reproductive isolation—would bring unity to studies of speciation and biogeography, and would eliminate the current confusion with subspecies. At present, some subspecies are separate evolutionary entities while others are arbitrary divisions of continuously varying phenotypes. Cracraft's definition would elevate all the former to species status. A problem that must be faced at some point, however, is that of distinguishing secondary contact of true evolutionary units from steep clines caused by selection within single widespread populations that have never been separated. Several papers by John Endler suggest that this will not be an easy task.—George F. Barrowclough.

54. Phylogeny and classification of birds based on the data of DNA-DNA hybridization. C. G. Sibley and J. E. Ahlquist. 1983. Curr. Ornithol. 1:245–292.—This paper is a review, with examples, of the theory and methodology being used by Sibley, Ahlquist, and their colleagues for the production and analysis of DNA hybridization data (see review **55**). Their laboratory has produced a wealth of information concerning the systematic relationships of birds over the last 5 yr. The technique involves a biochemical method for determining the extent of the differences between the DNAs of any 2 species. By comparing the resulting "distances," one can determine the taxon to which a species of particular interest is most closely related. Estimates of phylogenetic trees can also be inferred from a matrix of these DNA distances. The paper includes discussion of arguments, pro and con, bearing on these data and results, and summarizes the current avian evidence on many of the assumptions.

Several aspects of the method of analysis of the distance data merit comment. Most concern the assumption of a uniform rate of DNA base pair substitution among lineages. This assumption allows a simple, elegant method of analysis, but requires justification. Several arguments are used to support the constant rate assumption. Unfortunately, none is as quantitative and statistical as one might like. A relative rate test and a set of replicate experiments are described involving the repeated use of the same bird, and the repeated use of birds from the same taxonomic family, in an attempt to estimate experimental error and possible variation in the substitution rate. However, the several different components of variance involved in this technique—actual experimental error variance, variance attributable to radioactive label within individuals, variance due to different individuals within species, and variance among species within genera due to variation in base pair replacement rate, etc.—are confounded by the style of presentation. An analysis of variance specifically designed to obtain estimates of these different sources of variation would have made the results more convincing. A similar problem exists with the relative rate test; the auto-correlation due to shared evolutionary history could be removed statistically.

The establishment of a uniform rate, or at least of the magnitude of variation around some mean rate, is an empirical issue. The theoretical reasons to expect a uniform rate depend on neutral variation and effective population sizes that are constant through time. If population sizes fluctuate, as one might expect, then base pair substitution rates also may vary simultaneously over the entire genome (Korey, Evolution 35:139–147, 1981) and so the issue must be an empirical one. Again, in an analysis of variance framework, it is important to recognize that there are multiple sources of variation in estimates of evolutionary distances among taxa. One, variation due to different evolutionary rates in different sequences of the genome, is essentially eliminated in the DNA hybridization technique because the entire genome is sampled. The source mentioned above, however, variance in rate throughout the genome due to demographic events, such as bottlenecks or other changes in population sizes, may affect all loci simultaneously and so requires further theoretical and empirical investigation; it could be negligible or important.

It is possible to get around this latter problem by using methods of phylogenetic inference that are less sensitive to variation in evolutionary rates. Distance Wagner trees and maximum likelihood trees are 2 such approaches. If these techniques yield the same results as the average linkage methods now being used, then one would have more confidence in the results. If they did not, then one would at least know which branches of the tree to view with caution. At present it is difficult to evaluate the robustness of the estimates of the phylogenies.

In spite of these caveats, the DNA results are clearly the best estimates of relationship ever produced for the vast majority of birds. They are a revolutionary development in avian systematics. Although a few weak points exist, those should all yield to further empirical investigation.—George F. Barrowclough.

55. The relationships of the Bornean Bristlehead (*Pityriasis gymnocephala*) and the Black-collared Thrush (*Chlamydochaera jefferyi*). J. E. Ahlquist, F. H. Sheldon, and C. G. Sibley. 1984. J. Ornithol. 125:129–140.—The taxonomic affinities of these 2 endemic Bornean species have been disputed. Based on DNA-DNA hybridization techniques, the authors place *Pityriasis* near the Australo-Papuan genera *Cracticus, Gymnorhina, Strepera,* and *Peltops. Chlamydochaera* appears to be a typical thrush, closely related to *Turdus.*—Robert C. Beason.

56. A new albatross Diomedea amsterdamensis nova species discovered on Amsterdam Island (37°50′S, 77°35′E). (Un nouvel albatros *Diomedea amsterdamensis* n. sp. découvert sur l'île Amsterdam [37°50′S, 77°35′E]). J.-P. Roux, P. Jouventin, J.-L. Mougin, J.-C. Stahl, and H. Weimerskirch. 1983. Oiseau Rev. Fr. Ornithol. 53:1–11. (French, English summary)—A small colony of albatrosses was discovered and observed on Amsterdam I. in 1981–1982. This remote island lies in the zone of subtropical waters of the Indian Ocean midway between Australia and South Africa, roughly 100 km from Saint-Paul I. The small size of the population (30–50 individuals) and the fact that its principal breeding period is in the winter explain why its existence has gone unnoticed until recently. The albatrosses in this population are morphologically and biologically unique compared with other members of the subgenus *Diomedea* to which they unquestionably belong.

The bill of breeding adults from Amsterdam Island is flesh-colored, has a dark brown line that edges the upper mandible, and is tipped with a dark, greenish-brown spot. The nasal tube is oval and opens upward. They eyelid is white. The plumage on the face and cheeks is pure white and sharply demarcated from that on the top of the head with its dark brown or black crown. Neck and back are spotted with brown. The venter is white with fine brown mottling and has a light area of variable, but large size in the center. Upper wing coverts, rectrices, and feathers covering the tibia are black. Feet are gray. The leading edge of the wing bears an elongated black spot ventrally at the junction of the humerus and scapula. Wing length is 660 mm; culmen 140 mm; minimal bill height 31.5 mm; maximal bill height at the tip 35.8 mm; and bill height at the base 53.1 mm.

