RECENT LITERATURE

Edited by Edward H. Burtt, Jr.

BANDING AND LONGEVITY

(See also 15, 27, 35, 53)

1. Twentieth ringing report for Southern Africa. P. D. Morant. 1979. *Ostrich,* **50:**83–87.—Covering the period July 1976–June 1977 in South and South West Africa, the author documents the decline from 1972–1973 (ca. 75,000 birds banded) to this year's total (ca. 23,000). The decline is attributed to the government's policy of "project-oriented ringing"; "new ringers tend to view bird ringing as a tool to assist in solving problems rather than an end in itself." This laudable achievement will result in savings of money and increased satisfaction for the participants.—C. J. Ralph.

2. A Purple Heron (*Ardea purpurea*) that was 25½ years old. (Purpurreiher, *Ardea purpurea,* wurde 25½ Jahre alt.) R. Schlenker. 1978. *Vogelwarte,* **29**(3): 230.—A Purple Heron banded as a nestling in Austria was recovered 25½ years later, making this the oldest known wild Purple Heron.—R. B. Payne.

3. From birth to settlement, a female Pied Flycatcher moves a distance of 280 km. (Brut-Umsiedlung eines weiblichen Trauerschnäppers *Ficedula hypoleuca* über eine Entfernung von 280 km.) R. Berndt and G. Creutz. 1978. *Vogelwarte,* **28**(4): 276.—A female Pied Flycatcher, banded as a nestling near Parsau was found breeding the next year 205 km NNW from her birth site. She nested the next year 180 km NNW from her birth site, and again the following year 280 km ESE from her birth site. She successfully fledged young in all three years. Even if such movements are uncommon, the genetically effective dispersal must prevent any considerable genetic differentiation on a local level. And what huge study areas we need to keep up with our "local" birds!—R. B. Payne.

MIGRATION, ORIENTATION, AND HOMING

(See also 27, 42, 49, 50, 54, 87)

4. Golden Plovers during the passage through east Frisia. (Goldregenpfeifer auf dem Durchzug in Ostfriesland.) E. G. F. Sauer and E. M. Sauer. 1978. *Bonn. Zool. Beitr.,* **29**(1–3): 79–100.—Golden Plovers (*Pluvialis apricaria*) were observed for a month in late summer in East Frisia in migration. Reportedly the birds arrived and remained in pairs even in aggregations of hundreds of birds. However, the birds were not banded or otherwise individually recognizable, and without any supporting evidence (such as sampling distances between birds), the description remains a wordy anecdote. Aggressive behavior was not common and was seen only in bathing birds. The plovers fed on the tidal flats and rested between low tides.—R. B. Payne.

5. A preliminary account of the nature of bird flight traces. (Predvaritelnye dannye o kharaktere sleda za letyashchei ptitsei.) L. Kokshaiskii and V. Petrovskii. 1979. *Doklady Akad. Nauk, SSSR.,* **244**(5): 1248–1251. (In Russian.)—Observations of turbulence waves in the wake of a Chaffinch (*Fringilla coelebs*) flying in a confined space were recorded by stroboscopic photography. Fine dry sawdust grains suspended in air were the essential medium. The turbulence waves trailing the individual wingbeats were photographed; the suspended dust clouds were illuminated by appropriate light beams. The film shows a trail of successive turbulence rings strung along a flight trajectory on a curving plane. Most of the energy exerted is at the down–stroke of the wing. On the up–stroke action on the air is minimal and less turbulence results. This divergence suggests the energy advantage of wing flapping over a fixed wing structure.—Leon Kelso.

6. The winter flight of White-fronted Geese (*Anser albifrons*) and the Bean Goose (*Anser fabalis*) in northern Germany in late fall. Die Winterflucht der Blessgans (*Anser albifrons*) und der Saatgans (*Anser fabalis*) über Norddeutschland im Spätherbst.) 1973. D. Hummel. 1977. *Vogelwarte,* **29**(2): 81–101.—A large passage of White-fronted and Bean

geese over northern Germany occurred during two weeks in late autumn 1973. By recounting local counts, flight directions, and regional weather, it is likely that an early period of frost and snow forced the geese to depart totally their autumn migration range on the south Baltic and to move early to the wintering range. Most geese probably came from the DDR and Poland.—R. B. Payne.

7. About the development of migratory unrest among Garden Warblers (*Sylvia borin*) during inhibition of fat deposition. (Über die Entwicklung von Zugunruhe bei der Gartengrasmücke (*Sylvia borin*) bei verhinderter Fettdeposition.) P. Bergtold. 1977. *Vogelwarte,* **29**(2): 113–116.—Garden Warblers kept on a restricted diet to prevent fat deposition in their first autumn nevertheless began their seasonal migratory restlessness at the same time as wild birds.—R. B. Payne.

8. Observations on the effect of hormones on the migratory behavior of Robins (*Erithacus rubecula*). I. The effect of prolactin (LtH=HPr) on annual cycles. (Beobachtungen über die Wirkung von Hormonen auf das Zugverhalten bei Rotkehlchen (*Erithacus rubecula*). I. Die Wirkung von Prolaktin (LtH=HPr) im Jahreszyklus.) V. Ieromnimon. 1977. *Vogelwarte,* **29**(2): 126–134.—Prolactin decreased nocturnal migratory restlessness in captive European Robins. The interaction of prolactin, thyrotropin, and corticotropin upon this behavior was investigated but not resolved. No diurnal rhythm of prolactin release was observed.—R. B. Payne.

9. Radar observations of spring migration over northwest Germany and the southern North Sea in April and May 1971. (Radarbeobachtungen zum Frühjahrszug über Nordwestdeutschland und die südliche Nordsee im April und Mai 1971.) J. Jellmann. 1977. *Vogelwarte,* **29**(2): 135–149.—Movements of small birds migrating at night were observed by radar to take the form of broad fronts or narrow flyways, with the direction of migration varying nightly.—R. B. Payne.

10. The interaction of endogenous migration—programs and environmental factors during migration by warblers: an hypothesis. (Das Zusammenwirken von endogenen Zugzeit—Programmen und Umweltfaktoren beim Zugablauf bei Grasmücken: Eine Hypothese.) P. Bergtold. 1978. *Vogelwarte,* **29**(3): 153–159.—Nocturnal migratory activity was recorded for individual Blackcaps and Garden Warblers reared in captivity and was compared to activity for trapped wild migrants and for calculated migration patterns. All three groups were variable. Bergtold interprets the results as supporting his hypothesis that internal cyclic changes in the individual are largely responsible for seasonal migratory activity. He presents data only in terms of histograms of nightly activity, and he did not report any statistical tests showing regular correlated responses of the three groups, so his interpretation of the results is subjective. He argues that endogenous programs of migratory restlessness are integrated with variable environmental conditions in the following way: the internal cycles lead to endogenous bursts of migratory activity, except that unusually bad weather may slightly offset the time of these bursts. Hence his view of the timing of migration is essentially endogenous with only minor effects of weather conditions.—R. B. Payne.

11. Concerning the fall migration of the Crane (Grus grus) in the interior of Mecklenburg. (Zum Herbstzug des Kranichs (*Grus grus*) im mecklenburgischen Binnenland.) H.-J. Deppe. 1978. *Vogelwarte,* **29**(3): 159–178.—European Cranes were censused for 27 years between the Elbe and Oder rivers. Although the number of cranes counted in other areas has varied considerably, the number in this area has been nearly constant. Most of the detail of the paper documents the variation in migration in relation to the weather.—R. B. Payne.

12. Weather-influenced guidance factors during the fall migration of cranes in central Europe. (Witterungsbedingte Steuerungsfaktoren beim Herbstzug des Kranichs in Mitteleuropa.) H.-J. Deppe. 1978. *Vogelwarte,* **29**(3): 178–191.—European Cranes use favorable warm air currents on their autumn migration and they appear to anticipate cold fronts. Flights are more closely related to weather conditions at 1,500–5,000 m than to ground weather conditions.—R. B. Payne.

13. Migration of the Wood Pigeon (*Columba palumbus*) according to mapped observations at the Randecker Maar. (Der Wegzug der Ringeltaube *Columba palumbus* nach Planbeobachtungen am Randecker Maar (Schwäbische Alb).) W. Gatter and K. Penski. 1978. *Vogelwarte,* **29**(3): 191–220.—Wood Pigeon migration was observed systematically over more than eight years at the Randecker Maar observatory near Stuttgart. Pigeons often move in groups: median group size was 53. Counts from Randecker Maar paralleled counts from another observatory, Falsterbo, indicating population-wide migration peaks within a season. Peak movements were often seen between 0700 and 0900. Pigeons prefer winds from the east and clear weather. Migration did not match consistently with atmospheric pressure or with temperature. Pigeons migrate over low hills and change course only for the Alps, where they migrate through the mountain passes.—R. B. Payne.

14. Some features of avian vision and their flock patterns in flight. (Nekotorye osobennosti zreniya ptits i ikh stainye postroeniya v polete.) A. Molodovskii. 1979. *Zool. Zhurn.,* **58**(5): 685–692. (In Russian with English summary.)—By observation in the Volga–Caspian region from 1956–1978 of 48 species in 11 orders, a correlation concept of angular vision indices and its correlation to flock form was defined. The smaller the eye aperture angle and the smaller the interoptical axis angle, as well "as the binocular and total visual fields," the more restricted the flock structure both linearly and in composition. This pertained primarily to birds having only "one central fovea or band type of area." Inspection of the table affording many details for the 48 species cited reveals lower weight of eye relative to body size (1.0% or less) in larger, mostly aquatic species. Relative weight is higher in smaller shorebirds, swifts, and swallows (*Apus apus, Riparia riparia* and *Hirundo rustica*), 3–4%, in contrast to 0.1%, but the total field of vision in the latter group is less, 259–277°.—Leon Kelso.

POPULATION DYNAMICS

(See also 11, 20, 32, 61)

15. The mortality of British Grey Herons. C. J. Mead, P. M. North, and B. R. Watmough. 1979. *Bird Study,* **26**(1): 13–22.—This study analyzes the rates and causes of death of banded Grey Herons (*Ardea cinerea*) recovered in Britain since 1909. Herons are grouped into three age classes (first-year, second-year, and older) and three periods of time in which they were banded. Not surprisingly, mortality was highest in first-year birds and lowest in birds over two years old. Mortality rates peaked after pesticides came into wide use about 1946, but were reduced again by legal protection of herons instituted in 1954. The study is short but thorough, although I would have liked to see a breakdown of mortality by geographical area in Britain.—Scott R. Robinson.

16. Starvation in young Tawny Owls. G. Hirons, A. Hardy, and P. Stanley. 1979. *Bird Study,* **26**(1): 59–63.—Many juvenile Tawny Owls (*Strix aluco*) apparently starve during the late summer and autumn, as judged by the weight and condition of their pectoralis major muscle. Starvation occurred in about 18% of the dead owls sampled, and may be a consequence of juveniles being excluded from the territories of adult owls.—Scott R. Robinson.

