RECENT LITERATURE

Edited by Edward H. Burtt, Jr.

BANDING AND LONGEVITY

(see also 52, 61)

1. **Mortality and dispersal of the Glaucous-winged Gulls of southern British Columbia.** R. W. Butler, N. A. M. Verbeek, and R. G. Foottit. 1980. Can. Field-Nat. 94:315–320.—Analysis of band returns of 1002 Glaucous-winged Gulls (*Larus glaucescens*) revealed that mortality of first-year birds was less than 60% and occurred primarily between September and November. Mortality of second-year birds was less, with greatest mortality between October and December. Although a few juveniles disperse long distances, the mean distance between banding and recovery sites is not correlated with age. The authors suggest that the rapidly growing population has increased the competition for food, causing first-year birds to perish earlier in the annual food cycle than previously. Mortality of second-year gulls reflects the increased competition as first-year birds move into the population. This is an excellent example of the power of long-term banding studies.—Edward H. Burtt, Jr.

2. **Annual report to banders—summary of bird banding in Canada in 1978.** C. Hyslop and R. M. Poulin. 1980. Can. Wildl. Serv. Prog. Notes, No. 117, 11 p.—This is the 2nd annual report on Canadian bird-banding. It lists the number of individuals of each species banded in each province and territory during 1978. Canadians banded 274,203 birds of 298 species. Over 35,800 more birds were banded in 1978 than in 1977, the previous record year (11 years of counting). Over 230 of the 298 species and 36% of the total bandings occurred in Ontario where 49% of the active banders resided. An average of 1781 birds were banded by each active Master permit holder. Species banded most often were: Snow Goose (*Chen caerulescens*) (58,787), Mallard (*Anas platyrhynchos*) (34,459), Blue-winged Teal (*A. discors*) (18,778), and Canada Goose (*Branta canadensis*) (15,082), the same 4 species banded most often in 1977. A map shows the distribution of banding sites.—Richard M. Zammuto.

3. **Thirteen years at a decoy trap.** H. E. Burtt and M. L. Giltz. 1980. N. Am. Bird Bander 5:13.—Nearly continuous operation of a 15 × 30 m decoy trap at the University Farms (Columbus, Ohio) from October 1963 to mid-June 1976 yielded the following results: (species and numbers captured), Starling (*Sturnus vulgaris*) 48,412; Red-winged Blackbirds (*Agelaius phoeniceus*) 30,500; Common Grackles (*Quiscalus quiscula*) 14,519; Brown-headed Cowbirds (*Molothrus ater*) 44,069; Mourning Doves (*Zenaidura macroura*) 2,396; American Robins (*Turdus migratorius*) 617; Blue Jays (*Cyanocitta cristata*) 216; Cardinals (*Cardinalis cardinalis*) 57; and 13 "other species" 254. Recoveries included Starlings 1,033, Common Grackles 538, Red-winged Blackbirds 173, and Brown-headed Cowbirds 332.—Richard J. Clark.

4. **Hawk Cliff Raptor Banding Station: Ninth Annual Report.** M. Field and D. Field. 1980. Ont. Bird Banding 13:2–27.—The banding of 2866 birds (2,865 raptors and one Northern Shrike (*Lanius excubitor*)) is reported. Included in this total were 117 nestling American Kestrels (*Falco sparverius*), an average of 1.18 fledglings for each of 99 nests. Recovery of a Northern Harrier (*Circus cyaneus*) banded as a hatching-year male on 30 September 1972 at Hawk Cliff and recovered from the Nolichucky River area in eastern Tennessee on 19 January 1979 was noteworthy.—Richard J. Clark.

MIGRATION, ORIENTATION, AND HOMING

(see also 36, 61, 81)

5. **Weather and the migration of Canada Geese across southeastern Ontario in spring 1975.** H. Blokpoel and M. C. Gauthier. 1980. Can. Field-Nat. 94:293–299.—Canada Geese (*Branta canadensis interior*) that winter in the vicinity of Maryland and Delaware appear to move into northern New York staging areas from which they embark in late

April and early May on a flight to northern Quebec where they breed. Migratory flights over Ottawa, Ontario concentrated between 0400 and 1400. Moderate to heavy flights occur east of low pressure systems, near the center of high pressure systems, or along the west side of a high pressure ridge: conditions that insure the geese of clear weather and favorable winds.—Edward H. Burtt, Jr.

POPULATION DYNAMICS

(see also 1, 14, 16, 29, 39, 64, 73, 85)

6. Similarity of dispersal among sibling male Spruce Grouse. D. M. Keppie. 1980. Can. J. Zool. 58:2102–2104.—For 3 yr Keppie tried to keep track of individually marked juvenile male Spruce Grouse (*Canachites canadensis*) so as to determine distances dispersed from the brood range to the winter range. For 16 broods with at least 2 males (13 with 2, 1 each with 3, 4, and 5 males), he concluded that there was less variation in dispersal distances within broods than between broods. This conclusion, as Keppie discusses, does not prove a genetic basis exists for dispersal characteristics. To my mind, it might show so much less as to be meaningless. Fully 34% (13 of 38) of the juvenile males were not relocated; 9 of the 16 broods were represented in this group. Although Keppie got his same result whether he arbitrarily assigned distances of 2000 m to these males (2000 m = distance from an unspecified point to a boundary strip) or random values between 2000 m and 5250 m (5250 m = maximum known distance any male went), one could feel much better about Keppie's conclusions if it had not been necessary for him to hypothesize any of the data, much less an average of 51% of the data for 7 clutches and 100% for 2 others. Perhaps higher percentages of recovery could be achieved in future similar studies if implanted radiotransmitters or an entire small island were used.—A. John Gatz, Jr.

7. Prairie dabbling ducks, 1941–1990. H. Boyd. 1981. Can. Wildl. Serv. Prog. Notes No. 119, 9 p.—This paper compares Canadian Prairie dabbling duck population numbers over the last 40 yr to soil moisture and predicts population numbers for the next 10 yr. Soil moisture, more so than other variables, was significantly ($P < 0.001$) correlated ($r^2 = 0.54$) to numbers of dabbling ducks.—Richard M. Zammuto.

8. Populations of Blue and Great tits at Perivale Wood. P. J. Belman. 1980. Lond. Nat. No. 59:52–59.—Certain aspects of the population dynamics of the Blue Tit (*Parus caeruleus*) and Great Tit (*Parus major*) were studied for the period 1971 through 1979 in a 10.5 ha suburban study area. Both species nest readily in nest boxes which were provided yearly. The number provided varied yearly from 24 to 80 (mean = 47.5). The numbers of broods of the Great Tit remained relatively constant (suggesting territorial behavior spaced them out), while the numbers of Blue Tit broods varied in proportion to the nest boxes provided (suggesting nest site availability was a limiting factor). Mean brood size at ringing was 7.84 for the Blue Tit (n = 239, SD 0.49) and 5.70 (n = 70, SD 0.89) for the Great Tit. Breeding densities were 1.9–5.9 pairs/ha and 1.1–1.6 pairs for the respective species. Dispersal of breeding females from their birthplaces (within Perivale Wood) averaged 163 m (range 0–320, n = 23). Blue Tits moved locally up to 3 km and nestlings showed more site fidelity than Great Tit nestlings. The female breeding population contained 33% first-year birds of which up to 62% were immigrants. About ¼ of the females were thought to have bred the first year. Great Tits moved locally up to 5 km. The female breeding population contained 38% first-year birds of which up to 82% were immigrants. About ⅓ of the females were thought to have bred the first year. Recovery data indicated considerable post-juvenile dispersal for the Blue Tit as well as a peak of mortality immediately after fledging and the latter part of the nesting season for later years.—Richard J. Clark.

NESTING AND REPRODUCTION

(see also 1, 4, 8, 23, 28, 29, 42, 44, 65, 73)

9. Bigamy phenomena in the Whitethroat. (Yavlenie bigamii u seroi slavki (*Sylvia communis* Lath.) V. Muzaev. 1980. Biol. Nauki (Mosc.) 1980:38–42. (In Russian.)—Through observations and color-banding of nestling Whitethroats, bigamy was found in certain males. Males' responses during incubation and nestling feeding are described, as is effectiveness of males during growth of family groups. Authors' observations note trends toward polygamy in many species of songbirds as stated earlier by Malchevskii. The author suggests that polygamy is basically inherent in avian reproduction.—Leon Kelso.

10. The ecology of avian incubation. C. Carey. 1980. BioScience 30:819–824.—The limits of incubation temperature for birds are not well-known. For domestic galliforms and ducks they are 35°C and 40.5°C. The developmental zero for birds is placed at 25°C and temperatures much above 40 C are rapidly lethal. Egg temperature changes will occur during incubatory recesses and will depend, in part on duration of recess, nest insulation and ambient temperature, and radiative heating. The net energy expenditure of the adult during incubation may be diminished by cessation or restriction of energy intensive activities such as flight, social activities, and foraging. The extreme situations of hot and cold climates are considered. The former requires mainly protection against insolation by day. Depending on local conditions this requires shading, close incubation, or wetting eggs or overlying sand for evaporative cooling, or some combination of these. Cold climates may be met by close and continuous incubation involving feeding of female by mate or extreme weight loss by the incubating parent. A quite different method is to allow the eggs to chill during feeding absences even if these last hours or days. This last method lengthens the incubation period and may reduce hatchability. Finally, the embryo must obtain oxygen and get rid of CO_2 and excess water. Permeability of the shell is such that these actions are properly adjusted to the conditions of nest construction and incubation.—C. H. Blake.

11. Response of Red-winged Blackbirds to nests of Long-billed Marsh Wrens. J. Picman. 1980. Can. J. Zool. 58:1821–1827.—In a continuation of his earlier work on these species (Can. J. Zool. 58:337–350, 1980), Picman provides results of experiments in which courtship (nonbreeding) nests of Marsh Wrens (*Cistothorus palustris*) were placed near the nests of Red-winged Blackbirds (*Agelaius phoeniceus*). Red-wings demonstrated specificity of response and ability to learn through experience; bundles of cattails and sedges were not responded to, and response rates went up both during the breeding season and with age. Although there was not a statistically significant relationship between nesting success in blackbirds and their response to introduced marsh wren nests, the data show a positive trend. Interestingly, the intensity of some of the Red-wing responses was directly related to the densities of marsh wrens. As Picman continues to gather data and experiment with this system, further information about how the interactions influence the population dynamics of both species should be forthcoming.—A. John Gatz, Jr.

12. Aspects of the breeding biology of the Gentoo Penguin, *Pygoscelis papua*. A. J. Williams. 1980. Gerfaut 70:283–295.—Field observations during 2 yr at Marion Island showed laying from June to October, with most of the late clutches being replacement clutches. Clutch size in most nests was 2. The first-hatched chicks were heavier at hatching than were their siblings, and the first-hatched young were 4 times more likely to survive than second-hatched young. Survival from egg to fledging was only 21%. Much of the observed mortality resulted from the timidity of incubating birds; Lesser Sheathbills (*Chionis minor*) preyed on eggs that were temporarily deserted when the incubating adult left the nest. Chicks were marked and their growth was recorded at 5-day intervals. Growth was most rapid in the first month, but the bill continued to grow after 60 d. Most of the marked young were killed by predators, mainly giant petrels (*Macronectes* spp., see review **58**), and some died of starvation.

In no nest observed did both young survive. Williams suggests that the usual clutch of 2 was suited for conditions before the Antarctic convergence shifted to the south, with earlier waters providing more food. According to palynological data on Marion Island, the shift occurred more than 10,000 yr ago. It is unknown whether Gentoo Penguins more frequently raise 2 chicks successfully in the more southern breeding areas.—R. B. Payne.

