RECENT LITERATURE

Edited by Bertram G. Murray, Jr.

BANDING AND LONGEVITY

(See 73)

MIGRATION, ORIENTATION, AND HOMING

(See also 46, 47, 73, 75)

1. Migration and other types of movements of Coal Tits *Parus ater* passing through the Goleze Pass: II. (Migration et autres types de deplacements de la mesange noire *Parus ater* en transit au col de la Goleze: II.) B. Scherrer. 1972. *Terre Vie*, **26:** 257-313. (In French with English summary.)—Migrations of Coal Tits are basically tree to-tree movements that occur primarily in the early morning hours (peak at 08:00). Daily movements averaged 4 to 5 hours, but the birds did not move every day. An average lay-over was 3.5 days (based on banded birds) and became shorter toward the end of the migratory season. Visual fat estimates correlated well with lipid content extracted from some birds. Annual variations in average fat levels and the rate of fat storage correlated positively with an invasion year. Fat birds began a day's migration earlier and terminated their flight later than leaner individuals. The speed of movement was least (5 to 10 km/hr) in forests where the birds fed as they moved. In open areas, speed increased to 20 to 30 km/hr. Daily movements averaged 25 km. Migration was heaviest in clear weather with light valley breezes.—Kenneth P. Able.

2. Radar observations of three probably transoceanic migratory movements across the Gulf of Alaska in spring 1965. M. T. Myres. 1972. *Syesis*, **5:** 107-116.—Movements most likely involving subadult nonbreeding Black Brant (*Branta bernicla nigricans*) or Sooty Shearwaters (*Puffinus griseus*) were recorded on radar films from a station on the coast of British Columbia on 15 and 28 May and 8 June 1965. On these dates the radar screen showed spectacular line echoes from flocks of birds travelling WNW to NW away from the coast, apparently starting a migration into or across the Gulf of Alaska. The prevailing weather conditions at the time of the three movements and on the previous day were similar. A low pressure area was in the Gulf of Alaska or near Cold Bay, and a high was present off the California coast. Surface winds were not favorable, but the birds were flying just above the ocean surface. These movements occurred in late spring and were not recorded in April or the first part of May. This paper uses only a small portion of rather extensive film data gathered by Myres during the spring of 1965 from 22 March to 19 June with a 23-cm (L-band) radar located on the coast of B. C. I hope additional findings are forthcoming.—Sidney A. Gauthreaux, Jr.

3. Radar observations of bird movements along the arctic coast of Alaska. Warren L. Flock. 1973. *Wilson Bull.*, **85**(3): 259-275.—The results of this paper represent the first application of six DEW (Distant-Early-Warning) radars located along the northern arctic coast of Alaska to the observation of bird movements. Observations were made primarily from late July to early August in 1969, 1970, and 1971 and from late May to early June in 1972. The radar data document (1) the westward summer migration of eiders past Pt. Barrow, Wainwright, and Lonely, (2) a sometimes heavy fall westward migration that persisted into November at Pt. Barrow, (3) and an extensive spring east-west migration and a high-altitude eastward summer migration at Oliktok, near Prudhoe Bay, east of Pt. Barrow.

The identities of the birds in most of the movements were not known. At the time of the summer westward migration only eiders were found migrating in the field. Other movements occurred over overcast or at such high altitudes that the birds could not be seen with the aid of binoculars in clear weather.

This study constitutes the northernmost radar study of bird migration to date, and it demonstrates that sometimes heavy migratory movements do occur at 70° N latitude.—Sidney A. Gauthreaux, Jr.

4. **A study of hawk migration in eastern North America.** John R. Haugh. 1972. *Search-Agriculture*, **2**(16): 1-60.—This impressive paper is adapted from a Ph.D. dissertation presented to Cornell University. The report is based on daily spring observations during March-May on the southeast corner of Lake Ontario from 1963 to 1969 and along Lake Manitoba in 1968 and on fall observations along the north shore of Lake Erie during September-November in 1967. These data were compared with flight records from Hawk Mountain compiled between 1954 and 1968. When the species migrate and the influence of weather were emphasized in the study.

Haugh found that species-specific seasonal timing characterizes hawk migration. Hawks take advantage of the local weather situations along lakes and mountain ridges to soar rather than fly by flapping. Fall migration is associated with the recent passage of a low pressure area, northerly or westerly winds, decreasing temperature and humidity, and increasing pressure. Spring migration is associated with the approach of a low pressure area from the west, southerly winds, increasing temperature, and decreasing pressure. Migration is closely associated with lows, and this follows because the air mass surrounding a low center is unstable, creating updrafts that aid movement. After migration is underway, hawks take advantage of updrafts that may or may not be related to the original meteorological events that stimulated the start of migration. Once started hawk migration is more likely interrupted by unfavorable conditions in spring rather than in fall. Kestrels (*Falco sparverius*) and Red-tailed Hawks (*Buteo jamaicensis*) show a greater tendency to interrupt migration (both in spring and fall) when the original stimulating conditions diminish and to continue migrating when conditions are again stimulatory. Sharp-shinned Hawks (*Accipiter striatus*) show a greater response to wind-drift than do the other five species considered in this study, perhaps because of light wing loading. In addition to providing students of migration with an excellent review of hawk migration, Haugh's study will hopefully stimulate additional work on raptor migration in the U. S.—Sidney A. Gauthreaux, Jr.

5. **Movements of British raptors.** C. J. Mead. 1973. *Bird Study*, **20:** 259-286.—This paper is based on almost 2,000 recoveries of 13 species of raptors, as a result of ringing either in Britain (1,837 records of which 129 were abroad) or abroad and recovered in the British Isles (73). In the text are 16 maps showing more distant recoveries for 11 species. Additional information on recoveries and migration patterns, taken mainly from the literature, is discussed under each of 13 species. Pen-and-ink vignettes of each species by Robt. A. Hume appear throughout the text. The results show that, although the majority of British raptors migrate within the British Isles, some go to Europe and a few reach Africa. The paper provides valuable information on migration routes and winter quarters and emphasizes that raptor conservation needs to be on an international scale.—Sidney A. Gauthreaux, Jr.

6. **Raptor migration across the Straits of Gibraltar.** P. R. Evans and G. W. Lathbury. 1973. *Ibis*, **115:** 572-585.—The authors analyzed the visible migration of raptors from records kept throughout the spring passages of 1967 through 1970 and the autumn passages of 1967 through 1969. In early spring most visible migration is in the afternoons, and later in the year an additional burst of visible migration sometimes occurs in the early morning, but Evans and Lathbury conclude that most morning movements occur above visible range. Most visible migration takes place on days with westerly winds, and passage is rarely noticed when winds are easterly, because a strong upcurrent of air (standing wave) forms over Gibraltar carrying nearly all the migrants above visible range.

In spring, raptors of all species cross on a broad front from Tangier to Ceuta, except Honey Buzzards (*Pernis apivorus*) that probably cross chiefly near Ceuta. In autumn, all species from northern Europe cross between Tarifa and to the east of Gibraltar. The authors argue from visual and radar data that raptors can compensate for lateral drift by the wind and fly on chosen courses, but in very strong crosswinds (e.g., the easterly Levanters) the birds are probably drifted off course.—Sidney A. Gauthreaux, Jr.

7. **Orientation of European Robins to Kramer cages: Eliminating sources of error and bias in Kramer cage studies.** H. C. Howland. 1973. *Z. Tierpsychol.*, **33**: 295-312. (In English with German summary.)—Since 1949 when Gustav Kramer published his experiments on the orientation of caged migrants, many investigators have used the Kramer cage method in their researches on migratory orientation. Howland addressed his analysis to requirements that some investigators have held as self-evident in cage studies of migratory orientation, principally the problem of cage-associated asymmetries caused by biological and technical reasons. Howland critically examined the data appearing in a 1972 paper by H. G. Wallraff (Rev. **5**, *Bird-Banding*, **45**(1): 61, 1974) and found several artifacts caused by biological and technical assymmetries in the experiments. Investigators are urged to design experimental procedures that meet the following requirements: (1) the environment perceived by the birds has to be constructed with radial symmetry, (2) the equipment recording the activity of the bird must not have any directional bias, (3) the orientation of the cage with respect to its environment must be successively changed so that the frequency distribution of cage positions results in radial symmetry, and (4) one should not change the experimental procedure toward the end of an experiment based on the results obtained during earlier stages of the experiment. After reading Howland's paper I cannot help but wonder how many other studies of migratory orientation in caged birds have failed to meet the above requirements and consequently suffer from varying degrees of artifact.—Sidney A. Gauthreaux, Jr.

8. **Procedural problems in bird orientation studies with Kramer cages.** H. G. Wallraff. 1973. *Z. Tierpsychol.*, **33**: 313-318.—(In English with German summary.) This brief paper is a response to one by H. C. Howland (see above review) in which some of Wallraff's published data on migratory orientation in European Robins (*Erithacus rubecula*) were examined critically. Wallraff re-examined his data in light of several of the artifacts found by Howland and concluded that they did not affect the conclusions drawn previously regarding non-visual orientation of European Robins (Rev. **5**, *Bird-Banding*, **45**(1): 61, 1974). Other researchers might do well to re-examine their data on migratory orientation in caged migrants to see if their results are still valid in light of Howland's analysis.—Sidney A. Gauthreaux, Jr.

9. **Orientation of the Robin.** (K voprosu ob orientatsii zaryanok (*Erithacus rubecula*)). E. Ilenko. 1974. *Vest. zool.*, **1974**(2): 78-79. (In Russian.) —Experiments showed that orientation improved as the distance from the nest site increased. For example, 82% of birds transported 20 km from the nest oriented homeward in Kramer cages. None of those removed to 8 km did. The numbers of birds used in the experiments were not reported.—Leon Kelso.

