

RECENT LITERATURE

Edited by Edward H. Burt, Jr.

BANDING AND LONGEVITY

(see 5)

MIGRATION, ORIENTATION, AND HOMING

(see also 41, 45, 52)

1. Orientation behaviour recorded in registration cages: a comparison of funnel cages and radial perch cages. W. Beck and W. Wiltshko. 1983. *Behaviour* 87:145–156.—Migratory Pied Flycatchers (*Ficedula hypoleuca*) were used to examine the effect of cage design on their magnetic field orientation. In so-called Emlen funnels, the birds showed good, seasonally appropriate orientation. In so-called Merkel-Wiltshko radial perch cages, the birds failed to orient. These results emphasize, once again, the problems associated with interpreting negative results in studies designed to reveal sensitivity to an environmental stimulus.—Verner P. Bingman.

2. Initial orientation of homing pigeons at the magnetic equator with and without sun compass. J. Ranvaud, K. Schmidt-Koenig, J. Kiepenheuer, and O. Gasparotto. 1983. *Behav. Ecol. Sociobiol.* 14:77–79.—The authors performed a set of pigeon releases at the magnetic equator to examine the functioning of the pigeons' magnetic compass in the presence of only a horizontal field. When the pigeons were released at a time when the sun was away from the zenith, they showed reasonable homeward orientation. With the sun at the zenith, the birds continued to be oriented, but in a direction that differed from home. The plethora of explanations that could be used to interpret these results makes it impossible to clarify the effect of a horizontal field on the functioning of the pigeons' magnetic compass.—Verner P. Bingman.

3. Weight gains and resumption of passage by Willow Warblers on spring migration. N. Riddiford and R. C. Auger. 1983. *Bird Study* 30:229–232.—Evidence from mist netting and field observations suggest that spring migrant Willow Warblers (*Phylloscopus trochilus*) arrive at Dungeness before dawn. Riddiford and Auger report that weights of captured birds of similar size classes, determined by wing-length, increased during the day by .4 to .7 g, but their Table 1 indicates a range of .4 to 1.1 g. Willow Warblers had a single peak period of foraging activity 2–3 h after sunrise; very little foraging was observed in late afternoon and early evening. A very low frequency of recapture (1.3%) in the same season indicates that most birds resumed migration within a day. The significance of these stopovers and of the weight gains acquired at these sites to the survival of migratory passerines needs further investigation.—Stephen R. Patton.

4. The role of the geomagnetic field in the development of birds' compass sense. T. Alerstam and G. Högstedt. 1983. *Nature (Lond.)* 306:463–465.—By exposing young Pied Flycatchers (*Ficedula hypoleuca*) to a shifted magnetic field during the incubation and nestling period, the authors were able to predictably shift the orientation of these birds during the time of their first migration. What would otherwise be an important empirical advance in our understanding of the ontogeny of avian orientation behavior is unfortunately cluttered with a most extreme explanation of the data, an explanation which by no means follows from the reported results.—Verner P. Bingman.

5. Migration and winter distributions of Canvasbacks staging on the upper Mississippi River. J. R. Serie, D. L. Trauger, and D. E. Sharp. 1983. *J. Wildl. Manage.* 47:741–753.—The Mississippi River between LaCrosse, Wisconsin and Keokuk, Iowa contains important staging areas for migrating *Aythya valisineria*. Sightings (1005) of 1488 color-marked males during 1973–1975, and 258 recoveries of 3789 banded males and females during 1973–1977 revealed 2 different fall and winter migration routes from this region. One extends east to the Great Lakes and southeast to the mid-Atlantic states; the

other extends south to the lower Mississippi Valley, Gulf Coast, and east Texas. Birds colored red were reported at a significantly higher rate than those colored yellow or blue. Differential habitat use and predictability of Canvasback food resources along these routes are discussed.—Richard A. Lent.

POPULATION DYNAMICS

(see also 9, 14, 15)

6. Movements from and age of return to an expanding Scottish Guillemot colony. R. L. Swann and A. D. K. Ramsa. 1983. *Bird Study* 30:207–214.—From 1974–1982, the average annual rate of increase of the Guillemot (*Uria aalge*) population on the Isle of Canna, Inner Hebrides, has been slightly more than 10%. Concomitant with growth was some recruitment of 3- and 4-year-old Guillemots into the breeding population, an observation not previously reported from Great Britain. Early recruitment has been reported for other expanding seabird populations. Guillemots exhibited a strong tendency to return to their natal subcolony to breed (78.7%, $n = 94$) and adults almost always returned to the same subcolony in successive years (99.3%, $n = 741$).—Stephen R. Patton.

7. Population trends and selection of nest-sites in *Larus argentatus* and *L. fuscus* on the Finnish Coast. M. Kilpi. 1983. *Ornis Fenn.* 60:45–50.—Kilpi uses his own data and accounts from the literature to examine population trends in *L. argentatus* and *L. fuscus* from 1930–1980. He examined colony and nest-site selection and looked for evidence of competition between the species. *L. argentatus* has increased from 1500 breeding pairs in the late 1950's to 12,000 pairs in 1980; during the same period *L. fuscus* decreased from a peak of 1800 to 1400 pairs. *L. argentatus* colonized new sites by invading existing colonies of *L. fuscus* with a subsequent decline in numbers of *L. fuscus*. *L. fuscus* preferred sheltered nest sites near bushes and *L. argentatus* preferred open sites. Kilpi suggested that *L. argentatus* would broaden its nest-site selection with increased colony size but supportive data were not presented. The conclusion of the paper was that *L. argentatus* is expelling *L. fuscus* from Finland.

Given the data presented, the only conclusion I can draw from this paper is that the population of *L. argentatus* has increased in Finland. During the 50-year period, *L. fuscus* populations declined at only 2 of 5 colony sites studied. Indeed, in some areas of Finland Kilpi mentions that *L. fuscus* is declining where *L. argentatus* is scarce. A cause and effect relationship for population trends of these species has not been demonstrated in this paper.—Lise A. Hanners.

NESTING AND REPRODUCTION

(see also 7, 17, 26, 28, 29, 30, 31, 32, 51, 52, 53)

8. Breeding ecology of Vesper Sparrows in corn and soybean fields. N. L. Rodenhouse and L. B. Best. 1983. *Am. Midl. Nat.* 110:265–275.—Vesper Sparrow (*Poocetes gramineus*) breeding densities in central Iowa corn and soybean fields varied according to fencerow type: shrubby > herbaceous or shrubby < herbaceous. Data are given on territory characteristics, song perches, and nest sites in relation to agricultural activities. Nesting success was low in all fencerow types. Apparently, agricultural practices affected nesting success of pairs in all habitats about equally (27% of all nest losses). Predation accounted for a similar frequency of nest losses (29%). Vesper Sparrows placed nests later in the season near "nonproductive" areas, e.g., washes, rather than in croplands. This reduced the frequency of nest losses due to farming practices, but frequency of predation increased greatly. Nevertheless, overall nest success increased late in the season, primarily because agricultural methods had much less effect on nesting success, due to changes in nest placement. Estimates of annual production suggest Vesper Sparrows cannot maintain their populations without immigration.

It is refreshing to read a paper that asks questions about management of a nongame species, the Vesper Sparrow; there are precious few of these papers for any passerine. The effects of agricultural methods may apply to other species and geographical areas,

particularly ground-nesting passerines that build their nests on cropland in areas using modern agricultural methods. There are few studies of Vesper Sparrow breeding ecology in undisturbed or uncultivated habitats, so it is difficult to assess the significance of low nesting success in agricultural habitat. Comparison of Vesper Sparrow breeding ecology in both disturbed and undisturbed habitats in Iowa would have strengthened the authors' discussion. Further clarification of how nesting success is influenced by food availability and predation with respect to territory quality, crop growth, agricultural practices, and changes in nest placement (e.g., distance of nest from fencerow) is needed.—Douglas B. McNair.

9. Secondary sex ratio adjustment in Red-winged Blackbirds. P. J. Weatherhead. 1983. *Behav. Ecol. & Sociobiol.* 12:57–61.—The overall ratio of 1 male:94 female nestlings (sexed at necropsy as eggs or day-old chicks) from 97 four-egg clutches suffering no egg loss or infertility indicated a pattern of female bias early and late in the breeding season and a male bias in the middle. The mean proportion of males within clutches and the overall proportion of males remained relatively constant as the number of females on one male's territory increased. These two results are presented as tests of the maternal-condition hypothesis (Trivers and Willard. *Science* 179:90–92, 1973). The seasonal pattern, though not pronounced, is said to agree with a seasonal pattern of resource abundance through the breeding period of scarcity-abundance-scarcity. No quantitative data on resource abundance are presented in defense of this statement, so it seems difficult to conclude anything about the weak seasonal pattern of sex ratio variation. The second result provides no support for the hypothesis that females should preferentially produce sons when mated to high quality males (the number of females per male territory was considered a measure of male quality). Given these inconclusive results, this study joins the ranks of the vast majority of studies on facultative sex ratio adjustment in birds.—Patricia Adair Gowaty.

10. Adaptiveness of nest site selection and egg coloration in the African Black Oystercatchers *Haematopus moguini*. P. A. R. Hockey. 1982. *Behav. Ecol. Sociobiol.* 11: 117–123.—This article presents natural history observations on nest-site placement and color of oystercatcher eggs. Tested hypotheses are lacking and I wondered why such a paper appeared in *BE&S* rather than in a more organismally organized journal. First and second laid eggs in clutches of two (the modal clutch size) are recognizably (by humans) different, though data suggest predation is not a selective factor affecting egg sequence and color. So why are first and second eggs different? Is the information useful to parents? Given recent data on egg order and sex, the detectable variability is a fascinating open question.—Patricia Adair Gowaty.

11. Mechanisms of avian egg recognition: which egg parameters elicit responses by rejecter species? S. I. Rothstein. 1982. *Behav. Ecol. Sociobiol.* 11:229–239.—This is one of an apparently comprehensive series of reports on egg-recognition mechanisms. Although some data on other species are included, most of these data deal with American Robins (*Turdus migratorius*). Robins respond to relative size, color, and mottling of alien eggs, although small egg size was the most important in terms of eventual rejection response. These experiments were carried out between 1966 and 1970; I wonder how differently similar questions would be addressed now. In particular, I wonder how these responses might be affected by the use of live rather than dummy eggs.—Patricia Adair Gowaty.

