RECENT LITERATURE

Edited by Edward H. Burtt, Jr.

NEW JOURNAL

1. Birds, etc. 1:1–24. Published monthly by Bird Watchers International, 11 Pleasant Hill Rd., Owings Mills, MD 21117.—**Birds, etc.** contains a light blend of personal experiences, bird-watching tips, and conservation-oriented political information. The format is that of a newspaper, although the print is large and the paper more durable than typical newsprint. Most of the articles are reprinted from newspapers, raising the possibility that errors in the original articles will be compounded. However, I am not aware of any substantive errors in this first issue, although there were occasional typographical errors.—Edward H. Burtt, Jr.

BANDING AND LONGEVITY

(see also 15)

2. New Zealand Dotterel (*Charadrius obscurus*)—an endangered species? S. M. Reed. 1980. Notornis 28:129–132.—Thorough banding studies of this endemic plover have revealed good evidence for site tenacity, mate-faithfulness, and longevity (maximum 31 years). The total population is estimated at 1400 birds, which the author considers sufficiently low to count the species as endangered, despite its broad range.—J. R. Jehl, Jr.

3. The distribution, fall migration routes, and survival of Ross's geese. R. Melinchuk and J. P. Ryder. 1980. Wildfowl 31:161–171.—This paper reports and diagrams recovery localities of Ross' Geese (*Chen rossii*) banded in Northwest Territories, Canada. Of 3957 geese banded, 604 were recovered throughout Canada, the United States, and Mexico. A model indicates that 3% of the adults and 5% of the young banded in a given year will be shot the next, a low value when compared to harvest rates of other banded geese. On average, adult survival rate is 84% and that of young 47%. Possible fall migration routes are diagramed and discussed in light of recovery distributions.—Richard M. Zammuto.

MIGRATION, ORIENTATION, AND HOMING

(see also 45, 60, 72)

4. Weight, fat class, and wing measurements of Golden-crowned Kinglets during migration. K. W. Prescott. 1980. Inland Bird Banding 52:41–48.—This paper reports weights, fat deposits, and wing lengths for 222 migrating Golden-crowned Kinglets (*Regulus satrapa*) over a 6-year period in New Jersey. Juveniles weighed significantly more and displayed a wider range of weights than adults. Males weighed significantly more and had significantly longer wings than females within both juvenile and adult age groups. Wing length was positively correlated with body weight in adults.

The data support the Murray-Jehl (Bird-Banding 35:253–263, 1964) hypothesis that coastal migrants expend more fat and are thus lighter in weight than inland migrants, but the author's analysis (p. 44) is not statistically significant ($P = .34$). I calculated the convincing statistic ($\chi^2 = 31.3$, $P < .001$) using contingency analysis on data in Table 3. This result shows that inland birds are significantly fatter than coastal birds.—Richard M. Zammuto.

5. Factors influencing the spring arrival of the Brambling *Fringilla montifringilla* in northern Finland. A. Mikkonen. 1981. Ornis Fenn. 58:78–82.—The mean date of arrival at Utajärvi was 3 May. Multiple regression and multiple correlation analyses were carried out using local environmental variables as the factors explaining the annual variation in mean arrival time. Air temperature, snow cover, and conifer seed crop explained nearly all of the annual variation. However, variables experienced by the birds on their

wintering grounds and passage routes were untested and may have had some effect.—R. B. Payne.

6. Pigeons with a deficient sun compass use the magnetic compass. R. Wiltschko, D. Nohr, and W. Wiltschko. 1981. Science 214:343–345.—Previous studies have shown that young pigeons allowed to experience only a portion of the daytime sky, were able to orient homeward when released during a time of day they had not experienced. Homeward orientation at unfamiliar times was insensitive to clockshift manipulations, whereas orientation was sensitive to clockshifts at times previously experienced. This result suggested that naive pigeons were not using the sun when tested at new times and thus, some alternative cue must be used. The authors tested the hypothesis that the earth's magnetism was the alternative cue used. A group of pigeons was given experience with the sky for approximately half the day and tested for their homeward orientation under sunny skies during that portion of the day they had not experienced. These birds were divided into two groups: one carrying magnets that disrupted their magnetic field perception, the other without magnets. Birds without magnets oriented toward home; those with magnets oriented randomly. Hence, the magnetic compass was used during the daytime by naive pigeons and was available to these birds whether or not the sun compass had been established for that time. The important question now is whether any sun experience is necessary for the maturation of the pigeon's ability to use its magnetic compass (see review **9**).—Verner P. Bingman.

7. Relationships between migratory restlessness and migration in the Barred Warbler: an ecophysiological investigation. [Beziehungen zwischen Zugunruhe und Zug bei der Sperbergrasmucke *Sylvia nisoria*: eine okophysiologische Untersuchung.] P. Berthold. 1979. Vogelwarte 30:77–84 (German with English summary).—Barred Warblers breed in Europe and migrate to Africa, apparently passing around the Mediterranean on their route to East Africa. Berthold caged birds and observed their periods of migratory restlessness in summer and autumn. The pattern of activity under these conditions was for birds to enter restlessness earlier than in Garden Warblers (*S. borin*) and Sardinian Warblers (*S. melanocephala*) which migrate later (and to a much lesser extent in the second). Barred Warblers also tended to be active for a longer period, and Berthold relates this to their long migration route. However, the time involved was 150 days (the data are not broken down for individuals), much longer than the time of migration in the field. Berthold concludes that timing and intensity of nocturnal restlessness in laboratory conditions are genetically determined as are differences among species (see review **60**).—R. B. Payne.

8. Flight altitudes of migrating birds in NW Germany measured by radar. [Flughöhen ziehender Vögel in Nordwestdeutschland nach Radarmessungen.] J. Jellmann. 1979. Vogelwarte 30:118–134 (German with English summary).—The birds involved were mainly thrushes, starlings, and shorebirds. Because the wavelength of the heightfinder was 10 cm, birds smaller than 10 cm passed undetected. More than half of all echoes were found between 600 and 900 m. Only 1.5% of echoes were found at altitudes over 3000 m; the maximum detected height was 5500 m.

In the maritime conditions of the study, where humidity changes greatly from day to day, the altitude of bird flight seems to be limited by the altitude at which ice forms on the flying birds. On the days of the highest detected flight altitudes, local conditions at that level were frost-free.—R. B. Payne.

9. The effect of celestial cues on the ontogeny of non-visual orientation in the Garden Warbler (*Sylvia borin*). W. Wiltschko, E. Gwinner, and R. Wiltschko. 1980. Z. Tierpsychol. 53:1–8.—Birds handreared under the natural sky did not orient their autumnal migratory unrest in cages within a building, but those handreared indoors did orient southward. Sample sizes are large but the difference in orientation between the groups is very small: not evident to the eye at all, but substantiated only by statistical analysis. The authors conclude that indoor-reared birds use geomagnetic information whereas those reared under the natural sky come to depend upon celestial cues and hence are disoriented without them.—Jack P. Hailman.

POPULATION DYNAMICS

(see also 35, 50)

10. Clutch size and population stability in birds: a test of hypotheses. T. Slagsvold. 1981. Oecologia (Berl.) 49:213–217.—Most current theoretical models for evolution of reproductive characteristics suggest that large clutches are selectively advantageous in unstable populations. The applicability of these models to geographic variation in clutch size of passerine birds was tested. Several assumptions were implicit in this study and directly bear on the validity of the results: (1) populations are more unstable at the borders of the distribution of each species than in central areas, (2) breeding densities can be accurately predicted by the number of records of clutch size, (3) surveys of geographical variation can be accurately performed with as few as 3 records of clutch size per country, and (4) altitudinal variation in clutch size can be accurately determined with samples at only 2 altitudes. If the reader buys these assumptions, the conclusions of the paper are that the predictions are verified for geographical variation in clutch size in hole-nesting birds, but not in open-nesters or in birds breeding over altitudinal gradients.—Cynthia Carey.

NESTING AND REPRODUCTION

(see also 10, 20, 22, 27, 37, 59)

11. Analysis of weight lost by eggs of eleven species of birds during incubation. T. H. Manning. 1981. Can. Field-Nat. 95:63–68.—Eggs of 11 species of birds lost approximately 15% of their fresh weight during incubation, a figure comparable to weight loss of eggs in previously studied species. However, significant discrepancies exist between the present results and the results and theory of previous workers. Manning's discussion corrects some mathematical errors in previous work, thereby resolving one theoretical difference, but he fails to address the potential biological significance of the remaining discrepancies or of the interspecific differences evident in his own data.—Edward H. Burtt, Jr.