13. The Thin-billed Prion, *Pachyptila belcheri*, at New Island, Falkland Islands. I. J. Strange. 1980. Gerfaut 70:411–445.—The author purchased half of New Island to maintain it as a bird reserve and to encourage ecological research. An earlier owner considered the nesting prions to be pests as their burrows were hazards for horseback riding, and he introduced pigs to root out the eggs and young, as well as to destroy what fire had not of the tussock grass. However, the present population is vast (thousands?).

The birds were observed closely for 2 breeding seasons, after years of earlier observations. Breeding behavior, appearance, voice, and feeding ecology were studied, and 25 pairs were marked for individual recognition, with the sexes distinguished in some pairs by the presence of a swollen abdomen in the female just before laying. Breeding was rather synchronized, one night hundreds of pairs were seen to copulate but none did on the night before or after. The copulation period was followed by a "honeymoon" (though the birds enjoyed food not sex) of 2 to 3 wk, after which the females returned to lay. At this time many eggs were found on the ground, perhaps the result of other owners having taken up the honeymooners' burrows during their absence. One egg was laid. Incubation was shared by male and female, with brooding periods lasting usually 4 to 7 d. Hatching took 46–47 d, a little longer if the eggs had been deserted for a period. Chicks were fed mainly amphipods and euphausiids. Young fledged abruptly about 50 d after hatching; with practice flights being too dangerous because of predators. The main predator was the Falkland Skua (*Catharacta skua antarcticus*); other predators were Cassin's Peregrine Falcons (*Falco peregrinus cassini*).

The article is illustrated with attractive and interesting photographs that show the traffic patterns of night-flying prions (by flash), details of form and plumage, nesting sites, and skua predation (some birds locate young prions in their burrows and dig through the soil surface down to the chick).—R. B. Payne.

14. The influence of predation on the breeding results of the Woodpigeon (*Columba palumbus*) on the Southwest-Veluwe. (De invloed van predatie op de broedresultaten van de Houtduif *Columba palumbus* op de Zuidwest-Veluwe). R. G. Bijlsma. 1980. Limosa 53:11–19. (In Dutch with English summary.)—Egg-laying extended from the end of March to mid-November and was bimodal with peaks in April and early September. Predation is high and of 162 clutches only 45 young fledged; of 99 cases where causes of failure were established, 83% were due to predation. Predation was highest in May and August and coincided with periods of food shortages for adult pigeons and thus unguarded nests. Breeding success was inversely related to breeding density. Low breeding success was compensated for by more breeding attempts and thus average number of fledglings per pair per year hardly differed between pairs breeding at high or low densities. Average annual production (2.2 young/pair) was ample to replace adult mortality. Mortality through predation on eggs and nestlings is evidently unimportant as a factor regulating population size.—C. M. White.

15. Breeding behaviour and breeding success of a colony of Little Gulls *Larus minutus* in the Netherlands. J. Veen. 1980. Limosa 53:73–83.—The breeding distribution of Little Gulls extends in a disjunct fashion from southern Finland eastward to East-Siberia. Isolated breeding colonies occur far beyond the species' normal range in the western parts of Europe. In the Lauwerszee area where land was reclaimed by diking in 1969, a colony of gulls began to breed. Plumage patterns indicated that most were 3 and 4 years old with many immature feather traits and about 74% were in their third calendar year. Mortality of chicks was extremely high with only 2.9% of all eggs laid producing a fledgling. The primary mortality was predation by the Black-headed Gull (*Larus ridibundus*) which breeds in the same area. Throughout the Little Gull's range, however, they tend to breed adjacent to Black-headed Gulls. In the Lauwerszee area Little Gulls settle near Black-headed Gulls that are already settled and starting to breed such that the former is "selecting the company" of the latter. Changes in the distribution of colonies of both species between different years also coincided. The authors conclude that Little Gulls normally gain some advantage by selecting to nest near Black-headed Gulls, but that in the present case the inexperience of the Little Gulls, because of age, results in eggs and chicks being highly vulnerable to predation and other mortality factors.—C. M. White.

16. Timing of breeding and the clutch size in the Pied Flycatcher *Ficedula hypoleuca* in Finnish Lapland. A. Järvinen and H. Linden. 1980. Ornis Fenn. 57:112–116.—Timing of breeding and clutch size were studied for several years in 3 populations north of the arctic circle. Breeding varied with latitude, with the more northern birds beginning to lay at a later date and in colder weather. In more southern populations, clutch size decreases as the season progresses, and the small clutches found in Finnish Lapland seem to reflect the delay of the breeding season at the northern limit of the species' distribution. At the most northern population (69°N), the onset of laying matched the start of the growing season, but clutch size was smaller than in southern Finland.—R. B. Payne.

17. Single-breeding versus colonial breeding in the Caspian Tern *Hydroprogne caspia*, the Common Tern *Sterna hirundo* and the Arctic Tern *Sterna paradisaea*. G. Bergman. 1980. Ornis Fenn. 57:141–152.—Baltic populations of Caspian Terns nest as single pairs or in dense colonies. The first Caspian Terns to nest established themselves on islets near other species of larids, and the new colonies of Caspian Terns were seen to establish around these first immigrants. Caspian Terns avoided settling on islands without others. The single-breeding Caspian Tern pairs defend their whole islet against conspecifics, so the different kinds of breeding systems tend to persist on different islets over decades.

In the Common and Arctic terns the few single pairs do not prevent other conspecifics from settling near them, and the species are attracted to each other apparently as much as to their own species in settling a colony. They avoid settling near other species of larids, unlike the Caspian Terns, probably to avoid predation by gulls. The paper is a valuable resource describing the importance of social stimulation in the habitat selection of sea birds.—R. B. Payne.

18. Thermal environment and tolerance of embryonic Western Gulls. A. F. Bennett, W. R. Dawson, and R. W. Putnam. 1981. Physiol. Zool. 54:146–154.—Exposed eggs on San Nicolas Island, California, underwent a daily thermal excursion between 6 and 50°C. Eggs exposed to solar radiation heated slowly (5°C/h) and embryos maintained heartbeats between 11 and 46°C. Short-term exposure does not constitute an immediate threat to survival of embryos. This is contrasted with the behavior and thermal tolerance of other gulls nesting under hot and arid conditions.—C. R. Blem.

BEHAVIOR

(see also 9, 11, 13, 15, 17, 60, 77, 79, 80, 82)

19. Responses of naive temperate birds to warning coloration. S. Smith. 1980. Am. Midl. Nat. 103:346–351.—Forty-day-old House Sparrows (*Passer domesticus*), Blue Jays (*Cyanocitta cristata*), and Red-winged Blackbirds (*Agelaius phoeniceus*), hand-reared on a varied diet, were presented with wooden dowels painted in different aposematic patterns. All birds were first presented with solid-color models all of which were attacked, showing that neither the novelty of the dowels nor their bright coloring was sufficient to suppress an attack. All birds attacked all patterned models including those with a coral snake pattern, which neotropical snake predators have avoided. Smith concludes that in these temperate species the avoidance of toxic prey is not directed by an innate aversion to aposematic patterns, nor by any fear of novelty. The contrast of her present findings with her previous findings of rejection of novelty is explained as resulting from various factors including the fact that by the time the Blue Jays and blackbirds arrive in coral snake territory, they have had ample opportunity to learn to avoid aposematically patterned prey. Such an opportunity would not exist for the snake predators born in the territory. As Chi-square tests showed no heterogeneity within the House Sparrows or Blue Jays, responses were summed within species. The fact that there were only 2 blackbirds in the study makes any generalizations about this species less than hard and fast. Variables other than species and novelty were not controlled within the parameters of this study; instead, comparisons were made with the findings of others.—Lia M. Cooper.

20. Taste potentiates color-sickness association in pigeons and quails. B. T. Lett. 1980. Anim. Learn. Behav. 8:193–198.—Sixty adult pigeons (*Columba livia*) and 30 adult quails (*Coturnix coturnix*) were subjected to a series of "poison-based aversion learning" tests to determine the relative prominence of taste and visual cues. The absence or presence of flavor and color in the drinking water served as the means by which aversion learning was recorded. Two groups of 30 pigeons and 1 group of 30 quail were each divided into 3 sub-groups: Group F was conditioned to have an aversion to uncolored flavored water, Group C was conditioned to unflavored colored water, and CF was conditioned to colored flavored water. After conditioning was complete all birds were tested for aversion to flavored water (flavor test) and colored water (color test). Lett's results clearly indicated that a flavor cue enhanced the conditioning of a color cue, whereas, the color cue had very little or no effect on the flavor cue. Addition of a flavor cue may have stimulated a bird's "awareness" of the water's color and, therefore, enhanced its response to a color cue. Even color-(unflavored) conditioned birds showed little aversion to color tests. Lett's concern for the conflicting results of Wilcoxon et al. (Science 171:826–828, 1971) is very apparent in the paper and he refers extensively to previous studies. Elaborate explanation of methods is provided, and variables are taken into careful consideration. The paper lacks any visual display of accumulative results.—Camela Chop.

21. The role of the sexes in territory defense in the Magpie (*Pica pica*). G. Baeyens. 1981. Ardea 69:69–82.—The territorial boundaries (ca. 6 ha) were usually clearly demarcated and defended throughout the year. Non-breeders were non-territorial, mostly juvenile and unpaired birds, and roamed about into territories and in the no-man's-land between them. Males spent more time and energy in territory defense than females. They attacked male intruders more readily than female intruders. Also they were more likely to assist their mates in chasing other males than in chasing other females. Females were only slightly more aggressive to intruders of their own sex.

Baeyens suggests that males might profit from being tolerant to intruding females because they might gain additional fertilizations, an additional mate, and because it might facilitate mate replacement if that is needed. Females might also insure themselves against male loss by tolerating potential replacing males. However, the aggression females display is perhaps part of their strategy to test the male's future faithfulness since they need male assistance during incubation and chick-raising.—C. M. White.

22. Biology and colonial organization of two sympatric caciques, *Cacicus c. cela* and *Cacicus h. haemorrhous* (Icteridae, Aves) in Suriname. F. Feekes. 1980. Ardea 69:83–107.—Two sympatric colonial caciques exist in pure or mixed colonies in Suriname but *C. haemorrhous* prefers unbroken high forests and *C. cela* breeds in more open country. Anti-predator strategies are highly developed and include penduline nests built at terminal twigs, male sentries, alarm calls and fleeing at the approach of predators, and joint attack of intruders of the nest tree. Feekes argues that a super-abundance of food (since birds exploit numerous food resources) and strong predation pressure are the most important determinants of their social organization. Abundance of food permits gregariousness and absence of pair-formation. Males do not participate in parental care and there are more females than males in and around the nest tree. In groups, detection and attack of predators is facilitated, but groups also attract more predators. In these 2 species males remain largely hidden in and near the nest tree and come out to attack intruders.

Feekes concludes that *C. cela* is better adapted to what he presumes is a more vulnerable life in open country by nesting more densely clustered and by the males giving fewer displays in few preferred areas. In mixed colonies *C. haemorrhous* is more shy and thought to seek protection from the other species.—C. M. White.