12. Estimating survivorship when the subjects are visited periodically. J. Bart and D. S. Robson. 1982. *Ecology* 63:1078–1090.—Survivorship is a basic life history trait of interest in many ecological and evolutionary studies. Mayfield (*Wilson Bull.* 87:456–466, 1975) presented a technique for estimating a daily survival rate for nestling birds or any other organisms sufficiently sessile that one can always relocate them. If one assumes that the daily survival rate is constant over a longer time span, survival over that span can be estimated as the daily rate raised to the power of the number of days involved. Bart and Robson present an improvement that overcomes two major weaknesses of Mayfield's technique: Mayfield's estimates are biased and cannot be compared statistically. Bart and Robson overcome these problems by using maximum likelihood estimators. All equations

necessary to make the basic survival-rate calculations are presented in a clear fashion as are formulae for all imaginable needs: calculating confidence intervals of estimates, testing for the significance of a difference between estimates, estimating sample size necessary for a desired level of precision, and determining desirable intervals between samples. The equations one uses are the same no matter what sampling schedule is used. This latter point and several others are extensively tested using Monte Carlo simulations. Several interesting conclusions result which are important to anyone designing a sampling program. For example, it is better to sample more individuals with a lowered frequency than fewer individuals at a high frequency. Further, a violation of the assumption of equal survival rate throughout the sampling period has a much less adverse effect on the estimate than does varying the intensity of sampling during the study as long as there is no correlation between sampling interval and variations in daily survival. This does not mean sampling at a regular interval is desirable, just that one should not rush out to document deaths as soon as one thinks they have occurred while leaving long periods between samples involving few deaths. This paper is indispensable for anyone interested in estimating nestling survivorship.—A. John Gatz, Jr.

13. Concentrated nesting of Mallards and Gadwalls on Miller Lake Island, North Dakota. H. F. Duebber, J. T. Lokemoen, and D. E. Sharp. 1983. *J. Wildl. Manage.* 47: 729–740.—Over 5 yr, 2561 duck nests of 9 species (59% Mallard, *Anas platyrhynchos*; 34% Gadwall, *A. strepera*) were found on a 4.5 ha island located 180 m offshore in 385 ha Miller Lake. Over 97% of the Mallard and Gadwall nests were concentrated in about 1 ha of shrub cover. The authors claim that “. . . the Mallard nesting densities . . . are the highest yet reported for North America according to our extensive review of the literature on island-nesting waterfowl.” Most clutches contained 7–13 eggs for Mallards (mean 10.2, $n = 280$), 8–14 eggs for Gadwalls (mean 10.7, $n = 161$). Despite a relatively high (14%) rate of nest abandonment, nest success was far greater than is usually observed in prime breeding habitat on the mainland. However, hatching rates (83% for Mallard, 87% for Gadwall) were lower than the usual 90–95% for mainland nests. There was notable reuse of previous years' nests, an uncommon phenomenon on the mainland. Less than 1% of the nests succumbed to predators over 5 yr. This study illustrates the high reproductive potential of waterfowl in predator-free island habitats.—Richard A. Lent.

14. Offspring sex ratios in Red-winged Blackbirds is dependent on maternal age. J. L. Blank and V. Nolan, Jr. 1983. *Proc. Natl. Acad. Sci. USA.* 80:6141–6145.—Searches for adaptive variation in offspring sex ratios in birds are common (see review 9) yet seldom do results suggest that nestling sex ratios are the result of any but stochastic processes. The rarity of the demonstration that significant variation in the production of sons and daughters by young, middle-aged, and old mothers makes this paper notable and unique. The detail of investigation makes it important. Young Red-winged Blackbird (*Agelaius phoeniceus*) mothers produced nearly twice as many fledgling daughters as sons; middle-aged mothers produced statistically similar numbers of male and female fledglings; and old mothers produced significantly more fledgling sons. Based on calorimetry analysis, the study showed that the energy content of eggs of old mothers increased significantly with laying sequence, though middle-aged and young females allocated equal amounts of energy to all eggs in their clutches. These age specific differences in allocation patterns were independent of possible environmental differences associated with date of laying. The estimated sex ratio at hatching for young mothers and middle-aged mothers was not significantly different from 50:50, however in broods of old females the ratio significantly favored males. Starvation was highest among the offspring of young mothers and sex strongly influenced the chances that a nestling would starve. I highly recommend this paper.—Patricia Adair Gowaty.

15. Mortality of chicks and stability of parent-chick bonds in *Larus ichthyaetus*. 1982. G. N. Kostina and E. N. Panov. *Zool. zh.* 51:1531–1542. (Russian, English summary)—Interrelations of chicks and parents were studied in a nesting colony of Black-headed Gulls (a 24-nest and a 16-nest subcolony). The fate of 26 broods was followed in detail. In some cases, the adult members manifest aggressiveness toward their own chicks, most frequently the youngest in the brood, which usually results in the death of the chick

or its expulsion from the brood during the period when the brood leaves the colony for a creche. If a straying or expelled chick joins a brood, the adults' behavior is basically the same. Parental aggressiveness is one of the main causes of differential survival of older and younger chicks. In this colony, survival of first-hatched chicks was 88% in the first 20 days of life, that of second-hatched chicks 23.5%, and that of third-hatched chicks 0%; data from other colonies studied by the same investigators strengthen the impression that most of the chicks that die are indeed the younger ones. Parental aggression was not universal and sometimes alternated with care (brooding, feeding, defending from attacks by other adults).

What can explain this infanticide? Exploitation (cannibalism) and sexual selection (killing another's young so that one's own might survive) do not apply here—dead chicks were not consumed, and parents were aggressive to their own young. Manipulation of parental investment was seen as hard to apply in analyzing actual situations and so was not considered. Competition for resources does not apply while chicks are in the nest since the parents brought more food than the young consumed. There are no data on food adequacy for the creche of this colony, but if food were shorter there, the birds were somehow reducing their numbers "in advance," before this factor could take effect. Hence, only social pathology applies in this situation: it is one of the costs of obligate-colonial nesting in an unceasingly dense concentration and a complex social structure where raising chicks is conducted against a background of constant antagonistic encounters with other adults which would color relations between adults and young. Only further research will reveal why the younger chicks receive more aggression.—Elizabeth C. Anderson.

BEHAVIOR

(see also 4, 11, 15, 20, 21, 22, 23, 35, 48, 49, 51, 53)

16. A comparison of nest defence by Jackdaws, Rooks, Magpies, and Crows. A. Roell and I. Bossema. 1982. *Behav. Ecol. Sociobiol.* 11:1–6.—This is a descriptive study in which a live caged crow was presented at the nests of 4 related species. The results are relatively straight-forward. Unfortunately, only statistical tests rather than more complete data compilations are reported, reducing the utility of this paper to others who might attempt similar comparisons. The statement that the Common Crow (*Corvus corone*) is a "foe" of the other species is unsubstantiated. Though probable, I don't know what kind of "foe-ful" behavior Common Crows visit on the 4 species, so it was difficult to imagine (predict) possible responses. Apparently this was also the case for the authors who didn't provide any predictive hypotheses. The responses did seem to vary depending on both nest type (open, domed, or cavity) and whether nests were solitary or colonial.—Patricia Adair Gowaty.

17. Intragroup dynamics of a cooperative breeder: an analysis of reproductive roles in the Acorn Woodpecker. N. E. Joste, W. D. Koenig, R. L. Mumme, and F. A. Pitelka. 1982. *Behav. Ecol. Sociobiol.* 11:195–201.—Behavioral interactions between potentially reproductive individuals and contributions of individual group members to the total breeding effort in one group of cooperatively nesting *Melanerpes formicivorus* during the breeding seasons of 1978 and 1979 indicate that behavior of males may relate to their relative reproductive success within groups and that reproductive roles played by males can differ greatly. One male (of 2 potentially reproducing males) interacted aggressively with the other prior to and during egg-laying in ways that suggested the "aggressive" male was trying to keep the other from approaching the breeding female. This "aggressive" male also contributed significantly more to all aspects of nest and fledgling care. The data suggest that the aggressive male had a higher probability of fathering the offspring and that a positive correlation between amount of parental care and confidence of paternity exists. Although this study would have been strengthened by additional data on other groups, it does focus much needed attention on intra-group dynamics in cooperatively breeding species.—Patricia Adair Gowaty.

18. Space, time and the pattern of individual associations in a group-living species: Sanderlings have no friends. J. P. Myers. 1983. *Behav. Ecol. Sociobiol.* 12:129–134.—

Sanderlings (*Calidris alba*) associate in winter feeding flocks in Bodega Bay in a more or less random pattern; any associations between individuals are weak. This conclusion is based on data collected during 10 observation periods over 3 years. "Coherence" indices were calculated for each pair of marked birds and compared to coherence scores produced by random in computer simulations. This article provides evidence that sociobiology is growing up by reporting on a test of an implicit assumption of many studies of sociality.—Patricia Adair Gowaty.

19. An experimental study of birds' ability to discriminate the number of stimuli (*Muscicapa* (sic) *hypoleuca* as an example). E. N. Derim-Oglu and G. V. Egorova. 1982. Zool. zh. 51:1543–1548. (Russian, English summary)—In experiments over the course of several years, Pied Flycatchers (*Ficedula hypoleuca*) were presented with alternative choices differing only in the number of details. They were stimulated to choose via feeding behavior. Mature males had earlier been shown to be able to "count" to 6, females, to 4. In the final year's experiment, reported here, one male could tell the difference between 8 and 9, and a female, between 5 and 6.

The investigators replaced this pair's bird-house with a partitioned box with 2 entry holes. At both entry holes they placed markers decorated with symbols (triangles, rectangles, etc.), usually arranged symmetrically, identical in color, size, and shape, and differing only in quantity (by one, e.g., 5 vs. 6 symbols, or 6 vs. 7). The nest containing the hungry brood was moved into the box and placed first at one entry hole, then at the other, then back at the first, and so on. One marker (quantity of symbols) would always be placed at the hole behind which the nestlings were (the "positive" marker), the other marker always at the empty hole (the "negative" marker). The markers were changed when the nest was relocated to the other hole.