12. Nest-tree sharing by herons and cormorants in Montana. L. S. Thompson. 1981. Can. Field-Nat. 95:257–260.—Double-crested Cormorants (*Phalacrocorax auritus*) often nest in arboreal colonies of Great Blue Herons (*Ardea herodias*). Active heron colonies are relatively safe from predators, near one or more large bodies of water, and offer unused nests which allow some pairs of cormorants to begin breeding immediately. None of these suggested advantages are supported by data. Indeed, the existence of a nonrandom association between cormorants and herons, although plausible, is entirely without quantitative support. Thompson has made some interesting observations and he offers explanations with some insight. However, until he can offer data, the existence and biological significance of the heron-cormorant interaction will remain speculative.—Edward H. Burtt, Jr.

13. Incubation rhythm and behaviour of a Dotterel *Charadrius morinellus* nesting in Norway. A. O. M. Wilkie. 1981. Ornis Fenn. 58:11–20.—Incubation in the Dotterel is of interest in being confined to the male. In contrast to some other waders of high latitudes, this species is generally monogamous and the female is thought to lay but one clutch, smaller than that of most local waders. This field study documented times on and off the nest. The male spent 87.5% of his time on the nest. Time off for feeding varied threefold, from day to day, perhaps in relation to local food dispersion, though this was not shown. The attentiveness is similar to that of a female Pectoral Sandpiper (*Calidris melanotos*), female White-rumped Sandpiper (*C. fuscicollis*), and a male Sanderling (*C. alba*), all single-sex incubators at the nests observed. As the author notes, "the adaptive explanation of the Dotterel's single-sex (male-only) incubation strategy remains mysterious . . . ."—R. B. Payne.

14. The breeding success of the Jackdaw *Corvus monedula* in nesting cells. E. Antikainen. 1980. Ornis Fenn. 58:72–77.—Special nesting sites for Jackdaws were built into the Laitila Church and they were prevented from nesting in open-attic colonies. The

breeding success of these birds was compared with that of the more usual open-attic colonies in other local churches. Nesting success was higher in the nest cells, due to a combination of less territorial interference and the protection of these nests from interference and cannibalism by other Jackdaws.—R. B. Payne.

15. Studies on site tenacity, pair bond, and nestling survival in House Martins *Delichon urbica* in southwest Germany. [Untersuchungen zur Ortstreue, Paartreue und Überlebensrate nestjunger Vögel bei der Mehlschwalbe *Delichon urbica* in Oberschwaben.] 1979. Vogelwarte 30:107–117 (German with English summary).—House Martins nesting in artificial nest boxes were banded as nestlings from 1974 through 1979, and adults were caught at the nest boxes in later years. In a 200 km^2 study, local returns and local dispersal were determined with good sample sizes (thousands of birds were banded, and 198 young were found nesting in a later year).

Males were more likely to return to their birthplace, with 11 of 68 females and 73 of 125 males settling in the same village where they were born. The mean birth-to-nesting dispersal distance was significantly greater for females than for males. Birds born later in the season were more likely to settle at a greater distance.

Both sexes were more likely to change the nest site, the colony, or the village after a failed first nesting than after a successful first nesting. When the first nesting was successful, the females were more likely to change the nest, colony, or village than were the males.

The pair bond was more likely to persist for a second nesting if the first nest was successful than if it failed. The pair bond was not continuous from one year to the next, nor did the birds return often to the same nest box, though the instances of two birds returning to the same site might be due to a common attraction to the site rather than to each other.

Survival of nestlings decreased with the date of birth, and few young from second broods were recovered in a later year (12.5% recovery from first broods, 3.1% recovery from second broods).

This fine study owes much of its success to an intensive banding of local populations and to an intensive checking of the nesting sites for several years afterwards. Without checking several nesting areas within a rather large local study area it would have been impossible to distinguish between birds dying and dispersing. One reason for restricting the study to birds nesting in nest boxes is that it is impossible to band the young without damaging the nest in most other nest sites—BTO banders, for example, leave the "natural" nests alone.—R. B. Payne.

16. The reaction of Great Tits (*Parus major*) to experimentally altered broods. [Über die Reaktion von Kohlmeisen (*Parus major*) auf experimentell veränderte Brutsituationen.] W. Winkel. 1979. Vogelwarte 30:138–142 (German with English summary).—Nestlings were exchanged for eggs in two cases, and eggs were exchanged for young in two others. The behavior of the parents was recorded automatically. Three succeeded; in the fourth, the parents did not care for the 3 day-old nestlings. In a series of other experiments involving exchange of eggs at different stages of incubation, the parents adjusted to the changed conditions, incubating longer than normal, or switching to feeding behavior when the eggs hatched ahead of schedule for the nest.—R. B. Payne.

17. Causal and functional aspects of brood distribution in Sand Martins (*Riparia riparia* L.). [Kausale und funktionale Aspekte der Verteilung von Uferschwalbenbruten.] O. Sieber. 1980. Z. Tierpsychol. 52:19–56.—Males arrive in swarms and dig several burrows in sandy cliffs, beginning from near the top. Sieber found several factors influencing site-selection, including social aspects (birds dug near models set out on the cliff). There is some switching of mates between successive broods (see review **15**), and the second brood in new pairs tends to be reared in the male's previous burrow. Predation by a marten was greater in burrows lower on the cliff, and breeding success was higher in longer cavities. Colonies have synchronized breeding, and local groups (sub-colonies) are even more synchronized; the greater the synchrony in local groups, the higher the nesting success. This is a fine, long report with much quantitative data.—Jack P. Hailman.

BEHAVIOR

(see also 13, 15, 38, 67, 68, 69)

18. Ongoing behaviour and startle responses of chicks. R. C. Forrester and D. M. Broom. 1980. Behaviour 73:51–63.—The subjects were White Leghorn/Light Sussex crosses of domestic fowl (*G. domesticus*). The objective was to see how the ongoing behavior of 6-day-old chicks influenced their response to a novel stimulus (turning on a light bulb). Most chicks stopped ongoing activity and fixated the bulb. If they had been active (e.g., walking), they often showed fleeing, but if they had been inactive (e.g., preening) they were more likely to crouch and freeze in place.—Jack P. Hailman.

19. The imminence of behavioural change and startle responses of chicks. A. D. Culshaw and D. M. Broom. 1980. Behaviour 73:64–76.—Using the same paradigm as Forrester and Broom (review no. **18**), the objective in this study was to see differences between chicks interrupted at the beginning and end of a bout of activity such as feeding or preening. Chicks were more startled by turning on the light bulb near the end of a bout than near the beginning.—Jack P. Hailman.

20. The behavioural state during climax (hatching) in the domestic fowl (*Gallus domesticus*). W. L. Bakhuis and H. L. M. G. Bour. 1980. Behaviour 73:77–105.—Paradoxical sleep is the term used for a physiological state inferred from electrical recordings, and previous literature suggested that this state was involved in hatching. However, by the use of drugs (melatonin and amphetamine) and temperature, it was found that hatching is not temporally correlated with paradoxical sleep; rather, hatching is related to wakefulness of the chick.—Jack P. Hailman.

21. Territorial behavior of a blackbird: mechanisms of site-dependent dominance. R. H. Wiley and M. S. Wiley. 1980. Behaviour 73:130–154.—The Yellow-hooded Blackbird (*Agelaius icterocephalus*) was studied in 3 localities in northern South America. Advertisement was concentrated near the center of the territory, whereas aggressiveness toward intruders did not vary locally within the territory or according to the distance from the intruder. Changes in boundaries were usually preceded by use of an area before the male began to defend it against others.—Jack P. Hailman.

22. Variations and multiple functions of the advertising display of Western Grebes. G. L. Nuechterlein. 1981. Behaviour 76:289–317.—The advertising behavior of Western Grebes (*Aechmophorus occidentalis*) was studied at 2 sites on Lake Manitoba (1973–1975, 1976–1979), and single sites in Utah (1978), Oregon, and California (1978–1979). Birds were marked individually and display calls were recorded on a tape recorder with a directional microphone. Advertising calls of different types were played to courting males and females.

Advertising calls were given by grebes in a variety of contexts. In a pre-nesting context, advertising provided a means of initial contact between unpaired birds of opposite sex. Males exhibited strong approach and courtship responses to playbacks of female calls. During pair formation, advertising maintained contact between mates; later in the season calling maintained contact between parents and chicks. Bouts of advertising tended to be longest in early spring and became shorter as the season progressed.

Characteristics of advertising calls used in species discrimination, sex recognition, color-phase recognition, individual recognition, and pairing status recognition were determined by playback experiments and spectrographic analysis. In addition, these methods were used to examine whether geographic variation in advertising calls exists in this species. Further playback experiments established that previous display performances and the pairing status of the receiver influence responsiveness of birds to advertising calls.

The advertising display of Western Grebes is an open signalling system which has evolved to fill many different functional roles. Functional flexibility is achieved by variable signal form and variable contexts. Variability within a display provides the opportunity to convey subtle gradations in signal meaning.