23. Development and stability of single-parent family units in the Song Sparrow. J. N. M. Smith and J. R. Merkt. 1980. Can. J. Zool. 58:1869–1875.—Family units are defined as associations between parents and young, i.e., one parent and the one or several young that it feeds. In Song Sparrows (*Melospiza melodia*) on the British Columbian island studied here, some young became parts of family units the day they fledged and most joined within 2–3 days of fledging. Smith and Merkt were unable to document the long-term stability of these family units, but suggest that they may in a number of instances last continuously until independence of the young. Females may even continue to feed a single young while incubating a later brood. Sonograms of the begging calls of the young reveal enough individual differences to provide a means whereby the parent can recognize the members of its family unit. The patience, diligence, and luck required to determine long-term stability are considerable, but the information is critical before one can start speculating on the function or evolutionary origin of family units. Best wishes to those who would try!—A. John Gatz, Jr.

24. Intraspecific aggression in a group of caged Starlings, *Sturnus vulgaris*. E. van der Mueren. 1980. Gerfaut 70:455–470.—Aggressive action patterns or displays of Starlings were described in capitalized ethological terms. The frequencies of transition from one "pattern" to another were observed in captive birds. In the resulting transition matrix (12 "before" and 12 "after" patterns), certain postures were found to be associated with certain others. However the author did not report on the overall statistical properties of the matrix, although an overall test (such as a G-test) would be necessary to test the hypothesis of independence of patterns. In the absence of this, there is no statistical justification for the author's test of significance of association of just those patterns that were often associated in the data. This approach simply picks the cases that are post facto fits to an hypothesis of association. (For an example of an overall treatment of a comparable matrix, see Anim. Behav. 27:997–1013, 1979.) The author also separated the transition data for males and females and found certain sequences of displays that differed between the sexes, but he made no overall test of independence of the male-female matrices, and his diagrams of sequences show that the sexes were rather similar in the sequence of their behavioral patterns. The difference in the association of male and female sequences appears to reflect a higher frequency of aggressive patterns by the males and a higher frequency of "escape" patterns in the females ("escape" and appeasing behaviors were not distinguished). Although I think that the quantitative aspects of the study were unsuccessful, the author does show that the "aggressive" postures involve ruffling the body feathers and pecking, and the "escape" patterns involve sleeking the plumage.—R. B. Payne.

25. Agonistic behavior and feeding behavior of Starlings (*Sturnus vulgaris*) in captivity: effect of density. (Comportement agonistique et comportement alimentaire de l'Etourneau (*Sturnus vulgaris*) en captivité: effet de la densité.) A. Lejeune. 1980. Gerfaut 70:471–479. (In French with an English summary.)—Experimental birds were kept in sparse (9 birds) or dense (18 birds) groups in 8 m^3 cages. All of 5 displays that were considered to be aggressive spacing mechanisms in Starlings were more than twice as frequent per individual, on the average, in the dense groups than in the sparse groups. Individual food consumption also was higher in the dense group. Curiously the author concludes that life in a dense, competitive group increases the efficiency of the flock in exploiting its habitat. Let us point our knowing Darwinian finger at this line of reasoning as well as guiding our experimental design to test a biological question at the level of individual adaptation. The author did not report on the behavior of individual birds, so we cannot know from the data whether the more aggressive birds gained more food than the subordinate birds. Such an experimental design based on the costs and benefits to individuals with different behavioral strategies would be a better test of the functional and adaptive relationship of aggressive behavior and feeding behavior.—R. B. Payne.

26. Why are distasteful prey not cryptic? J. L. Gittleman and P. H. Harvey. 1980. Nature 286:149–150.—Male domestic chicks were fed blue- and green-dyed crumbs for posthatch days 1–3. On day 4, 36 chicks were exposed to distasteful (mustard and quinine sulphate mixed with dye) crumbs in 1 of 4 conditions (1. blue crumbs on blue floor, 2. green on blue, 3. blue on green, 4. green on green; all n=9) and allowed to feed for 2 min, being retested every hour for 13 h, "that being the number of trials after which each chick had refused food on at least one occasion." On the first trial, chicks with cryptic crumbs (blue on blue, green on green) ate significantly fewer than chicks with conspicuous crumbs (blue on green, green on blue). This situation changed quickly and after the next 12 trials chicks exposed to cryptic crumbs had eaten significantly more of the distasteful food. Chicks given conspicuous crumbs also first failed to feed in fewer trials. These findings indicate that neonatal male domestic chicks learn to avoid conspicuous distasteful crumbs more rapidly than cryptic ones, when given access to only one or the other. The authors suggest that either the appearance of conspicuous items is learned more readily and/or that eating many distasteful items in a short time provides a more powerful reinforcer than eating more over a longer time.

These results are very interesting, though it would have been extremely informative to compare these with the intake patterns of chicks exposed simultaneously to both cryptic and conspicuous distasteful crumbs. The authors recognize explicitly that their experiment does not mimic conditions that favor the evolution of aposematic coloration, i.e., the birds had no alternative, non-distasteful food items available to them during testing, and one wonders about the effects of such experimental manipulations also, but anticipates that such questions have been addressed by these researchers and that this information will come to public attention soon. Probably there will be a rapid proliferation (some of which is already evident) of this sort of research based on experimental approaches to unravel the proximate workings of functional patterns uncovered and studied in the field. This work appears to be an outgrowth of Tinbergen's approaches and perspectives which have been brought into the laboratory; it's exciting.—W. A. Montevecchi.

27. A Great Tit *Parus major* roosting in snow. P. Helle. 1980. Ornis Fenn. 57:175–176.—A Great Tit was seen digging into a snowbank in early twilight and excreta found the next morning showed that the bird had roosted in the snow.—R. B. Payne.

28. Extended family system in a communal bird. J. L. Brown and E. R. Brown. 1981. Science 211:959–960.—The Mexican Jay (*Aphelocoma ultramarina*) lives in sedentary, territorial flocks which may have up to 3 generations present at one time. Many of the younger birds are helpers at the nests. The relatedness of all in a flock is fairly low because considerable immigration provides unrelated mates for the younger birds. Some of these immigrants are known to come from neighboring flocks.—C. H. Blake.

29. Ecological study of social organization in the Great Tit, *Parus major L.* T. Saitou. 1979. J. Yamashina Inst. Ornithol. 11:137–188. (In English, Japanese summary.)—This excellent study is presented here in 3 parts as a continuation of previous work (Jap. J. Ecol. 28:199–214, 1978). It covers winter flock formation, dominance relationships in these flocks, pair formation, and territory establishment. More than 550 individuals were monitored in the breeding population and more in autumn and winter flocks. In large part the study augments or confirms the classic work by Hinde (Behav. Suppl. 2:201, 1952) on the same species, but many thousands of kilometers to the west. Saitou found that young join flocks away from their natal area. These flocks are usually made up of the resident adults plus one or more other adults from nearby areas, and several young of the year. The process of flock formation is gradual, a "summer flock" range of some young that finally coalesces into a smaller autumnal flock range. The final flock range was not defended against conspecifics, but the core area of each range did not overlap with other flocks. The resident adults were usually dominant over other birds in the flock. If both members of a resident pair survived, they paired with each other after the winter flocks broke up. In most cases a mate was selected from the flock and their territory was established in the previous winter's range. This is an excellent study, but suffered in part from a lack of data presented. Many conclusions were undoubtedly based on a great deal of information, but often only snippets from a single flock were presented as "an example." Despite this rather serious drawback, the study is worthwhile and deserves study by other workers.—C. J. Ralph.

ECOLOGY

(see also 7, 10, 13, 22, 25, 38, 49, 63, 75, 85)

30. A functional approach to estimating habitat edge width for birds. J. E. Gates and J. A. Mosher. 1981. Am. Midl. Nat. 105:189–192.—The authors present 2 functional approaches for estimating habitat edge width. Each relies upon the dispersion of the nests of edge bird species. Field data were used to compare and contrast the methods with the structurally determined habitat edge width. They state that their functional approach is an ecologically more meaningful estimate of edge width and that it has general applications.

It would seem that an element of circular reasoning exists in using edge species to estimate edge widths. In addition, a functional width measured for a Catbird (*Dumetella carolinensis*) might have no relationship to a width measured for a Brown Thrasher (*Toxostoma rufum*). Such a functional approach may be useful for measuring a single species' habitat edge width, but has limited use for a community of edge species—its suggested role.—J. M. Wunderle, Jr.

31. Energetics of feeding on tree sap by Ruby-throated Hummingbirds in Michigan. E. E. Southwick and A. K. Southwick. 1980. Am. Midl. Nat. 104:328–333.—During the breeding season in northern Michigan, Ruby-throated Hummingbirds (*Archilocus colubris*) were observed feeding on tree sap in holes made by Yellow-bellied Sapsuckers (*Sphyrapicus varius*). The females fed primarily on the sap rather than on the hummingbird's normal diet of flower nectar. The authors conclude that incubating female hummingbirds use sap as a food source so as to minimize the energetics of feeding. Energy use is minimized because the female's nests were within 300 m of the feeding trees, and because the females could obtain sufficient sugar from a single feeding, rather than having to fly to multiple flowers. They hypothesized that the females further reduced the calories burned during feeding by hovering at the tree for only 38% of the time, while perching for the remaining 62%; whereas they must hover for 100% of the time at flowers. The authors calculated that hovering requires nearly 10 times the calories of resting. Based on these observations, the Southwicks suggested that Ruby-throated Hummingbirds in northern Michigan are energetically tied to Yellow-bellied Sapsuckers, and that they select nest sites within the feeding area of sapsuckers. However, their conclusions are based on observations made during only a single nesting season, and in comparing energetics of sap and nectar feeding, they used quantitatively derived sap sugar concentrations for the area studied compared to estimated nectar sugar concentrations based on studies made out of the area studied.—Elizabeth L. Sisson.

32. Ecology and ethology of the Bean Geese *Anser fabalis fabalis* and *Anser fabalis rossicus*. (Ecologie et éthologie des oies des moissons, *Anser fabalis fabalis* et *Anser fabalis rossicus*.) J. Van Impe. 1980. Gerfaut 70:499–588. (In French with English summary.)—The Western Bean Goose (*A. f. fabalis*) breeds from Lapland to the Ural Mountains and the Russian Bean Goose (*A. f. rossicus*) breeds in arctic Russia and western Siberia. The 2 forms were compared as they wintered together in southern Netherlands. *A. f. fabalis* was mainly a grazer, drank fresh water, arrived earlier and departed later in the day from the feeding grounds, and was more docile; *A. f. rossicus* fed on the harvest waste of sugar beets and potatoes during early winter, then shifted to new grass and wheat in late winter, drank brackish water, and was generally more nervous in behavior. In emphasizing the behavioral differences, the author stresses the different endogenous periodicity and genetic adaptations of the 2 populations, and even argues for physiological and biochemical differences related to the differences in drinking and feeding behavior. However, there is no evidence that the behavioral differences are caused by genetic differences between the populations.—R. B. Payne.

33. Pied Wagtail roosts and numbers in the London area in winter. R. J. Chandler. 1979. London Bird Report 44:85–90.—Pied Wagtails (*Motacilla alba*) roost communally outside the breeding season. A "task force" of the London Natural History Societies' Ornithological Section conducted surveys within several 10 km squares in the London area during the 1978/79 winter. Twenty roosts were located and counts of birds entering the roosts were made on the weekends of 21 and 28 October 1978 and 20 and 27 January 1979. From these counts it was estimated that communally roosting wagtails in the area numbered 11,000 in October and 7500 in January. Reed-beds constituted 55% of the roost-sites.—Richard J. Clark.