After 3 days, the birds accepted the markers and learned that their brood would be at one or the other, that whichever was the correct marker would move from door to door, and that they needed to examine the markers to determine the "positive" one so as to choose the proper entry hole. (How they learned which was the "positive" marker and which the "negative" is unexplained.)

Both male and female chose the correct ("positive") number of symbols more than half the time for numbers up through 6. Then the female's results became statistically insignificant, but the male continued making 80–90% correct choices up through 8 vs. 9 symbols. When, as a control, the investigators made the choice 9 vs. 9, the male went from one marker to the other, uttering alarm calls, perched several times on both markers, but did not go in either hole.

These Flycatchers orient themselves to their nest's location by noting characteristics of the surroundings when departing for food. The investigators conjecture that both the male and female were using the number of symbols to determine the correct entry as part of this orientation, and they conclude that the female was able to count at least as high as 6 because that was the number of eggs in her clutch. The male's limit seemed to be 8 vs. 9, but might have been higher. Even when the growing young's voices were getting louder and thus became the identifier of the nest's location, the male continued, though with difficulty, to try to use visual clues (the markers now differentiating 9 and 10), but fatigue became apparent and he took to orienting himself mostly by sound.

Since fine visual details are not necessary in identifying predators or food, what use is it to a Flycatcher to be able to count, to make decisions in complex circumstances? This may be an "excess of reactivity" not fully used under natural conditions but, latent in the organism, may increase the ability of the animal to react adequately to a greater number of complicated situations with a greater range of deviation from normal conditions.—Elizabeth C. Anderson.

ECOLOGY

(see also 8, 13, 27, 29, 31, 34, 35)

20. Spacing and distribution of bowers in Macgregor's Bowerbird (*Amblyornis macgregoriae*). M. A. Pruett-Jones and S. G. Pruett-Jones. 1982. Behav. Ecol. Sociobiol. 11:25–32.—This excellent descriptive study describes dispersion of male bower sites.

Bower sites were linearly and regularly spaced along ridges with a mean interbower distance of $169 \text{ m} \pm 64 \text{ MSD}$. This study is notable because it seeks the ecological factors underlying spatial patterning (see review 22). The authors conclude that Macgregor's Bowerbird does not exhibit lek behavior. They indicate that their data suggest that the mating system may be classifiable as promiscuity or male-dominance polygyny. Given the almost total absence of information on female matings, I found this premature speculation the only weakness in this otherwise admirable study.—Patricia Adair Gowaty.

21. Seasonal variation, and associated energetic implications, in the hunting behaviour of the Kestrel. R. A. Pettifor. 1983. *Bird Study* 30:201–206.—Observations of 7 pairs of Kestrels (*Falco tinnunculus*) near Cambridge, England revealed the use of 2 important foraging techniques: flight-hunting and perch-hunting. Both hunting methods were used with nearly equal frequency in summer, but, in winter, perch-hunting was used significantly more often. Success in capturing small mammals per unit time was 5 times higher for flight-hunting than perch-hunting in summer, but only twice as high for flight-hunting in winter. Pettifor suggested that prey availability was lower in summer as a consequence of a seasonal increase in vegetative cover in summer.

Using unpublished wind-tunnel data for Kestrels provided by J. Videler, Pettifor estimated the energetic cost of flight-hunting to be $10 \times \text{BMR}$. The cost of perch-hunting was estimated to be $2.5 \times \text{BMR}$. Pettifor calculated the relative cost of perch-hunting and flight-hunting in both seasons. In summer, both hunting methods were nearly equal in energetic costs, but in winter, perch-hunting was more than twice as efficient as flight-hunting. The greater use of the perch-hunting method by Kestrels in winter can be explained by these data. Pettifor suggests that increased prey cover and increased prey demands by mates and young on breeding males are factors contributing to the greater use of the flight-hunting method in summer.

Although the sample of birds studied was small, these results nicely demonstrate how the availability of prey, the relative cost of foraging, and the demand for prey influence the choice of hunting methods used by Kestrels.—Stephen R. Patton.

22. Are Acorn Woodpecker territories aggregated? R. L. Mumme, W. D. Koenig, and F. A. Pitelka. 1983. *Ecology* 64:1305–1307.—Determining patterns of dispersion, i.e., whether individuals or territories are clumped, randomly, or regularly distributed, is a basic problem in ecology (see review 20) and, given a non-random outcome, a crucial first step to additional ecological analysis. Patterns of dispersion can be studied using either quadrats or nearest neighbors, but methodological pitfalls await the unwary user of either approach. This paper emphasizes some of the difficulties of the latter approach while at the same time providing citations to the relevant methodological papers. Burgess et al. (*Ecology* 63:575–578, 1982) reported the territories of Acorn Woodpeckers (*Melanerpes formicivorus*) to be aggregated on the Stanford University campus. Mumme et al. challenge this result on both methodological and ecological grounds, and they go on to report data that indicate either a random or regular pattern of dispersion of territories (depending on method of analysis) for the same species at a more natural site near Monterey, California. Burgess (*Ecology* 64:1307–1308, 1983) reanalyzed his data with no resultant change in conclusion for the birds at Stanford. Thus the question remains open whether the differences reported by Mumme et al. and Burgess (op. cit.) are the result of behavioral differences in local populations of Acorn Woodpeckers, environmental constraints, or some combination of these two.—A. John Gatz, Jr.

23. An experimental analysis of sex-specific foraging in the Downy Woodpecker, *Picoides pubescens*. W. D. Peters and T. C. Grubb, Jr. 1983. *Ecology* 64:1437–1443.—Differences in foraging behavior between male and female Downy Woodpeckers have been well-documented. The purpose of this research was to determine if these differences are genetically fixed or due to behavioral plasticity. Given that the segregation breaks down during periods of either strong interspecific competition or high food supply, the behavioral plasticity option seems the better bet a priori. And indeed, Peters and Grubb's results substantiate that view. Removal of male Downy Woodpeckers resulted in the females altering their foraging behavior to become more male-like, i.e., females in the absence of males chose smaller branches ($\leq 5 \text{ cm}$ diameter), spent nearly 20% more time

foraging in the upper canopy, and foraged about 20% more often on branches $<60^\circ$ from horizontal. Social dominance of the male is indicated as the mechanism leading to the sexual segregation in foraging behavior of Downy Woodpeckers.—A. John Gatz, Jr.

24. Turnovers in species composition of avian communities in contiguous riparian habitats. J. Rice, R. D. Ohmart, and B. W. Anderson. 1983. *Ecology* 64:1444–1455.—This study is one of several recent reports that document a high degree of flux in bird populations in continental areas. The data analyzed come from thrice monthly avian censuses conducted over a 4-yr period on 72 line transects in 11 vegetation types along the lower Colorado River. Species composition varied greatly; roughly 25–40% of the species present in a given season varied from one year to the next. This turnover was independent of the number of species present. Although in some years particular habitat types showed significantly higher than average turnover rates, overall a hypothesis of equal turnover rates for all vegetation types could not be rejected. Turnover was slightly higher, however, for non-breeding species than for bird species that bred locally. The authors tried to explain the patterns in variation as many ways as they could, e.g., residency, guild membership, or taxonomic relatedness, but were unsuccessful for all possibilities tried except for the previously mentioned breeding/non-breeding dichotomy. As a whole, then, it seems that the fluctuations in species composition either were stochastic or were due to so many underlying causes that on balance the several deterministic forces seemed to operate independently to yield an overall random pattern. Rice et al. hasten to emphasize the relevance of their results to other ornithologists. First, they note that studies of avian habitat preferences based on observations made in only a single year could be quite misleading whereas studies conducted over several years may be required to yield reliable results. Second, they caution that major changes in bird species composition can occur in a given area from one year to the next without any corresponding change in either species richness or species diversity. These latter indices alone tell one nothing about species dynamics. Neither point should be revolutionary to a thoughtful ornithologist, but both points are worth confronting directly in future studies in view of the sorts of data reported here.—A. John Gatz, Jr.

25. Habitat selection and environmental gradients: dynamics in the “stable” tropics. J. R. Karr and K. E. Freemark. *Ecology* 64:1481–1494.—Karr and Freemark have studied habitat preference over just the sort of time scale Rice et al. (see review 24) would like to see—4 yr. In spite of Karr and Freemark’s work having been done in such a different region from that of Rice et al.—four 2-ha study plots in Panama rather than the Colorado River valley—the generalized message is similar: Habitat preferences must be studied for extended periods to gain any real understanding, and constancy of species richness or species diversity tells nothing of underlying population dynamics. More specifically, what Karr and Freemark report is that within small areas of tropical forest, a vast range of microhabitats exists. In each, the vegetation structure varies but little whereas the microclimatic conditions vary greatly between seasons and years. The consequence for the birds is that 90% of the resident species show “. . . significant spatial and/or temporal variability in activity along vegetation and/or microclimatic gradients . . .,” i.e., avian habitat preferences change over time. The avifauna at any point or time is thus a nonequilibrium community, but not stochastic as its composition is predictable from knowledge of the environment. Similarly, full knowledge of seasonal ranges in habitat preferences for different bird species is necessary before one can accurately predict what species would go extinct as a result of particular types of habitat loss. Without long term studies, one would likely overlook possible impacts on many species. Environmental consultants take note.—A. John Gatz, Jr.

26. The effect of weather on bioenergetics of breeding American Woodcock. D. L. Rabe, H. H. Prince, and E. D. Goodman. 1983. *J. Wildl. Manage.* 47:762–771.—A computer simulation model, information from previous Woodcock (*Scolopax minor*) studies, and local weather data were used to evaluate effects of weather on daily energy requirements of adult female woodcock and their chicks. Availability of the principal woodcock prey, earthworms (Lumbricidae), was also modeled using field data collected by the authors in northern Michigan. By comparing plots of woodcock energy requirements over time

to plots of earthworm availability, Rabe et al. determined that the greatest potential energy stress to woodcock occurred during brood rearing (20 April–1 June). There was a significant positive relationship between worm availability and chick survival. Arrival of woodcock on their northern breeding grounds was closely tied in with an increase in earthworm activity near the soil surface.