This paper provides a clear and thorough examination of the components of a social display through playback experiments involving both males and females, a relatively new

approach to studies of vocalization. This is a valuable contribution to the concept of variation in display performances. The demonstration of the flexible nature of behavior may be readily extended to many observational studies.—Lise A. Hanners.

23. A time-activity budget for breeding Mallards (*Anas platyrhynchos*) in Manitoba. R. D. Titman. 1981. Can. Field-Nat. 95:266–271.—Broadly defined behavioral categories limit the precision of this study in which there are no surprises. Females spent a larger proportion of their non-incubating time foraging than did males. The data do not permit a comparison of absolute foraging times. This is unfortunate as both sexes lose weight during the breeding season, thus detailed comparison of energy intake would be interesting.—Edward H. Burtt, Jr.

24. The influence of object type and early experience on the discrimination ability of domestic chickens (*Gallus domesticus*). [Der Einfluss von Objektart und früher Erfahrung auf die Diskriminationsleistungen von Haushuhern.] B. Zoeke, K-P. Althoff, P. Judt, and U. Krebs. 1980. Z. Tierpsychol. 52:149–170 (German with English summary).—This is an unbelievably complicated set of experiments on visual discrimination, with the procedure laid out in admirable detail. Newly hatched chicks from two breeds (New Hampshire and Hubbard) were reared with wooden eggs, wooden cubes, in isolation, or in semi-natural "enriched" environments. Results from the learning experiments using the eggs and cubes as stimuli showed that rearing experience had no effect on the speed of learning, but discrimination of cubes is faster than that of eggs. The authors make a case for a subtle rearing effect on certain birds in a generalization test. The sample sizes are small (5 birds/breed in each group).—Jack P. Hailman.

ECOLOGY

(see also 5, 12, 32, 61, 64)

25. Oystercatcher counts at roosts and at feeding grounds. J. D. Goss-Custard. 1981. Br. Birds 74:197–199.—High water counts of waders are used to evaluate the importance of particular estuaries as winter feeding areas and to relate bird densities to the abundance of food in different estuaries. These studies are based on the assumption that counts of waders made at roosts at high water show the numbers feeding on adjacent intertidal areas at low water. This study examined the correspondence of assumption with fact by counting Oystercatchers (*Haematopus ostralegus*) at high and low water on two estuaries. In general the correspondence was extremely close: at one estuary the high water count deviated from the low water one by only 6% on average.—Patricia Adair Gowaty.

26. A test of three hypotheses for latitudinal segregation of the sexes in wintering birds. J. P. Myers. 1981. Can. J. Zool. 59:1527–1534.—This article synthesizes and expands present ideas about sexual differences in overwintering distribution of birds. Two of the three existing hypotheses on this subject make their predictions based on the existence of sexual dimorphism. These two derive from consideration of intersexual competition and physiological tolerances respectively. The third existing hypothesis deals with the intrasexual advantage of arriving at the breeding site first. Myers reports extensively on the Sanderling (*Calidris alba*) and Red Phalarope (*Phalaropus fulicarius*) and less extensively on 3 other sandpiper species. Myers' principal species present some interesting possibilities relative to the hypotheses just mentioned in that (1) the females are larger than the males and (2) both sexes arrive at the breeding ground simultaneously. As it turned out, neither species showed any sexual differentiation in overwintering distribution; hence, existing hypotheses based on sexual dimorphism seem not to hold. Myers' data were, however, consistent with the hypothesis that intrasexual competition will lead to both sexes returning to the breeding grounds as soon as resources there permit. Further interpretation of his results allowed Myers to generate additional predictions as to how the social system on the breeding grounds could also be used to predict sexual differences in overwintering location.—A. John Gatz, Jr.

27. Loss of mass in breeding wrens: stress or adaptation? L. A. Freed. 1981. Ecology 62:1179–1186.—Life history strategists take note: Freed's fascinating study calls into doubt one line of evidence for the standard assumption that reproduction at one time jeopardizes reproduction at a later time. The loss in mass frequently observed in breeding females between their completion of egg laying and the fledging of their young has commonly been interpreted to represent stress on the female, stress that could potentially be associated with an increased probability of mortality. In the case of House Wrens (*Troglodytes aedon*), however, Freed's careful documentation of just when the losses in mass actually occur suggests instead that the losses reflect only regression of the ovary and oviducts, not stress. For example, the 13% of body mass lost by females is lost before, not during, the maximally stressful time of feeding 10–16-day-old hatchlings. In fact, half of the loss in body mass occurred before the eggs hatched. Furthermore, brood size had no effect on the magnitude of loss in mass. Freed suggests that the mass reduction in females represents a means of significantly reducing the power required to maintain flight (23% power reduction for a 13% mass reduction) during the period of most intense feeding. Additional support is offered for this explanation by the facts that (1) female House Wrens that produce a second brood regain the mass lost after their first offspring fledge only to lose it again during the second incubation period, and (2) males feeding a brood deserted by the female do not show significant losses in mass even though foraging at similar rates as females. While one should not hasten to conclude that reproduction is risk-free relative to later mortality, in this case at least, the risks are not to be identified by studying losses in body mass.—A. John Gatz, Jr.

28. Why foraging birds in trees should climb and hop upwards rather than downwards. R. A. Norberg. 1981. Ibis 123:281–288.—This paper argues that it is energetically cheaper for a bird to forage by climbing a tree and flying downward to the next rather than the reverse. This assertion is based on several assumptions, such as the proportion of chemical power input that is converted into mechanical power output is the same for flying, hopping, and climbing. This may prove true for horizontal locomotion, but may not be true for vertical movement. The equations are not used to calculate results; therefore, assessment of the relative expenses of the two forms of foraging patterns is not possible. Nevertheless, the author feels that the relative cheapness of the climb-upwards-fly-downwards was the selective factor for the evolution of the foraging pattern of woodpeckers and treecreepers.—Cynthia Carey.

29. Ecological separation of the *Acrocephalus* warblers in southern France as found in food studies. [Ökologische Sonderung der Rohrsänger Südfrankreichs aufgrund von Nahrungsstudien.] C. Bussman. 1979. Vogelwarte 30:84–101 (German with English summary).—Great Reed Warblers (*A. arundinaceus*), Reed Warblers (*A. scirpaceus*), and Moustached Warblers (*A. melapogon*) were studied by placing a collar around the neck of the nestlings and identifying and counting food brought to the young in the nest. Great Reed Warblers brought longer, heavier, and more total food per trip than did the other 2 species; they also brought fewer items per trip. Reed and Moustached warblers were not different from each other in these measures. Great Reed Warblers often fed off their territories, whereas Reed and Moustached warblers fed almost entirely on their territories. Great Reed Warblers were generalists in foraging location, Reed Warblers fed mainly on flying or just-emerged insects in the vegetation, and Moustached Warblers fed mainly on newly emerged insects near the water surface or on insects and fishes below the surface.

Food items were identified, or when identification was not possible, were at least distinguished by morphotypes, and the frequency of each item was tallied for each species. The 3 warblers each had some overlap and some area of food space where they did not overlap. The amount of overlap is compared most graphically in a single Ven diagram. It appears that each warbler has more prey species that do not overlap than prey species that do, and that the proportion of overlap is about the same in all three pairwise comparisons. This result is not what I would have expected given the observations on size of prey items alone, but it is consistent with the multidimensional uniqueness of the niche of each species in terms of both size and foraging microhabitat (and with some taxonomic specialization of each species, though this may reflect the microhabitat). Bussman con-

cludes that the specializations in prey size allow sympatry of the warblers with only minimal competition for food, but doesn't develop any a priori hypothesis about what degree of overlap would show competition, or would make competitive exclusion a consequence.—R. B. Payne.

30. Comparative use of woody plantings by nongame birds in Kansas. R. J. Robel and N. G. Browning. 1981. Wildl. Soc. Bull. 9:141–148.—This paper explains avian use of a specially planted 0.8 ha stand of 3–6-year-old woody plants in Kansas. Each of 33 species was planted in a 25 m long row separated by a 5 m space between each row. Bird activity was observed in the stand for one year. Multiflora rose (*Rosa multiflora* and *R. m.* × *rugosa*), Manchu cherry (*Prunus tomentosa*), and cardinal autumnolive (*Elaeagnus umbellata*) rows were used more than 55% (29, 15, and 11% respectively) of the time by 44 bird species. These plant species as well as Sargent crabapple (*Malus sargenti*) and silver buffaloberry (*Shepherdia argentea*) are recommended plantings for increasing songbird habitats throughout the Midwest. Seasonal use with respect to insectivorous and granivorous bird species is tabulated for each plant species.—Richard M. Zammuto.