17. Observations on the Pink-footed Goose, *Anser brachyrhynchus*, in central Iceland in 1975 and 1976. J. Philippona and E. Smith. 1978. *Le Gerfaut,* **68**(2): 195–202.—In Thjórsárver, the main breeding place of the species, numbers of geese were down considerably from earlier years (2,600 adults versus 22,000 in other years). The brood size seemed down also; only 2.7 young were seen on average with their parents shortly after hatching. The poor success of geese in 1976 was confirmed by the low percentage of young birds in flocks in Great Britain later in the same year.—R. B. Payne.

18. On the population ecology of the Eagle Owl (*Bubo bubo*) in the high mountains: population, population growth and available living space in the central Alps. (Zur Populationsökologie des Uhus *Bubo bubo* im Hochgebirge: Bestand, Bestandesentwicklung and Lebensraum in den Rätischen Alpen.) H. Haller. 1978. *Ornithol. Beob.,* **75**(5/6): 237–

265.—Thirty territories of the Eagle Owl, including 24 breeding pairs, were followed over a 4-year period on a 3,250 km² plain in the Swiss Alps. These birds preferred the high plains along the larger river valleys between 1,060 and 2,020 m elevation. A small proportion of the territories were higher up on the slopes. Nests were usually placed on rocky crags and were relatively easy to locate. Of 40 nests observed, the average brood size was 1.80 and the mean number of young recruited into the population was 1.32. Man-induced mortality apparently has a significant impact on the population, including collisions with automobiles, trains, and high tension wires. One area supporting 30% of the country's owl population is relatively free from such effects, but development and general human population growth in other regions has taken its toll. The mean time required for a territorial bird to pair with a new mate after loss of its mate was 10 months (n = 5). The author feels that high mountains constitute barriers limiting the rate of recruitment of owls from other populations. This may be an important factor in the apparent inability of the birds to rebound from the impact of human encroachment.—Marshall A. Howe.

19. Mortality rates of the Red Bishop and the Redcollared Widow. A. J. F. K. Craig. 1979. *Ostrich,* **50:** 113–116.—To calculate mortality, the authors used the lack of recapture of birds older than three months at a banding station in Rhodesia. The Red Bishop (*Euplectes orix*) had a 47% (±1.6%) annual mortality rate, whereas the Redcollared Widow (*E. ardens*) had a 46% (±3.7%) rate. Using a different data base, the recoveries from 14 years of banding of South African bishops, a lower mortality rate of 44% (±4.5%) was found. This is an excellent little study and deserves repeating—many banding stations have similar data. As the authors correctly point out, when using return or recapture data, one has to assume that some individuals could have left the area, rather than dying. However, most studies indicate that birds remain loyal to a site, and this is confirmed by displacement experiments. It would then seem that lack of site tenacity is a minor perturbation in most species, although certainly not one to be ignored since, under certain circumstances, it could be very important.—C. J. Ralph.

NESTING AND REPRODUCTION

(See also 18, 27, 32, 33, 34, 44, 47, 61, 76, 87, 88)

20. The Avocet in the Western Sea of Azov. (Shilokliovka, *Recurvirostra avosetta* L., v zapadnoi chasti Azovogo Morya.) K. Filonov, and V. Siokhin. 1979. *Byull. Mosk. Obshch. Ispyt. Prirody., Biol. Div.,* **84**(2): 73–80. (In Russian with English summary.)—On the islands in the Molochi and Sivash lagoons, the distribution and population dynamics of the Avocet were analyzed. An increase from 30 to 313 pairs occurred between 1960 and 1974. This was followed by a 50% decline. Clutches were initiated at mid-April, and the height of hatching was about mid-May. Nestling mortality ranged from 80–90%, this coincided with severe weather and close crowding by larid species. Herring Gulls (*Larus argentatus*), Gull-billed (*Gelochelidon nilotica*), and four other tern species decidedly restricted the Avocets which were more numerous. Nonetheless the Avocets could not repel Herring Gulls which decimated nestlings 10–15 days old. Occasional floods eliminated many nests. Avocet prenuptial display is well described and illustrated.—Leon Kelso.

21. Pheromones are involved in sexual behavior in birds. J. Balthazart and E. Schofpeneils. 1979. *Naturwissenschaften,* **66**(1): 55–56.—Pheromones being nearly ubiquitous, their reported absence among birds caused concern. For "domestic ducks" the preen gland secretion was found to differ in adult males and females during the breeding season. With the end of the breeding season the disparity disappears and in juveniles it never develops. Experiments showed that nuptial behavior was elicited as an olfactory response to preen gland odor.—Leon Kelso.

22. Clutch dimensions and aspects of the breeding strategy of the Chaffinch *Fringilla coelebs* in northern Europe: a study based on egg collections. W. Svensson. 1978. *Ornis Scand.,* **9:** 66–83.—This study might better be titled: "Everything you could possibly want to know about Chaffinch eggs except the reasons why." This is an exhaustive inves-

tigation of geographic variation in egg size, clutch size, and breeding phenology of Chaffinches based on museum collections. Timing of nesting was investigated using the assumption that the size of the drill hole was proportional to the stage of incubation. Over a 100-yr period the average date of first laying has advanced four days. Clutch size within regions is a constant for the first 5–6 weeks of the breeding season and then drops off slightly. Later clutches, however, have larger eggs, perhaps reflecting increasing food availability. Seemingly every possible intercorrelation of egg size, clutch size, egg volume, nesting phenology, etc. is tested.

The focus of the study becomes less and less clear as one reads on. The discussion attempts to relate some of the results to the extensive information available from field studies of Chaffinches. One gets the impression that the author is desperately trying to make some sense out of the mass of the accumulated data. Unfortunately, this effort meets with little success. The study is further confused by awkward use of the English language which is especially misleading in statistical discussions (this seems to be a common difficulty with *Ornis Scandinavica*). Many data here are worthy of examination by students of geographic variation. Perhaps someone else can come up with better explanations than are offered here.—Marshall A. Howe.

BEHAVIOR

(See also 4, 21, 36, 37, 43, 44, 77, 80)

23. Aggressive reactions of ducklings to a nonliving target object. S. Gaioni, H. Hoffman, and P. De Paulo. 1977. *Aggressive Behav.*, **3**(4): 331–341.—Can aggression toward a nonliving target serve as an aggressive index for behavioral analysis? Yes, manipulations affecting aggression towards another animal had the same affect whether the target was living or nonliving. Furthermore, the behavioral sequence for a nonliving target was the same as that for a living target. Thus, the use of nonliving targets is valid.—Leon Kelso.

24. The behavior, voice, displays, and a breeding with fosterers of the Trumpeter Bullfinch. C. J. O. Harrison. 1978. *Avicult. Mag.*, **84**(2): 80–85.—This is a full account of the Trumpeter Bullfinch (*Rhodopechys githaginea*), also called the Desert Bullfinch, in captivity. One remaining unknown is the detailed morphology of the throat and esophagus that enables the finch to transport and store food.—Leon Kelso.

25. Nest site selection and its survival value among Laughing Gulls. W. A. Montevecchi. 1978. *Behav. Ecol. Sociobiol.*, **4:** 143–161.—The behavioral ecology of nesting Laughing Gulls (*Larus atricilla*) was investigated in the gullery on the salt-marsh islands of the Brigantine National Wildlife Refuge, N.J. The Laughing Gull's strategy in choosing nest sites is reflected in the nonrandom use of various habitat features. (1) Nests tend to be located on *Spartina* mats in tall grass. (2) Gulls nest near water and are about twice as likely to nest near creeks as pools. (3) Nests are typically built on low ground just above mean high water. Montevecchi notes that grass height, ground elevation, and proximity to water are interdependent features of nest sites.

Tidal flooding is the greatest single threat to reproductive success and represents a rather intense selective pressure. During the study period, a flood occurring late in the nesting season destroyed 70% of the nests in the study area. Here was an outstanding opportunity to evaluate the nest site features of successful and unsuccessful pairs of gulls. Results of this natural experiment showed that successful nests were associated with (1) mats, (2) taller grass (most important predictor), and (3) lower ground near creeks rather than pools. Laughing Gulls apparently select nest sites that enhance reproductive success. In general more pairs in the center of the colony were successful than those in the periphery. Montevecchi notes that females in the peripheral area laid smaller eggs and clutches, and laid later than females in the central area. He suggests peripherally nesting females are younger. Possibly the smaller reproductive investment is an adaptive strategy to conserve reproductive effort until the probability of success improves.—Frank R. Moore.

26. Ontogeny of feeding and drinking in the Greater Rhea (*Rhea americana*). P. Beaver. 1978. *Behav. Processes,* **3**(1978): 283–292.—The feeding sequence in the chick consisted of orientation, pecking thrust, head lift, forward jerk, and swallowing. Drinking comprised a downward, then upward motion. In adults these motions are similar. A trend was noted to adjust movements toward less energy expenditure. Feeding motions preceded actual feeding. Drinking motions were initiated on actual contact with water. Notable is the absence of any reference to the Rhea's habit of scooping up billfulls of sand or dust and showering them over its back, as described in several publications.—Leon Kelso.

27. Sand Martin movements within Britain and Ireland. C. J. Mead and J. D. Harrison. 1979. *Bird Study,* **26**(2): 73–86.—This paper is only one of several in the June issue of *Bird Study* that analyzes the 1962–1968 banding returns for Sand Martins (*Riparia riparia*). The descriptions of movement patterns are detailed and thorough, but the principal conclusions are not surprising: (1) movements away from breeding colonies in the late summer and early fall are strongly oriented to the southeast, toward the shortest crossing of the English channel, (2) juveniles begin to move from natal colonies much earlier than adults, beginning as soon as they become independent, (3) juveniles wander extensively around the natal colony, frequently visiting other colonies far away, before beginning the southeasterly migration, and (4) most adults and juveniles return to the same colony in later years. The authors speculate that the phase of juvenile wandering may help the young birds to learn landmarks for the returning spring migration, to find new breeding sites in the event of deterioration of the natal colony, or to avoid competing for food with breeding adults and dependent young.—Scott R. Robinson.

28. Nocturnal behaviour of Ring-billed Gulls during the early incubation period. P. M. Fetterolf. 1979. *Can. J. Zool.,* **57**(6): 1190–1195.—A comparison of observations made on four nights (2030–0030) with those made the following mornings (0515–0915) showed significant differences in the frequency of occurrence of nine recorded behavioral patterns. In general, non-aggressive behavior patterns, such as forward mews and copulations, were more frequent nocturnally, and aggressive behavior was more frequent diurnally. The point is well made that any study of colony life of Ring-billed Gulls and likely of many other species of gull will be woefully inadequate unless nocturnal observations are included.—A. John Gatz, Jr.

29. Optimal size of territory in the Clay-colored Sparrow, *Spizella pallida*. R. W. Knapton. 1979. *Can. J. Zool.,* **57**(7): 1358–1370.—Knapton provides a thorough study of territory size and territorial behavior during two successive breeding seasons for two populations in Manitoba. Although mean territory sizes varied slightly between the two populations, other aspects of behavior were similar. Information on intra-territory nest location, aggressiveness of the territory holder, density of shrubs in the territories, and reproductive success rate in different sized territories all indicated that territoriality in this species serves as a predator-buffer. Removal experiments indicated that floaters of both sexes are present and will occupy vacant territories within days. A comparison of territoriality in this species and seven other species of open-country sparrows indicated that the Clay-colored Sparrow holds the smallest territory and is the only species that feeds almost exclusively outside the territory. Sadly, Knapton's attempt to determine heritability of the behavior patterns he studied was foiled by the failure of any fledgling to return to either study site.—A. John Gatz, Jr.