The authors state that "much of observed woodcock breeding behavior is a result of bioenergetic constraints." Their model could be adapted for use throughout much of the woodcock's range, in conjunction with traditional spring censuses of singing males (see review 33), to monitor reproductive success. This study exemplifies the intelligent use of published data in the modeling of ecological processes. Their bibliography is a useful key to the "woodcock-earthworm literature."—Richard A. Lent.

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

(see also 8, 12, 32)

27. Seasonal dynamics, habitat relationships, and management of avifauna in farmstead shelterbelts. R. H. Yahner. 1983. *J. Wildl. Manage.* 47:85–104.—In farm country, shelterbelts are rows of trees and shrubs planted on the windward sides of buildings for protection against the elements. Yahner collected bird population and habitat data in 7 small shelterbelts ranging in area from .210 to .787 ha for 2 continuous years in southern Minnesota. Shelterbelts harbored 87 species of birds. In decreasing order, the 6 most abundant species were Common Grackle (*Quiscalus quiscula*), House Sparrow (*Passer domesticus*), European Starling (*Sturnus vulgaris*), American Robin (*Turdus migratorius*), Dark-eyed Junco (*Junco hyemalis*), and Mourning Dove (*Zenaidura macroura*). Most of the species with high importance values (a composite of abundance and frequency measures) were omnivorous or granivorous, with few insectivores. Seasonal dynamics of bird species richness, evenness, diversity, and abundance are described for 8 consecutive seasons. Significant differences were found for these community indices among seasons. Factor analysis divided the 7 shelterbelts into 3 groups based primarily on stability of the bird community in each. A species-area relationship was found in shelterbelts only in winter. Simple correlation analyses for 110 habitat and 188 avian variables (mostly means of bird species abundances) make up the remaining results and discussion. Management recommendations for design and enhancement of shelterbelts for birds conclude the paper. These are largely a summary of literature ranging in topic from island biogeography to bird feeders.

Results are based on a small sample size (7 shelterbelts comprising a total habitat area of only 3.32 ha). This is compensated somewhat by the 2 years of continuous bird data, but I would have tried to sample a greater number of shelterbelts, possibly by collecting less data from each. The author wisely does not attempt a multivariate analysis of 188 bird and 110 habitat variables because of small sample size and multicollinearity among habitat variables. On the other hand, his lengthy description of simple correlations among many variables was hard for me to digest. A critical selection of variables to measure beforehand might have led to a more straightforward interpretation of results without having to rely on factor analysis to weed out "unimportant" variables.—Richard A. Lent.

28. Artificial trees as a cavity substrate for woodpeckers. A. W. Peterson and T. C. Grubb, Jr. 1983. *J. Wildl. Manage.* 47:790–798.—Plastic trees for woodpeckers? I didn't believe it myself at first, but free-ranging Downy Woodpeckers (*Picoides pubescens*) excavated 51 cavities in 42 of 50 242-cm-high by 22-cm-diameter polystyrene cylinders placed for 11 mo in a 65-ha Ohio woodlot. Cylinders were painted brown to simulate natural dead trees. All of the 51 cavities were used as woodpecker roost holes. Configuration of woodpecker cavities was related to weather conditions. Cavities were deeper with colder temperatures, and were made with larger entrance holes in warmer weather. Entrances constructed in winter were located away from prevailing winds, but were randomly oriented in summer. The authors kept 6 Downy Woodpeckers for 1 yr in aviaries to evaluate the health effects of manipulating, and probably ingesting, polystyrene. No ill effects were observed.

Two uses for these artificial trees are suggested: (1) to increase populations of cavity

nesters in commercial forests for biological control of insects, and (2) for research into cavity construction and breeding biology of cavity nesters. To satisfy the picid urge to drum on non-resonant polystyrene, the authors suggest: "A short strip of plywood affixed near the top of each cylinder could function as an adequate sounding board."—Richard A. Lent.

29. Snag retention increases bird use of a clear-cut. J. G. Dickson, R. N. Conner, and J. H. Williamson. 1983. *J. Wildl. Manage.* 47:799–804.—Near Nacogdoches, Texas, breeding birds were censused from 1977 to 1981 in four 2-ha plots containing snags (dead trees) and 4 snagless plots situated in a 500-ha clear-cut. Bird species richness, abundance, diversity, and equitability were all significantly higher in snag plots. Not surprisingly, there were virtually no cavity-nesting birds in snagless plots. Cavity-nesters detected in snag plots were Great-crested Flycatcher (*Myriarchus crinitus*), Red-bellied Woodpecker (*Melanerpes carolinus*), Red-headed Woodpecker (*M. erythrocephalus*), Carolina Chickadee (*Parus carolinensis*), Downy Woodpecker (*Picoides pubescens*), and Hairy Woodpecker (*P. villosus*). An additional 17 open-nesting bird species used the clear-cut and were often more abundant in snag plots because they used snags for foraging perches and substrates. This is another study that illustrates, with clear-cut results, the importance of retaining some dead and dying trees in managed forests.—Richard A. Lent.

30. On the efficiency of the line transect method: a study based on nest searching. P. Helle and E. Pulliainen. 1983. *Ornis Fenn.* 60:35–41.—A comparison was made between line transect counts as a census technique and the total counts of nests on the island of Ulkokrunni in the Baltic Sea. The forested section of the island was searched during the breeding season for nests of species which presumably were detectable enough to be counted entirely. Line transect censuses were performed in June on 2 consecutive days with similar weather conditions.

The mean efficiency of a single line transect count was 50% for detectable species. These results were similar to those from other studies. Transect counts on consecutive days gave very comparable results. Census efficiency was higher for abundant species. The authors suggest that abundant birds may be counted twice and also are easier to detect because of increased activity between conspecifics.—Lise A. Hanners.

CONSERVATION AND ENVIRONMENTAL QUALITY

(see also 7)

31. Habitat usage of two woodland *Buteo* species in Central Ontario. E. Armstrong and D. Euler. 1983. *Can. Field-Nat.* 97:200–207.—Broad-winged (*Buteo platypterus*) and Red-shouldered (*B. lineatus*) hawks occupied deciduous, upland forest near water. However, Broad-winged Hawks nested in partially open forests and hunted in cleared areas as well as forest whereas Red-shouldered Hawks nested and hunted only in dense, continuous forest and may require as much as 2500 ha of undisturbed forest. Thus cottage construction in the forests of the Great Lakes-St. Lawrence region, where this study was done, may cause a marked decline in the population of Red-shouldered Hawks. Because Broad-winged Hawks often established territorial boundaries along lake shores or clearings, clearing around cottages may allow establishment of additional territories by providing additional boundary clearings. The future will provide a test of the authors' predicted population changes.—Edward H. Burt Jr.

32. Artificial incubation of falcon eggs. W. Burnham. 1983. *J. Wildl. Manage.* 47: 158–168.—The first part of this paper summarizes data on approximately 300 captive and 100 wild *Falco peregrinus* eggs from the captive breeding program of The Peregrine Fund, Fort Collins, Colorado. The author uses these empirical data and equations from the literature to address questions on egg volume and weight loss during incubation, shell thickness and conductance, and incubation time and temperature. Drawing on this information, Burnham then describes recommended incubation and hatching procedures designed for maximum success in captive breeding of falcons. Using his procedures, 83% of all fertile eggs from captive birds, and over 90% from wild eyries, hatched successfully. The techniques appear applicable to other species.—Richard A. Lent.

33. Woodcock singing-ground counts and habitat changes in the northeastern United States. T. J. Dwyer, D. G. McAuley, and E. L. Derleth. 1983. *J. Wildl. Manage.* 47:772-779.—Aerial photography from late 1960 to late 1970 was used to evaluate habitat changes along 78 call-count census routes for *Scolopax minor* in 9 northeastern states. Multiple regression analysis related changes in the call-count index to changes in 7 major habitat types. Declines in amounts of abandoned field, shrubland, cropland, field/pasture, and clear-cut forest occurred between late 1960 and late 1970, partly from successional trends. Urban/industrial area increased 33.4% over all 9 states. Amount of urban/industrial, abandoned field, and alder (*Alnus*) habitat types explained most of the variation in woodcock abundance. Changes in the amount of urban land were significantly related to changes in woodcock abundance. Results suggest that the observed decline in woodcock abundance in the northeast is due to an increase in urban/industrial development, which usually replaces abandoned field and shrubland, the preferred woodcock habitats.—Richard A. Lent.

34. Numbers and some ecological features of synanthropic populations of Corvidae under conditions of intensive urbanization. V. M. Konstantinov, V. G. Babenko, and I. K. Barysheva. 1982. *Zool. zh.* 51:1837-1845. (Russian, English summary)—A study of three species of corvid (Hooded Crow, *Corvus corone*; Jackdaw, *C. monedula*; and Rook, *C. frugilegus*) conducted 1963-1980 in the central region of the European part of the USSR (mostly Moscow) compared their ecology and numbers in slightly modified (agricultural), considerably modified (suburban), and completely modified (urban) landscapes. All 3 species were more numerous in completely modified areas than in slightly or considerably modified areas in winter; Hooded Crows were the most abundant. Hooded Crows and Jackdaws were also more abundant in completely modified areas than in the other 2 during the nesting season. Hooded Crows nested up to 10 times more densely (2-3 pr/km² in slightly modified areas, 32-36 pr/km² in completely modified areas), placing nests sometimes no more than 20 m apart. This semi-coloniality benefits them through earlier warning of danger and better information about food.

For centuries, corvids had roosted in cities at night during the winter. Gradually—and especially in the past 2 decades—some ceased leaving for the country to forage in winter, and then ceased leaving to nest, becoming a more settled, possibly year-round population. Habitat suitable for them has been created as cities have grown, and cities provide a slightly milder climate and a more-reliable, less-fluctuating supply of food (garbage) than is found naturally. Corvids' ecological plasticity has allowed them to take advantage of this by using anthropogenic food sources, anthropogenic materials for nests, and anthropogenic structures for nest placement. They have adjusted readily to human presence and activities by becoming tame enough to allow a person to approach to within 2.5 m, building nests to within 2.5 m of the ground, and timing flights to and from roosts to coincide with the turning on and off of streetlights. Urban-nesting Hooded Crows nest 2-3 weeks earlier than their conspecifics in less-modified areas, and have larger broods. As attempts are made to control the numbers of corvids in cities (through trapping and poison), one can expect that the birds will continue fine-tuning their adaptations.—Elizabeth C. Anderson.