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

(see also 3, 30)

31. Distribution and harvest of Canada Geese (*Branta canadensis*) in southern Manitoba prior to development of Oak Hammock Marsh. D. G. Raveling and C. C. Dixon. 1981. Can. Field-Nat. 95:276–280.—*B. c. maxima* predominated among geese killed in the area between lakes Winnipeg and Manitoba and in southeast and west-central Manitoba, whereas *B. c. interior* and a similar, but unidentifiable, subspecies predominated among geese killed near Oak Hammock Marsh, and *B. c. hutchinsii* predominated in the kill from Red River, Delta, and southwestern Manitoba. These data strongly support the author's contention that management practices must recognize the different requirements and problems of different populations. This will be especially important where populations differ greatly as in Canada Geese.—Edward H. Burtt, Jr.

32. Seasonal and daily use of plant communities by Sharp-tailed Grouse (*Pedioecetes phasianellus*) in the parklands of Alberta. D. L. J. Moyles. 1981. Can. Field-Nat. 95:287–291.—Data suggest that a mosaic of plant communities, especially grassland and grassland-shrub mixture with extensive edge, provides optimum habitat for Sharp-tailed Grouse. Increases in the extent and number of aspen copses reduce the grouse population apparently by reducing the number of sites suitable for display arenas. The paper makes no management recommendations, but provides an extensive data base from which decisions can be made.—Edward H. Burtt, Jr.

33. The impact of predation by Red-winged Blackbirds on European corn borer populations. B. E. Bendell, P. J. Weatherhead, and R. K. Stewart. 1981. Can. J. Zool. 59:1535–1538.—The European corn borer (*Ostrinia nubilalis*) destroys corn; Red-winged Blackbirds (*Agelaius phoeniceus*) eat corn borers. So farmers should try to attract these birds to their cornfields, right? Wrong! Bendell et al. found that Red-winged Blackbirds destroy enough lepidopteran larvae to yield a significant positive correlation between distance from the roost and density of borers. However, the amount of corn saved from destruction by the borers through the blackbird predation was only one fifth of the amount of corn estimated to be eaten by the birds themselves. In this case, Red-winged Blackbirds are not cost-effective biological control agents.—A. John Gatz, Jr.

34. Dispersal of limber pine seed by Clark's Nutcracker. R. M. Lanner and S. B. Vander Wall. 1980. J. For. 78:637–639.—Limber pine (*Pinus flexilis*) has large wingless seeds incapable of wind dispersal. Clark's Nutcrackers (*Nucifraga columbiana*) were reported carrying such seeds as far as 22 km. The seeds were buried in the ground for later use by the birds, but many seeds germinated after the birds failed to retrieve them. Burned-over areas were found to be thus restocked by the birds, and no other reliable dispersal agent of limber pine seed was found.

This paper provides a fine example of an area of research being shamefully neglected by ornithologists. What will it take to convince ornithologists that research such as this might reveal the importance of birds in the ecosystem and their many benefits to humans?—Paul A. Stewart.

35. Radiotelemetry studies of the Mourning Dove in Missouri. M. W. Sayre, T. S. Baskett, and K. C. Sadler. 1980. Missouri Department of Conservation, 17 pp.—The Mourning Dove (*Zenaida macroura*) is a game bird in many parts of the United States. Management and hunting regulations are based on population data gathered during the annual call count survey, a roadside count of doves seen or heard along more than 1000 32 km routes. Observers record the number of cooing males heard or seen during 3-min intervals at each of 20 stops spaced at 1.6 km intervals. Routes are censused once annually between 20 May and 10 June from ½ h before sunrise to 1½ h after sunrise. The call count survey is an operationally defined population index, but is it an accurate index? Sayre et al. found that unmated males cooed 20 times more than mated males, that males were 100 times more likely to coo on their territories than off their territories, and that the stage of the nesting cycle strongly affected the rate of cooing. Such variation suggests that the call count survey will be strongly affected by the ratio of mated to unmated males in the population and the stage in the nesting cycle on the day of the count, both of which can be expected to vary annually. The authors suggest that age ratio data from the fall harvest be used to clarify relationships among the call count, harvest, and production figures. I suspect that some sort of sampling system based on nest counts or ages of harvested birds will replace the call count survey which appears to be based on annually variable behavior.

A second important conclusion resulted from the telemetry studies. Home ranges of Mourning Doves are so large, hundreds of hectares, that food and water are almost sure to be included. However, monoagriculture threatens the availability of nesting habitat. Hence, management emphasis should be on provision of nest sites.—Edward H. Burtt, Jr.

36. The Snow Geese of Aksaniia-Nova (Belye gusi Aksanii-Nova). V. Zubko. 1980. Okhota okhot. khoz. [Hunting and Game Management] 4:22–23 (In Russian).—Snow Geese (*Chen caerulescens*) from the only extant colony in the USSR (Wrangel Island, Arctic Ocean) have been breeding in the zoo at Aksaniia-Nova (Ukrainian Republic) since 1962. Their production is enhanced by protecting very young goslings as follows. Eggs are left under the parents until hatched, and then all goslings and some adults are herded into a special enclosure with both covered and open pens. The youngest goslings (10–12 per adult) are placed in covered pens, then moved to open pens (2–3 broods together), and finally given the run of the enclosure. Eventually all are banded and released to the zoo's waterfowl pond. About 40% of the Snow Geese produced each year are not pinioned, and since 1962 some 200 have flown away; band returns have come from western USSR, France, and Scandinavia.—Elizabeth C. Anderson.

CONSERVATION AND ENVIRONMENTAL QUALITY

(see also 1, 2, 35, 36)

37. Low DDT residues in plasma of Bald Eagles (*Haliaeetus leucocephalus*) wintering in Colorado and Missouri. C. J. Henny, C. R. Griffin, D. W. Stahlecker, A. R. Harmata, and E. Cromartie. 1981. Can. Field-Nat. 95:249–252.—Adult Bald Eagles had 0.12 μg/g of DDT and its metabolites in their blood plasma. Such low levels of contaminants coincide with improved reproductivity among many populations of eagles.—Edward H. Burtt, Jr.

38. The wintering grounds of the Krasnovodsk Reserve (Zimovka ptits v Krasnovodskom zapovednike). 1981. Okhota okhot. khoz. 1:20–22 (In Russian).—The Krasnovodsk Reserve on the northeastern shore of the Caspian Sea covers 270 ha, of which 90% is shallow bays or inshore sea with abundant aquatic vegetation. It was founded and is maintained as a refuge for waterfowl and shorebirds; at least 300,000 birds spend the

winter there. Two species are particularly interesting: the rare, "gentle, beautiful, and incongruously raucous Flamingo" (*Phoenicopterus ruber*) (up to 80% of the Soviet Union's population winters here); and the Bald Coot (*Fulica atra*). This coot is the most numerous migratory and wintering bird of this part of the Caspian, and the 250,000 that winter here in flocks covering tens of hectares are the largest winter concentration in the USSR, perhaps in the world. A collective defense against predators like eagles has been observed here. When an eagle stoops, the coots roll onto their backs, flail their powerful clawed feet, and slap the water with their wings raising a cloud of spray. In the face of this an eagle can catch only a weak, sick coot ("but nocturnal enemies like owls can take whichever they please . . .").

This mass of game birds is more than some gunners can resist, refuge or not, and much prime waterfowl habitat lies outside the reserve. Because of this and since the Krasnovodsk Reserve is on an old and important flyway connecting the Palearctic with India and Africa and shelters many other Red Data Book species besides the Flamingo, the authors urge that it be enlarged.—Elizabeth C. Anderson.

PARASITES AND DISEASES

(see 57)

PHYSIOLOGY

(see also 20, 27, 46, 47, 49, 66)

39. Vitamin D-dependent calcium binding protein: immunocytochemical localization in chick kidney. J. Roth, B. Thorens, W. Hunziker, A. W. Norman, and L. Orci. 1981. Science 214:197–200.—A vitamin-D metabolite induces the formation of a calcium binding protein in the kidney and other sites. By appropriate staining it is shown to localize in the epithelial cells in the distal convoluted part of the kidney tubule and, to a lesser extent, in the initial collecting tubule and part of the collecting tubule.—C. H. Blake.

40. Steady-state relationship of calcium-45 between bone and blood: differences in growing dogs, chicks, and rats. L. Klein. 1981. Science 214:190–192.—Young animals were given multiple doses of ^{45}Ca and at short intervals after the labelling the animals were sacrificed and the quantity of ^{45}Ca in the blood and bone was measured. To beyond 12 months in dogs and to 16 weeks in chicks, the ratio of the two measurements was constant. In rats between 2 and 14 weeks, the bone resorption diminishes. In dogs and chicks this is consistent with growth modeling and haversian remodeling. The haversian bone of chicks is more vascular than the predominant haversian bone of dogs which in turn is more vascularized than the nonhaversian bone of rats.—C. H. Blake.