34. The bird community of reserved fields in central Finland. T. Törmälä. 1980. Ornis Fenn. 57:161–166.—Old fields abandoned after cultivation were censused to determine how the bird species and numbers change with time after abandonment. The main species in old fields were Whinchat (*Saxicola rubetra*), Skylark (*Alauda arvensis*), Yellowhammer (*Emberiza citrinella*), and Yellow Wagtail (*Motacilla flava*). With continuing succession, Skylarks dropped out and Willow Warblers (*Phylloscopus trochilus*), Garden

Warblers (*Sylvia borin*), Scarlet Grosbeaks (*Carpodacus erythrinus*), and Yellowhammers became more common. Different mixes of species were noted in fields of different sizes, with Whinchats persisting in the larger fields.—R. B. Payne.

35. Resource variation and the structure of British bird communities. B. C. Lister. 1980. Proc. Natl. Acad. Sci. U.S.A. 77:4185–4187.—The author examines foraging data collected in the 1950's at Marley Wood and Thetford Chase and suggests that British tits may represent a case of increased spatial-niche similarity rather than a case of niche-segregation. Different tit species in Britain spent the same amount of time feeding in various microhabitats such as branches, twigs, buds, leaves, and trunks when food was stable and/or abundant and a significantly dissimilar amount of time when food was rare and/or variable. The author suggests MacArthur's New England warblers were all feeding on an abundant resource in similar fashion, and may not have been avoiding intense competition as proposed.—Richard M. Zammuto.

36. Habitat differences among resident and migratory populations of Oriental Greenfinch *Carduelis sinica* groups in winter season. H. Nakamura. 1979. J. Yamashina Inst. Ornithol. 11:189–218. (In English, Japanese summary).—In a very interesting paper, the author contrasts a resident population of *C. s. minor* with winter migrants of that race (as well as transient *C. s. kawarahiba*). Although one might quibble over the author's designation of some *minor* individuals as "migratory" (it was based on residency and small, but significant, differences in size), at the very least, the migrant birds did not breed in the study area. The author documented rather striking habitat segregation between the populations of the subspecies. The resident *minor* lived along the forest edge, while the migrants frequented the more open farm lands. The residents formed loose flocks, maintaining (or establishing) pair bonds in the winter, and feeding on a wide variety of seeds. The migrants of *minor* (and *kawarahiba*) formed separate, but large and well-integrated, flocks, feeding on a very few species of seeds. The author's data show that the resident birds are most likely to occupy the best habitat, due to the proximity of shelter, although the migrants are larger and probably dominant (only 33 *minor-minor* interactions were observed). There thus appears to be some advantage to being resident. However, the migratory birds are possibly better able to find and exploit the abundant and patchy food left from cultivation, especially rice. Thus the distinct habitat preferences are probably maintained by a polarity of selective pressures, one set favoring the migrants, and the other set favoring the residents. This is a very stimulating paper that deserves close study and confirmation in other similar situations.—C. J. Ralph.

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

(see also 2)

37. An evaluation of long grass as a bird deterrent on British airfields. T. Brough and C. J. Bridgman. 1980. J. Appl. Ecol. 17:243–253.—Regular observations showed birds to be fewer on airfields with grass 15–20 cm tall than where grass was kept mowed to a height of less than 10 cm. Particularly reduced in numbers were Lapwings (*Vanellus vanellus*), Wood Pigeons (*Columba palumbus*), Rooks (*Corvus frugilegus*), Starlings (*Sturnus vulgaris*), and Black-headed, Common, and Herring gulls (*Larus ridibundus, L. canus,* and *L. argentatus*). These were the species found to be most hazardous to air traffic. Population sizes were not correlated with birdstrikes, but the logical assumption was made that reduced numbers of birds on airfields reduces the probability of birdstrikes by aircraft. The authors concluded that the growing of long grass near airstrips is an effective method for reducing birdstrikes by aircraft.—Paul A. Stewart.

38. Blackbirds and corn in Ohio. R. A. Dolbeer. 1980. U.S. Fish and Wildl. Serv. Resour. Publ. 136, Washington. 18 p.—This attractive and profusely illustrated publication involves the assembling of available information on losses of the Ohio corn crop by farmers. The information presented comes mostly from published sources, with 55 references cited. Losses caused by insects, weeds, diseases, and fungi are reported to be 20% of the potential harvest, with harvesting procedures also often leaving 5% or more of the harvestable crop on the fields. Blackbirds in Ohio reduce the crop yield of corn less than 1%, but levels of loss are often much higher on farms within 8 km of major roosting sites. Seven such sites are present in the Lake Erie marshes. Except on farms where losses to blackbirds, based on earlier experience, can be expected to exceed 5%, cost of chemical treatment for control of losses can be expected to exceed resulting benefits. Practices recommended for use by farmers attempting to reduce losses of corn to blackbirds include use of alternate crops, growing of more resistant corn hybrids, deeper planting, use of repellents, control of weeds, use of frightening devices, timing of harvest, and use of the pesticide Avitrol FC-99. Killing the birds is not recommended except in the fields actually receiving damages. It is properly noted that further research is needed on both the beneficial and harmful aspects of blackbirds. Much more information is given on the harmful aspects than the beneficial ones, showing that research is particularly needed on the beneficial aspects.

The glaring need for definitive research on economic ornithology is a shameful commentary on the ornithological community. Although the present publication is addressed to the assumed needs of farmers, it confirms the legitimacy of opinions already held by at least some farmers instead of guiding the farmers into more appropriate practices. In this connection 2 of my personal interviews with farmers in recent years are particularly relevant. In Sandusky County, Ohio, where Dolbeer reported losses of corn to blackbirds highest, one farmer responded to my question about damage caused by blackbirds as follows: "Our biggest problem is trying to make enough money to pay our taxes so you fellows can run around telling us we have a problem. I am planting corn. I don't have time to talk with you." Another farmer living in Kentucky beside a woods containing a blackbird roosting congregation told me how he and his wife had gathered blackbirds and taken them into their house, washed, and dried them after they had been sprayed with PA-14 by the Kentucky Department of Agriculture. The birds were then released.—Paul A. Stewart.

CONSERVATION AND ENVIRONMENTAL QUALITY

(see also 33, 62, 63, 64, 76)

39. Minimum population sizes for species conservation. M. L. Shaffer. 1981. BioScience 31:131–134.—The uncertainties to which a population may be subjected are stated to be 4: demographic variation (chance events in survival and reproduction); environmental variation (temporal variation in the habitat, competitors, predators, parasites); random natural catastrophes; and genetic diversity (mutations, degree of inbreeding, etc.). There is a detailed account of the last years of the Heath Hen (*Tympanuchus c. cupido*). Various possible methods of finding minimum populations are discussed. Actual experiments are likely to take too long, especially if the reserved area is subject to human pressures. The recording of populations on naturally isolated areas (e.g., islands) may involve too many variables, see the uncertainties listed above. In other directions theoretical models, based on diffusion theory, give rough approximations. Computer simulation is possible if enough of the variables listed can be quantified, this is not likely to be true. In general, genetic diversity will be poorly known. The difficulties should not stand in the way of serious attempts to accumulate potential data.—C. H. Blake.

40. White-tailed Eagle reintroduction on the Isle of Rhum. J. A. Love. 1981. Scott. Birds 11:65–72.—The Nature Conservancy Council of Scotland successfully re-established the White-tailed Sea Eagle (*Haliaeetus albicilla*) on the Isle of Rhum by using the falconers' technique of hacking-back, in which the young are initially restrained in cages for 2–3 months, and then released. The first few months, the period in which the eagles would normally be dependent upon their parents, provide ample time for the birds to become familiar with their surroundings. Upon release, the eagles are free to return to the site of captivity and feed at food dumps containing rifle-killed gulls, crows, and ducks. This appears to be an important step in encouraging interaction until the fledglings acquire the ability to fend for themselves. Of the 29 White-tailed Sea Eagles released between 1975 and 1979, 15 had been positively identified in 1980 and observed talon-grappling and nest-building. Successful reintroduction of endangered species, such as that of the White-tailed Sea Eagle on the Isle of Rhum, is important because the abundance of natural breeding habitat is decreasing at a dramatic rate. Alternate habitats must be considered to insure the continuation of the species.—Tracy A. Busch.

41. On regional Red Books as exemplified by that of the USSR. [O regionalnykh krasnykh knigakh na primere krasnoi knigi SSSR.] V. Sokolov, Yu. Gorelov, and T. Savlina. 1981. Zool. Zh. 60:5–17. (In Russian with English summary.)—The principles of selection and exclusion are the main consideration. Only 2 categories of animal species are specified at present: "endangered" and "rare." The increase of categories to 6 has been advocated by the "International Union" Red Book. Some forms erroneously included in the USSR Red Book featured a "secretive way of life" rather than small numbers as a criterion. Now various Red Books have been issued, for example those of Kazakhstan, Moldavia, and the Ukraine. Chapters include: Classification of species and subspecies admitted to the Red Book; Principles of admission of animals and plants to the Red Book; Of specific and subspecific levels of items presented; Features of species and subspecies in the USSR Red Book; and On further work on the USSR Red Book. More and better specialists on particular groups are invited. The simple inclusion of animals at species rank is questioned as "out-of-date" for modern evolutionary studies. Comments and amplifications of descriptions are suggested as is an increase in number of authors admitted to the editorship by the Scientific Coordination Councils dealing with plant and animal groups respectively.—Leon Kelso.

PARASITES AND DISEASES

(see also 69)

42. *Polymorphus minutus* (Acanthocephala) infestation in eiders and its role as a possible cause of death. J. Itamies, E. T. Valtonen, and H-P. Fagerholm. 1980. Ann. Zool. Fenn. 17:285–289.—The high mortality among young eiders (*Somateria mollissima*) in southwestern Finland may result from heavy infestations of intestinal parasites. Five dead young were examined. Two dead juveniles contained in excess of 2000 *Polymorphus minutus,* acanthocephalic worms that burrow into the mid-intestinal wall. Three dead young contained small numbers of *P. minutus,* but 2 of these contained large numbers of trematodes. One other young that contained no acanthocephalans contained abundant trematodes. Two apparently healthy individuals were examined, a juvenile that contained 24 *P. minutus* and an unspecified number of trematodes and cestodes, and an adult male that contained only one *Filicolis anatis.* The data are meager, but suggest that apparent starvation among eider ducklings may be due to parasitic infestation rather than lack of food per se. Is the level of parasitism documented here typical? There are too few studies for a judgement. Are ducklings more susceptible than adults? Immunological data would suggest so, but again more field study is needed.—Edward H. Burtt, Jr.

43. Avian Pox in the Gray-crowned Rosy Finch in Alaska. J. L. Trapp. 1980. North Am. Bird Bander 5:146–147.—The author captured, banded, and released 709 Gray-crowned Rosy Finches (*Leucosticte tephrocotis*) at the U.S. Naval Station, Adak Island, (Aleutians) Alaska in the winters 1970–71 through 1975–76. Symptoms taken to be that of viral avian pox were observed in 2 birds. Diagnosis was based on gross pathology, i.e., no histological examinations were made.—Richard J. Clark.

PHYSIOLOGY

(see also 10, 18)

44. Thermoregulatory development in the Belted Kingfisher. M. J. Hamas. 1981. Comp. Biochem. Physiol. 69A:149–152.—Nestling kingfishers (*Megaceryle alcyon*) established physiological endothermy at 16 d after hatching, although effective homeothermy within a natural brood occurred at 6 d of age.—C. R. Blem.

