RECENT LITERATURE

Edited by Edward H. Burtt, Jr.

BANDING AND LONGEVITY

(see also 15, 37)

1. **Ring loss from Canada Geese.** C. B. Thomas. 1979. Bird Study 26:270–271.—Rate of loss from a population of Canada Geese (*Branta canadensis*) marked with metal and engraved plastic rings in Yorkshire and Scotland was 2.3% per annum for metal and 1.7% for plastic rings. However the author presents data for only four years and assumes loss to be linear with time. Double loss is justifiably ignored, but for a semi-tame species it is worth noting that both may be removed for souvenirs or during veterinary treatment. Neither the pattern of metal ring used (both a clip and a heavier butt are specified for Canada Geese) nor the material (both monel and incoloy were in use at the time) is given, and the method of closure is not mentioned (overlap of butt rings prevents gaping from springback).—P. J. Belman.

2. **Loss of weight and legibility of bird rings.** M. P. Harris. 1980. Ringing & Migr. 3:41–48.—This is an historical perspective that chronicles ring wear on the aluminum bands in general use in Britain until 1965 which, despite their short useful life on marine species, are still widely used in many countries on grounds of cost. Monel, although an improvement, did not solve the wear problem for several species and has now been superseded by incoloy which, while offering the required performance, is expensive and likely to be replaced eventually in Britain by an appropriate grade of stainless steel.—P. J. Belman.

3. **Report on bird-ringing for 1978.** R. Spencer and R. Hudson. 1979. Ringing & Migr. 2:161–208.—This forty-second report on ringing in Britain and Ireland is the third to appear in revised format in this journal. The first 33 were published in *British Birds* and the next six as supplements to *Bird Study*. With the move to *Ringing and Migration* have come two major changes: (1) the more carefully written introduction attempts to compare year to year fluctuations in the ringing totals with ringing effort and abnormal weather to assess population change and, (2) the recovery section provides species summaries with tables of recoveries for all species published at 5-year intervals. Maps and a temporal breakdown of recoveries for selected species are occasionally published. The 1976 report contained the first 5-year summaries and was the same length as earlier reports, 64 pages. The last two are condensed to 48 pages with the omission of the 5-year tables while the number of maps is doubled.—P. J. Belman.

MIGRATION, ORIENTATION, AND HOMING

(see also 55, 59, 67, 89)

4. **The significance of the Lesser Black-backed Gull to models of bird migration.** R. R. Baker. 1980. Bird Study 27:41–50.—Recoveries of dead *Larus fuscus* originally banded in Britain show that adults have shifted their winter range steadily northward during the last 15 years. This flexibility of migration routes and seasonal ranges seems contradictory to the relatively fixed, internal programs predicted by clock-and-compass and goal-area models of bird navigation, but is consistent with an exploratory model, wherein young birds learn migratory routes and ranges partly through individual wandering and partly through association with or observation of experienced adults. One intriguing observation that supports such socially mediated learning is that adults began the southward migration in fall with young birds, but turned back north in midwinter to leave the young birds in southern winter ranges. Thus adults have shown a northward shift in winter distribution, but first-year birds have retained earlier migratory patterns.—Scott R. Robinson.

5. **An introduction to radar ornithology.** [Einfuhrüng in die Radarornithologie]. J. Jellmann. 1979. Gebiet der Vogellrunde 6:249–261.—This is an excellent introduction to

the basic concepts of radars, and how radars can be used in ornithological research. The author covers how range information is obtained and how bird echoes appear on both A-scope (oscilloscope) and PPI (Plan-Position-Indicator) displays. The discussion of the functional aspects is limited to a block diagram that is described in non-technical terms. The three general categories of radar (3 cm, 10 cm, and 23 cm wavelength) are discussed in regards to ornithological research.—Robert C. Beason.

6. The migration of coastal waders from the Palaearctic across Africa. R. J. Dowsett. 1980. Gerfaut 70:3–35.—Many species that winter on the coast in Africa also occur inland during migration, especially in fall migration. Generally there are no comparative data to indicate the proportion of a species that migrates across Africa, but numbers cited suggest a large proportion of some species migrate across land. Seasonal differences are explained by suggesting that the fall birds are in poor condition and feed as they move south across inland areas, whereas spring birds may be in good condition to fly thousands of kilometers on their flights and so may overfly most of Africa.