41. Gonadal hormones induce dendritic growth in the adult avian brain. T. DeVoogd and F. Nottebohm. 1981. Science 214:202–204.—Female canaries were ovariectomized and treated with sex hormones, including testosterone. Birds treated with testosterone, but not with other sex hormones, responded by singing. A class of neurons in a forebrain nucleus for song control, the nucleus robustus archistriatalis, was examined. The singing females had developed dendritic trees similar to those of intact males and much longer than those of intact or untreated females.—C. H. Blake.

42. Bioenergetics of captive Belding's Savannah Sparrows (*Passerculus* [sic] *sandwichensis beldingi*). J. B. Williams and H. Hansell. 1981. Comp. Biochem. Physiol. 69A:783–787.—Sparrows maintained on separate mealworm and chick starter diets metabolized more of the mealworm diet (75%), but diets had no effect on existence energy.—C. R. Blem.

43. Thermal conductance in mammals and birds: its dependence on body size and circadian phase. J. Aschoff. 1981. Comp. Biochem. Physiol. 69A:611–619.—This is an interesting review of much of the data on conductance. Major findings are that mammals have a conductance 35% higher than that of birds and minimal conductance is about 50% greater when measured during activity time of the animal than during rest time.—C. R. Blem.

44. DDT-induced feminization of gull embryos. D. M. Fry and C. K. Toone. 1981. Science 213:922–924.—DDT produces rather slight thinning of gull egg shells, so the embryos survive. Injection of estradiol or other estrogenic substances in small doses into the egg yolk feminizes male embryos. During and for at least 3 years after the massive pollution of sea water near Los Angeles, an abnormal proportion of females (3.85 per male) and female-female pairing were noted for Western Gulls (*Larus occidentalis*) at Santa Barbara. Experimental injection of estrogens or *o, p'*-DDT at doses as low as 2–5 ppm of whole egg weight into eggs of California Gulls (*L. californicus*) from areas not contaminated by DDT resulted in significantly high proportions of feminized male embryos.—C. H. Blake.

45. Electrophysiology of the olfactory pathway in the pigeon. A. W. Macadar, L. J. Rausch, B. M. Wenzel, and L. V. Hutchison. 1980. J. Comp. Physiol. A Sens. Neural Behav. Physiol. 137:39–46.—Birds have generally been considered primarily visual animals with poorly developed olfactory capabilities. This belief was based on the observation that avian olfactory bulbs, when compared to olfactory bulbs of other vertebrates, were relatively small. Some researchers have found it difficult to reconcile this observation with the results of Papi and his co-workers emphasizing the importance of olfaction for pigeon homing. This paper describes the results of attempts to elicit evoked potentials in the olfactory bulb and forebrain of pigeons by electrical stimulation of the olfactory nerve. Using this technique, the authors identified several lower and higher projection sites in the pigeon forebrain. Many of these sites coincided with areas of degeneration observed after damage to the olfactory bulb. One of the olfactory projection sites, the "Wulst," also receives visual and auditory input. The important point is that pigeons, which are intermediate among birds in the development of their olfactory bulb, apparently possess the neural capacity to process olfactory information which could be used for homing.—Verner P. Bingman.

MORPHOLOGY AND ANATOMY

(see also 4, 40, 41, 58)

46. Skull pneumatisation in African birds with reference to ageing and breeding and some comparisons with Australian species. H. J. de S. Disney. 1980. Proc. IV Pan-Afr. Ornithol. Congr.:43–50.—Despite its frequent use in estimating age, we know little about the timing or function of cranial pneumatization. Disney's review is primarily a plea for precise data from all avian orders. Pneumatization of the dome of the skull results from the bone separating into two layers reinforced by bony trabeculae. Although pneumatization does not seem necessary for survival, it is widespread among birds, being particularly well developed among large-headed orders (e.g. Psittaciformes, Caprimulgiformes) where it is important for strengthening and weight reduction. Pneumatization is poorly developed among rapidly flying birds (e.g. Apodiformes). Disney suggests that these species may require all available calcium for muscle activity, but his hunch will require quantitative data on calcium intake and calcium content of pneumatized and unpneumatized skulls. Such information is not in hand.—Edward H. Burtt, Jr.

PLUMAGES AND MOLT

(see also 59)

47. Carotenoids in wild and captive birds. A. H. Brush. 1981. In **Carotenoids as colorants and vitamin A precursors.** J. C. Bauerfeind (ed.). Academic Press, NY:539–562.—Brush provides an exceptionally lucid and comprehensive review of avian carotenoids; their functions, taxonomic distribution, evolution, metabolism, and biochemistry. Carotenoids are nearly ubiquitous, fat soluble hydrocarbons responsible for the dramatic yellows, oranges, and reds of birds. Carotenoids also include vitamins, the photon-absorbing chemical of the retina, and chemicals important in metabolism of lipids and maintenance of cell membranes. Despite their ubiquity and importance, carotenoids are not well studied, particularly among birds. Brush raises many unanswered questions and may thereby focus more attention on the biochemistry and function of avian carotenoids.

The only discordant note in this fine review is the misuse of the word pigment, misuse that is firmly rooted in tradition. A pigment is a particulate and insoluble colored material or mixture of such materials (Allen, **Colour chemistry**. Nelson, London, 1971). Carotenoids are soluble chemicals and therefore are not pigments. Fox (Science 100:470–471, 1944) and, more recently, Needham (**The significance of zoochromes**. Springer-Verlag, NY, 1974) have advocated use of the term biochrome ". . . a specific chemical substance with a colored molecule, synthesized by living organisms, ..." Melanin can be characterized as a pigment, but carotenoids along with other colored chemicals (e.g. fuscins, ternary quinones) do not fit the definition of pigment and the more precise term, biochrome, seems preferable.—Edward H. Burtt, Jr.

48. Timing of the onset of postnuptial moult in the Willow Warbler *Phylloscopus trochilus* in relation to breeding in southern Finland. J. Tiainen. 1981. Ornis Fenn. 58:56–63.—Willow Warblers were trapped and netted at 61°03′N in Finland and examined for molt. Birds began to molt in late June or July. Both sexes started to molt independently of their stage in the nesting cycle. Females began about 10–15 days later than males. The resulting overlap of breeding and molting schedules in many birds is considered to be an adaptation to the short summer, as is the "rapid rate of moulting." However the time for completion of wing molt appears to be about 60 days, no shorter than in North American birds in latitudes of 30°–40°. The rate of molt appears to be similar in males and females, at least when data are adjusted for the mean difference between the sexes in the time of onset of molt.—R. B. Payne.

49. Female feathering in Sebright cocks is due to conversion of testosterone to estradiol in skin. F. W. George, J. F. Noble, and J. D. Wilson. 1981. Science 213:557–559.—In the Sebright bantam and Campine breeds (*Gallus domesticus*), both sexes are normally hen-feathered. Castration causes cocks to assume cock-feathering and testosterone treatment causes a return to hen-feathering. Implanting a Sebright testis in a castrated Leghorn chicken causes development of male comb but does not affect feathering. The conclusions are that testosterone is converted in the skin to estradiol (or equivalent estrogen) but dihydrotestosterone is not converted and causes a change to male plumage in Sebrights.—C. H. Blake.

ZOOGEOGRAPHY AND DISTRIBUTION

(see also 10, 26, 31, 38, 72)

50. A first census of vultures (1979). (Primer censo de buitreras). J. A. Alonso and O. del Junco. 1981. Ardeola 26–27:165–312 (Spanish with English summary).—A general survey of the breeding colonies of the Griffon Vulture (*Gyps fulvus*) in the Iberian Peninsula was undertaken in 1979 by more than 130 observers organized into 24 regional groups. They recorded 2283 nests, and estimated the population at 3240 breeding pairs and 9250 individuals. Most vulture colonies were associated with Mesozoic limestone formations, with the average altitude of nests being 763 m above sea level. The colonies were organized into 10 groups, with 57% of the pairs clumped in northern Spain around the high Ebro and Duero valleys. Lesser groupings were found in Andalusia (25%), Extremadura (12%), and Salamanca-Zamora (5.5%). Colonies were found to be endangered by hunting, road construction, and poisoned baits. A general decrease in populations was evident.—Robert B. Waide.

51. Additions to the checklist of Saskatchewan birds since 1969. C. S. Houston, M. I. Houston, and J. B. Gollop. 1981. Blue Jay 39:145–154.—Fourteen species have been added, bringing the provincial list of birds to 339 confirmed species and 40 hypothetical species. The very complete account of recent sightings suggests that the Cattle Egret (*Bubulcus ibis*) and Orchard Oriole (*Icterus spurius*) have recently extended their ranges into Saskatchewan. The Willow Flycatcher (*Empidonax traillii*) and Eastern Wood Pewee (*Contopus virens*) are now confirmed as breeding in Saskatchewan, although they remain rare. Confirmation of recent additions was based on identifiable photographs or tapes of the song, suggesting a trend away from specimens. The trend may reflect the more active participation of serious bird-watchers in the study of avian zoogeography.—Edward H. Burtt, Jr.