Adults appear at Amsterdam I. in February where they nest at 500–600 m elevation on the Plateau of Tourbière, and are laying eggs in early March. Chicks (in light gray down) hatch synchronously in mid-March, have molted into the first juvenal plumage (dark brown except for the face, which is white, and the undersurface of the wings, which is like that of the adult) in December, and leave the island in early January.

The authors present a convincing case for distinguishing the Amsterdam population as a new species *Diomedea amsterdamensis* separate from the Wandering Albatross (*D. exulans*) and Royal Albatross (*D. epomophora*). However, their proposal is based on very limited morphological evidence—the head and wing of one (only!) specimen of unknown sex that died of natural causes in 1982 (C.G. 1982-1139, National Museum of Natural History in Paris), together with limited observations and photographs of breeding adults and chicks. Amsterdam Albatrosses are probably not hybrids of *D. exulans* and *D. epomophora,* since the latter do not hybridize on islands where they are currently sympatric during the breeding season. In fact, the unique features of the Amsterdam birds and their remarkable morphological uniformity indicate that they are reproductively isolated from other *Diomedea,* as do the facts that (1) Amsterdam I. is outside the range of *D. epomophora,* (2) no individual *D. exulans* has ever been seen on land there, and (3) the Amsterdam population begins to lay eggs at least 1 month after the other species have finished laying. The Amsterdam birds also differ from other *Diomedea* in several taxonomically important ways: the black wingspot, white eyelid, dark spot at the tip of the bill, dark plumage, and length of the chick-rearing stage, which is unusually short (235 days), are unique. However, the dark border of the upper mandible is shared with *D. epomophora.* And, culmen and wing length, the morphology of the nasal tube, and the dark first juvenal plumage are similar to the corresponding features of *D. exulans.*

The text is accompanied with line drawings and plates illustrating the morphology of this proposed new species, and maps showing the location of its nests on Amsterdam I. and the distance between that island and the breeding areas of subspecies of *D. exulans* and *D. epomophora*. There is also a table in which the major chraacteristics that separate and ally *D. exulans, D. epomophora*, and *D. amsterdamensis* are compiled.—Michael D. Kern.

EVOLUTION AND GENETICS

(see also 18, 53, 54, 73)

57. Bird chromosomes. G. F. Shields. 1983. Curr. Ornithol. 1:189–209.—This is a review of laboratory methods for preparing and staining avian chromosomes. The various specific banding techniques are each described and illustrated with figures and a brief discussion of results to date for birds. With the routine use of banding techniques, as Shields advocates, diploid numbers and homology of at least the macrochromosomes in the avian karyotype should become better understood. At present, avian karyology lags far behind the study of mammalian chromosomes, in part because of these 2 difficulties.—George F. Barrowclough.

58. Genetic structure and avian systematics. K. W. Corbin. 1983. Curr. Ornithol. 1:211–244.—Corbin addresses several current issues in evolutionary and taxonomic biology in this discussion of the use of electrophoretic data in avian systematics. For example, the existence of "genetic revolutions" during the process of speciation and the delimitation of higher taxa are among the topics raised. Most of his major points are based on analyses of plots of genetic distances among populations (D) versus a coefficient of fixation among populations (F_{st}). Unfortunately, there are problems with these analyses because the 2 measures are not free to vary independently. F_{st} is a normalized function of the product of the frequencies of the same allele in 2 different populations, and D is the logarithm of the same product, normalized in a slightly different fashion. Thus, a plot of the 2 measures is mathematically constrained to show a nearly perfect logarithmic (i.e., non-linear) relationship. Corbin finds that linear regressions on this D vs. F_{st} plot have different slopes and intercepts for points representing intraspecific comparisons and those representing interspecific ones. However, this is to be expected simply because the different classes of points fall along different regions of the non-linear curve. That is, points within species fall closer to the origin than do points among species. Tangents to different parts of a non-linear curve will inevitably have different slopes. Thus, the result is an artifact of the algebra and has no biological meaning. It does not support the existence of a "genetic revolution," as the author speculates.—George F. Barrowclough.

59. Hybridization between Hermit and Townsend's warblers. M. L. Morrison and J. W. Hardy. 1983. Murrelet 64:65–72.—An analysis of plumage color and pattern was used to obtain a "hybrid index score" for Hermit (*Dendroica occidentalis*) and Townsend's (*D. townsendi*) warblers and their putative hybrids. Ten specimens were tentatively identified as hybrids: 1 male F_1, 6 male backcrosses (to Hermit Warbler), 2 males of unknown parentage, and 1 female F_1. Sonographic analysis of F_1 and backcross hybrids from the east slope of the Oregon Cascades revealed that hybrids sang only Hermit Warbler-type songs (the number of hybrid individuals recorded was not specified). Hermit Warblers, Townsend's Warblers, and hybrids responded to playbacks of Hermit and Townsend's songs, which suggests that parent species and their hybrids are interspecifically territorial.—Jeffrey S. Marks.

60. High incidence of "leapfrog" pattern of geographic variation in Andean birds: implications for the speciation process. J. V. Remsen, Jr. 1984. Science 224:171–173.—Since much geographic variation is clinal, evolutionary biologists have assumed that gene flow and/or environmentally induced selection have primarily been responsible for determining population structure. This has provided much of the basis for speciation theory. However, this study of a "leapfrog" pattern of geographic variation in Andean birds suggests that there is a strong random component involved in phenotypic differentiation. Within the Andes are avian species having geographic variation in color in which two populations are very similar in appearance, are geographically separated from each other by very different intervening populations of the same species (hence designated as a "leapfrog" pattern). This pattern was found in approximately 21% of 135 taxa (species and superspecies) in which this pattern was possible (those with 3 or more component taxa). The fact that the ranges of the intervening taxa are widely scattered and not concordant suggests to the author that there is a strong random component in phenotypic differentiation with respect to direction, timing, and geography.