30. Flocking behaviour of the Chough and the Alpine Chough. S. Lovari. 1978. *Le Gerfaut,* **68**(2): 163–176.—The Chough (*Pyrrhocorax pyrrhocorax*) and the Alpine Chough (*P. graculus*) were studied in the Abruzzo National Park, in the Central Apennines, Italy. Birds occur in flocks the year around, but flock size is largest in summer. In Choughs large flocks are associated with a food source; Alpine Choughs also occur in large flocks while roosting. Threat behavior is not commonly seen in a flock, although in the Alpine Chough one bird often supplants another at a food source. Some breeding pairs associate with the flock in the breeding season whereas others roost and nest on their own—unfortunately the birds were not color-marked and the social behavior of individuals was

not resolved. Only one mixed-species roost was found, evidently a result of a common attraction of birds of each species to a scarce roost site.—R. B. Payne.

31. Aspects of the behavior of the Cattle Egret (*Bubulcus ibis*) at a roost in a mangrove region of Venezuela. (Aspects du comportement du heron garde-boeufs, *Bubulcus ibis,* au dortoir dans une region de mangroves du Venezuela.) M. N. de Visscher. 1978. *Le Gerfaut,* **68**(2): 177–193.—Cattle Egrets were watched as they daily formed a communal roost in mangroves on the coast of Venezuela. Roosts were traditional and were used over many weeks. Characteristically, the flight from the roost at sunrise is synchronized. Most of the data presented in the paper are an attempt to document the timing, minute by minute, of birds leaving or arriving at the roost, and to relate differences to the weather. It might be of interest in such a study to test whether the initial departing birds are in the more poorly-protected part of the roost or are nudged out by other remaining birds (the "you-first" behavior of social dominants getting others to test the safety of leaving the roost), but this remains to be done.—R. B. Payne.

32. Social organization and stability of local density of breeders in the Meadow Bunting *Emberiza cioides*. S. Yamagishi. 1978. *Miscell. Rpts. Yamashina Inst. Ornithol.,* **10**(3) (#53): 199–299. (In Japanese with English "summary" of 25 pages.)—This seven-year study in central Honshu contains much information on the breeding biology of this wetland sparrow. It is a multi-faceted study in the best tradition of Nice, but by no means as exhaustive. About seven pairs were watched intensively each year, and most aspects of the breeding followed. Predation was assumed (with good reason) to be the cause of egg loss (37% of those laid) and of young disappearing from the nest (50% of those hatched). The author has interesting data on the coincidence of song perches with territorial fights and utilized area. Many studies use only one of these measures of "territory" size. The species had a rather low mortality rate, to judge by the disappearance of males (about 25%) and females (about 60%). Most disappearances occurred in the breeding season. The females' high mortality rate probably results from their relative lack of site tenacity. Despite this, pair bonds were relatively long-lived and stable, the "divorce rate" being only about 10%. Locally produced young were the sole source of replacement of mates (which often took up with close neighbors). The author could document no immigration. This is a good solid piece of work that deserves the space and English translation it received. Studies like this are too rare, probably because they result in few "breakthroughs." They do, however, provide a solid antidote for those among us prone to "data-free" hypothesizing.—C. J. Ralph.

33. Behaviour of a Willow Grouse, *Lagopus lagopus*, at the nest. E. Pullainen. 1978. *Ornis Fenn.,* **55**(4): 141–148. (In Finnish with English and Finnish summaries.)—Rarely recorded incubation movements were observed with "a field television system with remote control" in eastern Finnish Lapland (67°44′N, 29°37′E) in continuous daylight. "The exact moment of laying could not be recorded," but only the hen incubated. She began with the penultimate egg and was off the nest only 5.7% of the time during which time the eggs were covered by vegetable debris. Settling and preening occurred all day long with a slight decrease at evening and midnight. In cold weather settling adjustments increased, whereas preening, body-shifting, and nest-restructuring decreased. Eggs were always shifted from nest edge to center, by ventral contact of bill and neck. Rate of insect capture increased gradually to 33 items in 26 hr at hatching day. No plant browsing or defecation were detected in or near the nest. Hatching accentuated preening, feeding, and nest building. The eldest chicks left the nest about seven hours after hatching.—Leon Kelso.

34. Contributions to the ethology and growth rates of the Wryneck *Jynx torquilla*. (Beiträge zur Ethologie und Gewichtsentwicklung beim Wendehals *Jynx torquilla*). H. Löhrl. 1978. *Ornithol. Beob.* **75**(4): 193–201.—This paper is a brief qualitative discussion of several interesting behavioral patterns of the Wryneck. Data on growth rates of young are also included. During courtship or aggression, Wrynecks sometimes stretch the neck forward and move the head back and forth through a horizontal arc. The display is accompanied by vocalization and feather erection on the head. The author considers this display (Pendeln) analogous to the head swaying of woodpeckers. Another display (Kopf-

drehen) is given when a bird is held in the hand, therefore, presumably in situations of extreme danger. The head is tilted back and then turned 90° to the side. The display is given repetitively "like clockwork," the periodicity varying among individuals. A series of photographs depicts the sequence. When disturbed in the nest cavity, an incubating or brooding adult gives a recoiling hiss display. Miscellaneous information includes observations of Wrynecks destroying eggs in unattended nests of Coal Tits (*Parus ater*) and other Wrynecks. Eggshells are fed to the young. Adults also bring snail shells, small bones and occasional man-made objects to the young, all presumably serving as supplementary calcium sources.—Marshall A. Howe.

35. Length of the pair bond in the Bearded Tit (*Panurus biarmicus*). (Paarzusammenhalt bei der Bartmeise (*Panurus biarmicus*). R. van den Elzen. 1977. *Vogelwarte,* **29**(2): 122–125.—Pairs of banded Bearded Tits tend to remain together outside of the breeding season.—R. B. Payne.

ECOLOGY

(See also 29, 45, 73, 87)

36. The utilisation of farmland by Golden Plovers wintering in southern England. R. J. Fuller and R. E. Youngman. 1979. *Bird Study,* **26**(1): 37–46.—Golden Plovers (*Pluvialis apricaria*) that winter in southern England aggregate in loosely-structured flocks (see review **4**.) that occupy restricted ranges (900–2,000 ha). Within these ranges, plovers are usually found on permanent grassland during the autumn and early winter, but move to fields of winter wheat in late February. Short cold spells apparently induce brief dispersal from the normal feeding ranges, and prolonged severe weather leads to substantial emigration for the rest of the winter. These results for plovers are briefly compared with similar data for Lapwings (*Vanellus vanellus*) observed in the same area.—Scott R. Robinson.

37. Feeding ecology of a population of nesting Yellow Warblers. D. G. Busby and S. G. Sealy. 1979. *Can. J. Zool.,* **57**(8): 1670–1681.—All too often data are gathered for their own sake or the sake of testing some ecological theory in isolation from thoughtful consideration of their significance to the life of the organism. Here is a paper that not only avoids this pitfall, but also presents a superior interpretation of the results. For two breeding seasons, May to August, in Manitoba, Canada, observations were made as to prey available, and methods and locations of foraging. Optimal foraging under resource limitations was indicated by generalization, i.e., eating prey in proportion to their abundance, while at the same time the sexes specialized, males foraging higher in trees than females and in trees with less dense foliage than those used by females. The authors suggest that both of these behavioral differences enable the males to advertise their territories while gathering prey. Females foraged low in densely foliaged trees, and thus they apparently minimized conspicuousness and also stayed close to their nest sites. All behavior reported here indicated adaptations for efficiency of energy utilization during foraging.—A. John Gatz, Jr.

38. Comparison of the ecological structure of avian populations of mixed temperate forests. (Structures ecologiques comparées des peuplements aviens de forêts mixtes temperees.) M. M. Thiollay. 1978. *Le Gerfaut,* **68**(3): 347–372.—From listing and field work with forest birds in three regions (France, Mexico, and Nepal), Thiollay compares the ecological structure of bird communities. The number of species and the species diversity indices are lower in France. Thiollay comments on similarities in species number in some guilds and on differences in other guilds, and suggests a number of reasons (ecological, faunal, climatic, and historical) for the patterns observed.—R. B. Payne.

39. Bird predation on forest insects: an exclosure experiment. R. T. Holmes, J. C. Schultz, and P. Nothnagle. 1979. *Science,* **206:** 462–463.—Patches of striped maple (*Acer pensylvanicum*) in a hardwood forest at W. Thornton, N.H., were enclosed in crop protection netting to exclude birds from early June to mid-August. Similar control, unprotected areas were nearby. At weekly intervals a visual census of Coleoptera, Homop-

tera, Heteroptera, and lepidopteran larvae and arachnids on 400 leaves, petioles, and stems was made. The only clearly significant reduction in population was that of lepidopterous larvae with an overall mean of 37%. The Mann-Whitney U test was used. The authors conclude that endemic levels are more affected by bird predation than are outbreak levels, and that this reduction may tend to lengthen the time between outbreaks. A more hypothetical conclusion is that such predation may tend toward the evolution of crypsis in caterpillars.—C. H. Blake.

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

(See 84)

CONSERVATION AND ENVIRONMENTAL QUALITY

(See also 18, 60, 87)

40. Hunting of White Storks in Niger. (Fang von Weissstörchen auch in Niger.) P. Giraudoux. 1978. *Vogelwarte*, **29**(4): 276–277.—White Storks (*Ciconia ciconia*) are hunted in several areas of West Africa, and this note documents the practice in Niger. Counts of storks and estimates of hunting success indicate that about half of the storks are killed each winter. The local hunters claimed they did not hunt Abdim's Storks (*C. abdimi*) because these breed in West Africa and the local people like their eggs. With this heavy pressure it will be impossible for storks to survive.—R. B. Payne.

PHYSIOLOGY

(See also 5, 7, 8, 10, 14, 21, 74, 76)

41. Regional distribution of blood flow during diving in the duck (*Anas platyrhynchos*). D. R. Jones, R. M. Bryan, Jr., N. H. West, R. H. Lord, and B. Clark. 1979. *Can. J. Zool.*, **57**(5): 995–1002.—Earlier research on circulatory responses during diving used different techniques in ducks than in seals. Consequently, it was unclear whether the variations reported between these animals were due to methodological or physiological differences. This paper reinvestigates cardiovascular responses during submergence in Mallard and White Pekin ducks using radioactively-labelled microspheres and other techniques similar to those previously used with a seal. The results show that ducks maintain absolute blood flow to the heart during submergence at approximately predive levels, increase blood flow to the brain, and drastically decrease most peripheral circulation. Thus, proportionate blood flow to the brain and heart is dramatically increased. In contrast, the use of this technique on a seal during submergence has shown it to maintain proportionate blood flow to the heart but not absolute blood flow, because overall cardiac output is reduced approximately ten-fold. Physiological differences in the diving responses of representatives of these two classes of homeotherms are verified.—A. John Gatz, Jr.