10. **Orientation of pigeons after transatlantic displacement.** H. G. Wallraff and L. C. Graue. 1973. *Behaviour*, **44**: 1-35.—Birds from Ohio and Germany were exchanged, and their performance upon release was compared with local controls. In general, foreign birds behaved as they would have at home, except that more often landed after being released. What this elaborate and expensive study tells us is that even with a 7,000-km displacement, homing pigeons still try to home (by whatever mysterious mechanism they use for such behavior).—Jack P. Hailman.

11. **Effect of training on return speed of Common Swallow to nests in homing experiments.** (Vliyanie na trenirovki na skorost vozvrashcheniya derevenskikh lastochek k gnezdy v e eksperimentakh no "gomingu.") L. Smorgozhevskii. 1974. *Vest. zool.*, **8**(1): 79-81. (In Russian with English summary.) —Repeated releases of 77 *Hirundo rustica* in groups averaging 8 repeats, 8 km from home, revealed return speeds of between 21 and 24 km/hr. Repeated releases resulted in only negligible improvement of return velocity. The limited improvement of rate by repetition was not credited to memory or familiarity but to exercise and sharpening of an endogenous navigational mechanism, what-

ever it might be. There was no indication of persistence in direction taken on the repeated releases.—Leon Kelso.

POPULATION DYNAMICS

(See 25, 26, 34)

NESTING AND REPRODUCTION

(See also 25, 26, 27, 34, 38, 58)

12. Nest sites and nesting habitats of the Ural Owl *Strix uralensis* in Finland during the period 1870-1969. E. Lahti. 1972. *Ornis Fenn.*, **49** (3-4): 91-97. (In English.)—Analysis of records of about 250 nests found that stumps, tree cavities, twig nests of other raptors, and nest boxes are most often used, with scattered nests in buildings, on rock slopes, and on level ground. During spread of modern sylviculture the species has increased as a whole. Humid heath forest has become more preferred, with pine being favored over spruce stands. Unlike the past it now occasionally nests near human homes.—Leon Kelso.

BEHAVIOR

(See also 10, 34, 35, 37, 44, 59, 61, 68, 69, 70, 71)

13. Animal territorialism as an evolutionary factor (**as exemplified by birds**). (Otnozhenie zhivotnykh k territorii kak faktor evoliyutsii (na primere ptits).) A. Malchevskii. 1974. *Vest. leningr. univ.*, **1974**(3): 5-15. (In Russian with English summary.) A survey of current literature and the author's original data find territorialism serving two contrary and perhaps alternating trends: restriction or expansion of a species' range. Hitherto, most student attention has dwelt on restriction rather than dispersal of the species as a whole. Here dispersion is seen as more than a consequence of overpopulation and struggle for territory, but rather a preventive of isolation, favoring panmixy, with increased adaptability over a broader range. Persistent constriction would result in range discontinuity with eventual decline and elimination of a species. —Leon Kelso.

14. Feeding of White Ibis on freshwater mussels. W. J. M. Vestjens. 1973. *Emu*, **73**: 71-72.—The White Ibis (*Threskiornis molucca*) carries mussels either singly in its bill or from 3 to 6 mussels in its esophagus to anvils (i.e., hard surfaces such as small islets of pebbles, a small flat rock, and trunks and limbs of fallen trees), where it puts the mussel down or regurgitates those in the esophagus, places a foot on one mussel, and breaks the shell by hammering on it with the bill.

The behavior is interesting and carefully and quantitatively described. The author implies that use of anvils by the ibises constitutes tool use, but can the anvil be regarded as a tool? There is no indication that the ibis ever manipulates the anvil. The anvil is a natural feature of the environment used by the bird in processing its food. Examples of such use of environmental features by birds are numerous. Nuthatches wedge seeds in crevices when splitting them. Gulls drop shells on roads. But use of environmental features differs from tool use (e.g., the Galapagos Woodpecker Finch's (*Camarhynchus pallidus*) use of a spine in probing for insects in holes). I have not been able to locate a definition of a tool or of tool use, but perhaps one exists. An objective definition of tool or tool use is needed before the concept becomes too vague to be useful.—Edward H. Burtt, Jr.

15. Response-contingent prenatal experience of maternal calls in the Peking Duck (*Anas platyrhynchos*). M. Impekoven. 1973. *Anim. Behav.*, **21**: 164-168.—When the duckling embryo moved, maternal mallard and chicken calls were played to it in one group and played randomly in another. The mallard call played by the contingency increased embryonic activity, but chicken calls and non-contingent mallard calls did not. An interesting study concerning the development of maternal-filial relations.—Jack P. Hailman.

16. Comparative study of behavioral ontogeny in accipiters and falcons. (Etude comparative de l'Ontogenese des Comportements chez les Rapaces Accipitridés et Falconides.) A. Brosset. 1973. *Z. Tierpsychol.,* **32:** 386-417. (In French with German and English summaries.)—A descriptive piecing-together of observations and information on various raptors leads the author to conclude that *Falco* differs so widely from genera such as *Accipiter, Buteo,* and *Circus* that their adaptations to predation are evolutionary convergences. At the very start young falcons beg for food with open gape, whereas other species grab at presented food with the mandibles. Siblings compete by monopolizing food in falcons, whereas direct aggression occurs in the nests of other hawks. The stimuli that evoke prey-capture appear to differ in the adults, and falcons kill with a specific neck-bite, whereas others kill with a combination of squeezing by talons and biting that may lead as readily to suffocation as direct neural damage.—Jack P. Hailman.

17. Responses of Ring-necked Pheasant chicks (*Phasianus colchicus*) to conspecific calls. G. Heinz. 1973. *Anim. Behav.,* **21:** 1-9.—In laboratory playback experiments the chicks approached the "brood-gathering" and "content" calls and ceased locomotion to the "alarm" and "squeak" calls. The "hiss," "brood-caution," "fright," and "flock" calls do not affect locomotion. It is unfortunate that so many of these vocalizations were given functional names; the descriptive "hiss" and "squeak" names are far better.—Jack P. Hailman.

18. An increase in activity of domestic fowls produced by nutritional deficiency. B. O. Hughes and D. G. M. Wood-Gush. 1973. *Anim. Behav..* **21:** 10-17.—Calcium deficiency causes increased general activity including pecking and a new action pattern: pecking into the air. Sodium deficiency has similar effects. The mechanisms and adaptiveness (if any) of the changed behavior remain unclear.—Jack. P. Hailman.

19. Effects of chick vocalizations on ongoing behaviour. A. Langford and J. A. Hogan. 1973. *Anim. Behav.,* **21:** 160-163.—Shrill calls and two artificial tones inhibited pecking at a key for operant reinforcement, but feeding twitters had no effect on the pecking rate.—Jack P. Hailman.

20. Stochastic properties of the foraging behavior of six species of migratory shorebirds. M. C. Baker. 1973. *Behaviour,* **45:** 242-270.—The study concerns the Least (*Calidris minutilla*) and Semipalmated sandpipers (*C. pusilla*), Dunlin (*C. alpina*), Short-billed Dowitcher (*Limnodromus griseus*), Lesser Yellowlegs (*Tringa flavipes*), and Semipalmated Plover (*Charadrius semipalmatus*) foraging on their breeding grounds at Churchill, Manitoba, and wintering grounds in Everglades National Park, Florida. Foraging was recorded on film, which was analyzed frame-by-frame for the temporal and sequential patterns of behavior. The question asked was: how is foraging controlled?

First, a histogram of the intervals between pecks was plotted. In many cases the intervals approximated a gamma-function, a special case of which is exponential decay. What conclusions such mathematical manipulations allow is unclear, but the same data replotted as cumulative probability functions in figure 2 yield interesting comparisons: the three *Calidris* species have longer intervals between pecks in summer than winter, whereas the yellowlegs is the reverse. No clear seasonal difference occurs in the dowitcher and plover, although it is evident that the latter is more variable than the former.

Next, analysis is made of the length of walking bouts in the sequences halt-walk-halt and halt-walk-peck; the latter walk is shorter. The parsimonious interpretation seems to me simply that the bird stops walking if it sights prey, and walks farther before stopping if it does not, but the author seems to have a different interpretation that I cannot understand clearly. Also the initial halt is longer in the halt-walk-halt than in halt-walk-peck, which is simply what one would expect when the prey are not very abundant in the immediate area.

Last, fashionable discrete parameter Markov analysis is made of the sequence of events in foraging. As one knows more about what the bird just did, the prediction about what it will do next is increased. Predictability becomes better faster in winter than in summer. The sample sizes for these calculations are not reported, and the sequential dependency is not surprizing, considering that if a bird has just walked one can predict that it will either halt or peck, and if it has just halted (or pecked) it must walk. In fact, I'm surprized the predictability is not greater than shown.

The discussion is a speculative attempt to show how foraging behavior might be adapted to stochastic spatial distributions of prey. The approach of this paper is modern and attractive, but one can question whether the sophistication of mathematical techniques really yielded much more biological understanding than would have more straightforward analyses.—Jack P. Hailman.

21. Some aspects of the ontogeny of cliff nesting behaviour in the Kittiwake (*Rissa tridactyla*) and the Herring Gull (*Larus argentatus*). H. M. C. McLannahan. 1973. *Behaviour*, **44**: 36-88.—Here are the highlights of a large study with many observations and experiments. Three important mechanisms by which young birds could avoid falling over a cliff are (a) by visual depth-perception, (b) by tactile perception of the cliff-edge with the feet, and (c) by wall-seeking behavior. Chicks of both species were reared in an artificial cliff, a flat surface, and hanging in the air in a transparent box. Kittiwakes avoid a cliff-edge and show wall-seeking no matter what the rearing conditions, but apparently they must learn to feel the edge of the cliff with their feet. Herring Gulls behave much like Kittiwakes when reared on cliffs, but develop few cliff-reactions when not. These laboratory results are strengthened by swaps of eggs from cliff- and ground-nesting Herring Gulls, by observations on both species, and by experiments with chicks of both species taken from nests. Cliff-nesting Herring Gull chicks apparently never learn to assess a cliff tactually, and in most respects their cliff-related behavior is less well-developed than that of Kittiwakes. The behavior of the parents is also important because Kittiwake parents come to the nest to feed, whereas Herring Gull parents come to the vicinity and call, so that their chicks must learn not to try to approach them. This is a very nice study, trying to get at one problem with various techniques, and relating laboratory and field studies. The one piece of curiosity that persists with me is the relative mortalities due to falling in these species; but it is hard to fault an author for what she did not do.—Jack P. Hailman.

