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RECENT LITERATURE

Edited by Jerome A. Jackson

NEW JOURNALS

1. **Trends in Ecology and Evolution.** Elsevier Science Publishers B.V., 68 Hills Road, Cambridge CB2 1LA, UK, subscription price $43.00 for 12 issues.—(*TREE* is a new monthly international journal devoted to publishing brief "news" and review articles of major research areas in ecology and evolution. In the first four issues (July-October, 1986) 5 of 30 articles dealt directly with birds, but birds were discussed in many other articles. The articles are generally technical, well written, and well illustrated, and relevant primary literature is cited. The journal includes book reviews, an upcoming meetings diary, and commentaries on areas of current controversy.—John C. Kricher.

BANDING AND LONGEVITY

(see also 72)

2. **Birds, bands and better broods?** P. H. Harvey. 1986. Trends in Ecology and Evolution 1:8-9.—Do Zebra Finches, *Poephila guttata,* allow the color of the artificial leg bands that they wear to influence their mating choice? Further, could leg band color actually influence breeding success and survival probability? This brief review summarizes the controversy initiated by Nancy Burley who made such claims. Harvey believes Burley's most recent experiments support her arguments, though he qualifies his support, arguing that Burley's work is still "preliminary." This review aptly condenses Burley's research and provides relevant citations from primary source literature.—John C. Kricher.

3. **Occurrence of the Ortolan Bunting (*Emberiza hortulana*) in NW Germany: observations on a colour-ringed population.** [Voorkomen van de Ortolaan (*Emberiza hortulana*) in NW-Duitsland: waarnemingen aan een gekleurringde populatie.] K. Conrads and M. Quelle. 1986. Limosa 59:67-74. (Dutch, English summary.)—Between 1976-1982, 24 males were color-banded in a 400 ha study area. The percent of color-marked males in the population varied annually from 25-60%. One male survived for 5 yrs. Annual mortality was 54%. The degree of fidelity to nesting location varied individually from 20% to 100%. Nest sites of those that returned were within 340-600 m in consecutive years.—Clayton M. White.

MIGRATION, ORIENTATION, AND HOMING

(see also 11, 38, 78)

4. **Hypotheses and arguments on the navigation capability of birds.** [Hypothesen und Argumente zum Navigationsvermögen der Vögel.] K. Schmidt-Koenig. 1985. J. Ornithol. 126:237-252. (German, English summary.)—The author briefly reviews the possible use of Coriolis force, geomagnetic field, solar cues, stellar cues, and inertial navigation for biocoordinate navigation by homing and migratory birds. Most of the article is devoted to a highly critical review of the olfactory navigation hypothesis. Despite the numerous studies which seem to support the use of olfactory navigation, the author remains skeptical of its use. The major difficulties he has with the hypothesis are that birds have not been shown to have the sensitivity necessary to use ambient olfactory cues for navigation, and the problems created by winds, wind eddies, and other meteorological factors would prevent the birds from obtaining any meaningful directional information from odors. He is more supportive of the hypothesis that birds can and do use the earth's magnetic field for navigation. This support is rather interesting because magnetic navigation is also a hotly contested hypothesis. In fact, there is no known receptor in birds to detect magnetic information, whereas olfactory receptors have been known for some time. The major drawback of this review is that it is unequal in its treatment of the various hypotheses it reviews.—Robert C. Beason.

5. **Autumn migration patterns of birds at Col de Bretolet, with special reference to post-breeding movements.** [Herbstzugmuster von Vögeln auf dem Col de Bretolet unter

besonderer Berücksichtigung nachbrutzeitlicher Bewegungen.] L. Jenni. 1984. Ornithol. Beob. 81:183–213. (German, English summary.)—The autumn migration of 76 species through the alpine pass Col de Bretolet in southern Switzerland was studied for 21 yrs. Post-breeding dispersal occurred earlier than the actual migration, and usually involved first-year birds prior to post-juvenal molt. The period of post-breeding dispersal overlaps the beginning of migration and sometimes obscures the latter. Only by examining the age and molt status of the individuals involved is it possible to determine the beginning of migrations.—Robert C. Beason.

6. **Meteorological conditions and the olfactory navigation hypothesis.** [Meteorologische Gesichtspunkte zur olfaktorischen Navigationshypothese.] J. Becker and H. van Raden. 1986. J. Ornithol. 127:1–8. (German, English summary.)—The use of olfactory mosaics and gradients for olfactory navigation by birds is questioned, based on basic meteorological phenomena which would degrade atmospheric odors through turbulence and removal processes. This degradation would strongly limit the use of olfactory cues for navigation. Because winds are strongly influenced by local terrain, odors may arrive from directions other than their true source direction. This condition would prevent the use of olfactory cues associated with a prevailing wind direction (as proposed in the olfactory mosaic hypothesis) for navigation. The problems of the gradient hypothesis are based upon the persistence and dispersal abilities of odorous substances. Long-lived substances generally do not have any useful gradient. Short-lived substances would have strong gradients, but would not be available more than a short distance from their sources. While this paper contains some serious theoretical opposition to the olfactory navigation hypotheses, it should also serve as a starting point for future research on the hypothesis.—Robert C. Beason.

7. **Homing ability and territorial replacement in some forest birds in south-central Africa.** R. J. Dowsett and F. Dowsett-Lemaire. 1986. Ostrich 57:25–31.—Of 43 individuals from 11 species of Malawian forest birds, only two exhibited any homing ability when displaced 6 km. Six individuals of five species were found later in the relocation area, two of these species establishing territories there. Some territories were replaced within a day in the vacated area, probably from a pool of non-breeders, but territories of some species took much longer to be reoccupied, and some territories never were.—Malcolm F. Hodges, Jr.

8. **Mass irruptions of Bramblings *Fringilla montifringilla* 1977/78 and 1982/83 in Switzerland: Dependence on snow cover and food resources.** [Die Masseneinflüge von Bergfinken *Fringilla montifringilla* 1977/78 und 1982/83 in der Schweiz: Abhängigkeit von der Schneedecke und vom Nahrungsangebot.] L. Jenni and F. Neuschulz. 1985. Ornithol. Beob. 82:85–106. (German, English summary.)—Detailed studies of the distributions of Bramblings suggest that as snow cover increases, the number of birds in large roosts (1–6 million birds) decreases as individuals move to snow-free areas. The main distribution of wintering Bramblings is concentrated in areas of heavy beech seed crops, their primary food. However, not all forests with heavy seed crops are visited.—Robert C. Beason.

9. **Radar observations on the directions of nocturnal bird migration along the northern border of the Alps.** [Radarbeobachtungen über die Richtungen des nächtlichen Vogelzuges am nördlichen Alpenrand.] M. Baumgartner and B. Bruderer. 1985. Ornithol. Beob. 82:207–230. (German, English summary.)—Four airport surveillance radars were used to study migration along the Alps in 1982 and 1983: Munich, Zurich, Geneva, and Basel. The primary direction of movement revealed by the radars was compared to the results of long-distance banding recoveries of birds banded in the general vicinity of the radar stations. Radar data and "long-distance directions" from banding data indicate a convergence of migratory directions towards the southern Iberian peninsula. The radar data from Munich are bimodal in their distribution: one peak ESE and one WSW, with very few birds going directly S. Changes in direction of migrants were observed on the Munich radar display as the birds avoided the Alps. Even long-distance migrants appear to fly around the Alps and the Mediterranean.—Robert C. Beason.

10. **Differential diurnal migratory patterns in old and young Barn Swallows (*Hirundo rustica*).** [Unterschiedliche tageszeitliche Zugmuster alter und junger Vögel am

Beispiel der Rauchschwalbe (*Hirundo rustica*).] W. Gatter and M. Behrndt. 1985. Vogelwarte 33:115–120. (German, English summary.)—The authors conclude that young Barn Swallows are more active in the morning than are adults, and adults more active in the afternoon than young. However, their data suggest that while young birds may begin activity earlier than adults, both groups have activity peaks in the morning, less than an hour apart. The claimed differences in the afternoon activity patterns are not apparent from their data.—Robert C. Beason.

POPULATION DYNAMICS

(see also 3, 7, 8, 23, 32, 47)

11. Are there sex-specific differences in site fidelity, settlement and mortality in the Blue Tit (*Parus caeruleus*)? [Gibt es geschlechtsspezifische Unterschiede in der ortstreue, Ansiedlung und mortalität bei Blaumeisen (*Parus caeruleus*)?] J. Zeh, K. -H. Schmidt, and B. Croon. 1985. Vogelwarte 33:131–134. (German, English summary.)—The breeding populations of both sexes were greatly increased by juvenile immigrants, while only a small proportion of the locally-reared juveniles remained resident. Males were 4 times more likely to remain in their natal area than females. Most of the immigrants moved into the area shortly before the beginning of the breeding season. In autumn and winter, females were 3 times more likely to leave the breeding area temporarily than males. Despite the differences in wintering strategies, winter mortality was the same for both sexes.—Robert C. Beason.

12. Waterfowl census in January 1984. [Water-vageltelling in januari 1984.] L. M. J. Van Den Bergh. 1986. Limosa 59:33–37. (Dutch, English summary.)—More than 1,478,000 individuals were present representing 28 species. Most common were the Mallard (*Anas platyrhynchos*), European Wigeon (*A. penelope*), European Coot (*Fulica atra*), Common Eider (*Somateria mollissima*), and Tufted Duck (*Aythya fuligula*) with over 100,000 each. The Netherlands appears to be an important wintering area for the Great Crested Grebe (*Podiceps cristatus*).—Clayton M. White.

13. The Ground Hornbill at the southern extremity of its range. C. J. Vernon. 1986. Ostrich 57:16–24.—Records of Ground Hornbill (*Bucorvus leadbeateri*) south of 31°S were reviewed, and its range found to have declined; human intrusion is blamed for the retreat.—Malcolm F. Hodges, Jr.