Fifteen species are considered and their seasonal records inland are documented. Maps are included for Terek Sandpiper (*Xenus cinereus*), Ruddy Turnstone (*Arenaria interpres*), and Sanderling (*Calidris alba*). Species observed most frequently in large numbers inland were the Sanderling and Black-bellied Plover (*Pluvialis squatarola*). All inland or coastal observations of Dunlin (*Calidris alpina*) were rejected by Dowsett as probable misidentifications of Curlew Sandpiper (*Calidris ferruginea*) or Broad-billed Sandpiper (*Limicola falcinellus*).

Curiously only the waders (Haematopodidae, Charadriidae, Scolopacidae) which breed in the Palaearctic and winter more or less exclusively on the African coasts are considered. The Curlew Sandpiper, which is the most abundant coastal wader in South Africa, is not discussed because some of the inland records are apparently wintering records and not in passage. The arbitrary exclusion of half of the species of Palaearctic waders wintering at all in inland areas reduces the interest in the paper. It is also difficult to know to what extent the records discussed reflect the abundance of the birds or of observers.—Robert B. Payne.

7. On the spring migration of palaearctic birds across the western Sahara. [Zum Frühjahrszug paläarktischer Vogel über die westliche Sahara.] W. Haas and P. Beck. 1979. J. Ornithol. 120:237–246.—Exhausted or dead migrants and killed controls were analyzed for fat and water content and for chlorinated hydrocarbons. Small species failed to cross the Sahara because of depleted fat stores, while larger migrants failed because of depleted water stores. Pesticides did not appear to influence mortality.—Robert C. Beason.

POPULATION DYNAMICS

(see also 3, 17, 23, 37, 50)

8. Mortality rates of the Great Tit (*Parus major*) in a northern population. M. Orell and M. Ojanen. 1979. Ardea 67:130–133.—Annual mortality rates of Great Tits were estimated on the basis of 4002 fledglings ringed in northern Finland between 1968–1977. From these, 163 were recaptured in the area as breeders in later years and 44 were recovered after their first January of life. Males showed a lower mortality rate (48.7–54.9%) than did females (51.7–55.2%) although difference between sexes seemed smaller than in populations farther south. Overall mortality of adults is perhaps slightly greater than in populations of central and western Europe. Mortality among young birds up to their first breeding was 78.1%.—C. M. White.

9. Hobby studies in England and Germany. D. Fiuczynski and D. Nethersole-Thompson. 1980. Br. Birds 73:275–295.—Although highly successful in England, the Hobby (*Falco subbuteo*) is endangered in Germany. This article exemplifies one of the main strengths of *British Birds* from my point of view. Data on breeding habitats, numbers of breeding individuals, breeding density and spacing, descriptions of nest and nest-trees, breeding phenology, and clutch size are concisely presented for populations in England and Germany. The possibility that pesticide contamination may be the cause of the Hobby's endangered status is discussed. Suggestions for further study are given and include precise studies of population status, breeding biology, and conservation.—Patricia Adair Gowaty.

10. Clutch size, breeding success, and parental survival in the Tree Swallow (*Iridoprocne bicolor*). D. De Steven. 1980. Evolution 34:278–291.—De Steven offers one of the better conceived and more intriguing "twinning" experiments reported to date. Her study was designed to explicitly test Lack's "maximal" clutch size hypothesis that in nidicolous birds clutch size should correspond to the maximum number of young parents can raise given current food limitations, as well as recent modifications that predict an "optimal" clutch smaller than the most productive owing to the negative feedback of larger broods on subsequent parental survivorship. During her study, more young were fledged from experimentally enlarged broods than from controls. Brood enlargement increased variability in nestling growth, but was not associated with any difference in mean fledging weight. Most tellingly, the return rate of fledglings as first-time breeders (and by inference survivorship) was independent of brood size. Not only was the natural modal clutch not the most productive, but even the most productive natural clutch was less productive than the experimentally enlarged broods. Such data unequivocally falsify Lack's maximal, or food-limited, clutch size hypothesis for the Tree Swallow. To unsettle matters further, De Steven demonstrated that females raising enlarged broods did not suffer disproportionate weight loss or decreased survivorship as measured by returns. In fact, for older females the experimentals had a higher return rate (63.3%) than did controls (53.3%). These data are inconsistent with an "optimal" clutch that balances the benefits of increased fecundity against the costs of decreased parental survivorship.