42. Infrasound detection by the Homing Pigeon: A behavioral audiogram. M. L. Kreithen and D. B. Quine. 1979. *J. Comp. Physiol.*, **129:** 1–4.—The sources and integration of cues used in orientation by migratory birds and homing pigeons are still one of the biggest mysteries in avian biology. As part of a continuing series of investigations on the sensory abilities of homing pigeons to detect environmental characteristics, this study used classical conditioning techniques to test whether homing pigeons can detect ultrasound. Natural ultrasounds resulting from wave action, thunderstorms, jet streams, and mountain ranges can travel unattenuated for thousands of km. Homing pigeons can detect extremely low frequencies (0.05 Hz) and are at least 50 dB more sensitive than humans below 10 Hz. Surgical manipulations indicate that such sensitivity results from modifications within the inner ear. Use of ultrasounds in navigation would require use of the Doppler effect, since the long wavelengths of ultrasound would prevent binaural differences in the time of arrival of the sound pattern used at higher frequencies to determine the direction from which sounds are coming.—Cynthia Carey.

43. Synchronization of a circadian rhythm in pinealectomized European Starlings by daily injections of melatonin. E. Gwinner and I. Benzinger. 1978. *J. Comp. Physiol.*, **127:** 209–213.—The location of the clock that drives the multitude of behavioral and physiological rhythms in birds has not yet been identified. The pineal gland has been hypothesized to play a central role in the control of many circadian rhythms in birds. This study tests whether the hormone melatonin, which is produced by and secreted from the pineal gland, is the principal mechanism of communication between the pineal and circadian functions. Ninety-five % of the pinealectomized starlings receiving daily injections of melatonin exhibited synchronized locomotor activity, in contrast to only 10% of the control birds. Therefore, a circadian rhythm in melatonin production by the pineal may act directly to drive other circadian oscillators. The study was unable to determine what mechanism might provide the circadian stimulus for production and release of melatonin.—Cynthia Carey.

44. The circadian rhythm of the Starling *Sturnus vulgaris* and other passerines in Abisko, northern Sweden. (Der Tagerhythmus des Stares *Sturnus vulgaris* und anderer Singvögel in Abisko, Nordschweden.) N. A. Andersson and K. Müller. 1978. *Ornis Scand.*, **9:** 40–45.—This paper presents information on circadian activity patterns of wild starlings and captive fringillids of several species during the arctic summer in Sweden. Frequencies of movement of breeding starlings in and out of nest boxes were monitored with an automated kymograph apparatus. During the laying and building periods, there was a mean of 30 visits/day, dropping to 18 during incubation. In contrast to the statement in the English summary, peaks of activity at these times were at dawn and dusk. When young were being fed, peak activity was at midday and the number of trips rose to 260/day.

Studies of *Fringilla, Plectrophenax,* and *Serinus* in activity cages under a natural light regime but constant temperature yielded the following results: during the period of 24-hr sunlight, the onset of daily activity shifted slowly back from midnight to late afternoon. This supports data from Aschoff's experiments on activity phase-shifts under constant light. It also suggests that ambient temperature mediates circadian activity patterns in the wild under a 24-hr light regime, because wild birds do not exhibit the phase shifts shown by birds held in a constant temperature environment.—Marshall A. Howe.

45. Ambient temperature and the daily energetics of two species of hummingbirds, *Calypte anna* and *Selasphorus rufus*. C. A. Beuchat, S. B. Chaplin, and M. L. Morton. 1979. *Physiol. Zool.*, **52:** 280–295.—As the title suggests, daily energy utilization and weight dynamics of two hummingbirds are extensively analyzed in relation to ambient temperature. The results of this paper are open to some criticism because of several assumptions made by the authors that are important in the methods used. For example, it is assumed that assimilation efficiency is 100% (because the food provided was not pure sugar, this would be remarkable) and that the R. Q. of sitting birds was always 1.0 (likely to be a relatively crude estimate in the absence of data). Other details in the paper detracted slightly from what is otherwise an interesting analysis. In particular, citations were not always appropriate. In some cases the specific source was difficult to discover; in others modern authors were credited with data that actually came from much older sources. Nevertheless, the final product should be read because it is a useful study that provides data usable in other aspects of hummingbird ecology and the absolute values are presented in such a manner that subsequent studies could check their accuracy.—C. R. Blem.

46. Osmoregulation by avian embryos: the allantois functions like a toad's bladder. D. F. Hoyt. 1979. *Physiol. Zool.*, **52:** 354–362.—Developing avian embryos obtain water from the allantois in a manner analogous to the way in which toads withdraw water from urine stored in the bladder. Ontogenetic and anatomical similarities also exist between the avian allantois and the toad's bladder. Water loss of chicken eggs after 17 days of incubation is largely replaced from the allantois which possesses a sodium pump that maintains the hypotonicity of allantoic fluid. This is an interesting, clear demonstration of one aspect of allantoic function.—C. R. Blem.

47. Metabolism of avian embryos: patterns in altricial and precocial birds. C. M. Vleck, D. F. Hoyt, and D. Vleck. 1979. *Physiol. Zool.*, **52:** 363–377.—The title is a bit of

a misnomer. Oxygen consumption was measured from individual eggs of only five species of birds (3 altricial, 2 precocial). Oxygen uptake increased throughout incubation in altricial species, but in precocial forms increased to a maximum during the first 75% of incubation, then remained relatively constant through the remainder of development. The physiology of the avian egg remains one of the most active, lively subjects in current ornithological research.—C. R. Blem.

48. Sexual difference in pattern of hormone accumulation in the brain of a songbird. A. P. Arnold and A. Saltiel. 1979. *Science,* **205:** 702–705.—Only males of the Zebra Finch (*Poephila guttata*) sing. Castration reduces song frequency and testosterone propionate injections restore it. Such injections do not stimulate females to sing. The test birds were spayed or castrated and a few days later injected with tritiated testosterone. Brain regions known to be associated with song production showed that their cells were larger and acquired relatively more testosterone in males than in females. This paper includes an interesting use of the Poisson distribution.—C. H. Blake.

49. Strong electrical currents leave the primitive streak of chick embryos. L. F. Jaffe and D. C. Stern. 1979. *Science,* **206:** 569–571.—Developing or regenerating systems produce steady electric currents. At the primitive streak stage of the chick embryo, a current of about 100 microamps/cm^2 leaves the primitive streak (most strongly near Hensen's node) and returns through the epiblast.—C. H. Blake.

50. Endogenous control of molt and migratory restlessness in Red-backed Shrikes from southern Finland and southern France. (Endogene Kontrolle der Mauser und der Zugdisposition bei südfinnischen und südfranzösischen Neuntötern (*Lanius collurio*).) E. Gwinner and H. Biebach. 1977. *Vogelwarte,* **29**(1): 56–63.—Red-backed Shrikes from southern Finland and southern France were taken from their nests and reared by hand in southern Germany, then were placed in environmental chambers held on 12-hr photoperiods until spring of the next year. Autumn migratory restlessness, winter molt, and spring migratory restlessness occurred at the normal times in the absence of season photoperiodic cues. The authors suggest that the timing of these events is controlled by an endogenous program in each bird, and this may be useful to birds wintering near the equator. However, back to the field. Most Red-backed Shrikes winter well south of the equator and are common into Zimbabwe Rhodesia and South Africa. At these latitudes the monthly changes in photoperiod and the seasonal changes in the landscape would provide many cues for timing a northward migration. Perhaps the internal rhythms are normally used as a back-up mechanism for timing the annual cycle at least in seasonal habitats, and a hierarchy of cues (in parallel with the scheme emerging in studies of orientation in migrating birds) may be used by the birds in the field.—R. B. Payne.

51. Observations about the effect of hormones on the migratory behavior of the Robin (*Erithacus rubecula*). II. Pharmacological effects. (Beobachtungen über Wirkungen von Hormonen auf das Zugverhalten bei Rotkehlchen (*Erithacus rubecula*). II. Die Wirkung von Pharmaka.) V. Ieromnimon. 1978. *Vogelwarte,* **29**(3): 221–230.—Pharmacological effects of CB154 and Trilafon on nocturnal migratory restlessness together with results of replacement therapy with prolactin and thyrotropin indicate that prolactin and thyrotropin are involved in the physiology of migration.— R. B. Payne.

52. The significance of the legs for thermoregulation by the House Sparrow (*Passer domesticus*) and Zebra Finch (*Taeniopygia guttata castanotis*). (Die Bedeutung der Beine für die Temperaturregulation bei Haussperling (*Passer domesticus*) und Zebrafink (*Taeniopygia guttata castanotis*).) C. Heisler. 1978. *Vogelwarte,* **29**(4): 261–268.—Temperatures were taken along the legs of House Sparrows and Zebra Finches. Temperature decreases all along the leg from the body to the tibiotarsal-tarsometatarsal joint, then remains constant or nearly so to the base of the toes. The temperature gradient apparently results from a series of veins returning blood to the body core, so that not all blood circulates to the distal leg. No significant differences were found between these two species in their responses to immersion of their feet in ice water; both quickly got cold feet and both recovered their distal leg temperature quickly when their feet were removed from the cold bath.—R. B. Payne.

MORPHOLOGY AND ANATOMY

(See also 24, 25, 46)

53. Timing of skull pneumatization of the Purple Finch and the Common Redpoll. R. P. Yunick. 1979. *N. Amer. Bird Band.*, **4**(2): 53–55.—The age of completion of skull pneumatization was studied in wintering Purple Finches (*Carpodacus purpureus*) by examination of 1,283 individuals captured and categorized as: skull incompletely pneumatized (SIP) or skull completely pneumatized (SCP). Results were analyzed in one-third (ca. 10 days) month periods from 1 January and 30 April 1977. A small percentage (ca. 2%) of the individuals remained SIP in late February–early March, so the study locale shifted from Schenectady, N.Y. to a breeding location near Corinth, N.Y. where 437 individuals were captured and examined. "Even into summer, this species continued to exhibit incomplete pneumatization." A majority of them were same-year males (SYM) captured between 25 June and 16 July but a male caught on 1 July was at least two years old. The timing and rate of completion of pneumatization in this species matches closely that of the Pine Siskin (*Carduelis pinus*). The capture and examination of 1,312 Common Redpolls (*Carduelis flammea*) showed that they had completed pneumatization by the end of February.—Richard J. Clark.

54. Pigeons have magnets. C. Wolcott, J. L. Gould, and J. L. Kirschvink. *Science*, **205:** 1027–1029.—Each of about 24 pigeons had a unilateral (side not stated) magnetic region (about 1 × 2 mm) very close to the skull. About 40% had a weak natural remanence indicating preferential alignment in the mass. The magnetic substance was mostly or entirely magnetite. How and if the structure can be used to determine the direction of magnetic lines of force is still unknown.—C. H. Blake.

PLUMAGES AND MOLT

(See also 49)

55. The suspension of moult by trans-Saharan migrants in Crete. R. L. Swann and S. R. Baillie. 1979. *Bird Study*, **26**(1): 55–58.—About 4,400 migrants were trapped in the autumn on a small island northeast of Crete. Of these, five species were found that showed high frequencies of interrupted molt of remiges. These birds, from eastern populations, show higher frequencies of suspended molt than western populations of the same species examined in western and southern Iberia. The authors relate this difference to later breeding in eastern populations, particularly for birds rearing second broods. This idea is plausible, but could be tested further by a comparison of these five species with other migrants that do not suspend molt. Unfortunately, the paper does not provide any data on the species not found to suspend molt, so such comparison is not possible.—Scott R. Robinson.