22. Extinction, disinhibition and spontaneous recovery of the pecking response in young Herring Gulls. M. Nystrom. 1973. *Behaviour*, **45**: 271-281.—By repeatedly presenting colored stimuli to two-day-old chicks of *Larus argentatus*, the author finds that the begging response to blue habituates (or extinguishes) faster than to red. He asserts that the faster habituation to blue brings out a red-preference in studies using repeated presentations (e.g., Kear, *Ibis*, **106**: 361-369, 1964); this explains why such results differ from other studies (e.g., Hailman, *Behav. Suppl.*, **15**: 1-159, 1967). However, my results are misquoted, and the author has overlooked a study that settled the question of such differences (Hailman, *J. Comp. Physiol. Psychol.*, **67**: 465-467, 1969), showing results to be dependent on the relative brightnesses of the stimuli.—Jack P. Hailman.

23. Agnostic behaviour of juvenile gulls, a neuroethological study. J. D. Delius. 1973. *Anim. Behav.*, **21**: 236-246.—Young captive Herring (*Larus argentatus*) and Lesser Black-backed (*L. fuscus*), gulls, which some authors treat as conspecific, were studied behaviorally and then stimulated electrically in the brain. Several postures are described, but the behavior is relatively unritualized at this age. Fear-like behavior was elicited by stimulation all over the brain, and persisted long after stimulation ceased. No stimulation produced attack, although threat-like postures were occasionally elicited from a particular brain region. This report is competent, but I remain unconvinced that brain-stimulation studies are revealing anything conceptually interesting about bird behavior.—Jack P. Hailman.

24. On the calling relation of parents and their chicks in the Razorbill (*Alca torda*). (Zur lautlichen Beziehung des Elters zu seinem Kueken bei Tordalken (*Alca torda*.) P. Ingold. 1973. *Behaviour*, **45**: 154-190.—The young auks jump from the nesting cliff into groups of chicks at the base, but parents and their own chicks get together successfully. Only one parent can be present at the time of the exodus, and playback experiments suggest parents distinguish their own chicks by the latter's calls. Because both parents care for the chick prior to the exodus, there is sufficient opportunity to learn individual peculiarities of calls.—Jack P. Hailman.

25. Home range of a population of *Aegithalos caudatus*. 2. Home range and territorialism in breeding season. T. Nakamura. 1972. *Misc. Repts. Yamashina Inst. Ornithol.*, **6**: 424-488. (In Japanese and English.)—A major paper on a species that had been said by Lack and others to be "non-territorial." The study area was Mt. Keito, near Matsumoto City. Fourteen adults and 21 young were color-banded, and others could be recognized by distinct plumage characters. Descriptions of pair behavior are given under nine stages from pair formation through feeding of young. All pair ranges derived from a single winter flock are included within their common winter flock range. Although pair ranges overlap broadly within this area, parts of pair ranges with high activity density never overlap. Ranges of individual pairs often, but not always, shift from year to year within the common flock range area. The dominant male of the flock pairs earliest, and his pair range is centrally located within the flock range; later pair ranges are established centrifugally from his. Late in May the pair ranges are discontinued and the flock range resumed, both by successful and unsuccessful breeders (the latter may help feed young of successful pairs). Detailed descriptions are given of agonistic behaviors, both intraflock and interflock encounters. Fixed "confronting sites" exist where pair ranges overlap, 15 to 100 m from the nest. Pairs will drive away any similar-sized bird at 5 to 10 m from the nest. Success of first nests in the study area was only 16.3%, and most unsuccessful pairs renested once or twice, sometimes shifting their pair range and causing disturbance of the spacing of the population and change or contraction of other pair ranges. There follows a full and careful discussion of the data in the context of various definitions of territoriality, and comparisons with other species. Drawing on a large body of international literature, the author then proposes a "classification of bird social structure based on family flock unit."

The *entire paper* is presented both in Japanese and English; the figures and tables are presented with the Japanese text but are in English.—Kenneth C. Parkes.

26. Breeding and behaviour of pilotbirds. M. H. Zwart. 1973. *Emu*, **73**: 124-128.—Territories in Sherbrooke Forest, Victoria, varied in size from 10,000 to 15,000 m^2 and appeared to be maintained throughout the year. Both members of the pair remain on the territory year-round and are intolerant of conspecifics, except for their own juveniles during a brief period after the juveniles leave the nest.

How the nest site is selected is unknown, but the female alone builds the enclosed nest. She may be accompanied by the male, who carries nest material about and waves it at the female, but he never deposits such material at the nest. Building requires nine days. The two eggs are laid 48 hours apart. Only the female incubates. She is fed by the male who may call her off the nest to feed her, or she may leave the nest and call the male, who soon arrives with food. After a 19 to 21-day incubation period, the two young hatch within 24 hours of each other.

During the first few days after hatching the female broods for long periods. Feeding and nest sanitation are the male's responsibility. The nestlings depart at 15 to 17 days old, but they remain cared for by the parents. The family may move about as a unit, or each parent may care for and move about with a single fledgling. After the young are independent they may remain together on their parent's territory, but at chance meetings the older birds chase the younger ones away. Of thirty-one eggs laid between 1968 and 1973, 19 young were fledged, a total breeding success of 61 percent.

The method of determining territory size is not made clear either in the text or in the rather cryptic figure. How adults and offspring are individually identified is not explained, although some, but not all, the birds were color-banded. Sample sizes are small, which is to be expected in working with small, noncolonial species. The descriptions of behavioral patterns are generally vague and tend to jump too readily to functional interpretations, but the behavior discussed is interesting. The paper should provoke further research on a poorly known species.—Edward H. Burtt, Jr.

27. Use of nests of other species by the Trumpetbird. C. J. O. Harrison and M. P. Walters. 1973. *Emu,* **73:** 188-190.—Eggs of the Trumpetbird (*Phonygammus keraudrenii*) have been collected from the nest of the Slaty Thicket Flycatcher (*Peneothello cyanus*) and nests of birds-of-paradise (*Paradisaea* spp.), but in every instance only eggs of the Trumpetbird were found. Therefore if the Trumpetbird is a brood parasite it must remove or destroy its host's eggs, or inhibit the host from laying. The authors suggest that the Trumpetbird may merely appropriate newly built nests of other species for its own use. The hypothesis based on records from egg collections requires field observation.—Edward H. Burtt, Jr.

28. Avoidance conditioning of jackdaws (*Corvus monedula*) to distress calls. P. A. Morgan and P. E. Howse. 1973. *Anim. Behav.,* **21:** 481-491. —This study combined the operant techniques of psychology with the normal behavior of an undomesticated species and thereby achieved some measure of uniqueness. A light came on before playing of the distress call and stayed on during it, then both went off for a time-out period. Birds could stop the distress call by pecking at a key, and readily learned to do so as soon as the light came on. This technique allowed presentation of various sounds to compare their effectivenesses as negative reinforcement: a low fidelity distress call yielded slower responses, as did a tone. However, just the high frequencies from the high fidelity jackdaw call and Herring Gull (*Larus argentatus*) distress calls elicited fast responses. The calls of the two species are similar, which may be due to evolutionary convergence for certain physical properties of alarm calls proposed by Peter Marler in 1957.—Jack P. Hailman.

29. A study of prey-attack behaviour in young Loggerhead Shrikes, *Lanius ludovicianus* L. S. M. Smith. 1973. *Behaviour,* **44:** 113-141.—Hand-reared birds all develop typical attack and killing responses without specific experience, but experience with small food hastens development. Young do not observe attack by their parents in the wild until the age at which they are already attacking. Movement of the prey is the most important stimulus-variable eliciting attack, but some tests with models seem to indicate that shrikes have a special image for mice as opposed to the generalized recognition of all other prey.—Jack P. Hailman.

30. Hybrid Swallow *X* House Martin. R. H. Charlwood. 1973. *Brit. Birds,* **66:** 398-400.—The hybrid swallow was captured in a mist net 22 September 1972. A detailed and complete description accompanies an excellent black-and-white photograph. The editors document several Swallow (*Hirundo rustica* X House Martin (*Delichon urbica*) hybrids and suggest that such hybridization results not from a pair bond, but from chance copulation with a female at the moment she solicits her own mate. The editors include a remarkable picture of a martin copulating with a swallow.—Edward H. Burtt, Jr.

ECOLOGY

(See also 25, 50, 58, 61, 64, 74)

31. Pattern and process in grassland bird communities. J. A. Wiens. 1973. *Ecol. Monogr.,* **43:** 237-270.—Emphasis in the U. S. International Biological Program has been on determining the variability and magnitude of rates of energy flow and nutrient cycling in ecosystems. This paper reports the results of a major team effort in 1969 and 1970 to discover the role of breeding bird populations in grassland ecosystems from this point of view. Wiens and eight others working on seven sites in six western states examined patterns of avian density and distribution and patterns of vegetation structure. The diets of each species were determined from stomach analyses. The study areas (in Montana, South Dakota, Colorado, Oklahoma, Texas, and New Mexico) represented palouse, tallgrass, mixed grass, shortgrass, and desert grasslands. By means of flushing single males from display sites, breeding territories on plots of 8.1 to 10.6 hectares were mapped. Indices to the structure of the vegetation were determined by the point-quarter sampling procedure.