NESTING AND REPRODUCTION

(see also 2, 3, 30, 36, 37, 43, 51, 85)

14. Sex ratio, differential cost of rearing young, and differential mortality between the sexes during the period of parental care: Fisher's theory applied to birds. T. Slagsvold, E. Røskaft, and S. Engen. 1986. Ornis Scand. 17:117–125.—Fisher (The genetical theory of natural selection, Oxford Univ. Press, London, 1930) argued that parents expend equal amounts of energy in raising male and female offspring, giving rise to a 1:1 primary sex ratio. Sex-biased differences in the cost of raising young, or in offspring mortality during parental care, should lead to unequal sex ratios at birth. Using 5 yr of data from Rooks (*Corvus frugilegus*), the authors developed a model to test Fisher's theory. Data were obtained on primary sex ratio, hatching success, growth, metabolic rate, and survival. The primary sex ratio was 1:1. Owing to sexual size dimorphism, male Rooks were 10–17% heavier than females by day 24 onwards and thus required more energy during development. Overall, parent Rooks invested an estimated 10% more energy on male offspring than on females. In accordance with Fisher's theory, however, this inequality was offset by increased mortality of young males such that an average pair of Rooks "seemed" to have invested equal amounts of energy on offspring of each sex.—Jeffrey S. Marks.

15. Is nest parasitism always deleterious to Goldeneyes? J. M. Eadie and H. G. Lumsden. 1985. Am. Nat. 126:859–866.—The hatching success and survivorship of young Common Goldeneyes (*Bucephala clangula*) in Ontario were compared in unparasitized broods, and those that were parasitized by Hooded Mergansers (*Lophodytes cucullatus*). Nest parasitism did not reduce the hatching success or survivorship of young Common Goldeneyes.

In parasitized broods, merganser young suffered significantly higher mortality than the host goldeneye young. Three possible explanations for these results are: (1) the parasitic young may react more slowly to the alarm behaviors of the host female, (2) the host female may be more protective of her own young than the parasitic young, and (3) predators may be more likely to capture the parasitic young because they are the odd prey within the brood.

Nest parasitism is generally viewed as disadvantageous to the host. In this study, where parasitism did not reduce the survivorship of the host young, the hosts may gain an advantage from being parasitized.—George Kulesza.

16. **Breeding bird associations in riparian habitat of north Kansas.** J. H. and E. F. Schulenberg. 1986. Bull. Kansas Ornithol. Soc. 37:33–37.—Using a fixed-width strip method of censusing, the authors recorded 42 species from various plots of riparian habitat in northern Kansas. Riparian habitat no longer exists in contiguous corridors along rivers in the seven northeastern counties surveyed, and inroads from agriculture and urbanization have left only remnant wooded tracts. Edge species predominated in such tracts. Those species associated with undisturbed understory were absent. To a degree, rivers still provide a route westward through the prairies.—Tristan J. Davis.

17. **On the biology of the Mesitornithiformes of Madagascar, with the first photographic documentation of the group.** [Zur Biologie der Mesitornithiformes (Nakas oder "Stelzenrallen") Madagaskars und erste fotografische Dokumente von Vertretern der Ordnung.] O. Appert. 1985. Ornithol. Beob. 82:31–54. (German, English summary.)—Mesitornithiformes includes two genera and three species, all of which are endemic to Madagascar. All three species inhabit woodlands and forage in the ground leaf-litter. Food consists primarily of small invertebrate adults and larvae, seeds, and small fruits. Although they are capable of flight for short distances, their primary means of locomotion is walking or running. The alarm calls of all three species are similar, and the birds remain motionless on the ground or a branch to avoid detection. Nests are located a short distance above ground in bushes or small trees. The eggs are short and oval, with both ends equally rounded. Both sexes share incubation and care of the young. The nestlings are nidifugous and covered with down. The systematic relationship of the group is uncertain.—Robert C. Beason.

18. **A record of Brown-headed Cowbird (*Molothrus ater*) nest parasitism of Rufous-crowned Sparrows (*Aimophila ruficeps*).** D. B. Miles. 1986. Southwest. Nat. 31: 253–254.—On 20 July 1981 an adult Rufous-crowned Sparrow was observed feeding a Brown-headed Cowbird chick in the Santa Catalina Mountains, 20 km northeast of Tucson, Arizona. Cowbird nest parasitism has been recorded only once before for the Rufous-crowned Sparrow, and this is the first record of a member of this species feeding a nest parasite.—Danny J. Ingold.

19. **Brood parasitism by Brown-headed Cowbirds in a simple host community in eastern Kansas.** R. Fleischer. 1986. Bull. Kansas Ornithol. Soc. 37:21–29.—At a site near Lawrence, Kansas, Brown-headed Cowbirds (*Molothrus ater*) were found to parasitize 14 species. Most data deal with the two species for which the most nests were found (Red-winged Blackbird [*Agelaius phoeniceus*] and Dickcissel [*Spiza americana*]). Cowbirds parasitized a large proportion of blackbird nests, but this proportion decreased upon the later availability of Dickcissel nests. This higher parasitism of Dickcissels may be due to Dickcissel nests being more visible, Dickcissels offering less resistance to cowbirds, or Dickcissels being superior hosts.

Within the local community, host nest density was not related to whether a nest was parasitized, but as relative host numbers changed, so did the parasitism rates of certain host species. Data show a strong correlation between cowbird density and levels of parasitism on blackbirds and Dickcissels when data from other localities are included. Higher nests tended to be more heavily parasitized. Egg placement by cowbirds into host nests appears to fit a modified Poisson distribution.—Tristan J. Davis.

20. **First nesting record of the Ash-throated Flycatcher in Kansas and an additional nesting record for the Black-billed Magpie.** R. Boyd. 1985. Bull. Kansas Ornithol. Soc. 36:34.—Observations of a family group and apparently mated pairs of Ash-

throated Flycatchers (*Myiarchus cinerascens*) in extreme southwestern Kansas document the nesting of this flycatcher in the state. Additionally, observations of 3 juvenile Black-billed Magpies (*Pica pica*) at a nest document the first nesting record for Seward County, Kansas.—Tristan J. Davis.

21. **First nesting record of the Cerulean Warbler in Kansas.** R. Boyd. 1986. Bull. Kansas Ornithol. Soc. 37:37–38.—Observations of a pair of Cerulean Warblers (*Dendroica cerulea*) feeding young at a nest in an oak tree provide the first documented nesting of the species in Kansas. During observations, the female fed the nestlings more frequently than did the male, and both parents were seen to dispose of nestling fecal pellets away from the nest site.—Tristan J. Davis.

22. **House Sparrow found feeding Western Kingbird nestling.** B. Gress. 1985. Bull. Kansas Ornithol. Soc. 36:25–26.—Detailed observations from a blind overlooking a Western Kingbird (*Tyrannus verticalis*) nest are given. Between 25 June (when there were 5 nestlings about 5 d old present) and 2 July, the author observed both kingbird parents visiting the nest to feed the young. A female House Sparrow (*Passer domesticus*) also visited the nest periodically to feed the young kingbirds. The kingbirds seemed to ignore the occasional feedings by the sparrow, but the sparrow soon grew intolerant of the kingbirds at their own nest and attacked the kingbirds twice as they approached the nest. On 2 July the young were near fledging and no sparrow was seen.—Tristan J. Davis.

23. **Nest mortality in House Sparrows.** P. E. Lowther. 1985. Bull. Kansas Ornithol. Soc. 36:27–32.—The author examines differences in season and habitat for their effect on mortality rates of House Sparrow (*Passer domesticus*) nest contents near Lawrence, Kansas. Although no conclusion is drawn to explain the variations in mortality rates in nests, several patterns are apparent. May nestings showed the least nest mortality; egg mortality was lowest early in the nesting season; and nestling mortality was lowest late in the nesting season. Mortality in general predominated at the initiation of incubation and at the time of hatching. Study sites differed significantly in their suitability for sparrow reproduction, which may be due to the variation in the abundance of food for the nestlings from site to site.—Tristan J. Davis.

24. **The breeding season of feral pigeons in Kansas.** R. F. Johnston and S. G. Johnson. 1985. Bull. Kansas Ornithol. Soc. 36:32–33.—Studies of breeding feral pigeons (*Columba livia*) in Lawrence, Kansas showed that pigeons breed year-round, even under the most adverse winter conditions. Nonetheless, there was a tendency toward a marked breeding season since the number of birds nesting during mid-winter was small. Thus, the feral pigeons have modified the tendency of their domestic ancestors to have eggs and young year-round, but only to the point where egg and young production during mid-winter is much depressed.—Tristan J. Davis.

25. **Nesting ecology of the White-fronted Goose *Anser albifrons* in different parts of its range.** [Ekologiya gnezdovaniya belolobogo gusya *Anser albifrons* v raznykh chastyakh areala.] A. V. Krechmar. 1986. Zool. Zh. 65:889–900. (Russian.)—From 1975–1984 the author investigated a total of 42 pairs from two populations nesting in the western Taimyr and in the middle reaches of the Anadyr River, a distance of about 2500 km. Data on incubation shifts and temperature were collected through the use of automatic cameras and recorders. There were distinct differences in habitat between these sites, but only slight differences in breeding biology between populations. The nest lining of the Taimyr population contained more down, fewer feathers, and was constructed more quickly than in the Anadyr population; the clutch size and egg size were smaller in Taimyr. It appears that the more western population in Taimyr is favoring a more efficient reproductive course, since the nest successes were similar between populations. Clutch temperatures and nest shifts were nearly identical between groups, but the incubation period was slightly longer (24 vs. 25 days) in Taimyr. Krechmar cites these details as evidence of nesting conservatism in the species, and possible support for the contention that the Anadyr population is relictual.—Douglas Siegel-Causey.

26. **Reproduction of Mountain Bluebirds in southcentral Montana.** J. E. Swenson.

1985. Western Birds 16:161–168.—A population of Mountain Bluebirds (*Sialia currucoides*) was studied within ponderosa pine (*Pinus ponderosa*) savannas in southcentral Montana in 1967–1969. In this area, there was a shortage of suitable natural cavities and population size was limited by the number of nest boxes provided for the bluebirds. This population exhibited stronger nest-site fidelity than found in other studies. Nest-site fidelity was attributed to the shortage of available nest cavities. First clutches averaged significantly larger than second, although hatching success and nestling survival were similar for both broods. Slightly more young successfully fledged from the first nesting attempt, but the differences were not statistically significant. With approximately two-thirds of the pairs attempting to renest, the average production per pair was estimated at 3.15 young each year. Since larger broods produced significantly fewer young than smaller broods, the adults' ability to provide food for the young was thought to be the most important factor limiting the number of successfully fledged young in each nesting attempt.—Bruce G. Peterjohn.