ZOOGEOGRAPHY AND DISTRIBUTION

(See also 6, 64, 67, 86)

56. The rediscovery of the White-winged Guan (*Penelope albipennis*). (Sur la redecouverte de la Penelope a Ailes Blanches, *Penelope albipennis.*) J. F. Dejonghe and B. Mallet. 1978. *Le Gerfaut*, **68**(2): 204–209.—The White-winged Guan, observed only once between 1877 and 1977, was rediscovered by John O'Neill in January 1977 in a valley in the province of Piura, Peru. B. Mallet visited the region in January 1978, and was guided by a peasant to the same spot. He found two pairs of guans. Several photographs show the habitat (a wooded valley at 1,800 m el. at the base of the mountains; the precise locality is not given) and the bird. The guan fed on white berries of a liana in the tops of small trees.—R. B. Payne.

57. Distribution of Amazon forest birds. J. Haffer. 1978. *Bonn. Zool. Beitr.*, **29**(1–3): 38–78.—Why are there so many species of birds in the Amazon forest? Haffer nicely poses the historical question as a paradox for allopatric speciation: given that the Amazon lowlands are without obvious geographic, vegetational, or climatic barriers, how have so

many species managed to evolve? He poses three models of speciation, namely isolation of populations in the Tertiary, isolation in the Quaternary in blocks of remnant forest, and isolation by the river system in the early Quaternary. Without developing specific predictions from his models he then plotted bird species onto 100-km grids on regional maps, and from "visual inspection" arrived at six main distributional centers, with about a quarter of the terrestrial species being restricted to one of these centers. He also mapped the regional distribution of species range borders from the same grid cells. In a third map series he counted total numbers of species occurring in each grid.

Results of the distributional analysis suggest to Haffer that the Quaternary isolation model accounts for much of the speciation history of the avifauna. Although species range borders coincided in many cases with the drainage map of the Amazon and its major tributaries (with 70–150 different species borders coinciding with the lower Amazon, and 30–50 species borders coinciding with much of the other river system), Haffer argues that these borders do not reflect barriers to speciations, for they may just as well indicate boundaries between competing species (including sister species). In this view the rivers act as semi-barriers that slow down gene flow and allow the home species to win before the invading species can become established.

Although species boundaries may coincide with interrefugial boundaries or with river barriers, the total number of species across the continent varies only gradually, with more species in the west, where varied topography begins. Haffer reasons that this shows the total number of species in an area should be explained by competition among species, with replacements of one localized species by another, or by a more widespread species.

The study has several weaknesses. The six "refugia" were determined subjectively, but they might have been shown in an objective manner by use of a multivariate clustering technique. The "refugia" account for only a quarter of the species. The coincidence of the rivers with species boundaries is exactly the kind of distribution pattern one would predict from the river model of speciation, but Haffer argues away the results as consistent with more than one model. The six distributional areas involved correspond with locations of forest refugia constructed from geomorphological and climatological data, we are told, and Haffer has contributed to these interpretations elsewhere, but the logic is not developed in the present paper. The comparison of the models is unsystematic, because Haffer did not develop discrete predictions from each model and set the predictions of one against those of the other in a manner testable by the results of his distributional data. He does not discuss the possible relevance of the results to the first model, and from this paper alone it is not possible to distinguish between Tertiary and Quaternary distributions. However, Haffer does develop this theme in other papers.—R. B. Payne.

58. On the breeding birds of Bahrain. M. D. Gallagher and T. D. Rogers. 1978. *Bonn. Zool. Beitr.*, **29:** 5–17.—The Emirate of Bahrain includes about 30 small desert islands in the Arabian Gulf. Birding records of the authors and of others are summarized. Twenty-three species were found to breed (of more than 240 species known from the islands); other species that may breed are described. Food and breeding notes are described for each species. Only five species were known previously to breed locally, and two were not reported previously to breed in Arabia—Turtle Dove (*Streptopelia turtur*) and Olivaceous Warbler (*Hippolais pallida*).—R. B. Payne.

59. Notes on habitat and distribution of montane birds in southern Iran. M. Desfayes and J. C. Prax. 1978. *Bonn. Zool. Beitr.*, **29**(1–3): 18–37.—Birds were observed in the Central Range and further east in southeastern Iran for two months in 1975. The montane habitat is dominated by low clumps of *Artemisia,* with occasional local shrubs of almond, pistachio, or juniper. A systematic list of birds observed is presented separately for the montane birds found mainly above 2,000 m and for the other species on the plateau averaging 1,500 m. Notes include altitudes, breeding records, local Baluchi names, and food and body weights of specimens collected. The most abundant bird was the Crested Lark (*Alauda cristata*). The authors are skeptical of previously reported sympatry between the *Alectoris* partridges. The breeding form of the Lesser Whitethroat (*Sylvia curruca*) was *althaea*; Vaurie had suggested sympatry of this form with nominate *curruca* but the authors suggest that the specimens in question were migrants in passage. Rock

Nuthatches (*Sitta tephronota*) were "extremely abundant" locally but absent from other apparently suitable habitats. Where the species lives with trees, it feeds on the ground, climbs trees, and nests in holes up to 1.7 m above the ground, plastering the nest hole with earth and resin. The species may originally have been a forest dweller that now lives secondarily in rocky habitat by dessication of its range and the loss of forest. House Sparrows (*Passer domesticus*) were almost all associated with man, mainly around cereal cultivation, but were absent from some towns where they were replaced by the Tree Sparrow (*P. montanus*). A flock of Red Munia (= Strawberry Finch) (*Amadava amadava*) was the first record for Iran; the species occurs nearby in Pakistan. The Grey-necked Bunting (*Emberiza buchanani*) apparently has regional song dialects. Surprisingly absent from the area were vultures.—R. B. Payne.

60. Notes on the birds, principally aquatic, of the region of the National Park of the delta of Saloum, Senegal. (Note sur les oiseaux, principalement aquatiques, de la region du Parc National du Delta du Saloum (Senegal).) A. Dupuy and J. Verschuren. 1978. *Le Gerfaut,* **68**(3): 321–345.—The authors report on birds seen on recent visits to a newly-established National Park in Senegal. The Park includes most typical habitats of the Saloum river delta and of the coastal islands south of Dakar. Grey-hooded Gulls (*Larus cirrocephalus*) breed locally, and most mangrove birds are found. No mention is made of any Little Egrets (*Egretta garzetta*) occurring together with Reef Herons (*E. gularis*). The brief list of birds adds little to our knowledge of water birds of that region, this being the field explored mainly by de Naurois in his monographic work. But the list of birds will help document local occurrences and may draw attention to conservation needs.—R. B. Payne.

61. The Great Gray Owl in Norbotten Province in 1975–1978. Lappuglan, *Strix nebulosa,* i Norrbotten, 1975–1978.) O. Stefansson. 1979. *Var Fagelvarld,* **38**(1): 11–22. (In Swedish with English summary.)—The Great Grey Owl depends on alien nests for breeding, especially nests of the Goshawk (*Accipiter gentilis*) of which 2–3 per territory were suitable. Whereas many owls bred here in "rodent years," their local future remains uncertain. Over a 15-year period owl and rodent populations "peaked" every 4th year. There was a corresponding fluctuation of *Strix uralensis, Aegolius funereus,* and *Asio flammeus* abundance. In 1975, *S. nebulosa* pairs fell to 2, and of 19 *S. uralensis* pairs, none bred. By 1977, the *S. nebulosa* population had risen to 35 pairs.—Leon Kelso.

SYSTEMATICS AND PALEONTOLOGY

(See also 68, 78)

62. Relationships of the passerine finches (Passeriformes: Passeridae). W. J. Bock and J. J. Morony. 1978. *Bonn. Zool. Beitr.,* **29**(1–3): 122–147.—The passerine finches (*Passer, Montifringilla,* and *Petronia*) have a tongue bone (preglossale) and muscle complex that is lacking in the other finches. The paper reviews the finch classification schemes of others and describes in detail the tongue anatomy of representative species. The authors conclude that since these three genera have the character complex and the others do not, the three are closely related, i.e., they are monophyletic and share a recent common ancestor that also had the character complex. This is a reasonable conclusion, because the other finches do not have the suite. The authors also conclude that the group of three genera should be recognized at the taxonomic level as a family. This is an arbitrary decision. The authors reserve judgment on *Petronia* (?)/*Carpospiza* (?) *brachydactyla,* which they did not examine, because of unpublished opinions of others on its systematic position.

The authors introduce their work with a series of (nonexclusive) "hypotheses" to be considered. However, they do not disprove any of their statements ("hypotheses"), and we must recognize these statements for what they are, namely predictions from the hypothesis that the character states are homologous and derived, and that the three species groups are monophyletic. Science advances when we can disprove one or more of two competing hypotheses, not when we find results consistent with our only hypothesis (cf., Platt, *Science* **146:** 347–353, 1964). Here and in the text following, the authors base character "homologies" and phylogenetic "relationships" on the same set of data. They point

out that one cannot logically base homologies on known relationships, or vice versa. However, are not the conclusions just as weak if there are no independent character sets available for study? They base their conclusions on a single character suite (a tiny bone and its associated muscle) and ignore a quantitative comparison of other characters. Although I agree that the three genera are probably closely related, the authors fall into the same trap as the one that Bock has elsewhere pointed to as a trap for Tordoff in his single-character comparison (bony palate) of finches. The authors do not designate the specimens that they dissected, nor do they indicate the number of specimens examined of each species; hence, it will be difficult to repeat their anatomical results. Apparently they dissected only one species for each major group at the level of subfamily or tribe outside of the three main genera in question. It will be necessary to examine a large number of anatomical and other characters and also a large number of the species involved, and logically and systematically to sort out the patterns of similarity with the help of phenetic and cladistic programs before we significantly advance our knowledge of finch relationships.—R. B. Payne.

63. On some enigmatic pipits associated with *Anthus novaeseelandiae* (Gmelin) from central and southern Africa (Aves, Motacillidae). P. A. Clancey. 1978. *Bonn. Zool. Beitr.,* **29**(1–3): 148–164.—Clancey describes variation in museum specimens of four taxa of pipits. (1) *Anthus latistriatus* Jackson 1899 may be specifically distinct from *A. novaeseelandiae,* but having not seen the material himself Clancey defers any taxonomic changes in the present paper. (2, 3) *A. richardi lwenarum* White 1946 and *A. r. editus* Vincent 1951 are regarded as identical, being specimens from the wintering range (Zambia, Shaba) and the breeding range (the highlands of Lesotho) of the same population. (4) *A. hoesch* Stresemann 1938 is reinstated as a recognizable subspecies known from Namibia and presumed to breed in the Huambo highlands of Angola. The paper unfortunately continues Clancey's personal attacks on the competence of the late C. M. N. White, who held different taxonomic views.—R. B. Payne.