PARASITES AND DISEASES

35. Responses of an avian predator and its isopod prey to an acanthocephalan parasite. J. Moore. 1983. *Ecology* 64:1000-1015.—Studies documenting that acanthocephalan and other parasites alter behavior or their intermediate hosts in ways that lead to increased vulnerability to predation relative to uninfected individuals are becoming increasingly common. Moore's study includes the usual demonstration of altered behavior of parasitized prey as well as the less common laboratory demonstration of enhanced vulnerability to predation of the infected prey. But what really sets the study apart is its inclusion of a field demonstration of this same differential vulnerability of parasitized prey. The definitive host is in this case the Starling (*Sturnus vulgaris*) and the intermediate host is a terrestrial isopod (*Armadillidium vulgare*). Moore autopsied nestling starlings to determine infection rates and compared these rates with those expected based on feeding

rates and proportions of isopods infected in the nesting areas. In all 4 cases studied, the incidence of infection was significantly higher than expected if starlings foraged on isopods at random relative to the presence or absence of parasites. Moore's laboratory work showed that parasitized isopods frequent less-humid and less-sheltered areas on lighter substrates than their uninfected conspecifics. Hence starlings would be expected to encounter infected isopods at a frequency higher than their proportional abundance in nature. The take-home message here for many ecologists who study foraging behavior including optimal foraging is one that Moore makes in her very first paragraph: The relative abundances of various prey species as determined by standard sampling techniques may give a very distorted view of their actual relative availability to a definitive host if one or more of the prey species is an intermediate host for a behavior-modifying parasite.—A. John Gatz, Jr.

PHYSIOLOGY

36. Falcon visual sensitivity to grating contrast. J. Hirsch. 1982. *Nature* 300:57–58.—A single captive male American Kestrel (*Falco sparverius*) was tested for visual acuity (contrast thresholds of stationary and phase-changing vertical spatial gratings) and compared with the mean sensitivity performances of 3 human observers. The kestrel was less sensitive to stationary patterns in the low spatial frequency range. However, cut-off frequencies (a measure of acuity) were similar for the kestrel and humans. This finding, which contrasts with a previous report that kestrel acuity was more than 2.5 times sharper than that of humans, is still remarkable however. Because the kestrel's eye is approximately half the size of a human eye, other things being equal the kestrel's acuity would be expected to be about half that of humans. The author explains the kestrel's visual capacity in terms of its 2-fovea retina that contains densely packed photoreceptors and produces a foveal magnification that is 33% greater than a human's.—W. A. Montevocchi.

MORPHOLOGY AND ANATOMY

(see also 51)

37. Species, age, and sex identification of Nearctic Goldeneyes from wings. S. M. Carney. 1983. *J. Wildl. Manage.* 47:754–761.—This paper describes criteria for identification of Barrow's (*Bucephala islandica*) and Common goldeneyes (*B. clangula*) for birds in the hand or from wing specimens. Using a graphic analysis of 166 hunter-shot specimens of *clangula* and 39 of *islandica*, along with wings of 836 *clangula* and 355 *islandica*, Carney presents 3 keys for separating the species and determining sex and age of individuals. The characters used were color patterning of greater and lesser secondary coverts (for species separation and age) and wing length (for sex). Figures illustrate feather and wing differences.—Richard A. Lent.

PLUMAGES AND MOLT

(see 37)

ZOOGEOGRAPHY AND DISTRIBUTION

(see also 5, 24, 25, 50, 51, 52)

38. An estimate of the Black Scoter, *Melanitta nigra*, population moulting in James and Hudson bays. R. K. Ross. 1983. *Can. Field-Nat.* 97:147–150.—An exceptionally thorough photographic survey revealed 88,700 molting male Black Scoters in James and Hudson bays in late summer 1977. That estimate suggests a total population of 259,300 in eastern North America. However, winter censuses along the Atlantic coast cannot account for so many scoters, a fact the author attributes to censuses not specifically designed for ducks that raft far offshore. Alternatively, the author might question his assumptions used to estimate the total population from the population of molting males.—Edward H. Burt Jr.

39. Avian breeding and occurrence notes from the Sutton Ridges area of northeastern Ontario. R. D. James, J. A. Dick, S. V. Nash, M. K. Peck, and B. E. Tomlinson. 1983. *Can. Field-Nat.* 97:187–193.—Lesser Scaup (*Aythya affinis*), Common Merganser (*Mergus merganser*), Long-eared Owl (*Asio otus*), Olive-sided Flycatcher (*Nuttallornis borealis*), Brown Creeper (*Certhia familiaris*), Hermit Thrush (*Catharus guttatus*), and Golden-crowned Kinglet (*Regulus satrapa*) are confirmed breeding in the Sutton Ridges of northeastern Ontario, far north of previously reported breeding limits (Godfrey, **The Birds of Canada**, Natl. Mus. Can. Bull. 203, 1966). Common Nighthawk (*Chordeiles minor*), Winter Wren (*Troglodytes troglodytes*), Cedar Waxwing (*Bombycilla cedrorum*), and Magnolia Warbler (*Dendroica magnolia*) are probable breeders and far beyond their previously reported northern limit. Breeding was confirmed for 9 additional species previously suspected of breeding in the region. These results suggest that “. . . a lack of work in a region where travel and access are difficult has limited our understanding of the status of many species.”—Edward H. Burtt Jr.

40. Hybrid phenotypes in male Figbirds *Sphecothebes viridis* in Queensland. J. Ford. 1982. *Emu* 82:126–130.—Ford collected a series of specimens across the zone of contact between two distinctive taxa of Figbirds in northeastern coastal Australia. One taxon (*S. v. vieilloti*) has a gray throat and breast; these are yellow in the other (*S. v. flaviventris*). Hybrids were collected with intermediate plumages, but some birds were also collected with white throats, a characteristic not found in either of the parental forms. The actual width of the hybrid zone was in good agreement with the width expected on the basis of a simple genetic model that assumes first contact about 10,000 years ago and no selection against hybridization. Interestingly, this is another example of several recent investigations of avian hybrid zones in which the present status has been shown to be consistent with predictions based on strictly neutral introgression.

A second interesting aspect of this paper is the problem of hybrid individuals having phenotypes, not intermediate, but completely unlike the characteristics of either parental type. However, as Ford points out, this is to be expected in cases where the phenotypes of the two parent taxa are due to dominant alleles at different loci. For such cases, some hybrid combinations (for example, F2 individuals) will be double recessives and hence will not resemble either parent.—George F. Barrowclough.

41. Resident Mourning Doves in Berkeley, California. A. S. Leopold and M. F. Dedon. 1983. *J. Wildl. Manage.* 47:780–789.—With 42 band returns from 1184 doves (*Zenaidura macroura*) banded over 8 yr, the authors determined that the resident urban population was nonmigratory. Adult mortality (48%) was close to that reported for hunted dove populations, even though the Berkeley population was hardly exposed to hunting pressure. Call counts of cooing city males were similar to counts in nearby rural areas. Apparently the urban vegetation was conducive to dove nesting success and city bird feeders provided abundant food. Results suggest that the North American population of Mourning Doves consists of a northern migratory and a central/southern nonmigratory component.—Richard A. Lent.

42. Henderson Island, Central South Pacific, and its birds. W. R. P. Bourne and A. C. F. David. 1983. *Notornis* 30:233–252.—Henderson Island is “one of the few islands . . . in the warmer parts of the world still little affected by human activity.” Its landbird fauna consists of four endemic taxa. The seabird fauna is less well known, in part because of the island’s rough terrain, lack of visitors, and the complicated nature of variation in the gadfly petrels that live there. These include *Pterodroma n. neglecta*, *Pt. arminjoniana heraldica*, and *Pt. alba*, as well as presumed hybrids involving all possible crosses of the 3 species. Bourne and David present a useful synopsis of the island’s history and physiography, as well as describing the avifauna, but note that development may be imminent as the construction of an airstrip has been proposed. A remarkable and encouraging fact is that goats and pigs, plagues when liberated on other islands, have failed to survive on Henderson. Perhaps we should find out why and try to duplicate similar conditions on other islands.—J. R. Jehl, Jr.

SYSTEMATICS AND PALEONTOLOGY

(see also 37, 40, 45, 50, 51)

43. Geographic differentiation, cladistics, and vicariance biogeography: reconstructing the tempo and mode of evolution. J. Cracraft. 1982. *Am. Zool.* 22:411-424.—In this paper, Cracraft continues the line of investigation of patterns of speciation and biogeography begun by Mengel (*Living Bird* 3:9-43, 1964) and Hubbard (*Living Bird* 12:155-196, 1973). In those works the authors showed that patterns of biogeographic distributions in related species were repeated (i.e., concordant) across several different groups of birds. Cracraft performs a similar analysis on several Australian passerine genera, but in addition performs a cladistic analysis within each genus. When several of these cladograms are compared to the geographic distribution patterns of the birds, it becomes possible to establish the overall temporal history of speciation events (vicariance pattern) giving rise to the current Australian avifauna. Cracraft argues that this type of analysis will greatly further the investigation of processes of speciation: if the cladistic pattern for a particular taxon is found to agree with the generalized vicariance pattern, then some deterministic process (geological events) must be responsible for the distribution and speciation; dispersal or parapatric speciation may be the cause of a distribution pattern inconsistent with the generalized vicariance pattern. Ornithological studies of speciation have been preoccupied with isolating mechanisms, hybrid zones, and species status; the type of analysis advocated and demonstrated in this paper will complement such studies and help illuminate a different aspect of speciation.—George F. Barrowclough.

EVOLUTION AND GENETICS

(see also 40, 43)

44. A comparison of the theoretical and electrophoretic assessments of genetic structure in populations of the House Sparrow (*Passer domesticus*). R. C. Fleischer. 1983. *Evolution* 37:1001-1009.—Although House Sparrows have only been in North America for about 100 yr, they already show noticeable morphological variation across their range (e.g., Johnston and Selander, *Evolution* 25:1-28, 1971). In this study, Fleischer begins the investigation of the extent of genetic differentiation, on a microgeographic scale, in the same species. Using dispersal estimates based on returns of nestlings banded on Kansas farms, he predicts, using a demographic model treating each farm as a colony, that 1.36% of the total genetic variation should be distributed among populations. Using electrophoretic data, he finds that .76% of the actual genetic variation is distributed among populations on these farms. That the prediction and measurement are of the same order of magnitude is remarkable considering the number of assumptions made and the unknown standard errors associated with the demographic estimates. This is one of a very few studies in which theoretical and empirical assessments of the genetic structure of populations have been made in the same organism. The estimates of the extent of genetic differentiation among populations are in the same range as estimates from other species of birds.—George F. Barrowclough.