27. The breeding ecology of the African Goshawk at Karen, Nairobi, Kenya. C. F. Dewhurst. 1986. Ostrich 57:1–8.—The author observed the breeding cycle of a pair of African Goshawks (*Accipiter tachiro*) in 1982–1983. Nest building was in November, incubation in December, hatching on 7 January, and fledging on 11 February. Prey items fed the chicks are listed. Two young fledged successfully, but the next year's attempt was unsuccessful.—Malcolm F. Hodges, Jr.

28. Using eggshells to determine the year of Common Loon, *Gavia immer*, nesting attempt. R. Alvo and K. Prior. 1986. Can. Field Nat. 100:114–115.—This is a brief note on using the amount of fading related to the length of time the eggshells have been exposed to the elements.—R. W. Colburn.

BEHAVIOR

(see also 2, 8, 10, 14, 17, 48, 76, 80)

29. Cliff Swallow colonies as information centers. C. R. Brown. 1986. Science 234:83–85.—One possible advantage of living in a social group is the opportunity provided to observe other group members finding food. In this instance, information regarding the location, quality, and quantity of food is transferred between members of the group and hence the group is considered to be an "information center." For example, social insects, such as honey bees, have colonies that serve as information centers. However, among the nonhuman primates few if any unequivocal examples of information centers have been previously demonstrated. Breeding colonies and communal roosts of birds are likely groups in which to expect the evolution of information centers. The author provides strong evidence for an information center in the colonial Cliff Swallow (*Hirundo pyrrhonota*).

The study demonstrates that unsuccessful foragers return to the nesting colony and locate a successful forager and follow that individual to a food source. Individuals frequently follow and are followed by their neighbors within the colony, presumably because neighbors can observe foraging success through food brought back to nestlings. The swallows feed on localized concentrations of aerial insects that occur unpredictably in both space and time. The successful birds made no attempt to disguise their foraging success or to discourage others from following them. The author argues that there is probably no cost to being followed since the concentrations of insects at a foraging site are so dense that recruitment of additional foragers probably does not affect an individual's harvest. Since these patches may disappear in 20 to 30 min when convection at the location ceases, foragers cannot afford to waste their time taking circuitous routes to and from the patch to elude other colony members. Thus, all individuals benefit from opportunities to receive information since individuals are equally likely to follow others or be followed to a food source.

How are new sites initially discovered if the swallow's main foraging strategy is to follow successful foragers to new patches? This appears to be the weak part of the story, but the author notes that there are always some birds foraging alone. Often after a bird is successful it will depart alone 20% of the time and hence might locate a new food source. In summary, this work appears to be the strongest demonstration of an information center known for a colonial bird species.—J. M. Wunderle, Jr.

30. **Incubation schedules in different parental care systems in the Dotterel (*Charadrius morinellus*).** J. A. Kalas. 1986. Ardea 74:185–190.—In the Dotterel (*Charadrius morinellus*), the male usually does all the incubation, but male and female may both incubate. Females are not known to incubate alone. At a nest where both sexes incubated, the male was removed. Thus, there were 3 categories of parental care systems; both sexes together and either sex alone. There was no significant difference in attention to eggs among categories. Incubation started with the first egg. A decrease in incubation time occurred as embryos increased development because the number of periods off the nest/d increased. Nests were not more likely to be lost as a result of only having one incubating adult.—Clayton M. White.

31. **Hunting activity and diurnal activity of the Gray Heron *Ardea cinerea* at small bodies of water during the summer and winter.** [Jagdaktivität und Tagesperiodik des Graureihers *Ardea cinerea* an kleineren Gewässern im Sommer- und Winterhalbjahr.] C. Geiger. 1984. Ornithol. Beob. 81:99–110. (German, English summary.)—The Gray Heron is a diurnal forager and does not forage as late in the day during the summer as in the winter. The heronry does not appear to function as an "information center." The herons foraged individually and not in groups.—Robert C. Beason.

ECOLOGY

(see also 1, 11, 44, 53, 89)

32. **Size-abundance relations in communities.** D. Griffiths. 1986. Am. Nat. 127: 140–166.—Published bird census data were used to plot the frequency distribution of body lengths (on a log scale) for all the species in a community. A weighting method was used to correct for unequal class size in the original measurements of body length. Griffiths sought to discover polymodality, or multiple peaks, in these frequency distributions which he calls "community profiles."

The majority of the bird community lots showed evidence for polymodality, but some were clearly unimodal. Additional data on insect communities and marine plankton communities likewise showed similar patterns.

Griffiths argues that the polymodality in community profiles is not likely to be caused by predation or competition—even though such factors represent a major theme of ecological theory. Instead he hypothesizes that polymodality is caused by particular life-styles of species that favor certain body sizes. Another contributing factor to polymodality is thought to be "species stacking" in which a particular size abundance peak depends on the occurrence of an abundance peak of smaller-sized prey species.

Probably the major value of this article is its innovative approach to studying community organization. By arguing that competition and predation do not explain the observed community patterns, this work is in step with current ecological fashion, but some will challenge the explanations that Griffiths offers.—George Kulesza.

33. **The present status of the competitive exclusion principle.** P. J. den Boer. 1986. Trends in Ecology and Evolution 1:25–28.—The competitive exclusion principle, which predicts either the elimination of one of a pair of sympatric ecologically highly similar species or niche shifts between them, is reviewed and critiqued by den Boer. Using several examples from ornithology, the arguments in favor of competitive exclusion and competition as the driving force in niche shifts are presented. However, there are substantial difficulties with competitive exclusion theory and these, too, are revealed. The "classic" example of character displacement among Asiatic nuthatches (*Sitta neumayer* and *S. tephronota*) is also open to interpretation as mere clinal variability, with no necessary interaction, historical or otherwise, occurring between the very similar species. den Boer concludes with the prediction that interspecific competition has been and will continue to be weakened as a force explaining the structure of ecosystems. He believes that both the role of predation and weather/climate factors will be given much more weight. In other words, the era of ecological equilibrium theory is being "competitively excluded" by non-equilibrium theory.—John C. Kricher.

34. **Niche relationships and life-history tactics of three sympatric *Strix* owl species in Finland.** E. Korpimäki. 1986. Ornis Scand. 17:126–132.—Tawny Owls (*Strix aluco*)

and Ural owls (*S. uralensis*) are widely sympatric in southern and central Finland but do not occur in northern Finland, whereas Great Gray Owls (*S. nebulosa*) occur throughout northern and central Finland but are absent from southern Finland. How similar are these species in their use of resources? Korpimäki answers this question by calculating niche breadth and overlap from existing data on activity times, food habits, breeding habitats, and nesting substrates of these 3 owl species.

Tawny Owls are mostly nocturnal, feed on a wide variety of prey species, and nest in moist forests in tree cavities. Great Gray Owls are active by day and night, feed almost exclusively on voles, and use broken snags and stick nests in all forest types. Ural Owls are somewhat similar to Great Gray Owls in activity time and to Tawny Owls in food habits and breeding habitat, but nest on a greater variety of substrates than do either Tawny or Great Gray owls. Overall, Tawny Owls and Ural Owls are more similar to each other than to Great Gray Owls. Thus, the 2 species with the greatest potential for competition exhibit the least amount of niche separation.

Great Gray Owls are large-sized, nomadic, and lay large clutches, and thus are adapted to the harsh environmental conditions and prey fluctuations typical of northern Finland. The absence of Great Gray Owls in southern Finland and the wide sympatry of Tawny and Ural owls there are not as easily explained. One potential problem is that data used in this paper were lumped from a variety of localities such that niche metrics could have varied with geographic differences in resource availability and with differences in the number of owl species at each locality. Finland would be an ideal place for latitudinal comparisons of resource use by *Strix* owls in which the number of owl species at each locality is known.—Jeffrey S. Marks.

35. **Whooping Crane roost site characteristics on the Platte River, Buffalo County, Nebraska.** G. R. Lingle, K. J. Strom, and J. W. Ziewitz. 1986. Nebr. Bird Review. 54:36–39.—Between spring 1942 and fall 1985 there were 14 confirmed Whooping Crane (*Grus americana*) sightings on or near the Platte River. The most recent sighting was of three adult-plumaged Whooping Cranes roosting in Buffalo Co., Nebraska on 21 October 1985. This roost site was located 41 m from the nearest shore and 137 m from the nearest herbaceous island in a channel approximately 30 cm deep. There was an unobstructed view of 220° within 350 m of the roost, which had open overhead visibility and was located 0.8 km from the nearest dwelling. These roost site characteristics are very similar to those described in previous sightings. Two other confirmed Whooping Crane sightings (one in 1974 and one in 1980) were within 1 km of this roost, indicating a strong site fidelity for this segment of river.—Danny J. Ingold.

36. **Habitat selection by the Northern Cardinal in three eastern Texas forest stands.** R. L. Ehrhart and R. N. Conner. 1986. Southwest. Nat. 31:191–199.—Northern Cardinal (*Cardinalis cardinalis*) breeding territories were examined in three areas of mixed pine-hardwood forests in San Augustine Co., Texas in 1979. Pairs studied nested primarily in small trees and shrubs; mean nest height was 1.6 m. Cardinal territories occurred over a wide variety of vegetational conditions, but specific nest-sites within territories were not as variable. Nest-site selection appeared to be for maximum foliage density which provided excellent nest concealment. Although cardinals in the southern United States are ubiquitous and seem to prefer "edge-like" habitat, they have specific nest-site requirements that are available in a wide range of forest conditions.—Danny J. Ingold.

37. **Adaptations to interspecific competition in five corvid species in the Netherlands.** I. Bossema, A. Roell, and G. Baeyens. 1986. Ardea 74:199–210.—The Carrion Crow (*Corvus corone*), Rook (*Corvus frugilegus*), Jackdaw (*Corvus monedula*), Black-billed Magpie (*Pica pica*), and Eurasian Jay (*Garrulus glandarius*) occur sympatrically throughout the year, overlap to some extent in ecological demands and directly or indirectly interfere with each other's breeding attempts. Crows dominate the other species and thus have a central position in interspecific relationships. Their aggression consists of chasing away, harassment, robbing nest material, taking over nests, or damaging nest contents. Subordinate species lessen crow impact in several ways. Jackdaws breed in holes within crows' territories and thus their nests are safe. Rooks nest in compact colonies and only solitary nests are vulnerable to crows. Jackdaws, magpies, and rooks tolerate higher human activity than do

crows, so often breed closer to human habitation than crows and avoid some negative impact from crows. When crow pressure is high, jackdaws and rooks forage in areas shunned by crows and receive some protection by flocking while foraging in crow territories. Magpies build roofed nests that eliminate crow impact on nest contents. Thus, the specific nesting traits of rooks, jackdaws, and magpies, their relatively low level of shyness, and foraging in flocks are adaptations enabling subordinate species to feed and breed inside crow territories.—Clayton M. White.