64. African Reed Warblers (*Acrocephalus baeticatus*) in Kaouar (Niger). P. Devillers and F. Dowsett-Lemaire. 1978. *Le Gerfaut,* **68**(2): 211–213.—In 1974, Fry, Williamson, and Ferguson Lees (*Ibis,* **116:** 340–346) described a new subspecies *A. b. hopsoni* from Lake Chad. It differed from birds to the east (Darfur) and southwest (Nigeria), *A. b. cinnamomeus,* in color and in its larger size (no overlap in the small samples compared). In the present note, an examination of a sample of 13 African Reed Warblers (previously reported incorrectly as the European Reed Warbler, *A. scirpaceus*) from the Lake of Arrigui, north of Bilma, Niger, proves to be intermediate in size between the Lake Chad birds and the Darfur birds, overlapping the five available Darfur birds in size and slightly overlapping (by 0.5 mm) the Lake Chad birds. The authors find no convincing evidence of color differences among the three samples, and they conclude that the material now available is insufficient to justify recognizing the Lake Chad form as a distinct subspecies.

Fry et al. (1974) also proposed that *A. baeticatus* is most closely related to the Palaearctic Blyth's Reed Warbler, *A. dumetorum,* and even proposed lumping the two species, insofar as the Lake Chad birds were intermediate in size and geography between other African *A. baeticatus* and the European *A. dumetorum.* But, the present authors note, all the West Palaearctic *Acrocephalus* warblers are larger, so this trend is not towards *A. dumetorum* in particular. Dowsett-Lemaire notes that the song of the African birds is "practically indistinguishable" from the song of the Palaearctic Reed Warbler, *A. scirpaceus,* and in fact the African birds respond readily to playback of that song. The authors agree with Hall and Moreau (1970) that *baeticatus* likely has its closest affinities with *A. scirpaceus.*—R. B. Payne.

65. Systematic place and geographic history of the Galapagos Hawk, *Buteo galapagoensis*. K. H. Voous and T. de Vries. 1978. *Le Gerfaut,* **68**(3): 245–252.—In a thesis, de Vries listed 16 characters that vary among several species of *Buteo* to compare the relationships of the Galapagos Hawk to other hawks. The characters are not described here, but are mentioned, and the authors conclude (but do not show in their table) that *B. galapagoensis* is most like the Red-backed Hawk (*B. polysoma*) but also similar to its

northern replacement the White-tailed Hawk (*B. albicaudatus*). The first is widespread in South America, the second in northern South America including the Netherlands Antilles in the southern Caribbean. This, argue the authors, is but one of many strong faunal links between birds of the Caribbean and birds of the Galapagos, which may thus be regarded from a faunal viewpoint as simply an extension of the "other" Caribbean islands. Thus we have an "Atlantic" and a "Pacific" Caribbean. The Galapagos Islands are not very old (3 million years), and it seems reasonable to argue for dispersal and speciation in the Galapagos from this area. Several other birds of the Galapagos, including Darwin's Finches, have their closest relatives among the Caribbean fauna, and in some cases the species are the same. The Galapagos Hawk may resemble the ancestor of some of the present North American hawks that have spread from South America, presumably the center of origin of this group of hawk species. However, I think that the authors overstate their case of resemblance of Galapagos and Caribbean faunas, because several of the species they cite are found elsewhere along the Pacific (Brown Pelican, Great Blue Heron, Yellow Warbler.—R. B. Payne.

66. The status of Percival's Oriole (*Oriolus percivali*) and its hybridization with *Oriolus larvatus* in east Africa. (Le statut du Loriot de Percival, *Oriolus percivali,* et son hybridation avec *Oriolus larvatus* dans l'est Africain.) A. Prigogine. 1978. *Le Gerfaut,* **68**(3): 253–320.—In their "Atlas of Speciation in African Passerine Birds," Hall and Moreau drew attention to the species problem of orioles in East Africa. *O. percivali* occurs sympatrically with *O. larvatus* in part of Central Africa, and is separated from it ecologically, altitudinally, and apparently also vocally. But hybrids are known from the East African highlands. Prigogine has analyzed most available museum specimens in the species complex and concludes that hybrids are uncommon, that destruction of the forests in the highlands has forced the two orioles together where they occasionally hybridize and introgress, but the two forms still exist side by side around Nairobi mainly without interbreeding. He concludes that the interbreeding is a recent result of man's habitat destruction, and that the two orioles are two distinct species.—R. B. Payne.

67. Distribution and relationships of South American Skuas. P. Devillers. 1978. *Le Gerfaut,* **68:** 374–417.—The several kinds of skuas breeding from the southern tip of South America to Antarctica vary in appearance within any one area and also vary geographically. Devillers explored the Falkland Islands and the Atlantic coastal sites of southern Argentina where skuas breed, found a total of 1,200 individuals, described plumage types seen in each area, and photographed 82 individuals to document their plumage, bill shape, and some display behavior. He also compared the photographs and field notes with museum specimens.

Two kinds of skuas breed on the Atlantic coast of Argentina. One (*Catharacta skua antarcticus*) breeds on the Falklands and also on the Argentine coast of Punto Tombo and Puerto Deseado. The second (*C. chilensis*) breeds from Puerto Deseado south through coastal Patagonia, and also occurs on the south coast of Tierra del Fuego and northwards along the fijords of southern Chile. Falkland Skuas are variable in adult plumage with light, intermediate, and dark birds, and observed mating combinations on the Falklands showed an apparent random mating among plumage classes. Chilean Skuas differ from Falkland Skuas in having a pronounced dark cap contrasting with the paler nape, red or pale underwing coverts and throat (less consistently red than reported by earlier workers, who perhaps had a biased sample of specimens), and a bicolored bill. Bill shape, stockiness, and the aggressiveness of parents at the nest (less aggressive in Chilean Skuas) also differentiate the two. One possible hybrid was seen (nonbreeding) on the Falklands. At Puerto Deseado where the ranges meet, skuas are much less common than in several other breeding areas. The population here is mixed with apparently pure Chilean Skuas, apparently pure Falkland Skuas, and "a number of birds showing clear signs of intermediacy." Devillers suggests that further detailed field work on the numerous islets along the coast in this area must be made, including data on mating combinations and parent-young combinations.

Evidence that these skuas and others in the superspecies group should be considered distinct species, and not intergrading subspecies, includes the apparent lack of introgres-

sion away from the narrow zone of contact, the persistence of the nonintermediate birds in the limited zone of hybridization, and the comparable situation in several species groups of gulls.

Devillers suggests that we recognize three species of skuas, McCormick's Skua (*C. maccormicki*), the Chilean Skua (*C. chilensis*), and the Great Skua (*C. skua*) (including as subspecies the forms *lonnbergi, antarcticus, hamiltoni,* and *skua*), but recognize that there is "at least limited hybridization" between the forms *maccormicki* and *lonnbergi* on the Antarctic Peninsula and between *antarcticus* and *chilensis* in Patagonia. The force of his argument is weakened by his switching back and forth in the text, discussion, and summary, so that *antarcticus* is called a species about as often as it is called a form of *skua.* A scenario for the history of skua distribution and speciation includes the Chilean birds moving overland across the southern tip of Patagonia rather than south along the coast at a time when the Andean ice sheet broke up inland but not across the Straits of Magellan.—R. B. Payne.

EVOLUTION AND GENETICS

(See also 3, 25, 57, 62, 65, 79, 80, 81)

68. Genic changes associated with the establishment of sympatry in orioles of the genus *Icterus*. K. W. Corbin, C. G. Sibley, and A. Ferguson. 1979. *Evolution,* **33:** 624–633.—Investigations of a zone of overlap and potential hybridization of the two "subspecies" of Northern Oriole (*Icterus galbula galbula* and *I. g. bullockii*) shed important light on avian speciation. Using isoelectric focusing, the authors described electrophoretic variation at 2 of 19 loci. In sympatry, around Crook, Colorado, they discovered sharp discontinuities in the variable Esterase allele frequencies between subspecies' plumage types. They contrasted this evidence for reduced introgressive gene flow with earlier studies that reported free hybridization and resulted in the lumping of the two "species". Assortative mating within subspecies is offered to explain the current allele distribution. Although never stated explicitly, the data are consistent with a view that the newly discovered assortative mating is an adaptive premating response to low-level postmating isolation which the previous studies overlooked or were unable to document. Their conclusion of a broader range of sympatry and speciation as the final result, overlooks the possibility that speciation had occurred in allopatry, and the current situation is fine tuning as a result of secondary contact.—William M. Shields.

69. Evolution in peripheral isolated populations: *Carpodacus* finches on the California islands. D. M. Power. 1979. *Evolution,* **33:** 834–847.—This is an avian test of one of the tenets of island evolutionary biology. Modern microevolutionary theories suggest that peripherally isolated populations may be important in permitting divergence and ultimately speciation. House Finch (*Carpodacus mexicanus*) populations on California's islands show greater morphological divergence and diversity than mainland populations as predicted. Power concludes that the variation observed is consistent with observed patterns and intensity of barriers to dispersal.—William M. Shields.

FOOD AND FEEDING

(See also 16, 34, 45, 56, 87)

70. Materials concerning food composition of raptors and owls. (Materialy po skladu pokarmu ptakow drapieznych i Sow.) W. Kochan. 1979. *Acta Zool. Cracoviensia,* **23**(10): 214–246. (In Polish with English summary.)—This summarizes analyses of alimentary tract contents of 409 raptors collected in southern Poland from February 1969 to April 1974: Goshawk (*Accipiter gentilis*) 69, Sparrow Hawk (*A. nisus*) 68, Buzzard (*Buteo buteo*) 104, Rough-legged Buzzard (*B. lagopus*) 11, Osprey (*Pandion haliaetus*) 3, Hobby (*Falco subbuteo*) 5, Merlin (*F. columbarius*) 2, Eur. Kestrel (*F. tinnunculus*) 11, Barn Owl (*Tyto alba*) 31, Little Owl (*Athene noctua*) 6, Tawny Owl (*Strix aluco*) 43, Ural Owl (*S. uralensis*) 3, Long-eared Owl (*Asio otus*) 44, and Short-eared Owl (*A. flammeus*) 4. Special attention was afforded three raptors, Goshawk, Sparrow Hawk, and Buzzard, and two owls, Tawny and

Long-eared. An unusual feature was the weight measurements recorded for intestinal food contents. In all the five species just mentioned the weight of stomach contents was definitely higher in females than in males.

Contents of the alimentary canal were rinsed by tap water onto a screen, arranged and identified separately. The contents were weighed, dried in open air and again weighed. Then they were analyzed relative to frequency and weight. A telling example is the Tawny Owl: mammals 51% by frequency, 22.5% by weight; birds, 22% by frequency, 57% by weight. Another example is the Long-eared Owl: mammals 85% by frequency, weight 95%; of *Microtus arvalis* frequency 58% (not weighed); of birds 15% frequency, and 5% by weight. Strangely no shrews, birds or insects were found in the females' diet.—Leon Kelso.

71. Prey selection by breeding Dippers. G. Shaw. 1979. *Bird Study,* **26**(1): 66–67.—The food of a pair of Dippers (*Cinclus cinclus*) was sampled by placing collars around the necks of four nestlings during one morning. The food they received from their parents could not be swallowed, and so was collected. This sample was compared to the food available in a nearby stream, which was sampled within 24 hr. The adult dippers selected larval and adult Trichoptera (caddisflies), Plecoptera (stoneflies), and Ephemeroptera (mayflies) in preference to abundant Crustacea, Gastropoda (snails), Coleoptera (beetles), and Oligochaeta (segmented worms).—Scott R. Robinson.