Comparisons with other studies indicate that the number of species and their diversity (H′) tend to increase regularly from grassland to desert to shrub to forest communities. However the number of individual birds tends to be lower per unit area in deserts than in grasslands. There were no distinctive faunal groupings of bird species among the grassland sites. Of the 23 species recorded 70% were present on only one of the seven sites. On the other hand, local differences associated with grazing intensity by cattle were important determinants of the plot-to-plot distribution of birds.

At the shortgrass Pawnee site in Colo. breeding passerine populations in 1970 were 269 to 393 individuals/km^2 and raptor populations were 0.05 to 0.19 individuals/km^2. Also, passerine standing crop biomass (160 to 170g/ha) was much greater than that of the hawks and eagles (0.6 to 3.6g/ha). Seasonal flux patterns of energy intake for each species at a site were estimated by calculating existence energy demands per individual with a weight-dependent, temperature-dependent metabolic function (see S. C. Kendeigh, *Condor,* **72**: 60-65, 1970) and the temperature records for the site. This was adjusted for activity and multiplied by the population density. The estimated total seasonal demand for all species at each of five sites from April through August ranged from 1.01 to 2.33 kcal/m^2. Thus the total energy flow through bird populations in grassland communities is surprisingly small. Although birds are conspicuous elements of grasslands, their importance as consumers is negligible.

In addition to the valuable descriptive material in this paper, two important conclusions emerge. First the patterns (defined as the spatial and temporal structure of the ecosystem) of variation could be understood best when single species rather than breeding faunas were considered. It is still necessary to look at the individualistic response of each species to the resources of the environment. Second, there are no apparent feedback effects between populations of grassland birds and their ecosystem. Instead the birds appear to be living and reproducing off the excesses of the system without really influencing it.—Frances C. James.

32. The avifauna of the Zator region with particular reference to abundance of water birds. J. Wasilewski. 1973. *Acta zool. Cracoviensia,* **18**(10): 475-528. (In Polish with English and Russian summaries.) A survey of the birds (including species other than waterfowl and waders) found along the Vistula River with respect to range and population changes. Of particular note, the Tufted Duck (*Aythya fuligula*), rare 30 years ago, is now abundant along the Upper Vistula.—Leon Kelso.

33. Food-habitat relationship of sea ducks on the New Hampshire coastline. R. S. Stott and D. P. Olson. 1973. *Ecology,* **54**: 996-1,007.—Three species of scoters (*Melanitta deglandi, M. perspicillata,* and *Oidemia nigra*) used areas having a sandy substrate where they fed mainly on clams. The Common Goldeneye (*Bucephala clangula*) and the Red-breasted Merganser (*Mergus serrator*) frequented areas having a rocky substrate and sublittoral algae, where the goldeneye ate amphipods, isopods, crabs, and gastropods, and the merganser fed on small fish. The Bufflehead (*Bucephala albeola*) was restricted mainly to estuaries where sand shrimp could be eaten from the soft bottom ooze. Of the species considered, the Oldsquaw (*Clangula hyemalis*) was the most generalized in diet and distribution. Thus the distribution of sea ducks in winter is largely attributable to the heterogeneous distribution of aquatic life and its associated substrates.—Frances C. James.

34. The Tasmanian Native Hen, *Tribonyx mortierii.* M. G. Ridpath. 1972. *C. S. I. R. O. Wildl. Res.,* **17**: 1-118.—An impressive study, based on almost 2,000 hours of field work, of a semi-isolated, color-banded, and wild population of a flightless gallinule endemic to Tasmania. Part I includes detailed and well illustrated descriptions of maintenance, agonistic, sexual, parental, and juvenile behaviors. The functions of these are discussed and compared with those of other Rallidae. Also described and discussed are the vocalizations.

Part II shows that territories are maintained by groups of 2 to 5 adults acting as a social unit. Although most groups include unrelated males and females, trios and larger groups usually contain siblings of the same sex, which participate equally in reproduction with an unrelated mate. The sex ratio in the study population, including young birds, was 2♂: 1♀. Adult composition of groups was stable from year to year. Little evidence of hierarchies among adults was found, but when crowding was induced by artificial feeding, adults were clearly aggressive toward, and dominant over, yearlings. However, hierarchies among the young were seen. Frequency of aggression within groups was highest for two months prior to the breeding season and prior to the departure of yearlings. Yearling departures were usually preceded by a roving period that eventually resulted in emigration from the study area. Those remaining in the study area paired with neighboring yearlings and annexed small portions of existing territories. Young birds usually held smaller territories than did older birds, and small groups held smaller territories than did large groups. Seasonal frequencies of fighting and displays are described, as well as the nature and consequence of fighting relative to its motivation, group relationships, and population density. Clutch size was greatest for old females and for females breeding in groups of more than two birds, but, whereas age had little effect on hatching success (89%) or chick survival, larger breeding groups had greater chick survival. Groups of old birds laid more clutches than groups of young birds, but group size had little effect on the number of clutches. In a year of high population density some groups of young birds failed to breed and chick mortality was higher in all groups, apparently because frequent conflicts with neighbors detracted from parental behavior. Evidence suggests that sexual and aggressive behaviors are not directly related.

Part III describes habitats, feeding habits, digestion of food, the relationship of food availability to breeding, movements and dispersal, and mortality. Fresh green herbage is of primary importance and is especially abundant in wet years. Evidence suggests that food availability influences the timing of breeding, numbers of clutches, and the size of clutches.

This is a thorough and informative study.—Brian A. Harrington.

35. Niche relationships among six species of shorebirds on their wintering and breeding ranges. M. C. Baker and A. E. M. Baker. 1973. *Ecol. Monogr.*, **43:** 193-212.—The authors studied the foraging behavior and microhabitat utilization of a population of Least (*Calidris minutilla*) and Semipalmated (*C. pusilla*) sandpipers, Dunlins (*Calidris alpina*), Short-billed Dowitchers (*Limnodromus griseus*), Lesser Yellowlegs (*Tringa flavipes*), and Semipalmated Plovers (*Charadrius semipalmatus*) on their breeding grounds near Fort Churchill, Manitoba, Canada, and the same species on their wintering grounds near Flamingo, Florida. Foraging behavior was categorized as one of eight combinations of single or multiple pecking or probing with the bill plus steady or halting locomotion. The microhabitat was categorized by type of substrate and vegetation, and by the depth of the water relative to the length of the leg of the bird. The foraging rate was slower in summer. In winter, when the food resources are more limited, the birds fed more exclusively on their species-specific resources (defined as a combination of microhabitat and foraging behavior), exhibiting less overlap between species and narrower niches.

A few details detract from the generality of the conclusions. If air temperature and feeding rate are both lower in summer, why are they not positively correlated? The application of diversity indices to behavioral data is a questionable procedure. The results vary with the combination of variables considered, the significance of differences is hard to evaluate, and two of the six species (*T. flavipes* and *C. semipalmatus*) tend to behave differently from the others.—Frances. C. James.

36. Some notes on strigine owls of Krasnoyarsk country. (Nekotorye svedeniya o neyasytyakh Krasnoyarskogo Kraya.) G. Kislenko and R. Naumov. 1974. *Ornitologiya,* **10:** 339-342. (In Russian.)—This account affords some welcome life history notes on two boreal forest species, the Ural Owl (*Strix uralensis*) and the Great Gray Owl (*Strix nebulosa*), which are remotely situated and secretive. These were observed in small numbers around Bolshoi Kemchug settlement in the Siberian taiga during the years 1957 through 1968. Other than a variety of breeding and habitat details, the foraging and ecological niche affinities of these two forms are clarified. The Ural Owl is more prevalent in denser, mixed conifer-birch timber, whereas the Great Gray Owl inhabits sparse and open, woods, mostly larch. Occurrence of the Ural Owl is more dependent on local murine rodent abundance. The openness of its habitat and its conspicuousness renders the Great Gray Owl much too often the prey of hunters, even in these remote areas.—Leon Kelso.

37. Notes on aggressive and territorial behaviour in nectar-feeding birds. M. D. Bruce. 1973. *Emu*, **73**: 186-187.—Another example of generalized foraging behavior in the absence of competitors that becomes more restricted when competitors are present. Comparison between Australian nectar-feeding associations (e.g., Red Wattlebirds *Anthochaera carunculata*, Rainbow Lorikeets *Trichoglossus haematodus*, and Scaly-breasted Lorikeets *T. chlorolepidotus*) and similar American associations may prove interesting, but more data and more quantitative data will be needed on Australian associations.—Edward H. Burtt, Jr.

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

38. Experimental attraction of open-nesting birds. (Opit privlecheniya otkrytognezdshchikhsya ptits.) D. Nankinov. 1974. *Vest. leningr. univ.*, **1974**(3): 22-26. (In Russian.)—This paper reports an experimental use of saws, chisels, and hatchets on potentially waste timber to make artificial holes, clefts, forks, and other depressions in old stumps, trunks, and broken branches of trees. The purpose was to stimulate their use as nest locations. Of 148 sites so prepared, 70 were accepted as spots for nest building, mostly by passerines, many by thrush species. Such site preparations led to nesting in territories previously unoccupied by certain species. Spring clearing of old nests out of tree cavities and clefts is recommended as favoring further use.—Leon Kelso.

39. Studies of panicle characters associated with bird resistance in Sorghum. R. Perumal and T. Subramian. 1973. *Madras Agric. J.*, **60**(4): 256-258. (In English.)—The resistance of *Sorghum* flower clusters (panicle, or head) to bird foraging was studied by analyzing the records of damage to 5 varieties of the plant. Fifteen panicles were chosen at random from each strain. The maximum resistance to damage was in those having elongate spike scales that covered the whole grain. Also more resistant was the lax, open type of cluster. Furthermore, the more compact heads were more durable than the partially open ones. Damage was relatively less in the bristle headed varieties.—Leon Kelso.