45. Resorption of yolk lipids by the pigeon embryo. B. Vanheel, J. Vandeputte-Poma and M. Desmeth. 1981. Comp. Biochem. Physiol. 68A:641–646.—The dynamics of yolk lipid use were examined by thin-layer and gas chromatographic analysis of eggs at various stages of incubation. During embryonic development, triglycerides and phospholipids are absorbed preferentially, mainly after the 11th d of development, but no selective uptake of particular fatty acids occurs. During retraction of the yolk sac into the abdominal cavity, yolk resorption is accelerated.—C. R. Blem.

46. Free and forced diving in birds. J. W. Kanwisher, G. Gabrielsen, and N. Kanwisher. 1981. Science 211:717–719.—The experimental subjects were hand-reared, tame but free-ranging Double-crested Cormorants (*Phalacrocorax auritus*) and Canada Geese (*Branta canadensis*). They were equipped with FM radiotelemetry for the electrocardiogram. Acoustic telemetry was used with the cormorants on and under the water's surface. For both species basal heart rate was 100–120/min. Tachycardia is evident with exercise. A goose with submerged head shows a normal active rate of 150/min, doubling when the head emerges. With forced submergence the rate soon drops to 50. The cormorants showed similar rates and pattern. While bradycardia may occur during long dives of mammals, most observations in the literature refer to "forced submersion."—C. H. Blake.

47. Different proteins associated with 10-nanometer filaments in cultured chick neurons and nonneural cells. G. S. Bennett, S. J. Tapscott, F. A. Kleinbart, P. B. Antin, and H. Holtzer. 1981. Science 212:567–569.—Protein with a molecular weight of 180 kilodaltons is associated with the neuronal filaments and is immunologically distinct from smaller neurofilament units and proteins in 10-nanometer nonneural filaments in other cells even when they are in cultures of neural tissues. Read the first paragraph carefully for explanation of acronyms and abbreviations.—C. H. Blake.

48. Frequency selectivity in the Parakeet (*Melopsittacus undulatus*) studied with narrow-band noise masking. J. Saunders, G. Bock, and S. Fahrbach. 1978. Sensory Processes 2:80–89.—Saunders et al. found pronounced differences between mammals and birds in the masking effects of narrow-band noise. These are evidently relevant to the differences in their middle and inner ears, and auditory structures in their central nervous systems. When differences between the bird and mammal systems are compared in detail (the parakeet basilar papilla is 3.7 mm long, that of man is 33 mm) it is significant that the bird's modifying curves are the more efficient. The authors found that the "traveling wave" on the avian basilar papilla is more symmetrical than that found on the mammalian basilar membrane. The present "behavioral tuning curves" suggest that frequency selectivity in birds is indeed superior to frequency selectivity in mammals. The mechanism of avian frequency selectivity is not yet fully understood, however.—Leon Kelso.

49. Dermal water loss in desert birds and reptiles. [Kozhnaya vlagootdacha u pustynnykh ptits i reptilii.] A. Grazhdankin. 1981. Zool. Zh. 60:265–271. (In Russian with English summary.)—The rate of water loss for 5 species of each group found in the severe aridity in East Karakum was determined by special formulae. All this is more adequately elaborated in 9 of the titles cited, particularly the 5 by Lasiewski. "Dermal evaporation at air temperatures of 31–33.5°C affords dispersal of not more than 3% value of heat production in small passerine nestlings, and 9.5–21.3% in diurnal lizards. With diurnal overheating brought about by insolation it may not provide stability of body temperature and have an essential role in maintaining heat balance of the organism."—Leon Kelso.

MORPHOLOGY AND ANATOMY

50. Comparative-morphological analysis of avian auditory reception (in pigeons, passerines, and owls). [Sravnitelno-morphologicheskii analiz sludhogo retseptora ptits (golubi, vopobinye, sovyi)]. L. Prokofieva and G. Yamalova. 1979. Biol. Nauki (Mosc) 1979:36–47. (In Russian.)—The paper discusses organizational principles of membranous cochleae of 3 bird species. Transverse and linear anisotropy occurs in the auditory receptors. The latter affords localization of air cells of various types at free and attached sites of the basilar membrane. The shape and size of the auditory papillae vary relative to the length of the cochlear canal. The authors suggest that the essential differences in cochlear structure of the Long-eared Owl (*Asio otus*), Carrion Crow (*Corvus corone*), and Feral Pigeon (*Columba livia*) are adaptive.—Leon Kelso.

PLUMAGES AND MOLT

(see also 58, 70)

51. Field identification of west Palearctic gulls. P. J. Grant. 1981. Br. Birds 74:111–142.—Part 4 of this continuing series includes the Little Gull (*Larus minutus*), Ross's Gull (*Rhodostethia rosea*), Sabine's gull (*Xema sabini*), Kittiwake (*Rissa tridactyla*), and Ivory Gull (*Pagophila eburnea*). Like its predecessors (Br. Birds 71:145–176, 72:142–182, 73:113–158) Part 4 is amply illustrated with line drawings and photographs of the birds and world distribution maps. Because the author intends to publish this series as a book, suggestions are requested.—Patricia Adair Gowaty.

52. Ageing and moult in western palaearctic Hawk Owls *Surnia u. ulula*. L. D. Forsman. 1980. Ornis Fenn. 57:173–175.—During one autumn 52 Hawk Owls were netted during an invasion along the southern coast of Finland. All were judged to be juveniles. Available museum specimens of Hawk Owls showed a juvenile : adult ratio of 6:1, with adults being taken both on the breeding ground and in autumn in apparent movement away from the breeding ground. Juveniles have more narrowly pointed feathers in the tail and have a grayish-brown pale subterminal bar on the inner web of the outermost rectrix, whereas adults have a more rounded outer rectrix and the subterminal bar is partly white. The other plumage difference noted was the innermost secondaries (or "tertials") which were more pointed, dull brown, abraded, and with the marginal spots worn away in the juveniles, but were distinctly marked with white bars in the adults. These plumage characters defined the age groups. The adult birds were mostly in their second year, judging from their unmolted juvenile and adult secondaries, with many birds having undergone an interrupted wing molt.—R. B. Payne.

ZOOGEOGRAPHY AND DISTRIBUTION

(see also 5, 32, 40, 51, 81)

53. Colonial waterbirds nesting in Canadian Lake Superior in 1978. H. Blokpoel, J. P. Ryder, I. Seddon, and W. R. Carswell. 1980. Can. Wildl. Serv. Prog. Notes No. 118, 13 p.—This paper reports the breeding population size of Herring Gulls (*Larus argentatus*), Ring-billed Gulls (*L. delawarensis*), Great Blue Herons (*Ardea herodias*), and Double-crested Cormorants (*Phalacrocorax auritus*) along the entire Canadian shore of Lake Superior for the summer of 1978. A total of 149 Herring Gull (6410 nests), 4 Ring-billed Gull (4935 nests), 34 Heron (328 nests), and 6 Cormorant (35 nests) colonies were found in a total of 167 locations. Each location is mapped and a table lists the number of nests of each species found at each site. Historical accounts are provided for some colonies.—Richard M. Zammuto.

54. The Booted Eagle, *Hieraaetus pennatus*, as a breeding species in South Africa. R. K. Brooke, R. Martin, J. Martin, and E. Martin. 1980. Gerfaut 70:297–304.—Booted Eagles in South Africa are usually regarded as Palaearctic migrants. During the past decade the Martins have located 37 nest sites in the Cape Province, and a further 42 suspected nest sites are under observation. The nesting area extends several hundred km from near Springbok south along the mountains inland as far east as the Cradock area, and north to Lady Grey. There were 2 early records (1869, 1907) that the authors reject as species misidentifications, and a third record of a nest found and identified by Austin Roberts as that of Ayres' Hawk Eagle (*Hieraaetus dubius*) was in fact probably a nest of the Booted Eagle. The authors argue that Booted Eagles have nested for hundreds of years in South Africa, and that their nesting was simply overlooked.—R. B. Payne.

55. Seabirds breeding on the Algerian coast. (Oiseaux de mer nicheurs sur la côte algérienne.) J.-P. Jacob and B. Courbet. 1980. Gerfaut 70:385–401. (In French.)—Yellow-legged Gulls (*Larus cachinnans*) nest commonly with more than 2500 pairs in 38 colonies, mainly on islands. Eight colonies of Audouin's Gulls (*L. audouinii*), comprising about 500 pairs were found. Other breeding seabirds found nesting in the area were Little Terns (*Sterna albifrons*), Gull-billed Terns (*Geochelidon nilotica*), Whiskered Terns (*Chlidonias hy-*

brida), Cory's Shearwaters (*Calonectris diomedea*), and Shags (*Phalacrocorax aristotelis*).—R. B. Payne.

56. A Franklin's Gull (*Larus pipixcan*) in southeastern Peru. T. S. Schulenberg. Gerfaut 70:403–404.—A November sighting of one bird in first-winter plumage at 12°49′S, 69°15′W, is the first record of the species in the Amazon basin.—R. B. Payne.

57. Spring observations of Osprey and Eleonora's Falcon on the Algerian coast. (Observations printanieres du balbuzard et du faucon d'Eleonore sur la côte algérienne.) J.-P. Jacob, A. Jacob, and B. Courbet. 1980. Gerfaut 70:405–408. (In French.)—Six pairs of Osprey (*Pandion haliaetus*) bred in Algeria in 1978; the total population may be 10–15 pairs. Eleonora's Falcons (*Falco eleonorae*) were not found breeding (they breed later), but the population appears to be 25 pairs or more, perhaps 50. Local sites are mentioned.—R. B. Payne.

58. Giant Petrels (*Macronectes*) of the Falkland Islands and southern South America. (Les pétrels géants (*Macronectes*) des îles Falkland et du sud de l'Amérique du Sud.) P. Devillers, J. A. Terschuren. 1980. Gerfaut 70:447–454. (In French, with English summary.)—Although 2 species of giant petrels have been known to breed sympatrically on some islands of the sub-Antarctic covergence, the situation in the present area has not been studied in recent years. Field observations in the present study relied mainly on the bill color, horn changing to a paler, bright apple-green tip in *M. giganteus,* and horn changing to a darker, brownish-red tip in *M. halli.* The bill color, plumage pattern of adults, and behavior of the Falkland birds shows them to all be *M. giganteus.* Summer visitors to the Patagonian continental shelf and to the Chilean fjords were all *M. giganteus,* as far as they were seen.—R. B. Payne.

59. Geographic and eco-climatic distribution of two forms of Yellow-rumped Barbets, *Pogoniulus bilineatus,* in Rwanda and Burundi. [Distribution géographique et éco-climatique de deux formes du barbion à croupion jaune, *Pogoniulus bilineatus,* au Rwanda et au Burundi.] J.-P. Vande Weghe. 1980. Gerfaut 70:487–497. (In French with English summary.)—Prigogine (Gerfaut 70:73–91, 1980) recently described the morphological intergradation of the yellow-rumped and golden-rumped forms of the barbets in Rwanda and Burundi as well as Kenya and Zaire. In the present paper the more local distributions of the 2 forms in Rwanda and Burundi were plotted to show the intergrading and replacing pattern of distribution. The yellow-rumped form "*leucolaima*" occurs mainly at higher altitudes and wetter sites than the lemon-rumped form "*bilineatus,*" with both forms occurring in the same general areas. In spite of extensive hybridization, the 2 forms coexist with some ecological differences.—R. B. Payne.