72. The diet of sand martins during the breeding season. D. R. Waugh. 1979. *Bird Study,* **26**(2): 123–128.—Feces of adult and nestling Sand Martins (*Riparia riparia*) were collected at five breeding colonies, and samples of available flying insects were gathered by means of an aerial suction trap. Based on identification of insects in these samples, the author claims that Sand Martins do not especially prefer insects associated with water, and that they positively select acalypterates (Diptera), aphids (Homoptera), and beetles (Coleoptera) while avoiding bees and wasps (Hymenoptera). Unfortunately, no data on the prey availability were presented, and the comparisons of diet with availability were not quantitatively described; so the author's claims must be taken on faith.—Scott R. Robinson.

73. Feeding ecology of Ring-billed Gull (*Larus delawarensis*) chicks. I. R. Kirkham and R. D. Morris. 1979. *Can. J. Zool.,* **57**(5): 1086–1090.—Feeding peaks occurred just after sunrise and just before sunset for Ring-billed Gull chicks at an insular colony in Ontario. Parents regurgitated fish and insects for their chicks with nearly equal frequency for the first five days after hatching, and thereafter offered primarily if not exclusively fish. Earthworms were the only other major dietary component recognized, and their abundance in the diet was positively related to rainfall or high relative humidity.—A. John Gatz, Jr.

74. Temporal change in gullet food passage in penned Red-winged Blackbirds (*Agelaius phoeniceus*): significance for research in feeding ecology. R. G. Gartshore, R. J. Brooks, J. D. Somers, and F. F. Gilbert. 1979. *Can. J. Zool.,* **57**(8): 1592–1596.—Different types of prey are digested at different rates and move through the digestive tracts of birds at different rates. Data pertaining to these differences are presented for Red-winged Blackbirds held in an outdoor aviary and fed on mealworm larvae and seeds. Concrete suggestions are also given as to when and how to make field collections of this species in order to obtain meaningful dietary observations. The primary requirement is that collections be made less than 30 min after feeding because most food passes through the esophagus and proventriculus within this time span.—A. John Gatz, Jr.

75. On the role of *Nereis virens* in marine birds' food in Kandalaksha Bay, White Sea. (O poli *Nereis virens* v pitanii morskikh ptits Kandalakshskogo zaliva belogo morya.) G. Shklyarevich. 1979. *Ekologiya,* **1979**(2): 91–93. (In Russian.)—Notwithstanding its evident abundance, this polychaete is almost absent from published records of marine bird diets. Its occurrence in the alimentary tract and pellets has been determined by the persistence of its mandibles. Relative numbers were obtained on the basis of the relatively longer left mandible. These occurred in stomachs and pellets collected in 1972–1975, mostly in June and July. They were found in Common Eider (*Somateria mollissima*) 5;

Herring Gull (*Larus argentatus*) 91; and Common Gull (*L. canus*) 6. The small samples render percentages unreliable.—Leon Kelso.

76. On the artificial rearing of nestling Blackbirds (*Turdus merula*) with ivy (*Hedera helix*). (Über die künstliche Aufzucht nestjunger Amseln (*Turdus merula*) mit des Efeus (*Hedera helix*).) P. Bergtold. 1977. *Vogelwarte,* **29**(2): 110–113.—Young blackbirds were reared on diets of ivy berries, on half ivy-half animal food, and on animal food. The birds reared on ivy berries, or on ivy plus animal food, grew more poorly than blackbirds reared on animal food. We conclude that these omnivorous songbirds need much animal food to rear their young.—R. B. Payne.

SONGS AND VOCALIZATIONS

(See also 24, 34, 48, 68, 83)

77. Roles of the song repertoire in Red-winged Blackbirds. D. G. Smith and F. A. Reid. 1979. *Behav. Ecol. Sociobiol.,* **5:** 279–290.—The adaptive significance of the male's song repertoire is receiving considerable attention lately. Smith and Reid outline several hypotheses currently available to explain song repertoire: (1) repertoires enhance individual recognition, (2) repertoires reflect male fitness and evolve in response to intersexual selection, (3) repertoires evolve in response to intrasexual selection (e.g., males with large repertoires gain larger or better-quality territories than males with smaller repertoires), and (4) specific renditions of a repertoire convey specific environmental or social information. Note first that the hypotheses are not necessarily mutually exclusive. Note further that hypothesis 3 incorporates the Beau Geste Hypothesis of Krebs (see Krebs, *Anim. Behav.,* **25:** 475–478, 1977).

The authors recorded over 7,600 songs of four male Red-winged Blackbirds (*Agelaius phoeniceus*). Repertoire size varied from 5 to 7 renditions. With respect to the aforementioned hypotheses, no support was found for Hypothesis 4. Males did not use specific renditions in certain social or environmental contexts. Furthermore, no evidence was found of female choice based upon repertoire size (see Hypothesis 2); e.g., Male 3 with a repertoire size of six songs was mated with only one female while Male 4 with a repertoire size of five was mated with three females. Of course a sample size of only four males is a bit small to draw conclusions about intersexual selection. The authors did find some support for the Beau Geste Hypothesis. If song repertoires provide false density indications, rendition change should occur immediately after perch change. Of the 422 rendition changes recorded, 80% accompanied perch changes. Other Beau Geste predictions were not confirmed. For example, males did not avoid frequent repeating of renditions (low recurrence intervals); high song rate was not correlated with low repetition number; and males with large repertoires did not sing more often. It was noted that rendition changes occurring when the males were stationary were usually in the presence of females, suggesting that repertoires are involved in male–female interactions. Undoubtedly Smith and Reid are correct in concluding that species repertoires evolved in response to a combination of selective pressures.—Frank R. Moore.

78. Comparison of the vocalizations of the genus *Regulus* (Goldcrest) as a contribution to systematics. (Vergleich von Lautäusserungen der Gattung *Regulus* (Goldhähnchen) als Beitrag zur Systematik.) P. H. Becker, 1978. *Bonn. Zool. Beitr.,* **29**(1–3): 101–121.—Audiospectrograms are compared for several species and subspecies of kinglets (*Regulus*). Playback experiments of recorded songs were made to wild Goldcrest (*R. regulus*) and Firecrest (*R. ignicapillus*) in southwest Germany. The songs of *R. satrapa* and *R.* spec. *teneriffae* are more like those of *R. regulus* than those of *R. ignicapillus,* suggesting that *teneriffae* is more closely related to *R. regulus.* Responses to recordings of song were usually made only to songs of the same species, but *R. ignicapillus* responded strongly to Ruby-crowned Kinglets (*R. satrapa*), perhaps because some notes of both species are quite similar.—R. B. Payne.

79. Geographical variation of the song of Goldcrests (*Regulus regulus*) and Firecrests (*R. ignicapillus*). (Geographische Variation des Gesanges von Winter- und Som-

mergoldhähnchen (*Regulus regulus, R. ignicapillus*).) P. H. Becker. 1977. *Vogelwarte,* **29**(1): 1–37.—The Goldcrest and Firecrest in western Europe have marked local and regional differences in song. The song of the Goldcrest, the more northerly species, is similar throughout much of the species' range but in southwestern Europe the complex songs are locally distinctive. The Firecrest's song is more variable geographically in the main part and the ending of the song; these components vary independently of each other. Generally neighboring populations are more similar than remote populations. Samples from large relatively continuous populations are more similar than samples from isolated populations. In playback experiments the Goldcrests respond more or less equally to all local songs, whereas the Firecrests respond more strongly to the songs most similar to their own local songs, and at least one population's songs (Soria) is not responded to by birds in another (southern Germany). A few birds are bilingual with songs of the local dialect and songs of another area, and others have mixed songs—both observations suggest immigration and song learning by dispersing males, but no instances were noted of individually marked birds having moved and switched their songs. The songs showed no evidence of contrast reinforcements in areas where the two species lived together. Becker reasons that the local song differences are not directly adaptive and so seem to serve no known biological purpose.—R. B. Payne.

80. About the spread and quality of a learned motif in the local song of a population of Blackcaps (*Sylvia atricapilla*) of western France. (Über Verbreitung und Eigenschaften eines erlenten Motivs in den Reviergesängen einer westfranzösischen Population der Mönchsgrasmücke (*Sylvia atricapilla*).) H.-H. Bergman. 1977. *Vogelwarte,* **29**(2): 101–110.—Blackcaps on Cape Ferret, northwest of Arcachon, France, have a local song variant or dialect. All birds recorded along 10 km on the cape had the "leier" phrase, whereas all birds recorded along a 16-km transect north of the cape lacked the phrase. The local uniformity in song probably results from a tradition of local learning. Bergman has reared a young Blackcap from another population from day 10 and played to it a tape recording of the "leier" song. The young warbler later sang this same song (Bergman, *J. Ornithol.,* **118:** 288–293, 1977). Bergman does not include information from banded birds to test whether Blackcaps tend to return to the same local site or to remain where they were born. He notes however that part of the population of southern and southwest France remains in the area through the winter, and the local birds may be nonmigratory residents. The cape is long and narrow and topographically isolated from other populations except at the northern base, where birds were not recorded.—R. B. Payne.

81. The song of the Marsh and Willow tits (*Parus palustris* and *Parus montanus*)—variation and function. (Der Gesang von Sumpf- und Weidenmeise (*Parus palustris* und *Parus montanus*)—Variation und Funktion.) E. Romanowski. 1978. *Vogelwarte,* **29**(4): 235–253.—Marsh and Willow tits were observed and tape recorded. Marsh Tits had variable songs with individual birds having up to five different song types and the species in the region having at least 37 song types. The species had some local song dialects characterized by different note types and other dialects characterized by the frequency of particular song types. In playback experiments, birds responded more strongly to songs of their own dialect than to songs from another area. Willow Tits in contrast had more uniform songs, with up to four recognizable song types in the species but with little variation, and no recognizable song dialects. The author suggests that the different Marsh Tit songs may have different functions, because some are given to neighboring territorial males, and others to females in courtship, but no quantitative comparison is given of song types in different situations.—R. B. Payne.

MISCELLANEOUS

82. Work Output of "Zoologicheskii" in 1979. The Editors. 1979. *Zool. Zhurn.,* **58**(3): 461.—The *Zoologicheskii Zhurnal* published 173 papers—91 brief notes, 9 papers in the section "Methods of zoological research," and 35 other accounts. In comparison with 1977, the number of brief reports declined (101 in 1977). The decline resulted from the

publication of accounts of defended and approved doctoral dissertations in zoology. In 1978, the average time from receipt of papers by the board to publication rose to 17 months (16 months in 1976). The number of publications in different zoological fields in 1978 were: 64 papers in systematics (101 in 1976, 75 in 1977); 61 papers in ecology; 46 on embryology and morphology; 29 on physiological ecology; 35 on faunistics and zoogeography; 12 on karyology; 12 on behavior. The distribution of papers devoted to specific systematic groups were: 3 on Annelida (8 in 1977); 62 on insects (97 in 1977); 6 on Amphibia and Reptilia (15 in 1977); more papers on Protozoa, flat and roundworms, and fishes. For other groups totals were about the same as in 1977: Mammals (52 in 1977 vs. 55 in 1978); Aves (22 vs. 26); Arachnida (20 vs. 19); Crustacea (19 vs. 22); Mollusca (18 vs. 17).