CONSERVATION AND ENVIRONMENTAL QUALITY

(See also 5, 38)

40. Bird mortality from oil slicks of eastern Canada, February-April, 1970. R. G. B. Brown, D. I. Gillespie, A. R. Lock, P. A. Pearce, and G. H. Watson. 1973. *Can. Field-Nat.*, **87**: 225-234.—Slightly more than 2.5 million gallons of oil spilled in February 1970 resulted in the known deaths of 1,500 ducks and seabirds and an estimated total kill of 12,000 birds. Oldsquaws (*Clangula hyemalis*), Red-breasted Mergansers (*Mergus serrator*), Horned Grebes (*Colymbus auritus*), and murres were the species most affected by the spill in Chedabucto Bay, Nova Scotia, and murres, Dovekies (*Alle alle*), and Fulmars (*Fulmaris glacialis*) were killed as the slick drifted between the Nova Scotia coast and Sable Island. Common Eiders (*Somateria mollissima*), murres, and Black Guillemots (*Cepphus grylle*) were the principal victims of a smaller spill on the southeast coast of Newfoundland.

Mortality was estimated from beach counts of dead birds, such counts providing only a minimum estimate of mortality. Birds covered by snow or so thickly coated with oil as to be unrecognizable are missed. Also observation from a helicopter showed that many birds come ashore alive and crawl across the beach into the protection of the scrub to die. These birds are rarely found. The micro-thin oil sheen left by the slick may have a debilitating effect on wintering birds causing a significant mortality long after the oil slick has passed. Finally some birds that are killed at sea never reach shore. The authors found that oiled bodies would remain afloat for at least a month in an outdoor salt water tank, but wave action and scavenging fish and birds might make the bodies disappear more rapidly.—Edward H. Burtt, Jr.

PHYSIOLOGY

(See also 18, 23, 31)

41. Water content of the salt glands and other avian tissues. M. R. Hughes. 1974. *Comp. Biochem. Physiol.*, **47A:** 1089-1093.—Water content of kidney, liver, ventricle, intestine, and pectoral muscle was determined in specimens of 28 species, 12 of which possess salt glands. No differences in water content were found between the two groups, but the water content of the salt gland itself was lower than that of any other organ except the liver. In growing Black Swans (*Cygnus atratus*) the water content of adrenal glands and of the heart decreased with age, and neither they nor other organs examined were affected by exposure to saline drinking water during growth. These results could be explained if salt glands operate equally effectively on freshwater and on saline regimes.

Hughes suggests that the generally higher water contents she found for growing swan organs might reflect either technical errors during processing or a real interspecific difference. It seems to me more that her results simply parallel those of Ricklefs (*Auk*, **84:** 560-570, 1967), that immature tissues have a higher water content during growth than they have at maturity.—Raymond J. O'Connor.

42. Cardiac response to diving in wild ducks. R. H. Catlett and B. L. Johnston. 1974. *Comp. Biochem. Physiol.*, **47A:** 925-931.—Diving was simulated in these experiments by attaching each bird to a board that was then tilted so as to submerge the bird's head; heartbeat was monitored for two minutes from submergence. The results show clearly that all four species adjusted to the resulting asphyxia by a reduction in heart rate. The development of this bradycardia was slower and less pronounced in the surface-feeding Pintail (*Anas acuta*) than in the three diving species (*Aythya americana*, *A. affinis*, and *Oxyura jamaicensis*), providing a nice correlation between physiology and feeding ecology. These results differ from those of another study (cf. Bond et al., *Am. J. Physiol.*, **200:** 723-726, 1961), which failed to find a difference between dabbling and diving species, probably because Catlett and Johnston's procedure minimized the handling disturbance to which birds were subjected.—Raymond J. O'Connor.

43. Distinct components of neutral amino acid transport in chick small intestine. D. S. Miller, P. Burrill, and J. Lerner. 1974. *Comp. Biochem. Physiol.*, **47A:** 767-777.—Neutral amino acid transport across the wall of the small intestine of 8- to 15-day-old chicks involved at least seven components, which can be grouped into three categories: (1) processes inhibited by both leucine and glycine, (2) processes inhibited by leucine but not by glycine, and (3) processes not inhibited by leucine.—Raymond J. O'Connor.

44. Electrophysiology of the diurnal rhythm of sleep and wakefulness in owls. (Elektrofiziologischeskoe issledovanie sutochnogo ritma sna i bodrostrovovaniya u sov.) I. Karmanova and E. Churnosov. 1974. *Zhurn. evolyuts. biokhim. i fiziol.*, **10**(1): 48-57. (In Russian with English summary.)—Experiments (170) on two Tawny Owls (*Strix aluco*) and two Snowy Owls (*Nyctea scandiaca*) found that maximum motor activity occurred at twilight. The Tawny Owl was more active. In general, nocturnal activity was higher than diurnal in both species, and the regularity of the daily fluctuation of activity somewhat resembled that of diurnal birds. There were three definite levels of awareness:

defined as (1) wakefulness, (2) sleep, consisting of slow wave and "paradox" stages, and (3) immobility or listlessness of a "cataleptic" type, predominant by day. The "paradox" stages were only a few intervals of 1.5 to 5.0 sec. For a similar study, with different terminology and details note one on the Burrowing Owl (*Rev.* **18,** *Bird-Banding,* **44**(3): 234, 1973).—Leon Kelso.

45. Growth rate and ontogeny of thermoregulation in nestling Great-tailed Grackles *Cassidix mexicanus prosopidicola* (Icteridae). 1973. R. F. Gotie and J. C. Kroll. *Condor,* **75**(2): 190-199.—Measurements of body temperature, weight, and tarsus were made on nestlings obtained on the Texas A & M campus. No mention was made of attempts to control for time of day when measurements were made, thus introducing a potential intervening variable. Three age classes were recognized: featherless, 0 to 40 g; feather eruption, 40 to 80 g; and prefledging, 80 to 120 g. Growth rates, determined by multiple regression analysis, were rectilinear for the 13-day nest life, except that tarsus length presented a poor fit for both rectilinear and curvilinear models. Nestling body temperatures, hence thermoregulatory ability, were more closely associated with body size than with age.

Nestlings of varying ages were subjected to temperature stress of two kinds in the laboratory. Static temperature tests were conducted for 60 min. at 5°C, 70% relative humidity, on 29 (or 13?) young; at 22°C, 70% r. h., n = 11; at 40°C (or 45°, they say both in different places), 40% r. h., n = 14 (or 19?). Temperature gradients, a cooling one from 24 to 0°C and a warming one from 22 to 45°C, changing 1°C/min, were administered to 29 young each after 60 min initial acclimatization at 22°C. All laboratory work was conducted in the same natural nest with nestlings insulated from each other by plexiglas plates. Rectal, nest, and air temperatures were monitored. Only nestlings of 80 to 120 g were able to control body temperature under cold stress, but the rate of temperature loss was significantly greater in the 0 to 40 g group than in the other two groups during the cold gradient test. Birds exhibited cooling behaviors, e.g. panting, spreading wings, escape attempts in the 40 to 80 g group, indicating that thermolytic mechanisms predate thermogenic ones in this species. Gotie and Kroll postulate that thermolytic mechanisms are more important in nestlings of tropical and subtropical birds than thermogenic ones, raising a question for comparative study of more temperate forms where thermogenic mechanisms might be expected to precede thermolytic ones.

There is confusion regarding presentation of some of the data. The discussion of why nestling temperature parallels ambient temperature at night and nest temperature during the day in their field tests is inadequately explained, and the sample sizes in several cases and the actual temperature used in heat stress experiments are stated differently at different places in the work, notably Figures 5 and 6. The results of the heat gradient experiment are apparently not presented at all.—Paul B. Hamel.

46. Annual activity cycles of hypothalamic neurosecretory systems of migratory and sedentary birds. (Godovye tsikly aktivnosti gipotalamicheskoi neurosekretornoi sistemy migiruyushchego i osedlego vidov ptits.) I. Dobrinina. 1974. *Z. zhurn.,* **53**(1): 96-103. (In Russian.)—Annual hypothalamic neurosecretory system activity cycles of migratory Chaffinch (*Fringilla coelebs*) and sedentary House Sparrows (*Passer domesticus*) differ basically. The annual cycle of the hypothalamic system of the Chaffinch shows enhanced activity in winter and premigratory fall periods, and declines during breeding and molting. The supraoptic center is more active during winter and breeding, with the paraventricular center operative during molt and premigratory fall periods. In the House Sparrow the annual activity cycle of the hypothalamic system takes a sharp rise in the postnuptial molt and during winter, with a less marked rise during breeding. The supraoptic center is more operative during breeding and early molt, and the paraventricular more active during late molt and winter. Both species show pronounced activity of the hypothalamic system in winter. A marked distinction of the annual activity cycle in the hypothalamic system in the migratory species (*F. coelebs*) is the accentuated activity of the paraventricular center of the hypothalamus in the premigratory fall period. This appears to be one of the initiative or dynamic mechanisms in the autumn migrations of birds.—Leon Kelso.

47. Seasonal variations in fatty acids of a migratory bird with and without a controlled diet. M. L. Morton and H. A. Liebmann. 1974. *Comp. Biochem. Physiol.*, **48A**: 326-335.—Seasonal changes in the fatty acid composition of free-living White-crowned Sparrows (*Zonotrichia leucophrys gambelii*) are documented. These changes involved principally a reduction in poly-unsaturated 18-carbon fatty acids and an increase in 14-carbon fatty acids, both at the time of premigratory fattening, and were apparently correlated with a change from a seed to a hemipteran insect diet: they did not occur in captive birds kept on a constant diet. Nevertheless one cannot conclude that a bird is merely what it eats, for the fatty acid spectrum of the captives differed systematically from that of their diet.—Raymond J. O'Connor.