This "leapfrog" pattern of geographic variation is unknown in other regions. Such a pattern might be amplified by the Andes' tremendous topographic relief, its long narrow range, and rich avifauna which increases the number of taxa in which a potential pattern may be detected. The "leapfrog" pattern may not be restricted to color variation; perhaps allele frequencies, morphometrics, or vocal dialects show similar variation. The presence of a "leapfrog" pattern in these characteristics and in other Andean biota would strengthen the author's attractive hypothesis.—J. M. Wunderle, Jr.

FOOD AND FEEDING

(see also 21, 25, 35, 38, 40, 41, 49)

61. Breeding season foods of Merlins *Falco columbarius* in Northumbria. I. Newton, E. R. Meek, and B. Little. 1984. Bird Study 31:49–56.—Prey remains (~2000) found at Merlin nesting sites and nearby plucking posts in Northumbria, England are described for the period April–July during the years 1974–1982. Birds comprised ~95% of all items found and 4 species (*Anthus pratensis,* 36.8% by wt.; *Alauda arvensis,* 15.6% by wt.; *Sturnus vulgaris,* 8.9% by wt.; and *Acanthus flammea,* 4.6% by wt.) comprised 77% of all items eaten (66% by wt.). Females took heavier prey than males. As suggested by the habitats of the prey, Merlins hunted almost exclusively in open habitats. Seasonal changes in prey taken by Merlins corresponded well with changes in prey availability. This is a good study of Merlin food habits from which other interesting questions about Merlin foraging ecology can be developed.—Stephen R. Patton.

62. Family breakup and migratory departure from winter quarters in the Common Crane (*Grus grus*). (Familienauflösung und Abzug aus dem Winterquartier beim kranich *Grus grus.*) J. C. Alonso, J. P. Veiga, and J. A. Alonso. 1984. J. Ornithol. 125:69–74 (German, English summary)—Young cranes, which accompany their parents to the Iberian Peninsula in the autumn, become increasingly proficient at feeding themselves and, consequently, more independent during the winter. Juveniles usually depart northward after the adults leave.—Robert C. Beason.

63. Feeding ecology of Mallards wintering in Nebraska. D. G. Jorde, G. L. Krapu, and R. D. Crawford. 1983. J. Wildl. Manage. 47:1044–1053.—This study examines the winter foraging ecology of *Anas platyrhynchos* in south-central Nebraska during December–March 1978–1980. Food habits were determined using esophagi of 68 birds. Daily feeding flights of "2 randomly selected radio-marked mallards" were monitored during January–February 1980. It is impossible to tell whether this means they radio-tagged 2 birds or whether they marked many birds and daily selected 2 at random for tracking.

Wintering Mallards used river channels, irrigation drainage canals, and croplands. Corn stubble fields were used intensively. Animal matter formed only 3% (dry weight) of the diet. Plant matter formed 97% of the total winter diet, 52% of which was waste corn. Sexes did not differ in diet. Winter icing hampered Mallard efforts to obtain invertebrates. Travel time and time spent feeding (based on radio-tracking) varied with snow cover and time of season. Less time was spent feeding, and less aggression was observed, during a mild (1980) versus a severe (1979) winter, due primarily to reduced food supplies in 1979 with deep snow. The authors suggest that the Mallard is the only dabbling duck that can adapt to harsh northern climates because it "has developed a successful foraging strategy . . . by using waste corn, a by-product of current agricultural practices." Lack of other species of dabblers on northern wintering grounds may reflect an inability to compete with Mallards or with the harsh climate.—Richard A. Lent.

64. Individual utilization of feeding areas by Black-headed Gulls (*Larus ridibundus*). (Individual'noe ispol'zovanie mest kormezhki ozernymi chaikami [*Larus ridibundus*]).

S. P. Kharitonov. 1983. Zool. Zh. 52:748–754. (Russian, English summary)—Feeding area preference and tenacity were studied in a colony of Black-headed Gulls nesting at a lake near Moscow and feeding at 2 garbage dumps and a reservoir. One thousand gulls were wing-tagged; the "home address" within the colony's 6 sections was established for two-thirds of the birds resighted.

Birds from all parts of the colony used each feeding area; there was no preponderance at any feeding area of birds from any one section (or "Neighborhood") of the colony. There was a definite tendency for an individual to return on one day to the same area where it had been seen the day before, but, of birds sighted more than once, one-third were seen also at one or both of the other sites. Thus, birds of this species do change feeding areas, having no or little preference for one over the others.

From one day to another, individuals departed from the colony to feed at roughly the same time (within an hour). Over the course of several days, these small discrepancies in departure time could build up to as much as 3 h.

Once a gull has visited one feeding area, it will return there for several days; then it may change to another area. Birds seen more than once were more likely to be at the dumps than at the reservoir, presumably because the dumps provided a more reliable supply of food. But the opportunistic gulls increased their chances of finding food by "patronizing" all the available sources, both reliable (permanent) and chancy (temporary, unpredictable), and by varying the time they departed to forage. These habits provided them with continuous "intelligence" about their environment and allowed them to take advantage of temporal and locational changes in food availability.—Elizabeth C. Anderson.