52. New reports of birds for Cuba. (Nuevo reportes de aves para Cuba). O. H. Garrido and H. González. 1980. Misc. Zool. 9:4 (Spanish).—The authors present records of six species rarely seen in Cuba: *Pheucticus ludovicianus* (3♂, 3♀), *Piranga olivacea* (2♀, 1♂), *P. rubra, Icterus galbula bullockii, Laterallus jamaicensis* (2), and *Zonotrichia* sp. (4). These individuals are exhibited in the Cárdenas Zoo in the Province of Matanzas in western Cuba and were presumably captured in this area. One of the three pairs of *P. ludovicianus* produced and incubated 3 eggs in an artificial nest in captivity. *Piranga ludoviciana* is reported for the first time from Cuba on the basis of a male captured on 2 January 1978 by Laudelino Bueno, director of the Zoo. Although the collector made color slides, no mention is made of the disposition of the specimen. Other species reported as sight records are *Carduelis tristis* (April 1978, 6♂), *Carpodacus purpureus* (October 1974), *Hesperiphona vespertina,* and *Bombycilla garrulus.*—Robert B. Waide.

53. A new sandpiper from Samoa. T. Teppen, C. Muse, and S. Muse. 1980. Notornis 28:34.—This trivial record of *Tringa hypoleuca* (probably) would deserve no mention, except that the authors published the *same article* in Elepaio 41:115, 1981. To top this, they followed it with another article on a record of *Larus atricilla* which they managed to get published in American Birds 37:848–849 and Elepaio 41:130. I have yet to read an article of such importance that it requires multiple publication, nor to hear a scientific paper that deserves presentation at more than one meeting. Such procedures are violations of professional ethics and can only be considered as advertising, not as an attempt to communicate. Publication is not a right but a responsibility, and using publication space or time on a podium for redundant purposes deprives others of their opportunity to communicate new information.

Must editors consider requiring authors to sign a disclaimer stating that "I have not submitted this article to any other journal"?—J. R. Jehl, Jr.

SYSTEMATICS AND PALEONTOLOGY

(see also 55)

54. Phylogeny and systematics of Birds. I. A. Neufeldt. 1981. Acad. Sci. USSR, Proc. Zool. Inst. 102:1–114.—This volume may be of more interest to biographers than to systematists. It contains 7 papers and 4 of the authors (or co-authors) are deceased—Kozlova, Portenko, Stegmann, and Yudin. There is a paper on sexual dimorphism in *Eremophila* by Kozlova, one on subspecies of nightingale *Luscinia megarhynchos* by Loskot, and on geographical variation in *Turdus ruficollis* by Portenko. There are valuable bibliographies of the writings of Mme. Kozlova, spanning 1918–1981, Portenko 1919–1981, and Stegmann for 1923–1981. Also portraits of Kozlova, Portenko, and Stegmann.—R. S. Palmer.

EVOLUTION AND GENETICS

(see also 7, 63)

55. Intragenomic DNA sequence homologies in the Chicken and other members of the class Aves: DNA re-association under reduced stringency conditions. H. E. Burr and R. T. Schimke. 1980. J. Mol. Evol. 15:291–307.—The structure of the avian genome was investigated using DNA renaturation studies on 12 species representing four orders. The underlying idea in this approach is similar to that behind DNA-DNA hybridization studies aimed at determining relationships. Here, however, after some processing that includes cutting it into 500 nucleotide base pair fragments, the DNA from a single species is melted, by heating, in order to separate the two strands that form the double helix. The solution is then cooled and the strands are allowed to re-associate. When reheated the strands will melt as a function of the degree of mismatch between the pairs. The more similar the two strands forming a pair, the higher the melting temperature. By doing this with DNA from a single individual, it is possible to derive information about the degree of repetitiveness of sequences within a genome. For example, if there are lots of identical copies of a single DNA sequence in the genome, then there will be a large fraction of the

DNA melting at a high temperature. On the other hand, if every sequence is unique, then most of the DNA will melt at low temperatures because the probability of the two complementary sequences finding each other during the re-association must be vanishingly small. In practice, a curve is obtained of the percent of DNA melting as a function of temperature.

The authors of this paper find three patterns of DNA melting curves. Of course, more might have been found if a wider sampling of species were undertaken. There is no correlation among the observed curves (hence genomic structures) and taxonomic relatedness. For instance, the domestic chicken (*Gallus domesticus*) and the Red Jungle Fowl (*G. gallus*) have quite different melting curves. These very interesting results suggest that genomic evolution is rapid, and that gene amplification or DNA translocations may be frequent. The results indicate that this kind of DNA study will not be useful for taxonomic studies. It appears that interspecific DNA-DNA hybridization would be better for that purpose.—George F. Barrowclough.

56. Heterozygosity at enzyme loci and morphological variation. P. Handford. 1980. Nature 286:261–262.—There has recently been some interest in the relationship between electrophoretic and morphological variation. Reports from two invertebrate studies have suggested that individuals that are relatively homozygous are morphologically more variable than are the somewhat more heterozygous individuals from the same population. Handford uses his data for four variable loci from the Rufous-collared Sparrow (*Zonotrichia capensis*) to investigate this issue. He points out the statistical quagmire associated with testing for differences in variability, and fails to find the association for this first test in birds.

In addition to the many problems Handford describes, there are additional statistical and logical problems with the underlying concept of a morphological-structural gene correlation. The loci examined using electrophoresis are less than 1% of the total number of structural genetic loci. The structural genes themselves represent only a fraction of the total genes in an organism. There are no standard errors for individual heterozygosity and it is highly unlikely that an individual somewhat less heterozygous based on four loci will also be relatively homozygous for its entire genome. This would only be true if there were significant linkage disequilibrium in the population. Such disequilibrium is not a common phenomenon. Nor is there any compelling reason why enzyme loci, associated with carbohydrate metabolism, should be related to skin measurements, unless, again, there is extreme linkage disequilibrium. Thus the theoretical and statistical bases of such genetic-morphological relationships seem doubtful.—George F. Barrowclough.

57. Co-evolution of the Cuckoo *Cuculus canorus* and a regular Cuckoo host. L. von Haartman. 1981. Ornis Fenn. 58:1–10.—Different individual female Cuckoos lay distinctive eggs, in many cases closely matching their main host species. The author carried out a study to test the reaction of the Redstart (*Phoenicurus phoenicurus*) to foreign eggs. A few pairs of Redstarts ejected the foreign egg; most accepted it. The author interprets the experimental results in terms of a genetic polymorphism for egg ejection in the foster species, changing environmental conditions resulting in both fewer Redstarts and fewer Cuckoos in recent times, and a relaxation of selective pressures on Redstarts to recognize and eject Cuckoo eggs.

The details of the study lead one to question whether any conclusion can be made other than that Redstarts often fail to eject an egg of the Great Tit (*Parus major*) from their nests. In a total of seven tests, the foreign egg was always a tit egg, never a Cuckoo egg, mimetic or nonmimetic of the Redstarts' eggs. Tests were made on 5 pairs of Redstarts (one pair was tested 3 times in one year). The experiments were made at various stages of nesting: laying, early incubation, late incubation, and nestling. Some of the 7 tests involved repeatedly introducing the egg; the author claims 13 experiments. Another source of variation was in the source of the eggs: although the description of the individual tests indicates only Great Tit eggs, the author's Table 2 introduces eggs of other species (to total the 13). With all these sources of variation it is not surprising that no trends were apparent in the inadequate sampling.

As amply documented by the author, Redstarts are *not* regular hosts of the Cuckoo in Scandinavia, hence the title is misleading as the wrong species or population was chosen for the test.

The author's introduction and discussion consider aspects of cultural evolution, crypsis in butterflies, the genetic basis of egg polymorphism in cuckoos (which remains totally unknown, the author's elliptical references notwithstanding), and the decline of small bird populations generally. Although the close resemblance of cuckoo eggs to those of their host has certainly evolved together with egg discrimination and ejection in the host species, there is nothing in this study that tests or confirms any predictions made from the coevolutionary model.—R. B. Payne.