Of 430 authors whose papers were published in 1978, 326 were in Moscow, 58 in Leningrad, 33 in Vladivostok, and 13 in Novosibirsk. This is about the same as in 1977. The board again advised that papers sent to the journal should conform to "Rules for Authors" published earlier. Papers whose length exceeds the maximum proposed by the "Rules" are not accepted and are returned to the authors. The editorial board asked readers to contribute remarks and proposals pertaining to the operations of the journal and in particular to consider the benefit of publication of dissertation summaries.—Leon Kelso.

83. Birds as Pests. R. K. Murton and N. J. Westwood. 1976. *In* Applied Biology, T. H. Coaker (ed.). Vol. 1, p. 88–181. London, Academic Press.—In its citing of more than 450 references, this paper is a reasonably complete review of the major problems in the world caused by birds to humans. The problems are classified as coming from the physical presence of birds, birds as vectors of disease-causing organisms, and problems in agriculture, horticulture, and fisheries resulting from feeding by birds. Human efforts toward control of problem birds are also summarized.

The classification of certain species of birds as pests without full cost-benefit analyses is a falacy that cannot be tolerated by thoughtful ornithologists, yet this is what was done by Murton and Westwood. In deference to these authors, it must be admitted that their paper is a review of the literature, and recent ornithological literature contains little information on benefits to humans imparted by those birds having some particularly undesirable features. Furthermore, Murton and Westwood properly noted that research administrators are often guided by political lobbying and votes, causing the administrators to "opt for control campaigns rather than scientific evaluations."

For an example of the vigor with which the policy against scientific evaluations noted by Murton and Westwood is enforced by one government agency, I can do no better than to cite a personal experience. As an employee of the Agricultural Research Service, U.S. Department of Agriculture, I was assigned to conduct research on the role of birds in control of tobacco insects. But when I found that birds sometimes gave the desired control if chemical insecticides were not used, I was fired. My being fired was part of the price I paid to publish the results of this research (Stewart, *Wilson Bull.*, **87:** 107–109, 1975). I am ready to believe that a march on Washington will be required if we are ever to see the results of needed research on cost-benefit relations of birds to humans.—Paul A. Stewart.

PHOTOGRAPHY AND RECORDINGS

84. The Vocally Versatile Mockingbird. S. A. Grimes. 1979. Droll Yankees Inc., Foster, R.I. 02825. 33⅓ rpm, 12 in monaural, phonodisc album.—Everybody talks about the way Mockingbirds (*Mimus polyglottos*) mimic the sounds of other birds, but Sam Grimes has done something about it. He has *proved* it to our entertainment and delight and it seems to me to our considerable scientific satisfaction. This record contains recordings of Mockingbird imitations of the songs and calls of 86 species of birds found mainly in the eastern U.S., most of them so accurately rendered that a knowledgeable listener would recognize the imitatees without hesitation, even without Mr Grimes' narration and list. Why Mockingbirds imitate is not considered here and that certainly is the ultimate question on the subject. But here is the raw material for any doubting audiospectrographer.

Samuel Grimes is the amateur Florida naturalist best known for his fine bird photography. Several years ago he became fascinated with the song of *Mimus polyglottos* and decided he would pursue the recording of its voice wherever the species occurred. He has travelled throughout the bird's range and has recorded it virtually everywhere that it sings—including, I believe he has told me, Hawaii, where, of course, it is introduced. Samuel Grimes' sound archive, at this time presumably housed in his residence, is a unique one, being almost completely devoted to this one species of bird!

As I said above, almost all the imitations presented on this disc are so accurate that they are easily identified by the experienced listener. A few, including the Fish Crow (*Corvus ossifragus*) and Parula Warbler (*Parula americana*), are brave attempts that I can accept as imitations only with the assurance of the recordist. Among the species well-imitated that you might have thought Mockingbirds would seldom hear—at least in the presence of Mr. Grimes' microphone—are Black Rail (*Laterallus jamaicensis*), Wilson's Plover (*Charadrius wilsonia*), and Gull-billed Tern (*Gelochelidon nilotica*). Most of the imitatees on the record are of the eastern U.S., and range in size from Ospreys (*Pandion haliaetus*) to Blue-gray Gnatcatchers (*Polioptila caerulea*), and from common garden birds such as Purple Martins (*Progne subis*) to rare or restricted species such as the Black-whiskered Vireo (*Vireo altiloquus*). I only wish that at least the general locality of each recording had been listed, so that a student of sound spectrography could study the physical details of imitative accuracy more thoroughly. Perhaps Mr. Grimes could supply such information on request. In any case, this record represents a job well done.—John William Hardy.

BOOKS AND MONOGRAPHS

85. An Eagle to the Sky. F. Hamerstrom. 1978. Trumansburg, N.Y., The Crossing Press. 139 p., paper, price not given.—"It was an unforgettable experience when one of these majestic birds flew in a window—without a sound—and sat among us as trusting as a member of the family." And so Nobel laureate Konrad Lorenz relates the way in which the author studies her subjects. As intimately and naturally as is possible. Dr. Lorenz was talking of Great Horned Owls but the same trust was extended to Golden Eagles. They were jessed for other reasons.

"An eagle for an emperor" made the author an empress twice over. She has blended her skill, knowledge and interest as a falconer, her attention to detail and expertise as a scientist and her philosophy as a nature-loving conservationist to achieve a rare bond and unusual results with two Golden Eagles. Further, she relates her experiences with these two birds with such uncomplicated simplicity and vividness that one shares her experiences, the pain and joy, excitement and fear.

Black-and-white photographs and line drawings enhance the very readable text. Biologists, conservationists and nature-lovers would all gain much from reading this classic.—Richard J. Clark.

86. Birds of Northern California. An Annotated Field List. G. McCaskie, P. DeBenedictis, R. Erickson, and J. Morlan. Berkeley, CA., Golden Gate Audubon Society. 84 p. $5.00, plus 0.80 postage.—This revised second edition of a work which first appeared in 1967 treats all of California north of the San Luis Obispo–Kern county lines. It is an excellent and up-to-date (to 30 November 1978) synopsis on the status of species, emphasizing recent records, but with cursory information on distribution. It incorporates recent changes in taxonomy and includes information on field identification for some difficult species (e.g., loons, jaegers, Thayer's Gull [*Larus thayeri*], "peep," Arctic Tern [*Sterna paradisaea*]) that is not in most guides.—J. R. Jehl, Jr.

87. Shorebirds in Marine Environments. F. A. Pitelka (ed.). *Studies in Avian Biology* [Cooper Ornithol. Soc.], No. 2. 261 p. $10.00.—This important symposium consists of an introduction, 21 papers, four abstracts, and a summary for each of two parts. Emphasis is on the Pacific coast of the Americas with a concentration of effort in California and Alaska and few papers that relate directly to Atlantic areas. Topics include censusing, habitat definition and utilization, staging and wintering areas, seasonal distribution, migration, foods and energetics, molting, and some behavior. All extant North American species are included, but the smaller-sized birds get the most space.

Since this monograph consists of welding large masses of detail, it must be read in the original. The following paragraphs give some indication of its scope.

The extent to which a feeding area is used is limited by the amount of adequate nearby roosting area. Baird's Sandpiper (*Calidris bairdii*) flies 4,000 miles nonstop to South America, where it is not restricted to mountains in winter. Minor morphological variation in the Semipalmated Sandpiper (*Calidris pusillus*) correlates with different migration routes and, to some extent, routes differ between spring and fall. Tundra-breeding species are spread out in summer and later are funnelled into narrow littoral habitats. (Such seasonal constriction is common to various other shorebirds.)

In southern Alaska, the Copper River Delta and eastern Prince William Sound comprise a staging area for some 20 million shorebirds in spring. That it remains in good condition, i.e., undamaged by oil pollution or other disaster, is critical to the welfare of some species. (Being close to breeding areas, in fall it is bypassed and the birds go to more southerly staging areas.) Some portions of the globe are enlightened to the extent that there has been a complete reversal of attitude toward wetlands, which now are being preserved. Yet even in Britain some loss of habitat continues.

Certain British studies of "waders" are more advanced than ours, through extensive cooperative censusing plus intensive banding programs. Most birds "summering" on "winter" range evidently are first-year individuals of transequatorial migrant species. The Black Oystercatcher (*Haematopus bachmani*) has been seen—unlike its European congener—to ignore cockles; it feeds on mussels (*Mytilus*). Three small plovers wintering in the Bay of Panama select prey of different size and so have limited dietary overlap. Many shorebirds have specific wintering areas to which individuals return and about 12 species are known to show more or less territoriality during this season.

Shorebird studies have a temporal succession, each new phase overlapping its predecessors. The sequence is about as follows: distribution and variation, regional migration studies, mating systems and displays, foraging behavior and energetics, and now a publicized need for long-term studies of shorebirds as integral parts of various ecosystems. These are necessary for proper "management." Toward this end, some real gains have been made by those whose work is reported in this fine symposium.—Ralph S. Palmer.

88. Through the Taiga of River Bikin. In search of the Fish Owl. (Po taezhnoi reke Bikin.) Yu. B. Pukinskii. 1975. Moscow, "Mysl" Press. 88 p. 150 photos. (In Russian.)—Considerable evidence is available for certain persons being "hipped" on owls, including the present reviewer, but no one is more so than Pukinskii. His observations of the Fish Owl (*Bubo blakistoni*), its resonant, whirring flight, its duetting, its whistling calls, and its proclivity for fish and frogs have been reported in numerous notes in semi-popular journals. The enthusiastic transports to which Pukinskii has been moved are shown in his chapter titles: O fabulous land; A friend of my friend is a friend (He describes and photographs over 120 species which favor the habitat of his chosen species.); On Bikin road; Two days at Red Bank, Chuk and I (A dog accompanies him.); The search begins; Its tracks border the Bikin; No nest (after a year's effort); Again to the Bikin!; A perilous ascent (up the nest tree of course); At the Fish Owl nest, 1971; A day of triumph (nest and contents actually observed); Duet singing; We talk it over; Owlets in a cavity (only two); An Owling night (no pun intended I trust). The night was rendered clamorous by the begging of two young of the current year and that of the long since fledged pair of the previous year. This confirmed the existence of another peculiarity in this apparently largest of owl species.—Leon Kelso.

89. My World of Birds. G. J. Wallace. 1979. Philadelphia and Ardmore, Pa., Dorrance & Co. 345 p. Cloth. $10.00.—This is the latest in what may prove to be a spate of ornithologists' autobiographies. Its author is best known for his work on Bicknell's Thrush and Barn Owl and as a teacher. His account of his life is straightforward, portions of it seeming like a rewritten daily journal—down to details such as whether the plane was late. Wallace, a Vermonter, got his higher education in Michigan and taught for 30 years at Michigan State University; between times, he traveled widely. Many names are dropped in this book, and many times that, many bird names. To top it off, lists of birds seen are provided. The book apparently has no particular message other than that being an ornithologist and bird-lister can be fun, sometimes. It should appeal especially to his friends and former students.—Ralph S. Palmer.