SONGS AND VOCALIZATIONS

(see also 59, 60)

65. Song repertoire size and female preferences in Song Sparrows. W. A. Searcy. 1984. Behav. Ecol. Sociobiol. 14:281–286.—Female Song Sparrows (*Zonotrichia melodia*) give copulation solicitation displays in response to Song Sparrow songs, so one can ask if the intensity of copulation solicitation is a measure of mate preference or a measure of the effectiveness of song in stimulating copulatory behavior. In a test of these possibilities in the lab, 23 of 24 estradiol treated females responded to recorded male song with copulation solicitations. Females gave more solicitations in response to large song repertoires. This bioassay is a measure of the stimulatory effect of song on female reproductive activity. Is it also a measure of female mating preference? In the field, the correlation between pairing date (an assumed measure of mating preference in which males paired earlier are considered "preferred") and repertoire size was examined. Correlations for two years were weak or absent and nonsignificant. Another correlation between a second measure of preference, which depended on the number of days to next pairing after female removals, and repertoire size also yielded low, non-significant values. Even after controlling for territory quality, no evidence for repertoire size and female preferences could be found. Searcy says, "it seems most parsimonious to suppose that repertoires have evolved in Song Sparrows simply because of their advantage in evoking courtship." Given this, it would be interesting to follow males in the field to determine if large repertoire males actually do copulate more often with consorts, neighbors, or others than small repertoire males. Too, I wonder if males with large repertoires are better defenders against predators or provide greater parental investments than males with smaller repertoires?—Patricia Adair Gowaty.

66. Acoustic signaling and communication in a local colony of Corn Crakes (*Crex crex*). (Akusticheskaya signalizatsiia i kommunikatsiia v lokalnom poselenii korostelei [*Crex crex*]). V. I. Rabovsky. 1983. Zool. Zh. 52:314–316. (Russian, English summary)—The Corn Crake was the subject of a study of principles of avian acoustic communication because its intraspecific communication is almost exclusively acoustic (it lives in tall grass) and because of the simplicity of its vocal repertoire (the "krek-krek" uttered by males to attract females). A group of 7 males abiding in a hayfield was listened to and tape-recorded one summer, including a 24 h recording session at the height of the breeding season.

Data were analyzed by counting repetitions of "krek" by each bird—an impressive manifestation of ornithological stamina.

Males "krek" most intensely between midnight and 3 or 4 a.m. from early May through July. Each bird exhibits at least one peak of intense calling per night; he may fall silent for a while and then resume. Males begin calling in late afternoon and stop in midmorning of the next day. They call in fairly individual and fixed patterns, each starting at about the same time (on his own schedule) every afternoon, and calling, with more, or less, intensity in the same pattern of peaks and *diminuendos.*

There did not appear to be any coordination or alteration between the birds as they vocalized. Presumably, the temporal characteristics of a bird's calling are determined by that individual's own rhythms and not in response to anything communicated from his neighbors. The lack of any unit of acoustic communication besides "krek" [but do the females not have "Here's food" and "Danger! Take cover!" calls for their chicks?] suggests that this species has no differentiated signals (no "language"), but that there is, nevertheless, some communication between males is evidenced by their non-random distribution within this local habitat [field].—Elizabeth C. Anderson.

MISCELLANEOUS

67. A Catalogue of the Ellis Collection of Ornithological Books in the University of Kansas Libraries. R. M. Mengel (compiler), A. Mason and J. Helyar (eds.). 1983. University of Kansas Printing Service, Lawrence, Kansas. 176 p.—Biological bibliophiles will find much to envy in this catalogue. The list includes rare and historically important works such as Cuvier's **Le Regne Animal Distribue** or Darwin's first edition of **On the Origin of Species by Means of Natural Selection.** There are numerous curious and obscure works such as Dalgleish's **Catalogue of the Collection of Birds' Eggs Belonging to John J. Dalgleish** and many works of historical interest such as Charleton's **Onomasticon Zoicon,** the first English list of birds to which illustrations were appended. Books are listed alphabetically by author with each citation providing information from the title page, a summary of the contents, and an evaluation of the book, along with reference to published reviews of the work. For anyone interested in ornithological history or a look at some very fine books, the Ellis Collection is clearly a must.—Edward H. Burtt Jr.

BOOKS AND MONOGRAPHS

68. The Swedish landscape—a journey in time and space. The 1984 SNF yearbook. (Sveriges natur—en resa i tid och rum. Svenska Naturskyd-dsforeningens arsbok 1984.) G. Brusewitz. 1984. Sveriges Natur 75:1–160. (Swedish, English summary)—The Swedish Society for the Conservation of Nature was founded on 16 May 1909, in the same year that Sweden acquired its first Protection of Nature Act and its first national parks. The society's 75th yearbook sets out to broaden our understanding of human impact, past and present, on the Swedish landscape, flora, and fauna. The eminent Swedish naturalist Gunnar Brusewitz, artist and author, tells the entertaining, instructive story of the Swedish landscape in words and pictures.

The yearbook opens with a summary of the history of the Swedish landscape, from the Ice Age to the present impact of agriculture, forestry, mining, and development. There follows a history of farming, from its beginnings in the Iron Age. Discussion of the first depictions of animals and natural scenery in rock carvings, on rune-stones, in painting, and in poetry is followed by descriptions of nature in literature and art during the 16th and 17th centuries.

Chapter 4 describes the 18th century Swedish landscape as seen by Linnaeus, Sweden's most famous naturalist. Chapter 5 carries us into the 19th century and the observation and idealization of "the wilderness" and "the simple country life" by Swedish authors and artists.

With chapter 6 the yearbook opens a general consideration of environmental change; the extermination of the bear and wolf in large parts of Sweden, the increasing numbers of elk and beaver, the declining numbers of predatory birds, and the disappearance of many wetland species. Alterations in range are illustrated by Barnacle Geese (*Branta leu-*

copsis)—the arctic migrants who suddenly began to touch down in large numbers on the island of Gotland, where they now breed. Man's relationship with the forests are the subject of chapters 8–11. The yearbook closes with a discussion of Swedish environmental issues, current environmental legislation, and a plea for greater environmental concern.—Edward H. Burtt Jr.