48. Seasonal and daily variations of sodium, potassium, and chloride levels in the plasma and brain of the migratory White-throated Sparrow, *Zonotrichia albicollis*. K. B. Davis and A. H. Meier. 1974. *Physiol. Zool.*, **47**(1): 13-21.—Daily rhythms in concentration were found for most of the electrolytes examined in this study. The pattern of these rhythms varied seasonally between April (when samples contained wintering but photosensitive birds with still slight fat deposits), May (birds with recrudescing gonads and extensive fat and displaying nocturnal locomotor activity), and August (postbreeding photorefractory birds with little fat). Because photoperiods were similar in April and August, the differences in timing of the diurnal rhythms must reflect physiological differences in the birds rather than photoperiodic control of the rhythms. The authors discuss the implications of their findings for photoperiod experiments. With recent work on the effects of food levels on photoperiodic response (e.g., Ward, *Ibis*, **114**, 275, 1972; Murton et al., *Ibis*, **115**, 132-134, 1973) and now this report, life is getting really complicated for those studying birds in light boxes.—Raymond J. O'Connor.

MORPHOLOGY AND ANATOMY

49. On the function of avian olfactory organs. (O funktsii organa obonyaniya ptits.) V. Sadovnikov. 1974. *Vest. moskov. univ., biol. div.*, **1974**(3): 76-79. (In Russian.)—By special methods, the ratio of total olfactory epithelium to total nasal surface area was calculated for representative species of Galliformes (9 spp.), Charadriiformes (7), Anseriformes (6), and Passeriformes (3 corvids). The average diameter of olfactory nuclei and the density of sense cells per 1 mm^2 were relatively constant through all orders. The ratio of olfactory epithelial area to total nasal surface varied from 2 units in corvids to 24 in charadriids (particularly in Woodcock, *Scolopax rusticola*). Olfactory sense cell density in birds is roughly one fourth that in mammals, yet it is suggested that greater abundance of olfactory fibrils and surface pits in the former may compensate for the discrepancy and even afford a keener sense of smell.—Leon Kelso.

ZOOGEOGRAPHY AND DISTRIBUTION

(See also 61, 73, 74)

50. An avifaunal review for the Barrow region and north slope of arctic Alaska. F. A. Pitelka. 1974. *Arctic and Alpine Res.*, **6**(2): 161-184.—This multipurpose paper is based on 23-years' field work by the author and his colleagues on the north slope of Alaska, particularly at Point Barrow. First, records of new species for the Barrow region are documented. Second, the avifauna is analyzed, dividing the species into breeders, migrants, visitors, and stragglers, and subdivisions of these. Pitelka focuses attention on what he calls the "core membership," breeding species dependably present. A knowledge of what constitutes the core membership of an area is essential for considering a variety of ecological and biogeographical problems. Appendix 1 lists the species in each subdivision. Finally, Pitelka discusses some biogeographical problems of the entire north slope and provides in Appendix 2 an updated annotated list of the avifauna of both the Barrow region and the north slope. This is an important paper.—Bertram G. Murray, Jr.

51. The Whale-headed Stork in Ethiopia. F. Duckworth. 1974. *Bull. Brit. Orn. C.l*, **94**(1): 3.—The author tells of obtaining photographs of *Balaeniceps rex* in "freshwater reedbeds" in the Gambela District of western Ethiopia, thereby confirming the occurrence of the bird in that country.—John Farrand, Jr.

52. The Pintail *Anas acuta* in Rhodesia. M. P. Stuart Irwin. 1974. *Bull. Brit. Orn. Cl.*, **94**(2): 56-57.—Two sightings, involving a total of 11 birds, well to the south of the species' normal winter range, suggest that an influx occurred during the unusually heavy rains of 1973-74. These records, and additional reports of Palearctic Anatidae from neighboring Zambia appended by the editor, may indicate that the extended drought in the northern semiarid savanna is forcing these winter visitors to move farther south than usual.—John Farrand, Jr.

53. The significance of records of the Common Sandpiper breeding in East Africa. C. W. Benson and M. P. Stuart Irwin. 1974. *Bull. Brit. Orn. Cl.*, **94**(1): 20-21.—Having earlier rejected all reports of *Tringa hypoleucos* breeding in the Ethiopian Region, the authors now accept a very small number of records from East Africa and conclude that instances of this Palearctic species nesting in its winter range are comparable to South African breeding records of *Ciconia ciconia* and *Delichon urbica.* It is noteworthy that several decades have elapsed since the last of these African breeding records of *Tringa hypoleucos.*—John Farrand, Jr.

54. *Larus minutus* in Angola. J. C. Sinclair. 1974. *Bull. Brit. Orn. Cl.*, **94**(2): 57.—A carefully documented sighting of a Little Gull at Lobito Harbor, Angola, on 6 May 1973 constitutes the first record of this Palearctic species south of the Canary Islands.—John Farrand, Jr.

55. Turtle Dove *Streptopelia turtur* in South West Africa. J. M. Winterbottom. 1974. *Bull. Brit. Orn. Cl.*, **94**(1): 19.—Two birds, captured separately in a wild state, were bred successfully in captivity but died without being identified. The offspring have now been examined and prove to be referable to this Palearctic species, although South West Africa is well south of the normal winter range of *S. turtur.* The author considers it more likely that the original pair were wild birds that had "overshot their mark" than escapes from captivity.—John Farrand, Jr.

56. Cape Grass Owl in Ethiopia. D. A. Turner. 1974. *Bull. Brit. Orn. Cl.*, **94**(1): 38-39.—A carefully documented sighting of *Tyto capensis* in a large grassy area about 50 km southwest of Addis Ababa is the first Ethiopian record of a species previously known from no farther north than central and western Kenya.—John Farrand, Jr.

57. *Locustella naevia* in Ethiopia. J. S. Ash and G. E. Watson. 1974. *Bull. Brit. Orn. Cl.*, **94**(1): 39-40.—A Grasshopper Warbler collected at Koka, in Shoa Province, is the second record of this Palearctic species from eastern Africa. The authors accept an earlier record from the Danakil region of Ethiopia, although the specimen upon which it was based is now lost. The Ethiopian birds are referred to the eastern race *straminea,* whereas the small number of records from Senegal and Sierra Leone appear to pertain to European *L. n. naevia.* The species is judged to be no more than a rare or casual winter visitor to Africa.—John Farrand, Jr.

58. The Boran Cisticola in Ethiopia. J. S. Ash. 1974. *Bull. Brit. Orn. Cl.*, **94**(1): 24-26.—Drawing on his several years of field work in Ethiopia, the author provides valuable data on the distribution, nesting, and habitat of this sibling species of the Rattling Cisticola (*Cisticola chiniana*). These data complement the more comprehensive study of Erard (See Rev. **61**), also reviewed here. The Boran Cisticola generally occurs in thicker and more lush cover than *chiniana* and seems to coexist with that species only in the Rift Valley where *chiniana* is much the more common of the two, and in parts of Sidamo. Ball-shaped nests of the Boran Cisticola have been found in April and June in Sidamo. Two of these nests contained four eggs; the clutch in the third was incomplete. Singing birds have been noted in Shoa from February to June. Additional records are given for Kaffa and Harar.—John Farrand, Jr.

59. Analysis of the eastward breeding expansion of Brewer's Blackbird plus general aspects of avian expansions. P. H. R. Stepney and D. M. Power. 1973. *Wilson Bull.*, **85**(4): 452-464.—Brewer's Blackbird (*Euphagus cyanocephalus*) has expanded its breeding range 700 miles eastward in the 20th century across the upper Great Lakes region. Stepney and Power analyze the data on nesting and summer residency, postulate routes of expansion, and discuss the effects of barriers upon the expansion. The initial opportunity apparently occurred when the forests of western Minnesota were disturbed about 1900 thus opening an avenue to previously logged and urbanizing areas in eastern Minnesota, Wisconsin, and Michigan. Most rapid advances occurred in areas of environmental modification by people. The authors demonstrate that the birds crossed a variety of water and vegetational barriers in the expansion, each of which slowed the advance. Vegetational barriers appear more as hypothetical constructs than natural entities, however, when the close association of the bird to human environmental modifications is considered. Stepney and Power indicate expansion routes according to dates of colonization and postulate that range expansion occurred from one breeding area to the next closest suitable habitat. They give no migration data to support the postulate. One location, Point Pelee, Ontario, remains unexplained and may indicate that another mechanism, winter range to breeding range expansion, is also occurring.

They suggest that expansion has been slowed in southern Michigan because the Common Grackle (*Quiscalus quiscula*), an icterid with similar human-associated ecology, was there first. They make no mention of the relationship of climatic gradients, particularly rainfall, that may also be affecting the process.

The authors recognize a number of factors related to the biology of a species (intrinsic) and environmental (extrinsic) that affect its potential to expand its range, stating that in general extrinsic factors work against expansion. They identify three kinds of range expansion: (a) explosive outward expansions with intervening areas colonized later; (b) dendritic expansion as exemplified by Brewer's Blackbird; and (c) gradual expansion on a broad front occasioned by shifts in climate.

The most frustrating aspect of the paper is that so many of the data appear to be missing or "in the literature" that the reader has difficulty in testing the authors' conclusions for himself.—Paul B. Hamel.

SYSTEMATICS AND PALEONTOLOGY

(See also 30, 74)

60. Individual variation in *Furnarius leucopus torridus* (Furnariidae, Aves). C. Vaurie. 1973. *Amer. Mus. Nov.* No. 2515, 11 p.—In the upper Amazon Basin, dark, pale, and intermediate individuals of *Furnarius leucopus* occur together. Zimmer believed that the dark individuals represented a distinct species, for which he used the name *torridus* Sclater and Salvin, 1866. The pale birds he called *Furnarius leucopus tricolor* Giebel, 1868. Zimmer's series, reexamined by Vaurie, contained only one intermediate, which Zimmer did not so identify. Hellmayr studied the same complex, but, using a different series that included intermediates, he considered the *torridus* and *tricolor* types to represent merely the extremes of individual variation. Vaurie assembled a series treble the size of those used by Zimmer or Hellmayr, and confirmed the existence of intermediates. The relative number of these is not stated, however, and all specimens examined are listed under the names *torridus* and *tricolor*. Proportion and size differences claimed by Zimmer are shown not to be valid, *except*, oddly enough, that the bills of the dark variants are significantly larger. Vaurie's discussion of "immature" birds (p. 8) suffers from both conceptual and terminological confusion and is best ignored. The conclusion is that all of these birds belong to a single variable subspecies for which *Furnarius leucopus torridus* is the correct name.—Kenneth C. Parkes.