45. Assortative mating and gene flow in the Lesser Snow Goose: a modelling approach. J. M. Geramita, F. Cooke, and R. F. Rockwell. 1982. *Theor. Popul. Biol.* 22:177-203.—Lesser Snow Geese (*Chen caerulescens*) from the various Hudson Bay colonies form pair bonds on the wintering grounds and during spring migration. Females are philopatric; males return to their mate's colony. Because the pairing areas are largely common to all colonies, this mating behavior results in nearly 50% gene flow among colonies each generation. Consequently, simple calculations would lead one to conclude that, due to the massive gene flow, there should be equal numbers of blue-phase and white-phase birds throughout the range after only a few generations. However, there has long been a pronounced cline in color-morph frequency in the central Canadian arctic. The authors of this paper use both field data and mathematical models of assortative mating to investigate the causes of this apparent paradox. In particular, they investigate the nature of the incomplete assortative mating known to occur: many geese, but not all, mate with geese of their own color morph. Assortative mating will tend to retard gene

flow among colonies of different predominant color. The authors show the situation is consistent with models in which most geese mate with an individual of a color phase present in their natal family group. However, it was found necessary to include a number of complicating factors in the calculations, e.g., some white birds may prefer to mate with a blue individual because they were raised by heterozygous blue parents (the allele for blue is dominant), some nest parasitism occurs, and some goslings become associated with non-parental broods due to chance wandering during foraging (goslings are nidifugous). Finally, some individuals apparently do mate randomly with respect to color morph. Through some judicious modelling, the authors were able to demonstrate that the effects of no single one of these life history parameters is sufficient to explain the degree of assortative mating and the observed distribution of phenotypes. Rather, the effects of all factors appear to be important. Thus, a combination of field data and mathematical modelling has led to quantitative predictions suggesting potentially productive directions for new field work.—George F. Barrowclough.

46. Winter foraging behavior of Short-eared Owls (*Asio flammeus*) in Ohio. B. A. Colvin and S. R. Spaulding. 1983. *Am. Midl. Nat.* 110:124–128.—The title of this paper is misleading because winter foraging *behavior* was not examined. Analysis of pellets of Short-eared Owl at winter roosts in NW Ohio revealed that Meadow Vole (*Microtus pennsylvanicus*) was the major prey and was taken far more frequently than its relative abundance would suggest. The only other important prey, *Peromyscus* spp., was taken less frequently than its relative abundance would suggest. Significantly more *Peromyscus* spp. were taken when there was snow cover, though the frequency taken was never greater than 16% of all prey for any week sampled. This paper could have been reduced to a note.—Douglas B. McNair.

47. The food of treecreeper *Certhia familiaris* nestlings in southern Finland. M. Kuitunen and T. Tormala. *Ornis Fenn.* 60:42–44.—The diet of nestling treecreepers was investigated by capturing 24 adult males and 7 adult females as they returned to nestboxes with food. The food items were almost exclusively arthropods with only 1% seeds. The most numerous food items were phorid flies, but spiders and harvestmen contributed the most significant biomass (77%). Taxonomically the prey was very diverse and included highly mobile arthropods from the bark microhabitat.—Lise A. Hanners.

48. Why does the Wryneck *Jynx torquilla* bring strange items to the nest? J. Terhivuo. 1983. *Ornis Fenn.* 60:51–57.—The contents of 121 Wryneck nests were analyzed in 1976–1979 for annual and regional variation in the quantity and nature of objects brought to the nest. The nesting success of these pairs was also determined. The mean number of objects in a nest-box was 37.4; there were no significant differences among geographical locations or nesting habitat. Experiments with test objects laid in the vicinity of nests revealed that the tendency for Wrynecks to pick up objects was significantly higher in the second half of the nestling period. Dissection of nestlings that died revealed that 11% died from eating strange objects; no significant correlation was found between the number of fledglings and the number of strange items in the nest. Terhivuo suggested that picking up strange items by Wrynecks is a product of their motivation to feed nestlings and represents an error in behavior. The large proportion of nests with objects (93%) and the high number ($\bar{x} = 34$) of objects per nest suggests to me that such "errors" are the rule rather than the exception. Terhivuo's data reject the previously held hypothesis that the objects supplement the nestling diet. An alternative explanation should be sought for this unusual behavior.—Lise A. Hanners.

SONGS AND VOCALIZATIONS

49. Call-system similarity in a ground-living social bird and a mammal in the bush habitat. V. Maier, O. A. E. Rasa, and H. Scheich. 1983. *Behav. Ecol. Sociobiol.* 12: 5–9.—The vocal behavior of captive Guinea-fowls (*Numida meleagris*) and dwarf mongoose (*Helogale undulata rufula*) are similar. Acoustic parameters correlate with similar types of behavior in each species. For both species, frequency sweeps were used in "peaceful" situations; rapid frequency modulation was associated with attention, excitement, and

alarm; and noisy calls were associated with defensive behavior. The authors discuss several hypotheses that may have favored the high degree of convergence in these sympatric East African animals.—Patricia Adair Gowaty.

FOOD AND FEEDING

(see also 3, 21, 23)

BOOKS AND MONOGRAPHS

50. Check-list of North American Birds, sixth edition. The American Ornithologists' Union. 1983. 877 p. \$25.00.—Since the publication, 26 years ago, of the fifth edition of the A.O.U. "Check-list of North American Birds," thousands of research papers, lists, notes, and popular articles on birds have been written, increasing our knowledge of the biology and distribution of American birds. New classifications of several groups have been proposed and there has been an effort among ornithologists to standardize internationally the English vernacular names of birds. In North America, people generally follow the classification and nomenclature that is set forth in the A.O.U. Check-list. Indeed, editors of scientific journals virtually insist on this. Because so many changes in classification and nomenclature have been proposed since publication of the fifth edition, it has become increasingly unclear which differences the A.O.U. Committee on Classification and Nomenclature would incorporate into the sixth. This uncertainty has persisted despite the publication of a series of supplements to *The Auk* in which the Committee listed many of the innovations that they had decided to use. Thus, the sixth edition, published late in 1983, was overdue.

The sixth A.O.U. Check-list was long in coming because it was more ambitious in scope than earlier editions, containing accounts of the more than 1900 avian species found from Panama to the arctic, including the West Indies and Hawaiian Islands (but not Greenland). (The fifth edition dealt only with birds found in the United States, Canada, Baja California, and Greenland.) The birds of Hawaii were included in the new edition because U.S. federal and state agencies use the A.O.U. Check-list as a standard reference source. Issuing a supplement for the birds of the 50th state, leaving the Check-list one of North American birds, might have been preferable.

In addition to the wider geographic coverage, the new Check-list differs from the fifth edition in a number of other important ways. In the fifth edition, the individual species accounts included a Latin name, an English vernacular name, the original citation to the species and type locality, a general summary of the distribution, and fossil records. For polytypic species, information on the nomenclature and distribution of each subspecies followed the general species account. In the new list, the information on subspecies has been omitted, but a brief statement of the habitats occupied by each species is included in each account, and, where necessary, additional information on geographic variation, polymorphism, hybridization, common English and Latin synonyms, and classification is given in a "notes" section.

Four appendices are provided. The first lists species reported in the Check-list area on the basis of seemingly reliable sight records. The second lists species reported on the basis of dubious sightings or specimens, or of species present probably through escape from captivity. The third lists species of doubtful status or of probable hybrid origin. The fourth appendix lists deliberately introduced species that apparently have not become established. A list of A.O.U. numbers is given, including new numbers given to species recently established in Canada or the United States (including Hawaii).

In the Preface to the sixth edition we are told that it was with regret that the subspecies accounts were omitted; however, this omission will not inconvenience most ornithologists because the format of the new Check-list permits the presentation of more information about interpopulational differences than did that of previous editions. For example, the account of the Savannah Sparrow (*Passerculus sandwichensis*), which requires about a page in the new Check-list, contains a far more useful summary of the distribution, migration, and habits of this variable species than did the 5-page list of subspecies and their ranges that appeared in the fifth edition. A desirable effect of this new format will be reduced

emphasis on the use of trinomials by people not engaged in studies of intraspecific systematics. Useful input from non-specialists will not be lost because in cases where races are clearly marked, such as flickers (*Colaptes*), Savannah Sparrows, and Northern Orioles (*Icterus galbula*), the distributions, and, in some cases, ecological differences of each distinct group of populations are given. For example, in the account of flickers we learn that it is specifically the *chrysoides* group that inhabits deserts; the *chrysocaulosus* group is resident in Cuba and on Grand Cayman; the *cafer* group breeds in the west and the *auratus* group breeds in the east; intergradation occurs between some groups; etc. However, except in cases of polymorphism, we are not given information on phenotypic variation within species. From the Check-list we cannot ascertain the diagnostic characteristics of, say, *Colaptes auratus cafer*, but at least we know that there is notable interpopulational variation in the habits and presumably appearance of flickers.

The sixth edition differs from the fifth with regard to the sequence of species, higher categorical classification, species classification, and Latin and English nomenclature. To a certain extent, these changes have already been presented and explained in the supplements to the Check-list. Of these, the 34th Supplement (Auk 99:1CC-16CC, 1982) is a useful summary of the sequence and name changes for the species in the "old" A.O.U. area. Although many of these changes were accepted by the journals and incorporated into the ornithological literature prior to publication of the sixth edition, there will be a period of confusion following the appearance of this book. Rising and Schueler (Syst. Zool. 21:438-439, 1972) calculated that each new edition of the Check-list has brought with it major changes in some 19 to 30% of the Latin binominal names, and the sixth edition has continued this tradition. On the basis of the 739 species that were listed in both the fifth and sixth editions, a total of 17% (122 of 739) of the binominals have been changed to the extent that they are unrecognizable to people unfamiliar with the synonyms (e.g., not counting changes such as *Bombycilla garrula* to *Bombycilla garrulus*). Of these, 14.1% have been changed as a consequence of reclassification at the generic level. This is comparable to the 14.3% change in generic names between the fourth and fifth editions, and the 13.8% change between the third and fourth. One wonders if continued renaming on this scale is in the best interest of science. Approximately 85% of the name changes reflect changes in the Committee's thinking about genera, and given the rules of zoological nomenclature, it is either necessary to make these name changes, or to freeze classifications. Ornithologists have been innovators in many areas of biological research. Perhaps this is the cue for them once again to lead the way: devise a new system of nomenclature that conserves names, when possible, and thus better serves the function of communication.