69. Iowa Birds. J. J. Dinsmore, T. H. Kent, D. Koenig, P. C. Petersen, and D. M. Roosa. 1984. Iowa State University Press, Ames. 356 p. $29.20.—This new book emphasizes "the status, habitats, and seasonal occurrence" of Iowa's birds. It begins with a detailed account of how "The State List" has grown (and at times shrunk) during the past 150 yr. This short section ends with predictions about future additions to the List. The second chapter, my favorite, contains detailed, quantitative definitions of the terms used to describe each species' status. The number of individuals that a "hypothetical competent and active field observer in appropriate habitat at the appropriate time of year without recourse to netting" would see during a day or a season is used to define the terms abundant (50+/day), common (6–49/day), uncommon (1–5/day) and rare (0–4/season). In older works, terms such as these were generally employed without any definition, presumably on the assumption that everyone used them in about the same way. Now that authors are defining them, we can see how wrong that view was. For example, in **Birds of Ligonier Valley,** the lower threshold for abundant species (non-breeders) is 500 individuals in a single day—an order of magnitude more than the threshold used in **Iowa Birds.**

In the section "Firmness of data," the authors provide 8 categories describing the evidence used to determine whether a species should be included on the State List. These range from a museum specimen to a record judged to be unacceptable. As the authors note, in some state accounts only museum specimens are accepted and in others, virtually all accounts are accepted. The authors' categories, and their indicating, for each species on the list, the basis on which it was accepted, provide a sensible middle course.

My only objection to this chapter concerns the series of terms under the heading "species occurrence." The terms refer to how often at least one individual of the species is recorded in the State: regular, casual, accidental, extinct, and extirpated. It might have been clearer to eliminate the first 2 terms and append the last 3 to the list of abundance terms above. If a second series of terms describing abundance was warranted, I would have preferred something describing variance (for example, consistent, variable, erratic—with suitable definitions). On p. 8, the authors admit to some difficulty in deciding how to treat species that "are common one year and rare the next," and they don't say how the dilemma was resolved.

Chapter 3 described "the relationship of birds to Iowa geography." Such descriptions seem to fall into 2 categories. Most books adopt a conventional (often geological) approach to sub-dividing the landscape and then mention some of the characteristic birds of each sub-division. Typically, it is unclear whether the species mentioned are restricted, or largely restricted, to these areas or even whether they reach greatest abundance in the area. Thus, it isn't clear what "characteristic" means nor is it clear whether the avifauna in general is thought to be responding to the criteria used to sub-divide the region or whether those criteria are used solely for convenience. In a few books—for example, **Birds of Kentucky**—a different approach is employed. The regions are delineated using criteria that "will sustain the maximum number of generalizations not applicable to other avifaunal regions," and these generalizations are then identified and discussed. Clearly, this approach is much more difficult, and in many cases it may not be feasible. Nonetheless, I was a little disappointed that in **Iowa Birds** the former approach was followed.

Chapter 5 is a detailed account of the "history of Iowa ornithology." It begins with the earliest explorations of Thomas Say in 1819; traces the development of numerous individuals, organizations, and publications; and ends with a description of current ornithological activities in the state such as the "forays" and winter raptor survey and of university, state, and private ornithological organizations. The historical information is particularly detailed and will be of great value to researchers.

Species accounts occupy the next 280 p of the book. For each species, the status is listed (using the terms defined in chapter 2), a brief habitat description is given, dates for migration, breeding, and wintering are provided, and, for less common species, variation in density throughout the state is described. The dates and unusual records occupy 30–50% of the species' narratives. Maps are used judiciously to illustrate variation in breeding, migration, or wintering records. Informative comments discussing trends in the distribution records, or in a few cases identification of the species, are included for many species. Frequent use is made of published literature. The appendices provide various species lists and are followed by a gazetteer.

Iowa Birds is oriented more to the bird lister than to the researcher. There are no detailed treatments of ecological relationships among species or between species and habitat. Nonetheless, the book does contain numerous insights about the state's avifauna. It will be useful to ornithologists concerned with distribution and ecology of the area's avifauna as well as to anyone conducting field work in the state.—Jonathan Bart.

70. Body weights of 686 species of North American birds. J. B. Dunning. 1984. Western Bird Banding Assn. Monogr. 1. ii + 38 p. (Eldon Publ. P.O. Box 446, Cave Creek, Arizona 85331).—Dunning provides a comprehensive listing of weights of North American birds based on the 1983 A.O.U. checklist. The list includes English and scientific names, A.O.U. number, mean weight and standard deviation, frequently with males and females given separately, range of weights, season and place of data collection, and source. Subspecies are presented separately where there is pronounced subspecific variation. An extensive list of references allows ready access to the primary literature. Altogether, Dunning provides an extraordinarily extensive data set, that will be useful to many ornithologists.—Edward H. Burtt Jr.

71. Birds of the Crimea (Ptitsi Kryma). Yu. V. Kostin. 1983. Nauka, Mosc. 240 p. 1.90 rubles. (Russian)—This volume is the first complete summary of the birds of the Crimean peninsula in recent times. The author has summarized over 20 yr of research in the field and museum to produce an authoritative account of the biology of 302 species. A valuable adjunct to the species accounts is a detailed literature review of sources rarely seen by Western ornithologists. Typical for Soviet surveys of this type, careful attention is given to details of breeding biology, clutch sizes, phenology, and diet. Notable uncommon species covered include *Larus ichthyaetus, L. genei, Porzana parva, Alcedo atthis, Motacilla feldegg*. This volume covers a particular region not well covered before, and is of special importance to biogeographers for that reason.—Douglas Siegel-Causey.