38. Ecological correlates of migrants and residents in a tropical African savanna. P. Lack. 1986. Ardea 74:111–119.—The 115 commonest land birds in Tsavo East National Park, Kenya, were placed in insect, fruit, seed, and nectar food categories and either resident, visitor from within Africa, or migrant from Palaearctic. Over ¾ of all species were principally insectivorous (all Palaearctic migrants) and nearly ½ of African visitors were granivorous. Nearly all partially frugivorous species were residents. Visitors needed a narrower range of foods than residents. Resident insectivores fed more on small items on the ground, while visitors fed more from green foliage or in the air. Residents seemingly divided the area more by habitat than food. Many visitors exploited resources that were only seasonally available.—Clayton M. White.

39. Ecological release and behavioural and ecological flexibility in Marsh Harriers on islands. D. J. Baker-Gabb. 1986. Emu 86:71–81.—The author studied niche use in Marsh Harriers (*Circus aeruginosus*) in New Zealand and Australia, and found them to inhabit a much broader niche in the former, probably due to different resource availability and a lack of interspecific competition causing ecological release. He suggests that the differences in New Zealand birds are due to ecological flexibility within the species, rather than genetic changes.—Malcolm F. Hodges, Jr.

40. The influence of landscape structure on the number of breeding bird species in the lower Reuss Valley. [Einfluss der Landschaftsstruktur auf die Zahl der Brutvogelarten im aargauischen Reusstal.] L. Schifferli, H. Blum, and B. Naef-Daenzer. 1985. Ornithol. Beob. 82:251–264. (German, English summary.)—Seventy-five breeding species were recorded in 31 1 × 1 km quadrats, with an average species' richness of 36.5 species/km^2. Based on backwards-elimination multiple regression technique, the authors concluded that the amount of woodlands, hedges, and wetlands had significant effects on the number of species present. Quadrats which had only a small amount of woodlands had as many bird species present as quadrats with more woods if they contained at least 3 km of hedges/km^2. Similar results were obtained for species of wetlands. At least 3 ha/km^2 were required for 75% of the species to be present. These results should be considered by persons working in the areas of land management and development.—Robert C. Beason.

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

(see 40, 41, 42, 46, 54, 55, 59)

CONSERVATION AND ENVIRONMENTAL QUALITY

(see also 13, 35, 46, 58, 74)

41. Birdlife in intensively used rural and urban environments. E. Bezzel. 1985. Ornis Fenn. 62:90–95.—For the past century, man-made industrial and agricultural environments have replaced much of the natural habitat throughout central Europe, resulting in a reduction in resource diversity. Consequently, numbers of bird species have declined, although a few have adapted well to the changed environments. Since the middle of the 19th century the ratio of decreasing/extinct to increasing/immigrated species per area in central Europe has been about 2:1. The ratio of these losses is unevenly distributed among different etho-ecological groups. Nonpasserine land birds have shown the largest declines. In intensively used areas, species richness is low, with a high numerical dominance by a few species. Islands of natural habitat are affected by surrounding areas and are typically not large enough to support natural bird associations. Seasonal distribution of birds is also influenced by modern land use and urban development, although studies elucidating these relationships are scarce. Granivorous, medium-sized omnivorous, and sedentary or partial migrant birds have shown the greatest success in adapting to intensively used environments. Some species that seem to have adapted to changed local environments are in fact unable to maintain stable breeding populations (e.g., Curlew, Lapwing, Great Tit) and persist through the immigration of surplus birds from other areas. The only means of preserving a rich bird life in exorbitantly used areas is by maintaining a network of natural habitats and reserves.—Danny J. Ingold.

42. American Coot and Black-necked Stilt on the island of Hawaii. P. W. C. Paton, J. M. Scott, and T. A. Burr. 1985. Western Birds 16:175–181.—Populations of the Hawaiian Black-necked Stilt (*Himantopus mexicanus knudseni*) and endangered Hawaiian American Coot (*Fulica americana alai*) were censused on the island of Hawaii between 1963 and 1981. During this century, the stilts were unrecorded from the island until 1961. This population increased rapidly and was relatively stable throughout the 18-yr period, reaching a peak of 36 stilts in January 1968. Habitat availability appears to be limiting this population. Coot populations increased significantly after 1971, primarily at one wetland on the west side of the island where 165 coots were counted during 1984. Decreased human disturbance of this wetland was the apparent cause for this population increase. At present, the island of Hawaii supports only 3% of the total populations of each subspecies. However, since wetlands are limited throughout the island chain and are continually threatened by development, maintenance of even these small populations is significant for the long-term welfare of both subspecies.—Bruce G. Peterjohn.

43. Population status, breeding and conservation of the Gough Moorhen. B. P. Watkins and R. W. Furness. 1986. Ostrich 57:32–36.—Observations of the Gough Moorhen (*Gallinula comeri*), a flightless rail on Gough Island, were made in 1983, when the population was estimated at 2000–3000 pairs. Observations of feeding and nesting behavior are detailed, as well as comments on preserving the species.—Malcolm F. Hodges, Jr.

PARASITES AND DISEASES

44. Parasites, disease and the structure of ecological communities. A. P. Dobson and P. J. Hudson. 1986. Trends in Ecology and Evolution 1:11–15.—The objective of this brief review article is to demonstrate the important influence that pathogens and parasites are capable of exerting on ecosystem structure. Three examples are developed, two of which deal with birds. Red Grouse, *Lagopus lagopus scoticus,* populations are strongly affected by both the nematode *Trichostongyle tenuis* and by the tick-borne virus, louping ill. Avian malaria is an important element in influencing the structure of the Hawaiian avifauna, especially regarding the effect of introduced on native species. Rinderpest virus affects the structure of the Serengeti grazing ecosystem. The review makes the point that parasites have been too long neglected as important potential influents in ecosystem structure.—John C. Kricher.

PHYSIOLOGY

45. Bird song and heart rate—radiotelemetry measurements during subsong on the Blackbird (*Turdus merula*). [Vogelgesang und Herzfrequenz—radiotelemetrische Messungen zum Subsong bei der Amsel (*Turdus merula*).] P. Diehl and H. -W. Helb. 1985. J. Ornithol. 126:281–286. (German, English summary.)—Heart rate was monitored during various activities on an 8-month-old, hand-reared male Blackbird in captivity. When the bird was singing subsong, heart rate increased 33%–72% compared to resting, baseline rates. If singing was interrupted, heart rate returned to within 15% to 20% of resting rates within 6–8 s. These observations suggest that even low intensity singing required an obvious increase in energy expenditure by the bird.—Robert C. Beason.

46. Bird predation on cutworms (Lepidoptera: Noctuidae) in wheat fields and chlorpyrifos effects on brain cholinesterase activity. L. C. McEwen, L. R. Deweese, and P. Schladweiler. 1986. Environ. Entomol. 15:147–151.—Horned Larks (*Eremophila alpestris*) and McCown's Longspurs (*Calcarius mccownii*) were collected at intervals from wheat fields in Montana that had been treated with chlorpyrifos for cutworm control. Brain cholinesterase levels in Horned Larks collected at 3 and 9 d after spraying were significantly lower than those in unexposed larks. However, larks collected 16 days postspray showed no significant difference from controls. Although it was evident that non-target birds were exposed to sublethal doses of chlorpyrifos and exhibited physiological responses, toxic effects were less severe than those of endrin, another pesticide commonly used for cutworm control. Stomach contents of both larks and longspurs revealed that both species are omnivorous, but feed heavily on Lepidopterans, mostly pale western cutworms (*Agrotis orthogonia*) during the spring and summer months. Birds collected at 3 d postspray had the highest incidence of cutworms, while birds collected at 9 and 16 d postspray had fewer cutworms and other insects than control birds. Effects of bird predation on cutworm population dynamics in wheat is uncertain, but this mortality factor complemented the use of pesticides.—Danny J. Ingold.

47. **Annual cycle of physiological stress and condition of the Silvereye, *Zosterops lateralis* (Aves).** I. J. Rooke, S. D. Bradshaw, R. A. Langworthy, and F. A. Tom. 1986. Aust. J. Zool. 34:493–501.—Monthly plasma samples taken over one year from a population of Silvereyes were measured for corticosteroid, sodium, potassium, and chloride levels; also measured were fat content, weight, and haematocrit. Corticosteroids were significantly higher in March, suggesting that the birds were more stressed then. Fat levels were lowest in March and June, indicating poor condition in these months. The author suggests that loss of birds at these times may be a form of natural population control.—Malcolm F. Hodges, Jr.

MORPHOLOGY AND ANATOMY

(see also 14, 71, 72, 75)

48. **On the problem of the means of mechanical protection of avian eyes. The Pied Kingfisher *Ceryle rudis*.** [K voprosu o sredstvakh mekhanicheskoi zashchity glaz u ptits. Zumordok *Ceryle rudis*).] L. P. Korzun. 1986. Zool. Zh. 65:944–946. (Russian.)—A number of anatomical structures (e.g., rictal bristles) are credited with associated abilities for protection of the eyes during insect capture, diving, etc. Korzun has found in the Pied Kingfisher an anatomical structure that may function primarily as an eye shield. Laterally attached to the prefrontal is a small scutelate bone which moves laterally during rhinokinesis. Thus, during diving when the upper bill is flexed open, the center portion of the eye is protected anteriorly by a small projecting shield of feathers. Since Korzun has only seen this in anatomical specimens, this functional explanation may be conjectural. This certainly should be investigated further by field observations. The text and figures are detailed, clear, and informative as expected for this author's work.—Douglas Siegel-Causey.