Although name changes are required by the rules of zoological nomenclature, the sequence of taxa in the Check-list is determined by the Committee. In the Preface they explain that, following previous lists, they have adopted sequences that "begin with the lowest or most generalized type, and end with the highest or most specialized" (p. xvi). Taxa are nested within category; hence orders are arranged in what is judged to be a "generalized to specialized" sequence; within orders, families are so arranged; within families, genera; etc. To the extent that we know relationships, this arrangement has the advantage of putting together closely related taxa: the roadrunners and anis are listed with the cuckoos; all of the ducks are together; etc. The disadvantages are that, (1) the sequence changes each time the classification is changed, and (2) it is difficult for people not familiar with avian classifications to use the list.

In determining the sequence, the Committee has "... followed what it considers to be the best published evidence and its own judgment" (p. xvi). As they point out, however, frequently there is a "... lack of sufficient evidence to make sound inferences about the phylogenetic history of a given taxon" (p. xvi). There is the additional problem of trying to express a branching pattern in a linear sequence, where one phyletic line must be appended to the end of the one that preceded it in the list. In the Check-list it is nowhere made clear where the Committee has good evidence for phylogeny and where they do not, or where the juxtaposition of two taxa is supposed to reflect close relationship and where the end of one lineage is followed by the beginning of the next. As an example, the sequences of emberizine genera mentioned in both the fifth and sixth editions are

TABLE 1. Sequence of Emberizine Genera Listed in Both Fifth and Sixth A.O.U. Editions.

Fifth edition (1957)	Sixth edition (1983)
<i>Arremonops</i>	<i>Arremonops</i>
<i>Pipilo</i>	<i>Pipilo</i>
<i>Calamospiza</i>	<i>Aimophila</i>
<i>Passerculus</i>	<i>Spizella</i>
<i>Ammodramus</i>	<i>Pooecetes</i>
<i>Pooecetes</i>	<i>Chondestes</i>
<i>Chondestes</i>	<i>Amphispiza</i>
<i>Aimophila</i>	<i>Calamospiza</i>
<i>Amphispiza</i>	<i>Passerculus</i>
<i>Junco</i>	<i>Ammodramus</i>
<i>Spizella</i>	<i>Passerella</i>
<i>Zonotrichia</i>	<i>Melospiza</i>
<i>Passerella</i>	<i>Zonotrichia</i>
<i>Melospiza</i>	<i>Junco</i>
<i>Calcarius</i>	<i>Calcarius</i>
<i>Plectrophenax</i>	<i>Emberiza</i>
<i>Emberiza</i>	<i>Plectrophenax</i>

given in Table 1. Many differences are implied. For example, *Spizella* was considered to be relatively specialized and close to *Zonotrichia* in the 1957 list; in 1983, it is back with *Pooecetes*, which is no longer close to *Ammodramus* or *Passerculus*. There is a published sight record of a possible hybrid *Pooecetes gramineus* × *Spizella pusilla* (Doolittle, Wilson Bull. 41, 1929), but to my knowledge, nothing has been published in the past 26 years that would support this change, although it resembles the reverse of the sequence used in the "Check-list of Birds of the World" (Paynter and Storer, Bull. Mus. Comp. Zool., 1970). In both A.O.U. lists, the sequence *Calamospiza*-*Passerculus*-*Ammodramus* occurs. It is generally accepted that the latter two genera are closely related, but the relationships of *Calamospiza* are uncertain; Mayr and Short ("Species taxa of North American birds," Publ. No. 9, Nuttall Ornithol. Club, 1970) suggest that *Calamospiza* may be close to *Calcarius*. One suspects that the Committee "had to put it someplace," but the implication is that *Calamospiza* is as close to *Passerculus* as *Passerculus* is to *Ammodramus*.

The commitment of the Committee to reflect relationships in the sequence is held at all levels, so that we even see changes in the sequence of species within a genus. For example, for years we have had *Melospiza melodia* as the last of the *Melospiza*; in the new list it is first. Can it be important to change *M. lincolni*-*M. georgiana*-*M. melodia* to *M. melodia*-*M. lincolni*-*M. georgiana*? Does this show us that of the *Melospiza*, *M. melodia* is the closest to *Passerella iliaca*, the species that precedes *Melospiza* in the list and that *M. georgiana* is the closest to the *Zonotrichia* that follow? One or the other, or perhaps both, of the above is implied, but it is not possible to know which.

In addition to the instability these changes of sequence introduce, they imply that phylogeny is known when, in many cases, it is not. They may imply close relationships when more remote ones are accepted, and they may be based on unstated preconception. It would be preferable to arrange orders alphabetically; within orders, arrange families alphabetically; and so forth. Is it not better to imply little or nothing about relationships than to imply false relationships? Speculation about phylogeny can be expressed in the "notes," as they are in the sixth edition, or in appendices.

The sixth edition, in spite of its numerous changes, is a conservative document. For example, within the Parulinae, the genera *Oporornis* and *Geothlypis* are not merged; neither are the genera *Vermivora*, *Parula*, and *Dendroica*. One cannot help but wonder if the Committee was not influenced simply by the rules of nomenclature in some of their

decisions. In the latter example, *Vermivora* is the senior name. Were these genera combined, in the Check-list there would be a single genus containing 40 species, and of these 31 would need to be renamed.

In general, the Committee has conserved well-established English vernacular names where possible, even if these, for various reasons, are not appropriate or meaningful (e.g., Cape May Warbler and Evening Grosbeak). "Common" has been removed from many names (e.g., "Common" Pintail becomes Northern Pintail; "Common" Flicker becomes Northern Flicker; "Common" Crow becomes American Crow), in part because these species are not everywhere common, but the Poorwill becomes the Common Poorwill and Common Murre (cf. Thin-billed Murre) is retained. Some English names that are widely used outside North America have been adopted (e.g., Common Moorhen for Common Gallinule), but others not (e.g., Oldsquaw and Winter Wren are retained). Modifiers have been added to many names to avoid confusion (e.g., Northern Rough-winged Swallow, to contrast with Southern Rough-winged Swallow; Northern Cardinal, to contrast with Red-crested and Yellow-billed cardinals). The use of modifiers such as "common" and "northern" is perhaps unfortunate, for most journals and magazines do not capitalize English vernacular names. In these, it will not be clear whether common moorhens are simply "common," or whether they are a distinct entity. Although everyone will disagree with some of these names (I prefer Long-tailed Duck to Oldsquaw, and Thin-billed Murre to Common Murre), I suspect that they will receive general acceptance.

The general format of the sixth edition is pleasant. Maps on the inside covers are clear and useful. The type is clear, the paper apparently of good quality, and the binding seems sturdy. I have yet to find a typographical error. The Index is arranged as in previous editions. I would have found a list of the species under each generic name useful. For example, if one looks up *Dendroica petechia*, in the index under *Dendroica* one will find only a list of the pages (four in this example) where general reference to that genus is made. The page upon which the list of *Dendroicas* commences is not specially noted (with boldface or italic type). The account of the species is under "Warbler, Yellow," or under "*petechia*, *Dendroica*," although not under "Yellow Warbler."

The Committee on Classification and Nomenclature chose, for the sixth edition, to create a volume in the image of the fifth. The changes that have been introduced make the sixth edition a more useful book than the fifth: gone are the recondite lists of subspecies; present are useful and succinct descriptions of habitats, and explanatory "notes," in which some of the confusing decisions about classification and nomenclature are explained. But the Committee has not gone far enough. For future editions, I would like to see the A.O.U. Check-list produced in loose-leaf format, such as used by the *Catalogue of American Amphibians and Reptiles* and *Mammalian Species*, published by the Society for the Study of Amphibians and Reptiles and The American Society of Mammalogists, respectively. This format permits new species accounts to be issued as available, and timely updated accounts to be released whenever substantial new information is available. Twenty-six years has been too long. As well, in nearly 100 years, and through six editions, the A.O.U. has done little to instill stability into the classification and nomenclature of North American birds. One senses that with each new edition there is the hope that this stability has been achieved, but if classifications are based on presumed phylogeny and the rules of nomenclature are adhered to, this is a vain hope. Phylogeny is largely unknown, and in many details probably cannot be determined. Without a knowledge of phylogeny, higher categorical classification must be to a certain extent arbitrary. Reasonable debate about classification and phylogeny should be encouraged, but American ornithology would be better served by an A.O.U. Check-list that stressed stability over speculation.—J. D. Rising.

51. The birds of China, Mongolia, and Korea. Passerines (Les oiseaux de Chine, de Mongolie et de Corée. Passereaux). R.-D. Etchécopar and F. Hüe. 1983. Société Nouvelle des Éditions N. Boubée, Paris. 704 p. 520 F. (French)—When Robert-Daniel Etchécopar and the late François Hüe set out 25 years ago to prepare a 4-volume treatise describing "the avifauna of all xeric areas of the Old World from the Canary Islands to the Gobi Desert and the Sea of China," little did they realize how long it would take. Their first volume (*Oiseaux du Nord de l'Afrique*) appeared in 1964; the next (*Oiseaux du Proche et du Moyen-Orient*) in 1970; the third (*Oiseaux de Chine. Nonpassereaux*)

much later, in 1978; and this final one after yet another 5 years. Monumental projects of this nature must require unshakeable resolve on the part of their authors and such was apparently the case here. Etchécopar acknowledges that the undertaking was often frustrating. As he puts it (p. 8), "... I often had to draw on all my tenacity (not to say stubbornness) when I had to face numerous obstacles alone . . . especially the two changes of editors and . . . the death of my two dear collaborators" (Hüe and the original illustrator for the series, Paul Barruel).