60. The Smew *Mergus albellus.* (Het Nonnetje *Mergus albellus*). A. J. Beintema. 1980. Limosa 53:3–10. (In Dutch with English summary.)—The world population of Smews probably does not exceed 140,000 birds. Since 1970 a population of 20,000 have regularly wintered in the Netherlands and winter concentrations of over 10,000 are only known in 2 other areas, the Caspian and Azov seas near river deltas. Band recoveries indicate that breeding grounds of Dutch wintering birds are as far away as Siberia. Adult males make up 42% of the birds. The author assumes a 1:1 sex ratio and thus suggests that juveniles must winter in some as yet undetected area. The Dutch Smews feed almost exclusively on smelt, a very abundant fish. Diving time averages 15 s regardless of water depth. During 15–20 min, Smews make about 3 dives per min. Dives are synchronized and during several s 97% of a group of 1200 can be below the surface simultaneously.—C. M. White.

61. Wintering site fidelity of migrant passerines in El Salvador, Central America. W. A. Thurber and A. Villeda. 1980. North Am. Bird Bander 5:131–135.—In this study the authors examined their recapture records for a 10-year period [years not given but probably 1970–80] for their banding operations at Cerro Verde, Montecristo, and Los Pinas (El Salvador). They categorized the recaptures as "A," i.e., birds that were present between 15 November and 15 February and probably representing birds demonstrating winter philopatry, and "B," i.e., birds present outside of that time period that might have been birds-in-passage following the same routes with regular stop-over sites or possible winter residents. The species listed and the extreme number of certain autumnal returns to the banding site determined by recaptures (parenthetical numbers denote number of probable autumnal returns inferred by assuming unvarying winter philopatry) are as follows: Parulids—Black-and-white (*Mniotilta varia*) A-2, Tennessee (*Vermivora peregrina*) A-2(5), Nashville (*Vermivora ruficapilla*) B-1(2), Yellow (*Dendroica petechia*) A-1(3), Magnolia (*Dendroica magnolia*) A-1, Townsend's (*Dendroica townsendi*) B-1(2), Ovenbird (*Seiuris aurocapillus*) A-2, MacGillvary's (*Oporornis tolmiei*) A-1(2), Yellowthroat (*Geothlypis trichas*) A-1, Yellow-breasted Chat (*Icteria virens*) A-1(2), Hooded (*Wilsonia citrina*) A-1(2), and Wilson's (*Wilsonia pusilla*) A-2(3); Fringilids—Rose-breasted Grosbeak (*Pheuticus ludovicianus*) A-1, and Painted Bunting (*Passerina cirus*) A-2(3). Hypotheses that might explain the above recaptures include chance, instinct, and route learning while returning to the breeding grounds. The latter is suggested as most plausible.—Richard J. Clark.

62. A survey of burrow-nesting petrels at Macquarie Island based upon remains left by predators. E. Jones. 1980. Notornis 27:11–20.—The avifauna of Macquarie Island has been much affected by the actions of predators, most notably skuas and feral cats. Seven species were taken, with Antarctic Prions (*Pachyptila desolata*) and White-headed Petrels (*Pterodoma lessonii*) predominating. The efficiency of predators in detecting the presence of species that have been overlooked by ornithologists is formidable. The paper extends our knowledge of the avifauna of Macquarie, and shows, all too clearly, how the leavings of predators can be used to provide a current (1974–76) inventory of the breeding seabird fauna.—J. R. Jehl, Jr.

63. The history and spread of the Moorhen *Gallinula chloropus* in Finland. E. Pullianen. 1980. Ornis Fenn. 57:117–123.—Moorhens (or Common Gallinules, as they are called in North America) have expanded their range northward in Finland in the past 2 decades. They have been observed north of the arctic circle, and they have nested at 64°40′N. Some birds overwinter in Finland, either along the coast or inland around towns and on farms, sometimes feeding on grain stored in barns. They occur in the summer in highly eutrophic or polluted waters including sewage ditches and basins. The spread of these habitats in Europe in the past decades may have helped provide habitat for Moorhens and have helped increase their population numbers.—R. B. Payne.

64. Numbers of gulls nesting on the northern coast of the Gulf of Finland. M. Kilpi, H. Puntti, and T. Toivonen. 1980. Ornis Fenn. 57:153–160.—Gulls have changed in numbers over the past 40 yr in the Gulf of Finland. Herring Gulls (*Larus argentatus*) have increased more than 20-fold, especially around Helsinki. Great Black-backed (*L. marinus*) and Common gulls (*L. canus*) have increased to a lesser extent. Lesser Black-backed Gulls (*L. fuscus*) have decreased in recent years due to competition and predation from the larger species of gulls, and some local efforts are being made to control the success of nesting Herring Gulls by pricking their eggs.—R. B. Payne.

65. Geographic variations of breeding success of birds nesting in northern deserts of Eurasia. (Geograficheskaya izmenchivost uspeshnost razmnezheniya ptits gnezdyashchikhsya v severnykh pustinyakh Evrazii.) A. Poslavskii. 1979. Vestn. Zool. 1979(5):56–61. (In Russian.)—Suggested is a classification of birds based on reproductive success. Following analyses of embryonic and nestling mortality in 69 species in forest, steppe, and desert zones, there is an analysis of alternative reproductive mechanisms. For example, markedly low embryonic mortality is characteristic of the avifauna of northern deserts. Species with covered nests find northern deserts less favorable than the steppe zone. In terrestrial, open nesting species, embryonic mortality in the forest zone is 31%, nestling mortality 20%, the overall breeding success 49%. The primary limiting factor in timber is embryo mortality, in southern deserts, nestling mortality. For the Bank Swallow (*Riparia riparia*) breeding success in northern deserts is 6 times higher than in the forest zone.—Leon Kelso.

SYSTEMATICS AND PALEONTOLOGY

(see also 58, 59, 72, 74)

66. Study of several secondary contacts in eastern Zaire. [Etude de quelques contacts secondaires au Zaire Oriental.] A. Prigogine. 1980. Gerfaut 70:305–384. (In

French.)—Contact zones of closely related species (including some forms often considered subspecies) in 17 species groups in eastern Zaire are reviewed from museum specimens. The examples of species in secondary contact are apparently taken from those that do show a more or less sharp break between the ranges of the related forms, leaving the more clinal patterns as supposed primary contacts. In most of these groups, one form repeatedly replaces another altitudinally in a series of disjunct high-altitude habitats. In others the 2 forms abut or marginally overlap, but hybrids are infrequent (or, as in the flycatchers *Terpsiphone bedfordi* and *T. rufiventer,* long a perplexing complex, hybrids are locally common). Prigogine stresses the instances of sharp discontinuities as evidence that the birds concerned are distinct species and, especially for the small goshawks *Accipiter tachiro* and *A. toussenelii,* the mapped distributions are convincing in showing that 2 closely related forms (species?) come together without interbreeding. Prigogine orders the species groups into categories of greater and lesser ecological overlap and of greater or lesser hybridization and introgression, then offers his view that the grades reflect stages in a process of speciation, but is unclear about the details. He coins a term "paraspecies" for the members of each pair of species, but does not refer to the concept of parapatric speciation.—R. B. Payne.

67. *Lamprolia* as part of a South Pacific radiation of monarchine flycatchers. S. L. Olson. 1980. Notornis 27:7–10. *Lamprolia victoriae,* a puzzling species of the Fijian Islands, has often been considered an aberrant member of the Paradisaeidae. Olson refutes that view, and other current interpretations, and argues on several grounds for its alliance with the monarchine flycatchers (*Muscicapidae, Monarchinae*), a placement that is appealing on geographic and other grounds. Anatomic evidence is needed for confirmation.—J. R. Jehl, Jr.

68. The morphology, moult and taxonomic status of the Black-fronted Tern. C. Lalas and B. D. Heather. 1980. Notornis 27:45–68.—Until recently the Black-fronted Tern (*Sterna albistriata*) had been considered a race of the Whiskered Tern (*Chlidonias hybrida*). Many lines of evidence support *Albistriata*'s inclusion in *Sterna* (it thereby becomes a new species endemic to New Zealand) and its close relationship to other *Sterna* of the high southern latitudes (*S. vittata* and *virgata*). The paper is a good review of the characters used in classifying terns.—J. R. Jehl, Jr.

EVOLUTION AND GENETICS

(see also 26, 28, 66, 78)

69. Genes, viruses, and avian leucosis. L. R. Crittenden and S. M. Astrin. 1981. BioScience 31:305–310.—Virus induced leukemias and sarcomas were first found some 70 yr ago in chickens. It has now been shown that the chicken genome contains viral DNA which may induce retroviral antigens or the complete virus. These genes are not needed for normal development and appear to be rather recent invaders of the genome.—C. H. Blake.

70. An analysis of a morph ratio cline in the Bananaquit (*Coereba flaveola*) on Grenada, West Indies. J. M. Wunderle, Jr. 1981. Evolution 35:333–344.—Bananaquits occur in 2 color phases on Grenada. In addition to the well-known yellow-breasted, white eye-stripe form, there is an all black morph. Wunderle investigated the evolution and systematics of this polymorphism through intensive fieldwork combined with the judicious use of evolutionary genetic models.

Most of the island is occupied by the black morph. Breeding yellow-breasted birds are limited principally to areas of dry scrub in the southwest and northeast parts of the island. A cline in frequency of the morphs extends from these lowland sites to the higher, wetter, inland areas. The proportion of blacks is highly correlated with rainfall. Behavioral experiments on sun tolerance and observations on the location of roosting nests indicate that shade is an important factor in the behavior and ecology of the black morph. Hence, foliage, mediated through rainfall, may be the variable driving the polymorphism.

Mating of the 2 morphs at selected sites did not differ from random. The plumage patterns of the progeny of known mated pairs suggest that the polymorphism is most parsimoniously explained by a simple, 2 allele genetic model, with black dominant to yellow.

Historical data indicate the yellow-breasted morph has established itself on the island during this century, and perhaps in as little as 22 yr. The data are not conclusive as to whether or not the situation is currently in equilibrium or if the yellow morph is still increasing. Cline theory models are used to investigate these possibilities, based on dispersal data from nestlings and adults. The author points out the difficulties of distinguishing between selection due to differential survival and habitat selection by the individual morphs.

A few loose ends do remain, and there are a couple of typographical errors in the equations, but overall, this study, with the documentation of the behavior, ecology, genetics, and local history of the polymorphism, represents 1 of the 3 or 4 best described and analyzed clines of this kind.—George F. Barrowclough.

71. Evolutionary genetics of birds. Comparative molecular evolution in New World warblers and rodents. J. C. Avise, J. C. Patton, and C. F. Aquadro. 1980. J. Hered. 71:303–310.—Twenty-eight species of wood warblers and 14 species of cricetine rodents (white-footed mouse, cotton rat, etc.) were examined using starch-gel electrophoresis. A total of 26 genetic loci were assayed. Genetic variability (heterozygosity) and differentiation (Nei genetic distances) were computed from the allelic frequency data. Sample sizes were quite small in many cases, and unfortunately, Nei's recent (1978) method for correcting estimates of genetic distance and variability for the sampling errors associated with small sample sizes was not used. Average heterozygosity was found to be 0.043, similar to calculations from other studies of passerine birds, and of the same magnitude as that found in many other vertebrates.