49. **Morpho-functional aspects of food specialization in mousebirds, Coliiformes.** [Morfo-funktsional'nye aspekty pishcevoi spetsializatsii ptits-myshei.] L. P. Korzun. 1986. Zool. Zh. 65:1207–1217. (Russian.)—Korzun continues his investigations into the functional anatomy of non-passeriformes. Mousebirds have continued to challenge the anatomist for clues to their relationships with other groups, and in choosing colies, Korzun has allied himself to a rich tradition of anatomical scrutiny beginning with Garrod, Murie, and Pycraft, continuing to the present. The unique structure of the rhamphotheca, the secondary articulation of the mandible, the articulation between mandible and quadrate, the form of desmognathy, the absence of a postorbital ligament, and the vertical orientation and length of the external jugomandibular ligament all reflect strong adaptations for feeding. Unfortunately, none of these specializations appears to be very useful in assessing the affinities of this troublesome group. Although there appear to be similarities between colies and some galliforms in diet and foraging techniques, Korzun feels these to be entirely convergent since the anatomy differs so much between these groups. The figures and analysis are of the highest quality, and his investigations into the biomechanics of the mandibular articulation are especially significant.—Douglas Siegel-Causey.

50. **The morpho-functional properties of the feeding apparatus in the Skylark *Alauda arvensis*.** [Morfo-funktsional'nye osobennosti chelyustnogo apparata plevogo zhavoronka.] F. Y. Dzerzhinskii and M. A. Yesilevskaya. 1986. Zool. Zh. 65:1218–1228.

(Russian.)—This article is one of a continuing series of investigations from L. O. Korzun's laboratory on the functional morphology of non-passerines. Alaudidae and some galliformes share similarities in the articulation of the mandible and quadrate, and in the presence of a false jugal bar. In particular, the adducting force in the Skylark mandible is greatly increased by a forward shift of the medialis extremus adductor muscles. Unlike galliform birds, there is no corresponding increase in mandible retraction force, since the retractor palatinin muscle and the occipito-mandibular ligament, both associated with the pterygoid muscle, are lacking in this species. The only drawback in this article, indeed in all that come from this group of anatomists, is the minor section where they attempt to adduce relationships by comparison. In this case, the choice of a galliform (domestic chicken) does not appear very enlightened from a systematic point of view, but may make more sense in terms of comparative anatomy. The figures are large, detailed, and of the particular high quality one expects from this group.—Douglas Siegel-Causey.

51. Body weight and aspects of pairing chronology of Green-winged Teal and Northern Pintails wintering on the southern high plains of Texas. G. A. Baldassarre and E. G. Bolen. 1986. Southwest. Nat. 31:361–366.—Body weights of 4155 Green-winged Teal (*Anas creca*) and 380 Northern Pintails (*A. acuta*) were measured between mid-October and mid-March 1980–1981 and 1981–1982 at two playas on the southern high plains of Texas, 0.5 km north of Hart. Body weights for both species were less than previously reported, possibly because earlier studies disregarded biases (e.g., wet plumage and crop content) when weighing specimens. Maximum body weights of the two species were attained in October for Northern Pintails and in December for Green-winged Teal. Several factors, including age, plumage color, resource availability, and physical condition likely influence pairing chronology of waterfowl. It is suggested here that body size relationships also influence pairing chronology in these and other Anatinae. Possible relationships between winter body weights and pairing chronology are discussed.—Danny J. Ingold.

PLUMAGES AND MOLTS

(see also 5, 57, 75)

52. Dichromatism of the Screech Owl in central Oklahoma. G. M. Sutton. 1986. Bull. Okla. Ornithol. Soc. 19:17–20.—The author recounted observations of red-phase Eastern Screech-Owls (*Otus asio*) in Norman, Oklahoma. In specimen collections Gray-phase Screech-Owls are about twice as common in Oklahoma as red-phase birds; the author suggested this may be due to red-phase birds being more visible to predators, or possibly to differential mortality in extremely cold winters.—Malcolm F. Hodges, Jr.

ZOOGEOGRAPHY AND DISTRIBUTION

(see also 12, 16, 20, 21, 25, 34, 73, 79, 90)

53. Land-bird densities in matched habitats on six Hawaiian Islands: a test of resource-regulation theory. J. T. Emlen. 1986. Am. Nat. 127:125–139.—It is often assumed that bird populations are resource-limited, but there are serious difficulties in demonstrating this by direct measurements of consumer and resource densities. Emlen hypothesized that in resource-limited bird communities, the total biomass of the community should be similar in isolated regions that have similar habitat structure. He studied two forest types in the Hawaiian archipelago: the kiawe forest in the lowlands of six islands, and the ohia forest in the uplands of four islands. The kiawe forest avifauna is entirely alien, with species introduced from all zoogeographic regions of the world. In contrast, the avifauna of the ohia forests is primarily endemic, but many of these species are very rare. Bird populations were censused, and the species' densities were arranged in discrete trophic guilds containing one or several related species.

The total population densities differed significantly within each habitat type among the islands. Total densities ranged from 27 to 65 bird detections per square km in the kiawe forest, and 16 to 65 bird detections per square km in the ohia forest.

Emlen considered three methodological problems with his study, and decided that these would not substantially affect his major conclusion of large differences in community densities in each habitat type among the islands. Biological factors that could influence community densities among islands include differences in habitat availability, intensities of interspecies competition, and the equilibrium between colonization and extinction.

Emlen concludes that his study is not sufficient to negate the hypothesis that the land bird communities on these islands are resource-limited.—George Kulesza.

54. A relict population of Chestnut-collared Longspurs in western Minnesota. A. M. Wyckoff. 1986. Loon 58:3–11.—Numbers of Chestnut-collared Longspurs (*Calcarius ornatus*) have declined drastically in the eastern part of their range since 1900. Fire management practices, increased grazing, increased agriculture, and an expansion of Brown-headed Cowbird (*Molothrus ater*) range have all been suggested as contributing factors in the decline of this species. In Minnesota, longspurs formerly nested throughout the western prairie, but are now classified as rare and endangered. The largest population of Chestnut-collared Longspurs remaining in Minnesota, consists of approximately 300 birds in Clay County. The propensity of these birds was to establish breeding territories in well-drained sites away from trees and shrubs and near wet areas. Relatively short, sparse vegetation devoid of litter but with an abundance of graminoids and arthropods was preferred. Future management practices for this species should include the preservation of tall grass prairies that are moderately grazed and/or hayed. Mowing operations should occur in late August, and surface litter thatch should be removed. Burning as a management tool appears to be detrimental to the species.—Danny J. Ingold.

55. Number and distribution of the Gray Heron *Ardea cinerea* in Switzerland. [Bestand und Verbreitung des Graureihers *Ardea cinerea* in der Schweiz.] C. Geiger. 1984. Ornithol. Beob. 81:85–97. (German, English summary.)—The Gray Heron was near extinction in 1925 as a result of human activities, but has since been given protection and its population has increased to at least 2800 individuals during the 1981/1982 winter count, with over 4800 individuals at the end of the nesting season. Heron presence was adversely affected by the presence of anglers and banks that lacked bushes.—Robert C. Beason.

56. Archaeological evidence of the Carolina Parakeet in Ontario. R. Prevec. 1985. Ontario Birds 3:24–28.—The former range of the Carolina Parakeet (*Conuropsis carolinensis*) extended from the Gulf Coast north to the Illinois and Ohio river valleys with occasional strays north to the lower Great Lakes. Hence, the discovery of Carolina Parakeet bones at an archaeological site near London, Middlesex County, provides the first confirmed evidence for Ontario and is considerably north of the previous records. Small bones from the head, wing and tail were found in association with Indian artifacts at a site dating approximately 1100 A.D. The original source of these bones can never be determined and the parakeet could conceivably have been received through trade with Indians in the south. However, this evidence plus the possibility of future archaeological discoveries may eventually indicate that Carolina Parakeets ranged farther north than the present historical records indicate.—Bruce G. Peterjohn.

57. Occurrence and identification of the Yellow-bellied Flycatcher on Southeast Farallon Island, California. D. F. DeSante, N. K. Johnson, R. LeValley, and R. P. Henderson. 1985. Western Birds 16:153–160.—Both California records of Yellow-bellied Flycatcher (*Empidonax flaviventris*) have been of individuals captured on Southeast Farallon Island during fall migration. These individuals are described in detail and their separation from the very similar Western Flycatcher (*E. difficilis*) is discussed. For birds in the hand, these species are distinguished by their different wing shapes and by the ratio of the length of the fifth primary plotted against tail length. Plumage differences between juvenile Yellow-bellied and Western flycatchers are also discussed with the appropriate cautions concerning field identification of extralimital individuals.

All extralimital records of Yellow-bellied Flycatchers from western North America are also summarized. There are relatively few vagrant records of Yellow-bellied Flycatchers as compared with eastern wood warblers which have a similar breeding distribution. While vagrant Yellow-bellied Flycatchers are undoubtedly overlooked among the similar western *Empidonax* flycatchers, other unknown factors also appear to be contributing to the relative scarcity of all vagrant ten-primaried passerines along the west coast.—Bruce G. Peterjohn.

58. The knowledge of the distribution of the White-backed Woodpecker (*Dendrocopos leucotos,* Bechst) and the Three-toed Woodpecker (*Picoides tridactylus* L.) in the district of Vsetin. (Prispevek k Rozšiřeni Strakapúda Bělohřbetého, *Dendrocopos leucotos*/Bechst/a Datlíka Tříprstého *Picoides tridactylus* /L./na Vsetinsku.) J. Pavelka. 1983. Sylvia 22:61–68. (Czech, English summary.)—This distributional study is based on over 100 sightings by eight observers. The White-backed Woodpecker occurs in eastern Moravia where it breeds in old beech-fir-spruce forests, southeast and east of Vsetin. The Three-toed Woodpecker occurs in similar forests east and northeast of Vsetin. The preservation of beech-fir-spruce forests is the major factor in conservation of these species.—Edward H. Burtt, Jr.

59. Trumpeter Swans wintering in Kansas. W. R. and E. M. Brecheisen. 1986. Bull. Kansas Ornithol. Soc. 37:29–30.—Increased numbers of observations of Trumpeter Swans (*Cygnus buccinator*) in recent years, mostly of birds from a restoration flock originating in Minnesota, suggest that restoration efforts by man are resulting in the reestablishment of the species as a winter resident in Kansas.—Tristan J. Davis.

60. Thayer's Gull in Riley County: first documented occurrence in Kansas. T. T. Cable. 1985. Bull. Kansas Ornithol. Soc. 36:21–22.—The author provides photographs documenting a record of Thayer's Gull (*Larus thayeri*) for Kansas.—Tristan J. Davis.

61. House Finch in Riley County. D. A. Rintoul. 1985. Bull. Kansas Ornithol. Soc. 36:23.—Rintoul provides photographic documentation of the easternmost record of the House Finch (*Carpodacus mexicanus*) for Kansas.—Tristan J. Davis.