61. The problem of the Boran Cisticola. C. Erard. 1974. *Bull. Brit. Orn. Cl.*, **94**(1): 26-38.—It has long been known that two sibling species of the genus *Cisticola*, one of them the Rattling Cisticola (*C. chiniana*), occur side by side in Ethiopia. The present paper is a critical study of the unidentified member of this pair of species, usually referred to in the literature as the 'Boran' Cisticola. The author finds that this bird must take the name *bodessa* Mearns, 1913, previously applied to the Ethiopian race of *chiniana*, whereas the latter now becomes *C. chiniana fricki* Mearns, 1913.

The two species are best distinguished by voice, which presumably provides the most important isolating mechanism. Series of specimens assembled on the basis of vocal differences reveal small but consistent differences in morphology, which in turn may be used to identify material collected prior to the present study. *C. bodessa* is widespread in Ethiopia, occurring as well at Nanyuki and Marsabit in northern Kenya. *C. chiniana*, widely distributed in East and South Africa, occurs as far north in Ethiopia as Shoa Province. Whereas *chiniana* is primarily a bird of dry thorny savannas with low bushes and shrubs, *bodessa* inhabits savannas with a denser growth of taller trees. In some areas the two species occur together and may occupy contiguous but evidently nonoverlapping territories. There appear to be differences in the timing of the molt of the two species, but further clarification is needed.

A new race, *Cisticola bodessa kaffensis* (Gibe valley, Kaffa Prov.), is described. —John Farrand, Jr.

EVOLUTION AND GENETICS

(See 13, 68)

FOOD AND FEEDING

(See also 14, 16, 20, 29, 31, 33, 34, 35, 37, 42, 68)

62. Fish offal scavengers off Luanda. J. C. Sinclair. 1974. *Bull. Brit. Orn. Cl.*, **94**(2): 58.—Offal thrown overboard by many small fishing boats entering Luanda Harbor, Angola, attracted about 500 *Egretta garzetta*, about 140 *Ardea cinerea*, and various Laridae, all of which followed the boats, dextrously picking up discarded material.—John Farrand, Jr.

63. Bird food of the Barn Owl and Long-eared Owl in Hungary. (Über die Vogelnahrung der Schleiereule *Tyto alba* und der Waldohreule *Asio otus* in Ungarn.) E. Schmidt. 1972. *Ornis Fenn.*, **49**(3-4): 98-102. (In German with English and French summaries.)—Of the former species, 5,888 pellets, and, of the latter, 1,998 pellets were analyzed. They were gathered mainly in suburban environments, generally year-round. Dominant in the food of *Tyto* was the House Sparrow (*Passer domesticus*), 98% (calculation by number not volume). This sparrow comprised 35% of *Asio* food, with various other passerines making up the remainder.—Leon Kelso.

64. Age of small mammals in the prey of two nocturnal raptors, the Barn and Long-eared owls. (L'age des micromammiferes dans le régime de deux rapaces nocturnes, *Tyto alba* et *Asio otus*.) M. Saint-Girons. 1973. *Mammalia*, **37**(3): 439-456. (In French with English summary.)—In foraging for murine and insectivorous mammals the two owl species showed a preference for animals of certain age groups. Of the voles that were caught, young and partly grown animals predominated, whereas of the mice and shrews, adult and partly grown animals were more frequent. The oldest individuals of all mammal species were rarely taken by the owls. Prey items corresponded to relative group availability in nature.—Leon Kelso.

65. Food of the Little Owl in Turkmen. (Pitanie Domovogo Sycha v Turkmenii.) A. Sukhinin, G. Belskaya, and I. Zhernov. 1972. *Ornitologiya*, **10**: 216-227. (In Russian.)—Widespread in Eurasia, *Athene noctua* (House Owl in Slavic languages) has developed some arid land races, which often dwell in mammal burrows as does the Burrowing Owl of the Americas. From 1954 to 1963, 5,943 pellets and prey remnants were collected from 8 localities in Turkmen. Desert species of rodents and reptiles comprised most of the annual food, with insects a close second. Occasionally insects exceeded the vertebrates, including birds and bats. Composition of the various prey items corresponded closely to their relative availability in the repsective localities. Field observations and nature of food showed that the owl is largely, although not exclusively, nocturnal. —Leon Kelso.

66. Winter food habits of Ravens on the arctic of Alaska. S. A. Temple. 1974. *Arctic,* **27**(1): 41-46. (In English with French and Russian summaries.)—About 10 *Corvus corax* wintered in an abandoned hangar at Umiat, Alaska in 1966 and 1967 and dropped 684 pellets. Results of analysis showed that about one-half of the food consisted of murine rodents, largely voles and lemmings. Most of the other half represented carcass scavenging, mostly of caribou and ptarmigans. A definite correlation with local availabliity was evident in the percentages of the items identified.—Leon Kelso.

SONG AND VOCALIZATIONS

(See also 17, 24, 28, 34)

67. Vocalization of a Fishing Owl. (Golosovye reaktsii Rybnogo Filina (*Ketupa blakistoni* (Seeb.)). Y. Pukinskii. 1974. *Vestn. Leningr. Univ.,* **1974**(3): 35-39. (In Russian.)—Having examined specimens of this and related species, the reviewer would judge it to be the heaviest and stoutest, if not the all-around largest, of owls. Here, on the basis of observations in Primor, its alarm, threat, assembly, and other calls are detailed. Their tape recordings are on deposit in the sound library of the vertebrate zoology division of Leningrad University. A distinctive feature is the vocal duetting of the mated pairs. It is of four interlocking syllables, the first and third by the male, the second and fourth by the female. The series lasts about 8 seconds and repeats at 8 to 10 second intervals This courtship calling somewhat resembles that of the Eagle Owl (*Bubo bubo*) but is louder and more prolonged. Fishing Owls can also emit a nonvocal flight sound, audible for many meters, evidently by means of indented narrower areas of the primaries.—Leon Kelso.

68. Vocal mimesis in nestling Greater Honeyguides. C. H. Fry. 1974. *Bull. Brit. Orn. Cl.,* **94**(2): 58-59.—The food-soliciting call of a single nestling of the brood parasite *Indicator indicator* closely resembles the sound of a whole brood of the colonial host *Merops bulocki,* and may act as a supernormal stimulus eliciting the feeding response not only from the foster parents but from nonbreeding helpers at the nest and even from neighboring pairs with young of their own. Bee-eaters of the genus *Merops* make up about one-third of the known host species of *I. indicator.* Vocal convergence between the nestlings of parasite and host is one of a battery of mimetic adaptations that have been discovered in various groups of brood parasites.—John Farrand, Jr.

69. The learning program basic to song development in the Straw-tailed Widowbird. (Das Lernprogramm in der Gesansausbildung der Strohwitwe *Tetraenura fischeri* Reichenow.) J. Nicolai. 1973. *Z. Tierpsychol.,* **32:** 113-138. (In German with English summary.)—The song of this nest parasite contains all eight phrases of its host's song plus one typical of all viduines, another typical of species in its genus, and a third that is species-specific. Three birds of each sex were reared by a foster-host that it does not encounter in the wild: the Bengalese Finch (*Lonchura striata*). The nestlings gave the begging call of their natural host (*Uraeginthus ianthinogaster*), and all male birds sang the three widowbird phrases. Other song was partially patterned after sounds the birds heard while developing.—Jack P. Hailman.

70. Organization of song of Rose-breasted Grosbeaks. R. E. Lemon and C. Chatfield. 1973. *Anim. Behav.,* **21**: 28-44.—This is another in a series of fascinating, detailed studies of the organizational rules governing bird song being conducted by Robert Lemon and his coworkers. The general technique is to record long sequences of singing and then analyze the sonographic records by mathematical models to find the principles upon which song-generation is built. This study is on the Rose-breasted Grosbeak (*Pheucticus ludovicianus*), one of a series of species in the subfamily Richmondeninae (Cardinalinae).

Singing consists of syllables (continuous sonographic tracings) separated by short intervals and grouped into sequences called songs that are separated by much longer intervals. The perverse grosbeak refuses to sing strictly according to these definitions, however, and the attendant problems are discussed. One bird had a repertoire of 23 different syllables, another of 15, whereas in two more the entire repertoire had not been exhausted in the samples including 22 and 16 different syllables. Birds share up to nearly one-half of the syllables with neighbors, but perhaps only 15% if not within hearing range of one another. There are about 9 to 11 syllables per song, and the interval between songs is about three times the duration of the song.

The structure of a song is approached through analyzing the sequences of syllables in the song. Grosbeaks only occasionally repeat syllables, unlike Cardinals (*Cardinalis cardinalis*) studied previously by Lemon in a series of papers. Also unlike the repeating Cardinal, the Grosbeak never repeats more than once in succession. The sequential structure is approached using discrete-parameter Markov chains combined with informational theory, which can be explained simply as follows. One calculates how difficult it is to predict the next syllable in a song knowing only the overall relative frequency of syllable types (zero order). Then calculate the improved predictability knowing the last syllable sung (first order). If one knows the last two syllables sung, in order, predicting the next one improves (second order) and so forth. The authors show that these uncertainty values drop for the Grosbeak as for the Cardinal as one moves to higher orders.