Average genetic distances were 0.056 among congeners, and 0.175 among genera of these parulids. These distances are small compared to those among the cricetine rodents of "comparable taxonomic level." Similar results have been observed and discussed in the literature before, and various suggestions have been offered to explain this discrepancy between genetic distances in birds and other taxa. These include: (1) differences in rates of molecular evolution among taxa (in particular, a slowdown in birds), (2) the possibility that avian taxa of a given level are more recent in origin than are those of other groups, (3) non-avian taxa may be less well studied, and, consequently, overlumped (conversely, birds may be oversplit), and (4) the electrophoresis has been done in different laboratories, and interlab comparisons might be meaningless. This study, along with work currently in progress at the Museum of Vertebrate Zoology, strongly suggests that the last possibility is not the cause. Here, for example, rodents and parulid warblers were processed by the same persons using the same techniques. As these authors point out, distinguishing among the other hypotheses will be difficult.—George F. Barrowclough.

72. Do the chromosomes of the kiwi provide evidence for a monophyletic origin of the ratites? L. E. M. de Boer. 1980. Nature 287:84–85.—The chromosomes of one of the kiwis, *Apteryx australis,* were examined, and the karyotype was found to be identical to that of the Emu and a cassowary. The karyotypes of the Ostrich (*Struthio camelus*) and rheas also have been described previously. Five of these 6 taxa share a feature unique in birds (but also found in crocodilians and some other reptiles), the absence of a distinctly heteromorphic pair of sex chromosomes (i.e., the large Z and small W of most birds). Darwin's Rhea (*Pterocnemia pennata*) may have the ZW pattern. In addition, the total number of chromosomes (diploid number) appears to be 80 for 5 of these 6 taxa, and possibly 82 in *Rhea.* Tinamous have not yet been studied adequately.

What, then, do these additional data on the chromosomes of a kiwi tell us about the phylogeny of the ratites? That is not clear. If by phylogeny we mean the branching pattern of their evolutionary tree, then it depends upon whether or not the traits found in the ratite karyotypes are primitive or derived. If primitive, as the crocodilian evidence suggests, then these additional data do not provide evidence for or against ratite monophyly. Thus the answer to the question posed in the title of the paper appears to be no. If, however, the ratites are monophyletic, as seems likely based on other data, then this new information from a kiwi is consistent with any of the various phylogenetic patterns recently proposed for the group.—George F. Barrowclough.

73. Evolution of clutch size in birds: adaptive radiation in relation to territory quality. G. Hogstedt. 1980. Science 210:1148–1150.—By enlarging or reducing Magpie (*Pica pica*) broods in Sweden, the author concludes that each female usually lays a clutch of optimal size for her territory. About 85% of the within-year variation in clutch size is associated with differences among territories. It appears that adult survival is correlated with clutch and brood size and hence with territory quality. Colonial species which have a common feeding area show less variation in clutch size than those which hold exclusive breeding and foraging territories. This is shown to hold in such species as *Corvus monedula* and *Sturnus vulgaris*.—C. H. Blake.

74. Evolutionary genetics of birds II. Conservative protein evolution in North American sparrows and relatives. J. C. Avise, J. C. Patton, and C. F. Aquadro. 1980. Syst. Zool. 29:323–334.—Twelve species of emberizine and one cardueline finch were assayed for approximately 20 structural genetic loci using starch-gel electrophoresis. Sample sizes were small; in most cases the individuals came from TV tower kills. Genic heterozygosity was typical of other passerines, averaging 0.054. Genetic distances among species, genera, and families of these birds were of the same order of magnitude as have been found in other recent surveys of passerines, but were small by nonavian standards (an approximate factor of 5).

Phenetic and phylogenetic trees inferred from the genetic data provided a couple of surprises, including the placement of the Chestnut-collared Longspur (*Calcarius ornatus*) further from the rest of the emberizines than the single cardueline, the Purple Finch (*Carpodacus purpureus*). However, this result was not based on an analysis of shared derived characters, and more taxa and larger samples ought to be examined.—George F. Barrowclough.

FOOD AND FEEDING

(see also 19, 20, 26, 31, 32)

75. Habitats and feeding of the Auckland Island Banded Dotterel (*Charadrius bicinctus exilis* Falla 1978) in autumn. R. J. Pierce. 1980. Notornis 27:309–324.—The biology of this newly described subspecies was studied for 12 d during the non–breeding season at Enderby Island, Auckland Islands. The birds concentrated in a small area and fed largely near pool areas on wave-cut shelves. Amphipods were the predominant food, though a variety of other items were taken. Pierce estimates that the birds spend 15–20% of the daylight hours in feeding activities. Comparative data on energy budgets of other shorebirds are scanty.—J. R. Jehl, Jr.

76. Relative attractiveness of different foods at wild bird feeders. A. D. Geis. 1980. U.S. Fish & Wildl. Serv. Spec. Sci. Rep. Wildl. No. 233, 11 p.—This paper reports foods preferred by 19 bird species as they were observed for over 179,000 bird visits choosing from 16 food-types at specially designed experimental feeders in residential Maryland. Each bird species and food-type has its own section in the text and tables list the relative attractiveness, consumption, and cost of all food-types in some cases with respect to individual bird species. Many food-types found in wild bird foods were found unattractive: cracked corn, wheat, milo, peanut hearts, hulled oats, and rice. This report should serve as a useful guide to feeding proper foods to birds common at feeders.—Richard M. Zammuto.

SONGS AND VOCALIZATIONS

(see also 13, 23, 48, 50)

77. The Cowbird: reflections on development from an unlikely source. M. J. West, A. P. King, and D. H. Eastzer. 1981. Am. Sci. 69:56–66.—The young Brown-headed Cowbird (*Molothrus ater*) at independence deserts its fosterers and soon joins a group of its own species. It has been concluded that this requires a "closed" (i.e., innate) system of species' recognition which is genetically determined. It is concluded that the major component is vocal but attitudes and actions may play a part. Males raised in isolation from adult cowbirds develop a song which is essentially that of normally reared males, but which is more potent in releasing the copulatory response in females. Comparison of sonograms showed that the "interphrase unit" is louder in isolate than in normal males. It was shown by experimentally altered recordings that the deletion of this unit produced the greatest response decrement. Further experiments suggested that the potency of isolate males is related to their social dominance. It was further shown that males retained an ability to modify their song, at least in the direction of lower potency. It was further shown that the song of *M. a. obscurus* contains a "mid-song element" lacking in *M. a. ater* and that females choose the appropriate subspecies. It therefore follows that beyond species recognition, the behavior is not a "closed" system. The sonograms are not well reproduced.—C. H. Blake.

78. Song dialects as barriers to dispersal: a re-evaluation. L. Petrinovich, T. Patterson, and L. F. Baptista. 1981. Evolution 35:180–188; and **Response to "Song dialects as barriers to dispersal: a re-evaluation."** M. C. Baker and L. R. Mewaldt. 1981. Evolution 35:189–190.—What we have here is a spirited dialectic on the causes and consequences of dialects. Petrinovich et al. report on the relationship between dialects and dispersal they observed in an admittedly "unusual" population of White-crowned Sparrows (*Zonotrichia leucophrys*) in the city of San Francisco. They proceed to contrast their results with those of Baker and Mewaldt (Evolution 32:712–722, 1978) on the same species in the relatively undisturbed habitat of Point Reyes, 38 km away. They spend the bulk of their paper explaining why Baker and Mewaldt's data, analysis, and conclusion that cross-dialect dispersal was somehow inhibited at the boundary were questionable "due to an artifact of sampling method." They concluded that their birds dispersed more widely and more readily crossed dialect boundaries than would have been likely were Baker and Mewaldt correct. The considerable differences between study areas and populations might have produced different local dispersal patterns so that both camps could be right, but the conclusions of Petrinovich et al. appear inconsistent with their own data. Of 325 nestlings (this sample is inflated with 1979 birds that could not yet have been resighted as breeders) banded in the main Presidio (P) study area, 35 were resighted. Thirty-one (88%) definitely bred in P, 2 (6%) were seen "immediately south" of P in a putative San Francisco (SF) dialect area, while 2 (6%) had clearly dispersed into SF territory. Eleven of the 35 had dispersed out of the main study area. Seven of the 11 (out of 30 birds sighted) were observed on the 1.38 km transect within the P dialect. On the 2.375 km of transect in SF, 62 birds were sighted, with 2 of the P nestlings on the southern border of P, and 1 well east into SF. (In 1980, the east transect yielded another P nestling in SF, but the number of birds sighted was not reported.) Given the effort and sample size, the data are remarkably consistent with dialect constrained dispersal, as Baker and Mewaldt have predicted. As Baker and Mewaldt note in their response, there are a number of other problems with interpretations and conclusions of Petrinovich et al. Yet, they have raised interesting questions and focused renewed attention on an area that all parties agree is deserving of a heavy research effort.—William M. Shields.

79. Environmentally dependent sensitive periods for avian vocal learning. D. E. Kroodsma and R. Pickert. 1980. Nature 288:477–479.—Of 18 male nestling Marsh Wrens (*Cistothorus palustris*) collected in New York in early July and placed in sound isolation chambers, 10 were exposed to photoperiods simulating an early June hatching and 8 an early August hatching. Subsequent photoperiods matched natural ones, and each group was sub-divided into 3 80-d experience treatments: exposure to (1) 2 different Marsh Wren songs every 5 days (32 songs); (2) a different Marsh Wren song every 5 days (16 songs); (3) no songs. The following spring, during development of adult song, all birds were exposed daily to 12 additional songs. These experimental manipulations were designed to test the possible effects of photoperiod and amount of exposure to song on the timing of the sensitive period for song learning.

Photoperiodic effects were many: compared to "June" birds, "August" young molted and showed migratory restlessness sooner and for less time, did less singing of subsongs, and produced rambling, rudimentary subsongs. Both "August" and "June" groups showed similar sensitive periods for song learning, though in spring 4 "August" birds imitated songs from spring training tapes, while no "June" males did. Two of these "spring learners" were from the "no song" treatment group and 2 from the 1 song per 5 days group. Thus late season ("August") daylength conditions apparently enhanced the tendency to imitate spring songs, and this effect was related to the amount of song exposure the chicks received in their hatching year. Males hearing one song per 5 days acquired autumn repertoires more slowly than those hearing more songs, and birds with no exposure to song in their hatching year were the last to develop final spring song: delayed song development resulting from limited prior exposure.

The authors speculate that the "late season" photoperiods produce low testosterone levels and/or reduced singing, which are important mediating factors in delaying the sensitive period and further that the timing of vocal learning has co-evolved with juvenile dispersal strategies (late season hatchlings may disperse farther than early ones), site philopatry, and habitat stability, etc.

These results are interesting and provocative, and stimulate one to learn more about avian song dialects and their influences on reproductive strategies and success. The possible association of the timing of song learning with dispersal patterns leads to considerations of possible sex differences in juvenile and adult dispersal and their influences on vocal reproductive strategies.—W. A. Montevecchi.

80. The change of song pattern of the Great Tit *Parus major* in Finland and Sweden. [Die Veränderung der Gesangmelodie der Kohlmeise *Parus major* in Finnland und Schweden.] G. Bergman. 1980. Ornis Fenn. 57:97–111.—According to earlier published descriptions, Great Tits in Finland and in much of Sweden sang mainly 3-syllable songs before 1950. In the late 1970's the author noticed mainly 2-syllable songs, and he solicited observations from local ornithologists to compile a map of the local distribution of different 2-syllable songs and 3-syllable songs. The recent observations show 2-syllable songs are now more common. Bergman suggests that tits in modern times have learned a new song tradition, that the shorter song is easier to learn, being shorter, and that it is easier to hear in its environment, which has changed towards urbanization. Also, urbanization has been accompanied by the loss of Coal Tits (*Parus ater*), and Bergman suggests that the Great Tits no longer have to have a long song to contrast with the other species. Bergman also argues that the autumn movement of tits, which he reviews, tends to spread the 2-syllable pattern into the less urban areas, and conversely the 3-syllable phrase is reintroduced into areas by migrant birds that learned their songs elsewhere.