58. Adaptive radiation of the digestive system, heart and wings of *Turdus pilaris, Bombycilla garrulus, Sturnus vulgaris, Pyrrhula pyrrhula, Pinicola enucleator* and *Loxia pityopsittacus*. E. Pulliainen, P. Helle, and P. Tunkkari. 1981. Ornis. Fenn. 58:21–28.—Six species of songbirds that eat rowan berries were autopsied, with all birds found dead in autumn and winter. As the condition of the dead birds varied, fat-free weights were used for comparison of the relative size of various body parts. Data are presented on body weight, mm/g body weight of intestine, caeca/intestine length, and % body weight of heart, liver, and plumage. No account was taken of allometric or other scaling problems, but rather the % weight was taken as a relative value regardless of body weight. The Bullfinch and Pine Grosbeak had relatively longer guts, small livers, high plumage weight, and large wing area; the Parrot Crossbill was similar but being migratory, had a more pointed wing. The other species feeding more on berries and insects had the reverse; the Fieldfare had the smallest heart. The trend for the more granivorous species to have small livers parallels the trend in mammals for noncarnivores to have smaller livers than carnivores. Some of the other trends, such as heart size, probably reflect basic engineering problems related to body size, not to food habits or migratory behavior.—R. B. Payne.

59. Polymorphism in the Arctic Skua *Stercorarius parasiticus* in NE Norway. F. Götmark, M. Andersson, and O. Hilden. 1981. Ornis Fenn. 58:49–55.—"Arctic Skuas" (our Parasitic Jaegers) are a model species for study of genetic sexual selection. In the work of K. Williamson, P. O'Donald, and associates, dark males in their first year nested earlier in the season and had higher success than pale males. But pale males were younger at first breeding, and demographic modelling suggests that pale morphs may increase in proportion over time. These studies were carried out mainly on Fair Isle, and it is of interest to find what the birds do in another breeding area.

During three years of study in Finnmark, 43% of the jaegers were pale and 57% were intermediate or dark. Plumage types determined in the field for 133 mated pairs showed that they mated at random; in contrast to some other populations (Fair Isle, Foula) where pairs mate assortatively.

Foraging efficiencies were determined for 15 individuals. Jaegers foraged mainly by pirating food from other seabirds. At least 34 out of 40 pirating raids were successful with the adult bringing food to its chicks. There was no difference in success of foraging in the different color phases, but average duration of flights was shorter (the difference was not significant) for pale birds than for dark birds. Some other populations have been observed with reports of greater predator success by the rare morph, and though the authors apologize for their results and for the study being carried out in an area where the two morphs are nearly equal, the study is in fact a good natural control population for there is no "rare" morph there nor is there a "more successful" pirate morph.—R. B. Payne.

60. Genetic basis of migratory behavior in European warblers. P. Berthold and U. Querner. 1981. Science 212:77–79.—There is a close correlation between the amount of migratory restlessness displayed in the laboratory and the species or population specific distances travelled on migration. This study tests the hypothesis that levels of migratory restlessness are genetically programed. F_1 hybrids between relatively sedentary African and relatively migratory German Blackcaps (*Sylvia atricapilla*) were examined. The exciting

result that emerged was that the pooled migratory activity of the F_1 hybrids was intermediate compared to the pooled activity of the parental populations. The intermediate activity level resulted from an intermediate number of hybrids that displayed migratory restlessness. This led the authors to suggest the existence of a genetically based behavioral polymorphism between migratory and non-migratory tendencies, the balance of which is population dependent.—Verner P. Bingman.

61. Intense natural selection in a population of Darwin's Finches (Geospizinae) in the Galápagos. P. T. Boag and P. R. Grant. 1981. Science 214:82–85.—*Geospiza fortis* was studied from July 1975 to June 1978 on the 40-ha islet of Daphne Major in the Galápagos. More than 1500 were color-banded and 7 measurements were made of each. Before, during, and after each breeding season: (1) a counted sample of seeds of each plant species, (2) standardized visual census of finches, and (3) at least 100 records of feeding behavior of banded birds were made. A severe drought occurred in 1977. The population declined by 85%, the species did not breed, only one of 388 banded nestlings born in 1976 survived to 1978, the female : male ratio changed from nearly 1:1 in 1976 to 1:6 in 1978. There was a sharp increase in the average size and hardness of available seeds, the average size of the surviving birds increased, many birds failed to molt in 1977. The changes in the birds are backed up by carefully calculated graphs and tables. The selection intensity (by O'Donald's method) is the highest yet recorded for a vertebrate population.—C. H. Blake.

FOOD AND FEEDING

(see also 23, 29, 33, 34, 42)

62. The hummingbird, *Chlorostilbon ricordii ricordii* (Gervais) (Aves: Apodiformes: Trochilidae), predator on spiders (Arachnida). (El zunzún, *Chlorostilbon ricordii ricordii* (Gervais) (Aves: Apodiformes: Trochilidae), depredador en Araneae (Arachnida)). G. Alayón G. 1980. Misc. Zool. 9:2–3 (Spanish).—The author reports 13 instances of predation by *C. r. ricordii*, 12 on *Uloborus geniculatus* Olivier (Uloboridae) and one on *Gasteracantha cancriformis* Linnaeus (Araneidae). In each case, the hummingbird was observed to hover before a web for 5–7 s as if searching and then peck once at the web. In 6 observations, the presence of a spider was noted before the attack. No web held spiders after an attack. The author suggests that the period of hovering before the web may constitute a fixed action pattern normally associated with nectar feeding rather than searching. A distinction is drawn between predation and cleptoparasitism (Burtt et al., Wilson Bull. 88:157–158, 1976; Waide and Hailman, Wilson Bull. 89:345–346, 1977).—Robert B. Waide.

63. Exploitation of *Opuntia* cactus by birds on the Galápagos. B. R. Grant and P. R. Grant. 1981. Oecologia (Berl.) 49:179–187.—Two finches on the Galápagos Islands, *Geospiza conirostris* and *G. scandens,* consume nectar and pollen from 2 species of cactus, *Opuntia helleri* and *O. echios,* respectively. They gain access to pollen in the dry season by snipping the style of buds or partially open flowers, thus destroying the stigmas in up to 78% of the flowers. This procedure prevents seed production by these cacti and likely limits food resources of the birds during the subsequent wet season. The authors hypothesize that foraging for pollen by removing the stigmas confers a short-term benefit in the dry season that may, however, increase the chances of extinction of these birds over the long term.—Cynthia Carey.

64. Weights of the crop contents of *Tetrao urogallus, Lyrurus tetrix, Tetrastes bonasia* and *Lagopus lagopus* in Finnish Lapland in autumn and winter. E. Pulliainen. 1981. Ornis Fenn. 58:64–71.—Crop contents varied with time of day, with the clearest trend being an increase in the evening. The contents also were greatest in January, suggesting a higher intake of food in the coldest time of winter and the time of greatest metabolic demands. All 4 species of grouse showed the same trends, though they were most clear in the Willow Grouse.—R. B. Payne.

SONGS AND VOCALIZATIONS

(see also 22, 41)

65. Sparrows learn adult song and more from memory. P. Marler and S. Peters. 1981. Science 213:780–782.—Nestling male Swamp Sparrows (*Melospiza georgiana*) readily learn taped songs of the species in the 3rd to 8th week of life and the full song 9 months later will contain some "syllables" of these songs. From the age of 100 to 150 days, some of the syllables may appear as subsong and after about 238 d the adult song begins with definite phrases which undergo little or no change thereafter. The birds reared in isolation may be taught and will use phrases from the Song Sparrow (*M. melodia*).—C. H. Blake.

66. A test for responsiveness to song structure and programming in female sparrows. W. A. Searcy and P. Marler. 1981. Science 213:926–928.—Treatment with estradiol conditioned female Song Sparrows (*Melospiza melodia*) to exhibit copulation solicitation displays when appropriately stimulated, as by a recording of male song. Tests showed significantly fewer displays when either Swamp Sparrow (*M. georgiana*) or Chaffinch (*Fringilla coelebs*) songs were used in the normal pattern of the species. This was also true with Song Sparrow syllables in a Swamp Sparrow pattern as with syllables of the latter in a pattern of the former. Response was significantly greater for a repetition of one song type than for a mixture of types. There was only a non-significant preference in trials in which song type was changed infrequently as opposed to continual change of type.—C. H. Blake.

67. Model choice in the song development of Bengalese Finches (*Lonchura striata* var. *domestica*, Estrildidae). [Vorbilwahl in der Gesangsentwicklung beim Japanischen Mövchen.] K. Dietrich. 1980. Z. Tierpsychol. 52:57–76 (German with English summary).—There is much variation among the songs of males, and sons tend to sing like their fathers. Juveniles fly to their singing fathers and thus hear his song at close range. When isolated at independence, the young males still showed emphasis on elements of their fathers' songs, but with some influence of songs of other males. Two juveniles returned to their fathers' presence at age 4 months and altered their songs to be even more similar to those of their fathers. If placed with strange males after independence, the young birds incorporated some new aspects from the songs of these males, but more strongly so when their songs resembled those of their father. In sum, the early (pre-independence) learning of the father's song is important, but the final song is perfected thereafter with a strong predilection to copy the father's song.—Jack P. Hailman.