62. Winter records of Swainson's Thrush in Ontario. M. K. McNicholl. 1985. Ontario Birds 3:64–67.—Since the normal winter range of Swainson's Thrush (*Catharus ustulatus*) is Central and South America, most winter records from North America are skeptically treated as probable misidentifications. This article summarizes the status of winter records from Ontario. In addition to several unsubstantiated or inconclusive Christmas Bird Count records, there are at least 8 December records from the province, including one banding record and a specimen. All of these records probably pertain to extremely late fall migrants. Mid-winter records are limited to a documented sighting in early March and two unsubstantiated mid-March sight records, suggesting that most birds are unable to survive the province's harsh winter climate. While Hermit Thrush (*C. guttatus*) is the most likely *Catharus* thrush to be encountered during winter, these records provide evidence that a few Swainson's Thrushes may linger into the early winter period as far north as Ontario.—Bruce G. Peterjohn.

63. Minnesota's first Common Black-headed Gull. R. B. Janssen. 1986. Loon 58: 104–107.—On 28 May 1986 a Common Black-headed Gull (*Larus ridibundus*) was seen on North Heron Lake in Jackson County. The bird was an adult in breeding plumage. The exact date which it left Heron Lake was not known, although it likely departed with a group of Franklin's Gulls in mid-July.—Danny J. Ingold.

64. Rare and vagrant scolopacid waders in southern Africa. P. A. R. Hockey, R. K. Brooke, J. Cooper, J. C. Sinclair, and A. J. Tree. 1986. Ostrich 57:37–55.—Southern African records of shorebirds from the Nearctic and Palearctic are reviewed and analyzed, and shorebird habitat in southern Africa is discussed.—Malcolm F. Hodges, Jr.

65. Sightings of a Black-throated Sparrow, *Amphispiza bilineata,* and a Black Vulture, *Coragyps atratus,* in British Columbia. D. F. Brunton and T. Pratt. 1986. Can. Field Nat. 100:256–257.—This is a report of a sighting of a Black-throated Sparrow in British Columbia in June of 1981, the third record of this species in Canada. The first sighting of a Black Vulture in British Columbia is also noted (June, 1981).—R. W. Colburn.

66. Mongolian Plover, *Charadrius mongolus,* in Alberta. R. E. Salter, J. A. Smith, W. R. Koski, and J. M. Barbeau. 1986. Can. Field Nat. 100:257–258.—A Mongolian Plover was observed in full breeding plumage and photographed on 18 June 1984, north of Fort McMurray, Alberta. This is the first record for Alberta and the second record in Canada for this species.—R. W. Colburn.

SYSTEMATICS AND PALEONTOLOGY

(see also 17, 56, 73, 74, 86)

67. Paleoenvironment of the earliest hominoids: new evidence from the Oligocene avifauna of Egypt. S. L. Olson and D. T. Rasmussen. 1986. Science 233:1202–1204.—Avian fossils can be important in reconstructing the ancient environment in which hominids evolved and can provide an independent check for the reconstruction of these environments. The authors examine the fossil avifauna of the Fayum depression of Egypt, a region renowned for having produced remains of the earliest known hominoid primates. Unlike the fossil mammals of the area, which belong largely to extinct groups, most of the birds can be referred to modern families, with some belonging to modern genera. The avifauna consists primarily of aquatic species (i.e., jacanas, storks, night-herons, flamingos, cranes, rails, cormorants, and ospreys). The presence of jacanas and shoe-billed storks (related to *Balaeniceps rex*) suggest that expanses of freshwater with dense floating vegetation once existed in the region. To find an area today where an avian assemblage most similar to that of the Fayum occurs. Olson and Rasmussen used distribution maps, from which the distributions of all modern counterparts to the Fayum birds were superimposed. Overlap between the ranges of 12 of the 14 species occurs only in a very restricted area of Uganda, north and west of Lake Victoria, including that lake's north shore. Thus the ancient vegetation of Fayum may be inferred from the modern Lake Victoria vegetation. By analogy with Uganda, the climate of the Fayum region of Egypt during the early Oligocene may be assumed to have been warm, annually stable, and tropical. The Fayum avifauna suggests that fossil birds may be an important tool for paleoenvironmental reconstruction, providing a relatively direct means of interpretation. The author's "take home" message: paleontologists should be made aware of this underestimated resource so that avian fossils are no longer disregarded.—J. M. Wunderle, Jr.

68. Why are there so many kinds of passerine birds? R. J. Raikow. 1986. Syst. Zool. 35:255–259.—Raikow notes that known passerine synapomorphies are "quite ordinary," lacking any "special biological significance." What then accounts for the large size of the order? Raikow concludes that traditional emphasis of this particular node results from "an artifact of its classificatory history," resulting from the "traditional dominance of taxonomy over phylogeny" (whereas the reverse would be preferable). He gives the *impression* of meaning that classificatory history has somehow influenced the actual size of the order, which of course it has not.

A more intuitive answer might be that there are lots of passerines because several subgroups have become big. In connection with this, Raikow notes that passerine diversity appears to correlate with syringeal complexity. He makes the interesting suggestion that syringeal complexity, via vocal complexity, may have some influence on speciation or species survival. But this is extremely difficult to test; indeed, the essay is at least in part a discussion of the difficulties of testing so-called "key innovations."—Peter F. Cannell.

69. Superspecies and species limits in vertebrates. J. Haffer. 1986. Z. Zool. Syst. Evolut.-forsch. 24:169–190.—This appears to be about possible effects that use of different species concepts may have on analyses, and so is potentially of interest. But there is a problem. Here is an example: "If the four component species of these two sister groups are interpreted to have originated from two ancestral sister species (presumably paraspecies like their descendants) then each of the two groups should be considered a distinct first order superspecies (sister superspecies) rather than as together forming one normal superspecies. Two or more of such allopatric or parapatric and directly related first order superspecies (or a superspecies with one or more markedly differentiated allo- or parapatric species) may be combined as a second order superspecies or mega-superspecies." If you think you can take 16 small print pages like that, then go right ahead.—Peter F. Cannell.

70. The taxonomic affinity of the New Guinean Magpie *Gymnorhina tibicen papuana*. A. Black. 1986. Emu 86:65–70.—An examination of morphological characters of the New Guinean Magpie is made in an attempt to reveal a phylogeny of this variable species. The author postulates that it is similar to both *G. t. dorsalis* and *G. t. longirostris*, but that the New Guinean form may be most closely related to the latter.—Malcolm F. Hodges, Jr.

EVOLUTION AND GENETICS

(see also 1, 14, 15, 32, 33)

71. Adaptive advantages of reversed sexual size dimorphism in European owls. A. Lundberg. 1986. Ornis Scand. 17:133–140.—The adaptive significance of reversed sexual size dimorphism in birds of prey has spawned a run of competing hypotheses that attempt to explain both the degree and direction of dimorphism. All of the hypotheses are difficult to test, and none has provided an explanation suitable both for falconiforms and strigiforms. Using weight and wing length data from 13 species of European owls, Lundberg begins by pointing out that degree of dimorphism in weight is not correlated with that in wing length, suggesting that male and female owls are under different selection pressures regarding size dimorphism. Degree of dimorphism in wing length is correlated with the proportion of birds in the diet (as has been found for falconiforms), and degree of dimorphism in weight is correlated with mean latitude of breeding range. Male owls are the sole providers of food from the preincubation through brood-rearing periods, during which females spend most of their time at the nest. In addition, many owl species begin nesting in late winter when low temperatures and periodic storms make for unpredictable foraging conditions. Lundberg thus suggests that selection acts on males to become efficient foragers (i.e., shorter wings allow greater maneuverability) and on females to become resistant to periodic food shortages (i.e., larger bodies take longer to starve). Because falconiforms share many of the breeding habits of owls (e.g., division of labor at the nest and late winter breeding), this appealing hypothesis may find support from existing data on other groups of raptors.—Jeffrey S. Marks.

72. On being the right size: natural selection and body size in the Herring Gull. P. Monaghan and N. B. Metcalfe. 1986. Evolution 40:1096–1099.—Thousands of Herring Gulls were cannon-netted at garbage dumps in Scotland. Captured birds were aged, sexed, measured, banded, and released. The authors analyzed size patterns of birds later recovered dead. For statistical reasons, size was presented as three pooled categories: small, medium, and large.

For both sexes, the extreme size categories showed a higher recovery (mortality) rate, suggesting stabilizing selection. Smaller birds of both sexes showed greater mortality outside the breeding season. Within the breeding season, large females showed higher mortality while male mortality was equally distributed among size classes. The authors provide speculative interpretations of these patterns involving breeding stress and foraging dominance.

Of course, this does not precisely pertain to what is the "right size" for Herring Gulls, in an absolute sense, but clear demonstrations of survival patterns remain rare; thus, this is certainly a useful contribution. Relevance to the evolution of Herring Gull body size depends on the heritability of these features.—Peter F. Cannell.

73. Origin and evolution of continental biotas: speciation and historical congruence within the Australian avifauna. J. Cracraft. 1986. Evolution 40:977–996.—From phylogenies of 8 genera of Australian birds, Cracraft argues that the Australian biota, perhaps all continental biotas, arose through vicariance rather than dispersal. The vicariance argument is now old, but empirical applications remain scarce within ornithology (but see Mengel, Living Bird 3:9–43, 1964, for an early approach to vicariance in a continental biota).

There are 2 logical steps to the argument. First, shared geographical patterns of historical relationship must be demonstrated. Cracraft discusses 2 such patterns within Australia, with a total of 9 proposed geographic "sister-regions." He shows area-cladograms for these but does not cross-reference the figure to the supporting data, as one would do routinely for a taxon-cladogram. With a bit of work, one can determine that each area-node is supported by 2 to 5 sister-taxa distributions.

Next comes the causal interpretation; Cracraft states that "the discovery of common patterns of historical biogeography is reason enough to search for a common causal explanation." He argues that congruence of complex patterns, as shown here, are difficult to explain by dispersal. As a generality, this is forceful, but there are at least two potential problems. First, how might one detect congruent dispersal patterns when they do occur?