72. Terns (*Tiirud*). R. Maend. 1982. Valgus, Tallinn, Estonian SSR. 70 p. 30 kopecks. (Estonian, Russian summary)—Seven species of terns in 3 genera nest in the Estonian SSR. Arctic Terns (*Sterna paradisaea*) inhabit seacoasts and marine shorelines, and number about 12,000 nesting pairs. Common Terns (*S. hirundo*) also breed on freshwater coastlines in addition to the above habitats, but in much lesser numbers (5000 breeding pairs). Both species arrive in late April, begin incubation by mid-May, and are strongly philopatric in site selection. Banding records show them to leave by late August and winter in Southwestern Africa.

About 100 to 200 pair of Sandwich Terns (*Thalasseus sandvicensis*) nest on island coastlines in dense colonies near Saaremaa. Chicks fledge by early June. Adults leave by late September and winter in the lakes of western Africa. The Little Tern (*S. albifrons*) is found occasionally in northwestern Estonia, breeding usually in the company of the other tern species. Chicks fledge by mid-June; adults leave by late August. Details of the breeding biology for the Little Tern are quite sparse, but for the other tern species the results given here seem in line with what is known from nearby areas.—Douglas Siegel-Causey.

73. Camouflage and mimicry. D. Owen. 1980. University of Chicago Press, Chicago. 158 p. Softcover. $10.95.—Because birds are important predators of insects, they provide the selective force that drives the evolution of camouflage, deception, and mimicry among insects. Thus the book should interest ornithologists despite its emphasis on insect examples.

The book, one of a series from University of Chicago Press (see review **53**, J. Field Ornithol. 55:285–286, 1984), appears aimed at the intelligent layman. The text is readable, filled with striking examples, and abundantly illustrated in color and black-and-white. Owen often uses experimental results to illustrate functional interpretations of patterns of camouflage or mimicry. Where functional interpretation is unclear, Owen suggests alternative explanations or poses critical questions, thereby imparting a sense of active inquiry rather than passive collecting of anecdotes.

Despite these strong points the book lacks a theoretical framework within which the reader can place the many examples. The problem stems from Owen's failure to operationally define camouflage. Thus examples of background matching and disruptive coloration are lumped with examples of object mimicry all of which are considered camouflage. Owen uses mimicry only in its most restricted sense to apply to an unpalatable model and its look alikes. The book would be greatly enhanced by a discussion of evolutionary mechanisms leading to mimicry. As presently written, there is a lack of evolutionary perspective and even occasional teleology. Nonetheless, the book is an attractive overview of a fascinating phenomenon.—Edward H. Burtt Jr.

74. Population ecology of the Dipper (*Cinclus mexicanus*) in the Front Range of Colorado. F. E. Price and C. E. Bock. 1983. Studies in Avian Biol. No. 7—The American Dipper is a distinctive passerine specialized for foraging in clear, fast-flowing, rocky streams. This study was conducted in Colorado over 2½ years (1971–1973), a total of 472 field-days, and 558 individual birds were banded—an impressive effort. The investigators sought to examine population dynamics of the Dipper in relation to several biotic and abiotic variables. There are useful empirical data on population movements, population density and dispersion, and survival and productivity. However, the results are often poorly analyzed. There are methodological problems and the paper is unorganized and not clearly written.

Thirty-nine variables were used in analyses of dispersion, territory size, and reproductive success. There is no indication that values of any variables were transformed to conform with the assumptions of the parametric statistics used in this paper. Many variables are intercorrelated, though later analyses suggest the authors were aware of this. Significance levels of $P < .10$ were used with no justification for this unusual procedure. Four measures of habitat quality were used, the most important being measurement of food availability. However, benthic invertebrates were sampled during only 4 monthly periods and only once in spring. The single spring sample was used to estimate food availability for all 3 spring seasons, a procedure repeated for samples from other seasons. Furthermore, a nonrandom procedure was used such that only superior foraging habitat (shallow rubble bottom) in certain stream segments was sampled. Food samples were plotted from each stream segment measured, and a food index was derived. Interpolations from this index were used for other stream segments despite great variation in stream quality. No stomach or neck-collar samples were taken to correlate prey captured with prey availability. There was no sampling of terrestrial prey, despite its possible importance during the breeding season.

Monthly censuses of Dippers during the non-breeding season and estimates of numbers during the breeding season are sound. Hence, there are useful data on movement with respect to altitude, season, age (comparison of juvenile and adult as the two age classes), sex, and locality (interdrainage movement), though these are often less detailed than one would like, e.g., natal dispersal of juveniles is poorly known. However, philopatry of adults was strong and well documented. Dippers were more mobile than expected. The high local mobility in fall and winter is especially interesting, but has no thorough explanation. Winter is the period of greatest mortality and it is clear that Dippers are stressed at this season. Data on the winter territorial system are informative. Several simple field tests indicated that dominant resident birds forced transients to move. Augmenting natural winter food with mealworms increased aggressiveness, but did not lead to exclusive territories. These and other analyses indicate that the winter territorial system ranges from strong defense of a solitary territory to group-occupation of an area with little aggressiveness among members. Examination of social factors affecting winter territoriality and dispersion would have been strengthened if biometric data had been collected and analyzed (e.g., Lundberg et al. J. Ornithol. 122:163–172, 1981).

The timing of breeding varies greatly, but proximate cues that initiate breeding are unclear. The authors assert that early breeding is adaptive, but provide no supporting data. Analysis of breeding density, clutch size, and nesting success require more detailed examination. For example, causes of nesting failure are inadequately known. Almost half of all failed nest attempts were due to unknown factors or adult abandonment. Flooding was the major cause of nest failure, despite selection of superior nest sites (bridges, cliffs, large boulders) on the study areas. Simple correlation analysis of the amount of spring flooding with the subsequent winter population size (based on selected Colorado Christmas Bird Counts) showed that the number of Dippers declined with a high spring runoff, which also implicates flooding as a factor in nest failure.