I find the study unsatisfactory, and it certainly is not a documented case of cultural evolution or of character divergence. There is no mention of possible seasonal variation in songs. More importantly, there are no audiospectrograms of songs either before or after 1970, and there are no references to any tape recordings of local songs. Without some kind of electronic recording it is not possible to compare the details of bird song. What one person hears or remembers as 2 "syllables" may be more complex. It is certainly possible that the species learns its local songs, because most songbirds do. No published studies of song learning in Great Tits are cited in the paper, but Bergman mentions some unpublished results by R. Eyckerman of song learning.—R. B. Payne.

PHOTOGRAPHY AND RECORDINGS

(see 13, 51, 86)

BOOKS AND MONOGRAPHS

81. Birds of The Gambia. M. E. J. Gore. 1981. British Ornithologists' Union Checklist No. 3. 130 p. £9.—The Gambia, an independent country within the British Commonwealth since 1965, is bounded on 3 sides by Senegal on the West African coast. It is a long, narrow country that is divided lengthwise by its outstanding geographical feature, the River Gambia. The highest elevation in the country is no more than 90 m above sea level. The vegetation ranges from mangrove swamps near the river to savannah woodlands and grassy floodplains inland. The Atlantic ocean buffers temperature changes near the coast, but minimum and maximum mean temperatures inland vary between 15.6 and 40.9°C, respectively. One rainy season per year brings an average of 1100 mm of moisture and occurs between mid-June and mid-November.

The presence of the River Gambia in this otherwise arid portion of Africa results in a rich and dense avifauna. This book updates past checklists and incorporates new observations by members of the newly formed Ornithological Society of The Gambia. Since travel inland and upriver is still difficult, it is certain that more species will be added to this list. A total of 489 species of 73 families is documented. At least 194 of these breed in The Gambia, but observations are totally lacking on at least 48 other species that are probably resident breeders. Breeding for most species occurs during and after the rainy season. This country does not appear to be an important wintering ground for transequatorial migrants, but many Palearctic migrants, especially waders, pass through. The checklist is amply supplemented with descriptions of habitats, breeding schedules, and an extensive bibliography. This book will prove a valuable addition to the libraries not only of ornithologists but also of biogeographers, systematists, and naturalists. It also should help stimulate travel to this country and further study of its rich avifauna.—Cynthia Carey.

82. Development of behavior in the Golden Eagle. D. H. Ellis. 1979. Wildl. Monogr. 70:1–94.—This monograph summarizes 5 years of field research on 7 eaglets in western Montana with over 150 eaglet observation days. The 7 eaglets (6 males:1 female) were closely followed from hatching to fledging and most of the behavioral data were mechanically recorded with a keyboard-chart recorder system. In addition, these field data were supplemented with observations on several other wild and captive eagles. Physical development of the eaglets was monitored while 82 ethons (units of behavior of more than one type) were described. Most of the nestling ethons were followed quantitatively until fledging.

Trends in the development of eaglet behavior were obtained by collating data on performance frequency and behavioral descriptions. The development and maintenance of eagle ethons were illustrated by 6 basic sigmoid curves which were generalized from the curves for the frequency of performance of all relevant ethons.

The author views behavioral ontogeny as an array of overlapping processes rather than as a series of discrete stages as earlier suggested by Nice (Trans. Linn. Soc. N.Y. 8:1–211, 1962). The data on physical development, parental care, ethon performance levels, and appearance of ethons in the Golden Eagle substantiates the author's viewpoint.—J. M. Wunderle, Jr.

83. The British Ornithologists' Guide to Bird Life. J. Flegg. 1980. Blanchard Press, Dorset, England. 324 p. $27.50.—This **Ornithologists' Guide** is designed to bridge the gap between pocket field guides with brief descriptions and illustrations that help solely with identification and the multi-volume references that deal in great detail with each species. It is a book for beginners. The layout of the drawings reminds me of a children's book, flat and crowded; however, the drawings themselves are adequate and attractive. I would also include it as recommended reading for bird watchers planning a trip to England or northern Europe. Helpful characteristics are the short notes on typical behavior and morphology that aid in field identification. Three hundred species are covered in the book. The copy includes notes on field identification, calls, breeding, food, and status. I will include my copy in my traveling reference collection on my next trip to England.—Patricia Adair Gowaty.

84. Bulletin of the British Ornithologists' Club. J. F. Monk, ed. 1980. 100:1–132.—The sense of history held by ornithologists rivals that of physicists. Seldom has the history of ornithology been so enjoyably presented as in this special issue of the 100th volume of the Bulletin. Notes on the history of the British Ornithologists' Club and reminiscences by members may represent parochial issues; however, as a student of animal behavior I was particularly interested in W. H. Thorpe's notes on the early history of the B.O.C., which was founded to enable members of the British Ornithologists' Union to meet more frequently than once a year. By far, however, the major contributions of this volume are the zoogeographical reviews of developments in ornithology during the past 50 yr. I recommend this volume to anyone who is interested in where ornithology has been and where it is going.—Patricia Adair Gowaty.

85. Population dynamics: alternative models. B. G. Murray, Jr. 1979. Academic Press, New York. 212 p. $21.00.—The writing of a book that will be found satisfactory throughout—let alone excellent—is probably an impossible task. Perhaps the most an author can hope for is that at least large portions of his effort meet with praise. I am pleased to suggest that, in my view at least, much of Murray's book is deserving of both praise and thoughtful reading. In particular, although Murray explicitly denies it as a purpose (p. 3), his "sorting out" of earlier theories relating to population dynamics is a major strength of his short book. His critical approach to synthesizing earlier references is exemplary. The reader is treated to delightful synoptic reviews of such areas as life table functions, limiting factors to population growth, the evolution of life history patterns and Lack's hypothesis, r- and K-selection, prudent predators and maximum sutainable yield, and competitive exclusion. Impressive numbers of references are included along with Murray's critical bottom line assessments of both the heuristic and predictive value of each of these topics. Murray's section on "Population Consequences of Natural Selection" should be required reading for those wishing to interpret for themselves Wade's experiments on group selection (e.g., Evolution 31:134–153, 1977).

On the other hand, when Murray presents his own theory of population dynamics, he can do no better than to generate "predictions that appear to be consistent with many observations collected in the field and laboratory." Although being able to make such a statement is clearly preferable to being unable, many of the data cited are not inconsistent with alternative hypotheses as well. Data permitting the rejection of one or another of the alternatives apparently do not exist, and, distressingly, may never exist in some instances because of the high degree of similarity of predictions of the various models (e.g., Figures 3.7 A–D). An attitude of abandonment of hope is easily adopted. In the end, Murray's new models predict little that is, to my mind, either profoundly new or non-intuitive. His new treatments do, however, reemphasize both what areas are most data deficient and just how far ecologists are from understanding "the central topic of ecological interest in the 1950s . . . ."

Beyond this certain intractability of the subject matter, there are several additional problems that I, as a reviewer, found annoying. First, as an example of self-inconsistency, Murray suggests that some good early theories were ignored because they were associated with group selection ideas, yet he later unequivocally states "natural selection selects individuals" (p. 179). Second is the problem of clarity of expression. Murray suggests earlier authors may well have had some of his same models, but that they were unable to express them well. I fear that Murray's words did, at times, fail him as well. Although he attempts to define density-dependent factors from the start, the wording of his definition is ambiguous enough that different people can arrive at different understandings of what phenomena would qualify. Finally, there is the matter of redundancy. For example, on 3 different occasions (p. 80, 105, and 121) the reader is told of Cole's conclusion that "adding a single egg to the clutch of an individual that reproduces once and dies" is as good as immortality.

The preceding carpings are not meant to overpower my positive sentiments about the book. Murray successfully points out forms of data that are most important to gather—age-specific birth and death rates—and emphasizes the need to gather these in conjunction with full information on the space, time, food, and predation limitations existing on the population in order for any rigorous testing of models to occur. Let the work begin.—A. John Gatz, Jr.

86. The Great Gray Owl—Phantom of the northern forest. R. W. Nero with photographs by R. R. Taylor. 1980. Smithsonian Institution Press, Washington, D.C. $17.50.—When a scientist who appreciates the beauty and intricacies of nature teams up with a wildlife photographer *par excellence* and they take to unlocking the secrets of an owl species which is rarer than people in the northern boreal forest, something exciting has to result. When the scientist is gifted with the ability to "paint verbal pictures" and has a conscience, and the photographer is both an artist and a craftsman who knows his subjects, *Strix nebulosa* has a couple of very strong allies. This volume is a rare combination of biological information and beautiful informative photographs that is likely to make it a biologists' coffee table item with pages well worn from use. I must admit that it does leave one large question—does a biologist need a fishing license to band Great-Grays in Manitoba?! This work must be read to be appreciated.—Richard J. Clark.

NOTES AND NEWS

WINNERS OF THE 1981 E. ALEXANDER BERGSTROM MEMORIAL RESEARCH FUND

The Northeastern Bird Banding Association is proud to announce the recipients of 1981 awards from the E. Alexander Bergstrom Memorial Research Fund:

JENNIFER SHOPLAND DILLON—$245.50—The Effect of Mixed-species Flocks on the Foraging Success and Interspecific Interactions of Two Species of Territorial Warblers (Parulidae). (University of Chicago).

ROBERT R. COHEN—$250.00—Population Dynamics and Demography of the Tree Swallow in Colorado. (Metropolitan State College, Colorado).

RICHARD HARRIS PODOLSKY—$175.00—Proximate Factors Affecting Colony Formation in Leach's Storm Petrel (*Oceanodroma leucorhoa*). (University of Michigan).

ROGER L. BOYD—$164.50—Population Movements of Snowy Plovers. (Baker University, Kansas).

CHRISTOPHER W. SWARTH—$165.00—Feeding Ecology of the Snowy Plover (*Charadrius alexandrinus*) at Mono Lake, California. (California State University, Hayward).

Northeastern Bird Banding Association Research Grant.—The E. Alexander Bergstrom Memorial Research Fund of the Northeastern Bird Banding Association, Inc., promotes research on birds. Small grants, usually not exceeding $200, are available to cover expenses but not salaries or overhead expenses to institutions. Further details and application forms may be obtained from Susan Roney Drennan, Chairman, NEBBA Research Committee, *American Birds*, 950 Third Ave., New York, NY 10022. The deadline for filing completed applications is 15 February 1982.

EBBA and WBBA Research Grants.—The Eastern Bird Banding Association and the Western Bird Banding Association are each offering a research grant of $250 in aid of research using bird banding techniques or bird banding data. Applicants should submit a resumé of his or her banding or ornithological background, the project plan, and a budget to the joint selection committee chairman: Robert C. Leberman, Powdermill Nature Reserve, Star Route South, Rector, PA 15677. No formal application forms are available, and the amount requested should not exceed $250. The deadline for receipt of applications is 15 March 1982.

Frank M. Chapman Fund.—The Frank M. Chapman Memorial Fund gives grants in aid of ornithological research and also post-doctoral fellowships. While there is no restriction on who may apply, the Committee particularly welcomes and favors applications from graduate students; projects in game management and the medical sciences are seldom funded. Applications are due on 15 September and 15 February. Information on form and content of applications may be obtained from the Frank M. Chapman Memorial Fund Committee, The American Museum of Natural History, Central Park West at 79th Street, New York, N.Y. 10024.