For example, patterns of relationship between birds on New Guinea to birds on the Cape York peninsula, the closest continental point, might as easily be explained by dispersal. Second, Cracraft warns that discovery of taxa with incongruent patterns does not constitute falsification; "we should not be surprised to uncover several 'general' patterns, each supported by intercladal congruence, but which appear incongruent with one another." Well enough, but what then, in a precise sense, constitutes "a pattern" as opposed to coincidental congruence? As it is, to take a quote out of context, "all cases are explained and no hypotheses are eliminated" (Raikow, Syst. Zool. 35:255–259, 1986).

The article is handicapped by a dense writing style, but does make a bold hypothesis that is available for corroboration if not for testing.—Peter F. Cannell.

74. The problem of avian extinction. S. A. Temple. 1986. Current Ornithol. 3: 453–485.—Temple asks: how widespread, taxonomically and ecologically, is avian extinction?; what are the causes of population decline?; what are the solutions?; and how well are we enforcing solutions? These are, of course, important questions. More's the pity that the treatment given here is so unsatisfactory.

The problems are legion and result from both overgeneralization and omission. A few examples: a large table surveys the taxonomic distribution of threatened species, but since it is presented as proportion of species per family, it is primarily a comment on the size of each family and is difficult to interpret in other respects; much discussion is based on a comparison of the first and second editions of the I.C.B.P. Red Data Book, but no mention is made of whether the doubling in number of endangered species represents real status change, increased knowledge of specific problems, or some other cause; despite extensive emphasis of the vulnerability of island birds, there is not a single reference to the important work by Olson, James, and Steadman demonstrating the early and devastating effect of humans on island bird populations throughout the world (e.g., Olson and James, Science 217:633–635, 1982); there is no discussion of the growing field of conservation genetics (or genetics at all); although captive breeding is discussed, the growing involvement of zoos in conservation management is not; there is no discussion of the long-standing debate between single large preserves vs. many smaller preserves; etc.

Although there is information here, it must be read critically and used cautiously. It is clear that this is not the definitive review of avian extinction or conservation. Temple argues that ornithologists lead in conservation research; if this is so, it is not demonstrated here. He seems to leave the impression that ornithological conservation efforts are at least moderately successful. Certainly there have been individual, highly-publicized successes, but for a different, more global perspective read Janzen, Annu. Rev. Ecol. Syst. 17:305–324.—Peter F. Cannell.

75. The evolution of feathers. J. Dyke. 1986. Zool. Scripta 14:137–154.—Much thought and many words have been devoted to the origin of birds. Little thought and few words have been devoted to the origin of their feathers. Dyke's novel and thoughtfully argued ideas should stimulate interest in the evolution of feathers. Based on comparison of different feather types and feathers from different species, Dyke suggests that pennaceous feathers evolved before downy feathers; that the primitive structure of pennaceous feathers was open with narrow barbs, narrow barbules oriented at right angles to the plane of the feather vane, and no interlocking hooks and flanges; that the interlocking structure evolved within an open structure; and that the overlapping flanges of adjacent barbules on flight feathers is a recent specialization.

Having established the above evolutionary sequence, Dyke addresses the still more difficult question; how did an open pennaceous feather evolve from a scale? The fundamental problem, which is not explained by any of the previous hypotheses, is the origin of the open structure characteristic of feathers. As Dyke points out, an enlarged "glide scale" could evolve and ribbed supports would strengthen such a membranous scale, but why would the membrane between the ribs of such a scale disappear as has happened in the open, pennaceous feathers of birds? Dyke's answer? Feathers evolved to improve the water repellency of a littoral reptile. The open, ribbed structure characteristic of pennaceous feathers causes surface water to form droplets that roll off. Every step from the flat membranous scale, to a ribbed scale, to pronounced ribs without connecting membrane would increase water-repellency and would be selected over the preceding adaptation. Dyke suggests that transformation of a scale is less likely than evolution of the feather as an outgrowth of the scale. The outgrowth would extend back over the next posterior scale and direct water off that scale. As the open structure enlarged to cover the scale, the spacing of adjacent ribs, which is critical to water repellency, could be maintained by the development of an interlocking network of hooks and flanges. At this stage, other functions (e.g., flight, heat shield, optical display) and other selective forces might influence the feather's structure, but the initial progression that no other function and no other hypothesis can account for has been accomplished. The feather as an open surface with interlocking barbules has evolved.—Edward H. Burtt, Jr.

76. **The genetics and evolution of female choice.** M. E. N. Majerus. 1986. Trends in Ecology and Evolution 1:1–7.—The experimental demonstration of female choice in sexual selection is summarized in this review article. An example from ornithological research is the widowbird, *Euplectes progne,* where experimental manipulation has demonstrated that females show mating preference for males with longer tails. Other examples from fish (stickleback), amphibians (tungara frog), and insects (fruit flies, two spot ladybird beetle) demonstrate both female choice and a genetic basis for it. Female choice has been much more difficult to document as a selection pressure than male-male competition, and this review summarizes clearly some of the evidence in support of the evolutionary reality of female choice in sexual selection.—John C. Kricher.

77. **Evidence that group selection counters the evolution of sexual dimorphism.** R. C. Lacey. 1985. Evol. Theory 7:173–177.—The author separated North American passerines into sexually monomorphic and dimorphic groups, and found that monomorphic species have significantly more subspecies than do dimorphic species. He theorizes that, as evidenced by greater interpopulation variation, group selection is acting on the monomorphic species, selecting for traits advantageous to the population rather than the individual. He believes that in these species development of sexual dimorphism is suppressed because of its high cost in breeding success, especially for monogamous species (the majority of species considered). He considers and rejects three other theories that might explain the observed phenomenon.—Malcolm F. Hodges, Jr.

78. **The evolution of avian migration systems between temperate and tropical regions of the New World.** G. W. Cox. 1985. Am. Nat. 126:451–474.—Five current theories are reviewed that attempt to explain the evolutionary origin of Nearctic-Neotropical migration in birds. (1) The increased seasonality theory suggests that migration to the Neotropics may have resulted from progressive climatic differentiation in North America during the Tertiary and Quaternary. (2) The optimal energy budget theory postulates that migration evolved to increase the birds' productive energy budget which is related to latitudinal patterns of temperature and photoperiod. (3) The competition theory postulates that competition among species of partial migrants, that have moved to adjacent seasonally favorable regions, caused the gradual evolution of disjunct migration patterns. (4) The predation and food theory suggests that individuals have reduced the risk of nest predation and competition for food by their annual migrations. (5) The time allocation theory suggests that a gain of fitness is related to improved reproductive success in the breeding range and increased survivorship in the nonbreeding range.

Cox concludes that none of these theories is adequate to explain the full pattern of Nearctic-Neotropical migration, and that the relationship between wintering migrants and tropical residents is not taken into account.

Cox then describes a comprehensive theory of Nearctic-Neotropical migration which he names the "time-allocation and competition model." Migrants are viewed originally as species near the temperate-tropical interface that have evolved seasonal breeding ranges at temperate latitudes, and winter ranges at tropical or subtropical latitudes. Disjunct breeding and winter ranges may have occurred because of increased seasonality, or speciation of isolated migrant population segments, but primarily when the resident population of a species was competitively eliminated by the expanding populations of other resident or migrant species. Cox views the Mexican Plateau as the center where interspecific competition has eliminated many resident populations leaving only the migratory segments of populations.

Cox attempts to test his model with data on the geographic distribution of parulid warblers. He argues that the warbler data are consistent with the hypothesis that competition has favored range expansion, and that the extinction of some subspecies has occurred in the evolution of fully migrant species. Furthermore the data are consistent with the hypothesis that the expansion of breeding ranges of migratory populations occurred together with the extinction of resident populations.

This paper deserves to be recognized as a guide to constructing testable hypotheses on the evolution of migration patterns.—George Kulesza.

79. Character displacement between distantly related taxa? Finches and bees in the Galapagos. D. Schluter. 1986. Am. Nat. 127:95–102.—Examples of competition and character displacement among species are typically studied in closely related species. Schluter provides a possible example of character displacement between two species of *Geospiza* finches and the only species of bee, *Xylocopa darwini,* occurring on the Galapagos Islands. On islands having nectar-producing flowers, the finches have smaller body mass when the bees are absent, and larger body mass when they are present. The finches also consumed higher levels of nectar on islands where the bees are absent.

Individuals of *G. fuliginosa,* that were defending flower clumps, showed significantly smaller body size than conspecifics that consumed only seeds on the same island. It is thought that smaller-sized individuals, with lower metabolic requirements, have an advantage over larger-sized individuals, because they can meet a greater fraction of their metabolic needs while feeding on nectar.

Four alternative explanations for these data are considered: climatic differences among islands, seed characteristics on the islands, differences in flower types among islands, and relative food abundance on the islands. Not all of these alternative hypotheses could be completely ruled out, but the occurrence of character displacement between the finches and bees remained as the most likely explanation.—George Kulesza.

FOOD AND FEEDING

(see also 8, 17, 27, 29, 31, 34, 43, 46, 48, 49)

80. Bait-fishing by the Green-backed Heron (*Ardeola striata*) in Japan. H. Higuchi. 1986. Ibis 128:285–290.—Fishing with the use of bait has been previously reported for the Green-backed Heron in the U.S.A., and for some other species of birds. This study examines this interesting behavior by reporting the frequency of its use and its effectiveness while also comparing these aspects between juvenile and adult herons in Japan. In its simplest form, bait fishing involves use of the bill to pick-up a "bait" and transport it to the water where it is dropped. The bait usually floats on the surface and frequently attracts fish which are then stabbed by the crouching heron. Adults will use almost anything available as a bait such as: flies, large adult insects, insect larvae, earthworms, twigs, leaves, berries, feathers, plastic foam, crackers, etc. Sometimes the earthworms were obtained by digging in muddy ground, and plant material, such as fresh leaves and bark, by tearing from the tree. An even more suprising observation was of two adults breaking twigs into two pieces, one of which was used for fishing. This lure making is an example of tool-making, which is only previously well known from one of the Darwin's finches. As might be expected the success rates of the various baits differed, with animal material having a 74.1% success rate, followed by inanimate objects (62.5%), and plant material (23.7%).

As with numerous studies comparing the foraging behavior of juveniles and adults, this one again shows that juveniles are relatively inept at foraging. They seldom succeeded in catching fish with any kind of bait. Low juvenile fishing efficiency was attributed to their failure to crouch after throwing the bait, and so were easily seen by fish. Furthermore, the twigs, leaves, and feathers used by juveniles were too large to lure fish. Since the juveniles frequently failed to catch fish, they often fed on insects, and earthworms. In summary, the author has provided a nice contribution to our understanding of tool use.—J. M. Wunderle, Jr.