One can question whether the sample size is sufficiently large for meaningful calculations. The transition matrix for Grosbeak 1 is a 23 x 23 contingency table of preceding vs. succeeding syllables, and the informational calculations depend upon calculating row probabilities from cell probabilities. Suppose we demand only a small average sample per cell: say 10 observations upon which to base a probability estimate. Then for a 23 x 23 x 10 table, one requires about 5,290 syllables for calculation, and the authors have less than 10% of that number. For second order calculations more than 100,000 syllables would be required under the same assumptions. Hence the actual sample of 452 seems hardly adequate.

The authors pick from the data particularly frequent triads of syllables, and these probably tell us more than the overall uncertainty values based on relatively small samples. The authors also note that there is a tendency to alternate long and short syllables, and to structure the song temporally according to other trends. The overly long discussion section on neurophysiological implications of control mechanisms strikes me as speculative at this stage in our understanding of avian vocalizations.

This is a fine study, pioneering a useful approach. We do know more about Grosbeak song as a result of this paper, but we certainly do not know enough yet to say that the rules of song-generation are truly understood.—Jack P. Hailman.

71. Copying of rhythm and phrase construction during song development in several *Lonchura* species (Estrildidae). (Kopiervermögen von Rhythmus und Strophenaufbau in der Gesangsentwicklung einiger *Lonchura*-Arten (Estrildidae). H. R. Güttinger. 1973. *Z. Tierpsychol.*, **32:** 374-385. (In German with English summary.)—Sonograms are provided for nine species. Young *L. flaviprymna* raised together develop the same song, and four *L. punctulata* learned the song of the father that reared them.—Jack P. Hailman.

MISCELLANEOUS

72. Reliability and unreliability in scientific biography. (Dostovernoe i nedostovernoe v biografii uchenogo.) B. Kedrov. 1973. *Priroda*, **1973**(3): 88-94. (In Russian.)—A certain portion of ornithological and other scientific publications is occupied by obituaries, appreciations, or other accounts of a person's life's work. They are usually a matter of formal courtesy rather than a vital account. The author, being a top-rank academician in Russia and well-known abroad, has taken a challenging approach, calling for accuracy and seriousness rather than trivialities and frivolities. He points out the possibilities of biography as an art form, as well as a form of history. He points out the obvious obligation to truth as a prime desideratum. "Like you (writes systematist G.

Lawrence) I believe that biographical accounts should tell it like it is, to use the vernacular, and seldom do I read one of a botanist I have known without thinking that the account in hand rarely gives the reader any degree of comprehension of the man as he really was."

This article has aroused a series of responses in the same journal, the latest being "The logical and psychological in scientific biography" by M. Yaroshevskii (ibid., **1973**(11): 63-67, 1973). This subject deserves a symposium at conferences here and there. An available and thought-provoking book they cite is the very readable one by Andre Maurois, "Aspects of Biography" (D. Appleton, 1966).—Leon Kelso.

BOOKS AND MONOGRAPHS

73. The Migration of European Passerines. An Atlas of the Recoveries of Banded Birds. Part 1. (Der Zug Europäischer Singvogel. Ein Atlas die Wiederfunde beringter Vogel. 1. Lieferung.) Gerhardt Zink. 1973. Vogelwarte Radolfzell. DM 48. (In German.)—This ambitious work will present maps of more than 3,000 long-distance band recoveries from about 100 species of European passerines. Part 1, reviewed here, deals with 30 species, including the Wheatear *(Oenanthe)*, chats *(Saxicola)*, *Luscinia* thrushes, warblers (*Locustella, Acrocephalus, Hippolais, Sylvia,* and *Phylloscopus*), and the kinglets or goldcrests (*Regulus*). Two more parts, dealing with the remaining species, are in preparation. Twenty-five species will not be treated; for all of these, the available recoveries have been analyzed sufficiently in other publications. The introduction presents a complete list of these publications and a succinct yet very adequate exposition of the methods and terminology used in the atlas. The author also discussed briefly the problems encountered in a study of band recoveries.

The recoveries are presented as a straight line connecting the banding and recovery localities. The maps are an equal area projection; one must pay careful attention to the slant of the lines of longitude and the curves of latitude, yet these are represented by mere stubs in the margin of each map. No map adequately portrays the direction and distance of band recoveries; the author's choice of projection is a reasonable one. Although a map has the value of presenting recovery data in a form that can be interpreted by the mind's eye, I wonder if this is the best, or only, way in which to present recovery data. With the aid of modern computers more sophisticated analysis is readily available. It is a pity that the author did not avail himself of this possibility, at least for the treatment of the more commonly banded species.

Part 1 consists of 25 unbound pamphlets in a flimsy cardboard folder. The large (13.5 x 10.5 inch) size permits large maps but creates a difficulty in storage on a bookshelf. Each pamphlet begins with a full page for the title, and maps usually are printed on only one side of the paper, resulting in considerable waste space. For example, the Great Reed Warbler is treated in a 6-page pamphlet, of which 2.5 are blank, one is the title page, 2 are of maps, and there is only a half-page of text. The price of $19 seems excessive for this collection of loose pages. I noted one major printer's error: the text and maps for *Acrocephalus palustris* are substituted for that of *Sylvia nisoria* and *S. hortensis*. This misprint leaves my copy without an exposition on the latter two species and a repeat of the former.

The author considered all available recoveries of birds banded in Europe that were recovered more than 100 km from the banding locality. Recoveries that might present a false impression of the migratory route have been deleted. This editing process is, to some extent, subjective and possibly based on foregone conclusions, but perhaps unavoidable in this type of presentation.

Adequate recovery data were not available for all species; 3 of the 30 treated in this part of the work are represented by only a single recovery, and less than 10 recoveries exist for 4 additional species. Bird-banding has been conducted in Europe for more than 70 years, and there are those who feel that continued efforts are a waste of resources; the paucity of recoveries of many species indicate that this is a very premature judgment.

The best idea of the magnitude and form of this work probably can be obtained from a brief summary of the pamphlet on the Blackcap (*Sylvia atricapilla*), the most commonly banded species treated in the first part. There are 7 full page maps, 4 occupying a half-page, and two small inserts. Two maps are devoted to recoveries of birds banded as nestlings, one to birds caught during the breeding season and captured in the following fall, another of breeding birds captured in the subsequent winter, eight maps of the recoveries of birds banded as fall migrants in various regions of Europe and recovered in the same fall or subsequent winter, including one showing reversed or other strange migratory directions, and one showing selected recoveries after the first year of fall and spring migrants. More than a page of text is devoted to a description of the fall and spring migrations and the wintering area. The analysis is based on 761 recoveries, of which 584 were mapped. The Vogelwarte Radolfzell recorded 31,004 bandings of Blackcaps prior to 1970 and 162 recoveries for a percentage of 0.52. Similar figures for Great Britain are 29,311, 175, and 0.59%. The countries of origin for the various bandings are listed along with the years of banding. A list of references (6) of previous publications analyzing returns of the Blackcap is given along with 20 more general references dealing with aspects of the migration of this species. In all, this is a concise, yet very complete account of the migrations of *S. atricapilla.*

I fear that I have been perhaps too critical in this review. This Atlas is an important and very useful work, and Dr. Zink is to be congratulated for his efforts. I would be overjoyed if something even remotely similar were available for North America. I fear the barrier of language, and perhaps high price, will effectively shield this work from the eyes of Canadians and Americans, and thus permit our continuing, comfortable ignorance of what can be done with banding data. One wonders why the banding office does not attempt to obtain money to hire a biologist-computer programmer to produce a similar work for North American birds.—Helmut C. Mueller.

74. Check-List of Japanese Birds. Fifth and revised edition. 1974. The Ornithological Society of Japan. Available through Gakken Co. Ltd. 4-40-5, Kami-ikedai, Ohta-ku, Tokyo 145, Japan. 364 p. 8,000 yen (about $29). (In English.)—The Japanese equivalent of the AOU Check-list is an informative, thoroughly up-to-date volume, dealing with the 626 species and subspecies occurring in Japan, the southern Kuriles, the Ryukyus, Bonin Is., and adjacent smaller islands. Although prepared by a committee, it seems that Nagahisa Kuroda was mainly responsible for the final manuscript of the Non-Passeres, and H. Morioka for that of the Passeres. There are numerous footnotes, particularly among the Passeres, giving critical comments on relationships and the validity of subspecies, as well as new synonymies. In an appendix of synonyms, 89 names that had been recognized in earlier check-lists as valid subspecies are listed as well as 21 recently proposed names that are likewise considered synonyms. Great care is given to detailed ranges and to the habitats in Japan. These accurate habitat descriptions should be of special value to ecologists. An indispensable reference volume. There is a companion volume in Japanese.—Ernst Mayr.

75. The View from Hawk Mountain. M. Harwood. 1973. New York, Charles Scribners Sons, 199p. $6.95.—It might be assumed that the story of Hawk Mountain has thoroughly permeated the ornithological world and that another book on the topic would only cover well-traversed ground. Despite this handicap Mr. Harwood has proven his talents as a nature writer and produced an intricate and interesting mixture of first hand accounts, oft-told tales, a history of the sanctuary, and life history information on the birds of prey. Reading it gives one an intimate sense of having joined the thousands of pilgrims who have visited this hawk-watching Mecca and documented for themselves the annual passage of birds, ranging from smaller Kestrels and "Sharpies" to rare Peregrines and majestic Bald and Golden eagles. Brief descriptions of the history and development of this famous sanctuary and its personnel are intermixed with vivid sketches of times spent hawk-watching on the ridges. An up-to-date coverage is also presented of the modern threat to raptor populations posed by organochlorine pesticides, a threat less obvious than the past slaughter of raptors on these very ridges by armies of gunners, but one even more insidiously dangerous. This book represents some of the best in nature writing and will be enjoyed by layman and professional alike. However, it is likely to instill an irrepressible urge to visit, or revisit, this special place each time it is read, or, as I am sure will be the case, reread. Mr. Harwood is to be congratulated for this contribution.—Charles T. Collins.