The real value of books such as this is that they bring information about a large number of small, well-studied areas together and put it in perspective. **Oiseaux de Chine, de Mongolie et de Corée (Passereaux)** succeeds in doing so. Because of its large size (7.6 cm thick and 704 pages long), it cannot be used easily in the field, although it is organized like many field guides. Rather, it will serve as a sourcebook in which 596 species and countless subspecies of sinoasian birds are chronicled in detail. It deals with each of the 28 "large groups" or families of birds represented in China, Mongolia, and Korea, their genera, species, and subspecies. There are keys to the species within each genus, but the meat of the book is its descriptions of species and subspecies.

The species accounts are standard in form, but more thorough than those in other recent treatises of this kind (e.g., Colin Harrison's **An Atlas of the Birds of the Western Palearctic**. 1982. Princeton University Press). Each account begins with the species' scientific and vernacular (French and English) names. There follow, in this order, sections concerning its:

Identification.—Diagnostic characteristics, including body length, plumage color, sexual dimorphism, and bill shape; together with a statement entitled "*in natura*" containing useful tips for recognizing the species in the field.

Behavior.—Just that. For example, White-spotted Laughing-Thrushes (*Garrulax ocellatus*) are gregarious, high-altitude birds that prefer areas having rhododendrons; they move about in groups of 6–10 individuals, but are very secretive—difficult to see or hear (p. 248).

Nidification.—Particulars about the nest, nest site, clutch size, and egg dimensions and color.

Distribution and subspecies.—The local and worldwide distribution of the species. Races are listed separately with their key characteristics, ranges, and nesting areas. The authors frequently comment about the validity of the subspecies in this section, for example, on p. 314: "Cheng still lists *Paradoxornis webbianus styani* [a race of Vinous-throated Parrot-bills] . . . although it is likely only a hybrid of *ricketti* and *brunneus*."

Range maps accompany most descriptions of *sedentary* forms and show the distribution of the subspecies. There are well over 300 maps, all large and very clear, even though they are in black-and-white. I could not, however, find information in the text (perhaps it is in another volume of the series) about the symbols in some of these maps and more importantly (given the long time it has taken to complete the series) about how recently the maps were compiled. (Nor did I find much about recent range expansions and contractions in the species accounts themselves.) There are occasional inconsistencies between the written descriptions of subspecific ranges and those depicted on the maps. And, in some cases, the maps don't show the ranges of all of the subspecies described in the text.

Many of the cities and landmarks mentioned by Etchécopar and Hüe in their species accounts will not be familiar to Western ornithologists. This won't trouble zoogeographers, but for relatively provincial Americans, like me, it will. The authors apparently anticipated this difficulty and put political and topographical maps of China, Mongolia, and Korea inside the book's covers. However, many of the names that commonly appear in the species accounts are not on these maps.

The text is complemented by numerous line drawings (93 in all) of individual birds, silhouettes of birds in flight, birds at the nest, and specific parts of the birds' anatomy, parts ranging from the head to the wings, rectrices, and even feet. Some of them did not reproduce well on the book's coarse paper (e.g., the belly and part of the nape of the Eurasian long-tailed Tit (*Aegithalos caudatus*) on p. 437 are missing). There are also 2 black-and-white and 22 color plates portraying 450 species. These were rendered by Patrick Suiro and C. Gilbert Armani. Suiro's illustrations are particularly nice, close attention

having been paid not only to detail and color, but also to layout. It's unfortunate that the legends of Plates 24 and 42 were reversed when the book was assembled.

I was surprised to find the table of contents at the back of the book, in the company of 3 useful indices that list the birds by their French, English, and scientific names. Here too is an abridged, annotated bibliography (150+ entries), which was prepared rather carelessly. The abbreviations of journal names are not only unusual in some cases, but inconsistent from one citation to another. Volume numbers and other vital parts of some citations are also missing. However, this list is a valuable source of information particularly for Western ornithologists since many of the entries are from journals that are little known and not readily available to us (Biological Bulletin of Fukien Christian [Chr.?] University and Tori, to name but two).

In summary, **Oiseaux de Chine, de Mongolie et de Corée (Passereaux)** is a comprehensive and crisp summary of the avifauna in a large region of the Old World. I think it will be particularly useful to zoogeographers because it covers an area and uses many source materials to which Western (and possibly even European) ornithologists have not had ready access until recently. I am not sure that it will adorn the bookshelves of all serious ornithologists, but its modest price (520 F or roughly \$65) should certainly make that possible.—Michael D. Kern.

52. Illinois Birds: Wood Warblers. 1983. J. W. Graber, R. R. Graber, and E. L. Kirk. Illinois Natural History Survey Biological Notes No. 118. 144 p.—The ninth in a series of publications on Illinois bird populations, this excellent monograph covers all wood warblers known to occur in the state. Its format is similar to other monographs in this series. For each species, information on distribution and abundance during each season of the year is thoroughly summarized. The breeding biology of summer resident warblers is also discussed. This information is derived from the author's extensive statewide census data plus an exhaustive review of all pertinent literature sources.

Perhaps the most valuable aspect of this publication is the detailed migration data provided for most species. In addition to arrival and departure dates and periods of peak movements in every portion of the state, the authors discuss habitat preferences and provide population densities for most migrants in a variety of habitats. They also discuss differences in relative abundance between spring and fall seasons and provide some adult/immature ratios based on autumn tower kill data.

Information during the nesting season is derived solely from studies undertaken within Illinois. Studies from neighboring states are frequently cited, but specific details generally are not provided. Hence, the extent of information varies considerably from species to species depending upon the availability of data. For species that have been extensively studied within the state, such as Prothonotary Warbler (*Protonotaria citrea*), Yellow Warbler (*Dendroica petechia*), Common Yellowthroat (*Geothlypis trichas*), and Yellow-breasted Chat (*Icteria virens*), a wealth of information is provided on all aspects of their breeding biology including nesting habitat, nesting cycles, population densities, and reproductive success. However, similarly detailed information is not available for most other breeding warblers in Illinois and their discussions are largely limited to distribution and habitat preference.

Like the other monographs in this series, this publication serves as an excellent source of information whose usefulness extends beyond the boundaries of Illinois. It will prove to be a very valuable reference for anybody having an interest in the eastern wood warblers.—Bruce G. Peterjohn.

53. Sexual strategy. T. Halliday. 1982. The University of Chicago Press, Chicago. 158 p. No price given.—“This book is about the behaviour that precedes, accompanies and follows the act of mating in animals and man.” Halliday's opening sentence both summarizes accurately what his book is about and illustrates his clear and direct writing style. It is fitting that The University of Chicago Press chose to issue this book first published in U.K. in 1980. The overall organization of chapters is logical as Halliday proceeds from background information on sex and mating systems through discussions of how mates are located, subsequent mate choice and mate competition, the act of mating itself, and finally social contexts of mating and rearing of offspring. While this context is good and a necessary framework for the examples to follow, I consider the more than

200 examples themselves including the excellent illustrations to be the greatest strength of the book. Some 75% of the examples deal with vertebrates and, in spite of Halliday's warning that he "tended to use a lot of examples from amphibians," a generous third of his vertebrate examples feature birds. While the frequent defining of simple biological terms within the text and extensive glossary indicate that the book was designed for readers with a minimal biological background, the diversity of examples virtually assures every reader will learn something.

The faults I find are the standard sorts of things that are bothersome in nearly any book written at this level: oversimplification and lack of reference citations. Only two books and one article are cited in a "Further reading" section so the reader interested in finding substantiation of, for example, the assertion that "sneaky mating behaviour" of young red deer stags is unlikely to lead to fertilization (p. 98) is out of luck. As an example of oversimplification, geographic speciation is presented as the means by which most closely related species originate (p. 70); the many alternative modes of speciation are ignored. This is especially unfortunate considering one of Halliday's subsequent examples involves the diploid-tetraploid species pair of *Hyla chrysoscelis*-*H. versicolor*, a species pair for which autopolyploidy seems a much more likely means of origin. The professional biologist, then, can read through the book with one of several attitudes. One possibility is to look for exceptions or errors in the examples presented, e.g., the prenuptial all male "orgy" of spotted salamanders leads to the deposition of hundreds of spermatophores in the absence of even one receptive female (cf. p. 100), or the stalk-and-run hunt, not the ambush (cf. p. 138), is the prevalent technique of hunting used by Serengeti lions (Schaller, *The Serengeti Lion*, Univ. Chicago Press, Chicago, 1972). A second possibility is to use the generalizations Halliday presents relating reproductive patterns to the physical and biological environment as a source of inspiration as to where more work needs to be done. Halliday himself indulges in some of this. A third option is to merely read and enjoy. I consider either of these last two options desirable and potentially rewarding.—A. John Gatz, Jr.

54. The Case of the Hook-billed Kites. J. S. Borthwick. 1983. Penguin, New York and elsewhere (first published in the U.S. by St. Martin's Press, 1982). 348 p. paperback. \$3.50.—*Chondrohierax uncinatus* is a tropical kite ranging from Peru north through Mexico; the regular sightings of this species along the Rio Grande River in south Texas are so recent that Robbins' (*Birds of North America*, Golden Press, New York, 1983) revised field guide merely mentions the bird without illustrating it. Sight records of the Hook-billed Kite are what Borthwick's murder mystery is all about. Let's admit first that as a whodunit the book fails badly. Everything evolves so gradually that one knows long before the end who did it and why, despite the persistent and forlorn hope that the author really has a sudden terminal twist up her sleeve to fool the reader. As a sort of adventure-novel about bird-watching, however, the book is first-rate. Nearly everyone you have met in the "birding" world is here somewhere in stereotype, and the story is not only true to life for the people but ornithologically accurate as well. I myself do not know amateurs that go around spouting the Latin names of birds, but maybe they exist, and in any case such eyebrow raisers are so few and trivial as to avoid distraction. And if you have already visited the "birding hotspots" in south Texas, relive them with this book and be introduced to the newest (and fictitious) National Wildlife Refuge: Doña Clara, where watching birds is definitely fatal. All in all, it's a "fun read."—Jack P. Hailman.

Erratum.—John J. Flora was mistakenly identified as John J. Flores in the Journal of Field Ornithology 54(2):137.