The importance of spring flooding and winter behavior on population size are reiterated in the discussion. Formulating critical tests of hypotheses prior to fieldwork would have given focus to population regulating mechanisms far better than the descriptive, holistic approach used in this work. Of 134 cited references, only 12 are post-1974. Consequently, there are few meaningful tests of current hypotheses in population biology, ecology, or behavioral ecology. In addition, this publication is too long for its data. Elimination of spurious statistical analyses, figures, and tables, with a reorganized and rewritten paper, could have reduced this work to a standard length paper in a major journal. While the present publication will be valuable to Dipper enthusiasts, I cannot otherwise recommend its purchase.—Douglas B. McNair.

75. The Seaside Sparrow: its biology and management. T. L. Quay, J. B. Funderburg, Jr., D. S. Lee, E. F. Potter, and C. S. Robbins (eds.). 1981. North Carolina State Museum of Natural History, Raleigh. 174 p. $15.00.—Seaside Sparrows (*Ammodramus maritimus*) breed from Maine to Texas. With the exception of the Cape Sable Sparrow (*A. m. mirabilis*), the 9 currently recognized subspecies are all strictly confined to saltmarshes which has caused their populations to shrink drastically in recent decades. The Dusky Seaside Sparrow (*A. m. nigrescens*) is thought to be extinct in the wild, and there is concern over the immediate future of several other subspecies. In October, 1981, a 2-day symposium on Seaside Sparrows was held at Raleigh, North Carolina, bringing together "nearly all workers currently involved with Seaside Sparrow research." The proceedings of this symposium contain 16 research papers on Seaside Sparrow biology and management.

In an introductory paper, Cooper distinguishes 5 types of saltmarsh on the Atlantic and Gulf coasts and briefly discusses the impact of mosquito control on the marshes and on Seaside Sparrows. Contributions by Austin, Funderburg, Quay, Robbins, and Kale describe the species' phylogeny, current status, and natural history. Robbins provides a concise series of maps showing the number and range of each subspecies as estimated in 1895, 1910, 1931, 1957, and 1981.

Delany and Mosher studied 2 small populations of Seaside and Song sparrows (*Zonotrichia melodia*) on the Great Fox I. Group in Chesapeake Bay. They found that Seaside Sparrows occurred mainly in *Spartina alterniflora*, both nesting and foraging in this community. Song Sparrows avoided these areas, occurring in most of the other habitat types including sand dunes and beaches. The authors attribute the spatial segregation to preference rather than competition.

Kushlan and Bass report the discovery of a new population of Cape Sable Sparrows. They estimate the total population of this subspecies to be slightly more than 3000 pairs. About half of the birds occur in the vicinity of Taylor Slough, which Werner and Woolfenden report may soon become unsuitable habitat due to invasion by exotic trees.

McDonald provides descriptions and contexts of 4 types of song and 10 types of calls of Scott's Seaside Sparrows (*A. m. peninsulae*). She also presents a detailed, annotated bibliography covering all aspects of the species' biology and management. Hardy discusses geographic variation in the primary song, showing that most, if not all, of the 9 subspecies have distinctive songs. A flexible, plastic record is included with the proceedings on which the songs and calls described by McDonald and Hardy are recorded.

Greenlaw reviews the primary habitat requirements of nesting Seaside Sparrows on Long Island—nest sites high enough not to be flooded, and access to bare ground and the bases of surrounding plants—and shows that, using these cues, it is possible to predict quite accurately which parts of a previously unsurveyed marsh will have the species. The relevant habitat features are difficult to detect except early in the season. Greenlaw believes this may have misled other observers who have reported that the species shows true coloniality. On Greenlaw's study sites, all suitable habitat was fully occupied.

Merriam used the ligature method to compare food brought to nestlings in ditched and unditched marshes. In both habitats, the species was highly insectivorous; however, differences existed in where the parents foraged and in the size of the prey they delivered to their nestlings

Post and co-workers report that reproductive success (measured as number of young leaving the nest/number of eggs laid) was 35% in a New York population, but only 3% in a Florida population. In Florida, Rice Rats (*Oryzomys palustris*) drove Seaside Sparrows out of their preferred habitat and destroyed clutches. Depsite the low success rate, the Florida population was judged to be stable.

Several papers report on management aspects of the species. Taylor describes the complex interactions between Cape Sable Sparrows and fire. Burning can be helpful, even essential, in manipulating habitat, but must be carried out properly to avoid long term degradation of the site. Webber and Post describe their successful attempts to induce breeding in captivity, and Gee and Sexton provide a progress report on techniques for semen collection and storage.—Jonathan Bart.

76. A guide to the birds of Puerto Rico and the Virgin Islands. H. A. Raffaele. 1983. Fondo Educativo Interamericano. San Juan, P.R.—Prior to the publication of this field guide, it was necessary to use several different books to identify the birds of Puerto Rico. While Bond's **Birds of the West Indies** was the old stand-by, it did not have pictures of the 126 migrant species that occurred on the island, which required use of a North American field guide. Nor, did Bond's book contain descriptions or pictures of the 36 or more introduced species now common to the island. These exotics, many now quite common, provided headaches to the local bird watchers who frequently had to refer to field guides for Africa, southern Asia, and Central and South America. Then there was always Biaggi's outdated **Las Aves de Puerto Rico**, providing descriptions in Spanish with a hopeless collection of abstract paintings. Thus there would appear to be an open niche available for a good self-contained field guide to the birds of Puerto Rico.