68. Vocal dueting and the pair bond. I. Coyness and partner commitment. A hypothesis. W. Wickler. 1980. Z. Tierpsychol. 52:201–209.—Editor Wickler has a habit of concluding an issue of his journal with his own speculations about animal behavior. In this case the idea is that complex dueting between mates is difficult to learn, and hence the coy female makes her mate learn it as insurance of fidelity "for he would have to invest time and energy to adjust to a new mate." There are no data.—Jack P. Hailman.

69. Vocal dueting and the pair bond. II. Unison dueting in the African Forest Weaver, *Symplectes* [sic] *bicolor*. W. Wickler and U. Seibt. 1980. Z. Tierpsychol. 52:217–226.—In this species, which is also called the Dark Backed Weaver, the mates perch and sing together, so that it is nearly impossible to tell which sounds come from which mate. Both birds have the same repertoire, sometimes singing the same element together, sometimes not. The authors argue that such dueting therefore cannot have evolved to indicate the sex or presence of the singer, the status of the pair, the identification of the partner, or the partner's location. Nor did the duet evolve to transfer information between mates or provide species identification. Song must, in their view, be territorial advertising, but as this "is not improved by two birds singing in unison" the duet feature *per se* must have another explanation. This last point is based on the assertion that "singing nearly in unison does not noticeably increase the intensity and the range of the sound and thus does not seem to make the display more effective." However, the entire analysis is based on one hour of recording of one pair in Natal with no measurement of intensity, range to which the sounds carry, or effectiveness of display to other birds. The authors interpret the function of dueting in terms of Wickler's hypothesis (see review

no. **68**), for which there is no critical evidence. Speculation appears to be well ahead of data.—Jack P. Hailman.

MISCELLANEOUS

70. Field identification of west Palearctic gulls. P. J. Grant. 1981. Br. Birds 74:363–394—Part 5.—The last installment of the series describes Glaucous Gull (*Larus hyperboreus*), Iceland Gull (*L. glaucoides*), Sooty Gull (*L. hemprichii*), and White-eyed Gull (*L. leucophthalmus*). The series is invaluable as a key to the field identification of gulls. I have recommended the 4 predecessors in the series and I recommend this part highly.—Patricia Adair Gowaty.

71. 200 years of ornithology in Canada. F. Cooke. 1981. Can. Field-Nat. 95:2–5. **An assessment of Walter Raine and his Saskatchewan records.** C. S. Houston. 1981. Blue Jay 39:168–181.—Cooke divides the ornithological history of Canada into 4 phases. The discovery phase extended throughout the 18th century. Chief among Canadian naturalists was Andrew Graham, a Scottish employee of the Hudson's Bay Company. During 30 years on the west coast of Hudson's Bay he compiled 10 volumes of *Observations* on the area's natural history. The inventory phase occupied most of the 19th century. The distribution and taxonomy of species were the prime concern of amateur and professional ornithologists. Walter Raine, by vocation an engraver, by avocation an oologist, typifies ornithologists of this period. Houston's account offers a valuable perspective on the enthusiasm, excitement, and inaccuracies of the period. Toward the end of the 19th century the conservation phase began. It was marked by increasing concern for the future of birds and ultimately by their legal protection. Ornithology then entered the population phase in which it continues as Canadian ornithology devotes much of its effort to understanding the population dynamics of its native species. Cooke's phases probably characterize ornithology in the United States equally well, but is present ornithology as devoted to population dynamics as Cooke, a population biologist, suggests?—Edward H. Burtt, Jr.

BOOKS AND MONOGRAPHS

72. The Avifauna of the South Farallon Islands, California. D. F. DeSante and D. G. Ainley. 1980. Cooper Ornithological Society, Studies in Avian Biology No. 4. 104 p. $10.00.—This monograph draws together daily observations collected from 1968–1976 during which time 331 species were recorded on Southeast Farallon Island (.41 km^2). An addendum documents 15 other species sighted in a subsequent 42 month period and brings the species total to 346 (cf. 496 known to have occurred in northern California at that time). Sightings are summarized in individual species accounts, which contain seasonal census data and information from previous studies and museum collections.

The authors dealt carefully with the 3 major classification difficulties involved with comprehensive annotated listings: residency, seasonal occurrence (including breeding), and abundance. Some inevitable problems arise with seasonal classifications based on assessments of age class (immature, mature) and of pre- and post-breeding conditions; a summer visitant category is used only for Starlings (*Sturnus vulgaris*) and House Sparrows (*Passer domesticus*). Consequently, most summer sightings are split into either "spring" or "fall" categories. For example, the fall occurrences of Wandering Tattlers (*Heteroscelus incanus*) range from 24 June to 30 December (1 January = start of winter). Procedures for determining residency are also problematic in some cases, e.g. winter resident Wandering Tattlers arrive as early as 16 June and stay as late as 14 June.

Data are discussed in view of ecological/taxonomic species groupings: breeding, sea-, and landbirds; pelagic and neritic seabirds; estuarine/freshwater shorebirds and non-shorebirds; coastal, interior lowland, montane, Great Basin visitant and vagrant landbirds. Breeding seabirds include the world's largest populations of Ashy Storm-Petrels (*Oceanodroma homochroa*), Brandt's Cormorants (*Phalacrocorax penicillatus*), and Western Gulls (*Larus occidentalis*); Leach's Storm-Petrels (*O. leucorhoa*), Pelagic Cormorants (*P. pelagicus*), Common Murres (*Uria aalge*), Pigeon Guillemots (*Cepphus columba*), and Cassin's Auklets (*Ptychoramphus aleuticus*) are abundant breeders; Double-crested Cormorants (*P. auritus*), Black Oystercatchers (*Haematopus bachmani*), and Tufted Puffins (*Lunda cirrhata*) are com-

mon breeders, and Rhinoceros Auklets (*Cerorhinca monocerata*) breed uncommonly. Owing to severely limited habitat diversity, Starlings, the most abundant landbird on the Farallons, and Rock Wrens (*Salpinctes obsoletus*) were the only landbirds that nested during the study. Some species, such as Western Wood Pewee (*Contopus sordidulus*), Cape May Warbler (*Dendroica tigrina*), Ovenbird (*Seiurus aurocapillus*), and Ash-throated Flycatcher (*Myiarchus cinerascens*), were singing or territorial during some breeding seasons but were not found to nest.

The greatest diversity and abundance of visitants occur in fall. Rocky-intertidal shorebirds predominate—arriving in July, increasing to maximal numbers in September, when the generally rare freshwater/estuarine birds occur. Migrating landbirds, especially nocturnal migrants, from western North America that winter in the tropics, arrive in early August and peak in September. The greatest diversity of pelagic seabirds also occurs in September, though highest numbers are in late summer—owing to the abundance of Sooty Shearwaters (*Puffinus griseus*), Red (*Phalaropus fulicarius*) and Northern phalaropes (*Lobipes lobatus*). Vagrant landbirds, mostly from eastern North America and Canada, arrive early in September and are commonest from mid-September to early October.

More information about the massive migration wave of 1972 that was so often referred to in species' summaries was not presented in the discussion and was missed. White-winged Scoters (*Melanitta deglandi*) are stated to show a spring influx (p. 64), though data in Table 2 do not appear to support this.

A bounty of other interesting findings emerges. Dabbling ducks are more apt to fly over open ocean than most estuarine/freshwater ducks. Nocturnally migrating landbirds are more common than diurnal ones, and the number of landbirds arriving on a given day is related to the "gathering area" of the island, i.e. (p. 71) "area of ocean over which the island, rather than the mainland, first becomes visible to a landbird returning toward the mainland from the sea." "Gathering area" is optimal, when low overcast skies yield visibility from the Farallons of more than 15 but less than 30 km; the mainland is 32 km distant. The House Sparrows' and Rock Doves' (*Columba livia*) unusual patterns of greater spring than fall abundance are speculated to reflect a pre-breeding dispersal strategy that facilitates the range expansions of these highly successful colonizers.

Nine-primaried passerines (particularly wood warblers, but also icterids, and finches) were proportionally more common as vagrants than 10-primaried passerines (tyrant flycatchers, mimids, thrushes, vireos) with similar source populations and breeding ranges. The high degree of vagrancy found for the nine-primaried birds is suggested to reflect an ongoing process of rapid adaptive radiation and to support Storer's (**Avian biology** 1:1–18, 1971) recent taxonomic placement of these birds in last positions.

All in all, this monograph is an informative, integrative data compilation of large proportions, and I recommend it to those interested in West Coast avifauna, migration, and island zoogeography.—W. A. Montevecchi.