81. Feeding rates and prey selection of oystercatchers in the pearl islands of Panama. S. C. Levings, S. D. Garrity, and L. R. Ashkenas. 1986. Biotropica 18:62–71.—This study documents selective predation by *Haematopus palliatus* on an intertidal primarily molluscan community. Oystercatchers were quite selective about prey choice, and predation by oystercatchers strongly affected the abundance of favored prey species. Oystercatcher predation was hypothesized to add substantially to intersite variability in the Panamanian intertidal zone by virtue of the fact that the oystercatchers represent a patchily distributed predator that exerts major effects wherever it feeds.—John C. Kricher.

82. Competition for food between the Snowy Owl *Nyctea scandiaca* and the Arctic fox *Alopex lagopus*. [Konkurentsiya iz-za korma mezhdu belymi sovami *Nyctea scandiaca* i pestsami *Alopex lagopus*.] N. G. Ovsyanikov and I. E. Menyushina. 1986. Zool. Zh. 65:901–910. (Russian.)—The authors were fortunate enough to pursue observations on Wrangel Island through a period (1980–1984) of high and low lemming populations. In the high cycle, Snowy Owls predominately fed on lemmings. In years of low population densities, and every winter when the rodents hibernate, Snowy Owls systematically steal prey from Arctic foxes. This facultative kleptoparasitism apparently is the means by which owls can remain on this high Arctic island yearround. This non-migratory behavior has its drawbacks, for in deep winter foxes begin to prey on owls. In addition, some nesting areas become so well known that foxes consume young in the early days of life. The authors mention, but do not investigate, the differences between migratory and non-migratory Snowy Owls.—Douglas Siegel-Causey.

83. Feeding ecology of Mourning Doves (*Zenaida macroura*) in southeastern New Mexico. T. L. Best and R. A. Smartt. 1986. Southwest. Nat. 31:33–38.—During the mornings of 1–2 September 1979, 157 Mourning Doves were collected near Carlsbad, New Mexico to determine: the types and amounts of food ingested; whether sex, age, or temporal differences existed; and whether foods were selected proportional to those available. Prairie sunflower (*Helianthus petiolaris*) was the dominant food item. Discriminant function analysis revealed no significant differences in the crop contents of males and females, but showed some slight age and temporal differences. Food items were not selected in proportion to their availability on the study site.—Danny J. Ingold.

84. Food segregation in three hole-nesting bird species during the breeding season. J. Torok. 1986. Ardea 74:129–136.—The Great Tit (*Parus major*), Blue Tit (*Parus caeruleus*), and Collared Flycatcher (*Ficedula albicollis*) were studied near Budapest, Hungary. Food samples were taken between 1978–1982 from nestlings by placing neck collars on them to prevent their swallowing the food. The flycatcher took the most diverse food, but the composition of food shifted from year to year. High densities of flycatchers may be diffuse competition for food of tits. The Blue Tit is a food specialist, but also uses a food resource in common with the generalist Great Tit. As a result, the Blue Tit is dominant in any competitive interaction.—Clayton M. White.

85. The diet of chicks of Greatwinged, Kerguelen and Softplumaged petrels at the Prince Edward Islands. M. Schramm. 1986. Ostrich 59:9–15.—The author collected chicks from Great-winged (*Pterodroma macroptera*), Kerguelen (*P. brevirostris*), and Soft-plumaged (*P. mollis*) petrels and examined their stomach contents. The diet of all three consisted mainly of cephalopods, with some crustaceans and, least of all, fish. Sampling methods were biased by small sample sizes and differential digestibility of prey parts (i.e., cephalopod beaks persist, possibly accounting for the high percentage of this group). Nesting in these three species is seasonally isolated, presumably to avoid interspecific competition in feeding.—Malcolm F. Hodges, Jr.

SONGS AND VOCALIZATIONS

(see also 17, 45)

86. Bird songs and avian systematics. R. B. Payne. 1986. Current Ornithol. 3:87–126.—Two major topics are addressed. The first is the role of song in species discrimination. The presentation here is useful, with examples and references, but adds little to numerous and extensive discussions already available on this subject.

The use of song elements in phylogenetic inference is newer and more controversial. Payne provides some theoretical discussion (ruling out contributions from the fossil record) and two case studies of his own (examples from the Indicatoridae and Parulinae). These analyses do not appear highly rigorous, but do demonstrate potential usefulness of song patterns as characters at lower taxonomic levels.—Peter F. Cannell.

87. Song types in the Corn Bunting *Emberiza calandra*: matching and discrimination. P. K. McGregor. 1986. J. Ornithol. 127:37–42.—Based on playback experiments, the Corn Bunting appears to be able to discriminate between its 2 song types in central England. Although the birds did not show song matching to the playback song type, they did show habituation to the repeated playback of one song type. Response to the playback tape was elicited again when the song type was switched.—Robert C. Beason.

PHOTOGRAPHY AND RECORDINGS

88. Voices of some Galapagos birds. J. W. Hardy. 1986. Tape cassette, available from Holbrook Travel Agency, 3520 NW 13th St., Gainesville, FL 32601.—Visitors to the Galapagos Islands encounter a bewildering variety of songs heard nowhere else in the world. The gurgles, buzzes, and clicks are hard to describe; the species, known collectively as Darwin's finches (Geospizinae) look frustratingly similar; and both songs and looks vary from island to island. Thus visitors, who are typically in the islands about a week and on a different island every day, tend to pay little attention to Darwin's finches. That is unfortunate, because the finches are unique to the Galapagos, played a crucial role in Darwin's formulation of evolutionary theory, and continue to provide one of the best model systems for the study of evolutionary processes.

Hardy has taken an important step toward making the finches more accessible to Galapagos visitors. The tape includes songs of 8 species of Darwin's finches with the emphasis on those in the littoral and arid zones where most visitors spend most of their time. Each species is clearly introduced, the location of the recording is given, and the most conspicuous background noises are identified. Some of these noises complement the song (e.g., surf, calls of sea lions) and convey the atmosphere of the islands. Other noises (e.g., wind, static) and songs of other species (e.g., Galapagos Mockingbird [*Mimus trifasciatus*]) make the focal song difficult to identify. Several of the finches are represented by more than one vocalization, and dialects from different islands are provided for the ground finches (Geospiza). Most of the species' voices need more repetition. The songs of the Small Ground Finch (*Geospiza fuliginosa*) and the Large Ground Finch (*G. magnirostris*) are repeated only twice and no song is repeated more than six times. Space is available on the tape, which is only about half filled.

In addition to the finches, songs are provided for the Galapagos Mockingbird and Yellow Warbler (*Dendroica petechia*). The seabirds of the Galapagos are conspicuous and easily identified by visitors, but vocalizations of the Swallow-tailed Gull (*Creagrus furcatus*), Lava Gull (*Larus fuliginosus*), Waved Albatross (*Diomedea irrorata*), and Great Frigatebird (*Fregata minor*) are included.

Despite its minor shortcomings, this tape is an important contribution to the popular understanding and appreciation of the Galapagos Islands. Holbrook Travel Agency, a major sponsor of Galapagos Tours, distributes the tape and is to be congratulated on its effort to educate participants in its tours. I hope that other tour sponsors will make the tape available to their participants and that with an increased appreciation of the Galapagos finches, visitors to the Galapagos will help preserve the islands and their unique species for future generations.—Edward H. Burtt, Jr.

BOOKS AND MONOGRAPHS

89. Floristic regions of the world. A. Takhtajan. 1986. Univ. California Press, Berkeley. 522 p. $60.—Here, the world is divided into hierarchical floristic categories: 151 provinces within 35 regions within 6 kingdoms. Leaving theoretical and methodological questions aside, this book may be of important practical use to ornithologists. For each category, Takhtajan (through his translator T. J. Crovello and editor A. Cronquist) offers a crisp, well-written summary of the dominant and endemic plants. References of more detailed floristic analyses are included. Accounts vary in length; several North American provinces receive 5-page descriptions while the entire Neotropical Kingdom receives only 8. This will not endear the book to neotropical types. Alternatively, in investigating areas of the world unknown to you, this may offer the best first approach to the characteristic floras. There is a 50-page appendix that lists families of vascular plants and their sizes and distributions. Certainly ornithologists should know of this book's existence and hope for its availability somewhere in their library system.—Peter F. Cannell.

90. Birds of the Indiana Dunes. 1986. K. J. Brock. Indiana University Press, Bloomington, IN. 178 p.—Situated at the southern end of Lake Michigan, the Indiana Dunes area has long been known as a location where migrating birds congregate during their annual passage along the shores of the lake. Since it includes the entire Lake Michigan shoreline in northwest Indiana, the Dunes area has provided records of a number of species that have very few records elsewhere in the state. This book describes the status and distribution of 337 species plus 16 hypothetical birds that have been reported within this area.

The species accounts are fairly brief but provide a wealth of information. These accounts emphasize migration data, especially the status and times of occurrence of migrants. Instead of the traditional vague status categories such as "common," "uncommon," etc. . . . , the author developed a system using 10 codes precisely defined in terms of birds per observer effort. These codes provide a much clearer picture of each species' status within the area than provided by the traditional categories. The time of occurrence information is also presented in more precise terms that allow quantitative analysis. Most accounts are accompanied by histograms which plot numbers of individuals versus time intervals. For a number of species, these histograms depict several migration peaks, such as the movements of adult and juvenile shorebirds during fall which would not be evident in a more traditional analysis of migration data. With the exception of the extreme migration dates, the arrival and departure information is defined in precise quantitative terms so that is possible to determine which dates mark 10%, 50%, and 90% of each species' records for the area. This quantitative approach may be unique for a book of this scope and certainly serves as an excellent example for similar analysis in other regional bird books.

In addition to this quantitative information, distributional data within the Dunes area are also provided as well as maximum single party counts. The book's only weakness lies in its treatment of the breeding birds. Other than distributional and status information, notes on the breeding chronology and habitat preference are scant.

Since the introductory material also provides a site guide to the most productive birding locations within the Dunes area, this book is a useful reference for birders visiting the area. However, its main strength lies in its unique approach to the analysis of migration data which makes it a valuable reference for the study of bird movements through the Great Lakes region.—Bruce G. Peterjohn.