Puerto Rico with 85 species of breeding land birds (including exotics) supports the largest number of breeding, terrestrial species of any West Indian island. It is second only to Cuba in the total size of its avifauna (269 species). Though the island's native avifauna (excluding extinctions and introductions) is only 232 species, 14 of these (6%) are endemics (including 2 species also occurring on the Virgin Is.). The Virgin Is. have considerably fewer species with a total of 181 species. The text of the guide contains accounts covering 273 living species of birds from the region. The accounts provide an adequate description for identification, local names, voice, nesting, distribution, and comments. The accounts frequently contain helpful and interesting natural history notes, particularly for the endemics. Chapters on biogeography, and conservation (including a discussion of fossil birds) are informative, while those people planning to visit these islands for the first time will find the chapter on "places to bird" helpful. An annotated list of vagrants and unestablished exotics is also valuable.

The heart of a modern field guide is its illustrations, upon which the success or failure of the book rests. The guide's 40 plates, of which 24 are in full color, were illustrated by Cindy House and John Wiessinger. The critical field marks are emphasized with pointers as devised by Peterson in his guides. Full page plates are devoted to individual species of 4 species, with the plate of the Puerto Rican Lizard Cuckoo (*Saurothera vieilloti*) and the Puerto Rican Woodpecker (*Melanerpes portoricensis*) being especially good. Overall, the plates are variable in quality, with the Pearly-eyed Thrasher (*Margarops fuscatus*) picture being particularly poor. While one might wish to bicker about proportions or colors of some of the illustrations, it appears that the plates will enable the novice to identify the birds of these islands. My novice Puerto Rican students were capable of using the plates for successfully identifying the majority of species observed on the island.

The author and illustrators are to be applauded for a job well done, while the publisher is to be condemned for a disgraceful job of book binding (several of my students lost pages and plates from their guides before entering the field). Another difficulty with the book is the absence of page numbers for the species accounts within the plate sections, thus requiring reference to the index to locate additional information on a species. However, with these minor problems in mind, I would recommend this guide to anyone planning to visit Puerto Rico and the Virgin Islands for the purpose of bird watching.—J. M. Wunderle, Jr.

77. Reproductive biology of the Tetraonidae of the North (Biologiya razmnozheniya teterevinykh ptits na severe). O. I. Semenov-Tyan-Shanskii. 1983. Nauka, Mosc. 64 p. 65 kopecks (Russian)—This monograph summarizes 32 years of work by the author and colleagues on the tetraonids of the northeastern reaches of the USSR. Detailed information is given for breeding habitat preferences, breeding phenology, clutch size, egg weights, incubation times and shifts, time budgets, chick growth, and survival. Five species are covered: *Tetrao urogallus, Tetrao tetrix, Bonasa bonasia, Lagopus lagopus,* and *L. mutus.*—Douglas Siegel-Causey.

78. Red-cockaded Woodpecker symposium II proceedings. 1984. D. A. Wood, ed. State of Florida Game and Fresh Water Fish Commission, Tallahassee, Florida 32301. 112 p. $2.08—The Red-cockaded Woodpecker (*Picoides borealis*) is perhaps the least "endangered" of all threatened species, numbering 5000 to (more likely) 10,000 birds over a wide range in southeastern North America. In the sense of "endangerment" all too much has been written about this bird, although of course we have much to learn in detail about its biology. No other species is, in my opinion, so amenable to human management and protection, and so dependent upon them. Indeed, if we can't save this species, it is doubtful if we can save any!

The Symposium proceedings contain 16 papers and 16 notes on many conservation and other biological aspects of the Red-cockaded Woodpecker from throughout its (Virginia to Texas) range. It seems clear that the species is declining, chiefly through loss of habitat and old pine trees needed for roosting and nesting. It is discouraging to learn that but 2.5% of the South's commercial pinelands are now considered as favorable for this woodpecker (report of Lennartz et al.). Also discouraging is the lack of information from private and some state pinelands that could have significant populations of the bird, and are vital if any corridor scheme is to be developed for connecting viable populations.

The Symposium reports support my considered views of what needs to be done. All populations viable in the long-term (Shaffer, BioScience 31:131–134, 1981), i.e., of more than 500 birds, must be saved. All smaller populations that might be saved by effective management should be saved. And corridors of favorable habitat ought to connect as many of the populations as possible. Each state and local area should be encouraged to do its utmost to preserve local populations, however small (state and local pride may be the best forces for saving the species, for individuals can have a strong say locally). It would not come as a surprise to find that a state with a small Red-cockaded population, e.g., Virginia, would save its birds, while states with much larger populations of the Woodpecker would lose theirs. Specificially, trees that are suitable for nesting and roosting must be retained in areas of favorable habitat. One point not brought out clearly in the Symposium (though see Harlow and Lennartz, p. 41 ff., Delotelle and Newman, p. 104, and Odom, p. 106) is that fragmenting of the habitat forces increased competition with woodpeckers such as the Red-bellied (*Melanerpes carolinus*) and Red-headed (*M. erythrocephalus*), which I have seen attacking Red-cockaded Woodpeckers, and which may usurp that species' nesting trees.

That federal agencies, especially the U.S. Forest Service, may be biased toward one or another aspect of recovery plans is all too clear. The Forest Service has conflicting objectives (commercial forest management versus saving threatened species), and operates only on federal lands. Recently, control of the long term South Carolina studies of Dr. Jerome Jackson (the leading student of the Red-cockaded Woodpecker) was transferred administratively from the U.S. Department of Energy to the U.S. Forest Service and a Forest Service biologist was put in charge of the project on which Jackson worked for seven years. This kind of action does not bode well for the nature of the actions that may be taken to save the woodpecker, or for its ultimate fate.

Anyone interested in endangerment, and particularly those wishing to know the current (January 1983) status of the woodpecker in their region, and of the newer efforts (e.g., translocation by necessity or design) to help the species will want to peruse this Symposium's reports.—Lester L. Short.