Having effectively eliminated the two hypotheses possessing "most favored" status, De Steven faced the question, what is left? She mentioned the possibility of increased predation on larger broods that tend to remain in the nest longer before fledging. There was a lengthened nestling period in the larger broods, though her design limited possibilities for predation. Her most favored alternative appears to be an almost intuitive mistrust of her own data. She explores in detail the tremendous effort and extreme difficulty that would mark an unequivocal demonstration of numerically small but biologically significant differences in survivorship associated with differences in brood size. Why is it that such *ad hoc* mistrust of data only blossoms when a *favored* hypothesis is falsified? And why is Wynne Edwards nowhere mentioned by De Steven, though her data are entirely consistent with his hypothesis that the favored clutch size is less than individual productivity would permit? His group-selected brood size is expected to balance mortality and so regulate population size at an optimum for the group, rather than reflecting individual benefits. While the older theoretical models of group selection may be wanting, newer less onerous ones are constantly being developed (e.g., Wilson, Am. Nat. 111:157–185, 1977). And whether right or wrong, when the *data* suggest a possibility, should we not at least admit it? As with any good research, De Steven's stimulating paper raises more questions than it attempts to answer.—William M. Shields.

11. Population dynamics of Indigo Buntings and the evolution of avian polygyny. M. Carey and V. Nolan, Jr. 1979. Evolution 33:1180–1192.—The authors provide a clear exposition of the main arguments of the Verner-Willson-Orians (VWO) model for the evolution of avian polygyny and straightforward tests of many of its predictions. Consideration of the model's premises and the biology of the Indigo Bunting (*Passerina cyanea*), led them to predict the latter would occasionally be polygynous. Their subsequent observation, that 10% of the males in their area had 2 mates while many others remained unmated, confirmed the prediction. Since polygynous females were as productive as monogamous females (especially when the success of secondary females was compared with that of monogamous females whose males had previously been rejected by the secondary females), and since habitat quality differences were suggested by differences in dates of first settlement and productivity of young, they concluded their data were more consistent with the VWO model than with explanations based on biased sex ratios, sexual bimaturism, or on absolute food abundance.—William M. Shields.

12. Factors influencing Emperor Penguin mortality at Cape Crozier and Beaufort Island, Antarctica. F. S. Todd. 1980. Gerfaut 70:37–49.—Emperior Penguins (*Aptenodytes* *forsteri*) breed in traditional sites which are usually on sea ice around the coast of the Antarctic. Males incubate the egg during the Antarctic winter, fasting for 60–64 days while keeping the egg warm. Females return about the time the chicks hatch and relieve the emaciated males who then feed at sea. The Cape Crozier population is of special interest because it was first recorded in 1902 and has been visited periodically since. Population size has varied and is now only a fifth of what it was 20 years ago. Chick and egg mortality was high with more than half of all broods lost to weather. Adults also suffered high mortality due both to the extreme weather at this southernmost colony and to falling rocks and rock slides—sea ice is apparently a safer nesting site than below rocky cliffs and is closer to the feeding sites as well. Penguins at Beaufort Island are doing alright but here also bad weather killed numbers of eggs and chicks.—Robert B. Payne.

13. **Population dynamics in the Pied Flycatcher *Ficedula hypoleuca* at subarctic Kilpisjärvi, Finnish Lapland.** A. Järvinen. 1980. Ornis Fenn. 57:17–25.—During a 14-year study near the northern limit of the species' range, population density of breeding pairs using nest boxes varied greatly, with the maximum density (57 pairs) being 7 times the minimum. Nearly all clutches were begun in a 2.5-week period during the leafing of the birches. Clutch size averaged 5.4, varying little from year to year. This is the smallest clutch size known in populations of the species. Breeding success varied from year to year and averaged 3.5 fledglings per nest. Most losses were due to failure of eggs or young to survive cold, rainy weather. Only 1% of the nests were lost to predators. Given the mortality of adults in other populations, the local production of young flycatchers appears too low to maintain a stable population (but as noted the population size was not stable), so the local population numbers probably depend in part on immigration. One such immigrant was noted—a female born 100 km to the SW. The yearly variation in the number of breeding pairs, the low clutch size, and apparent lack of production of enough young to account for mortality of the adults, as well as the observed importance of weather on nesting success, indicate that the population is ecologically marginal.—R. B. Payne.

NESTING AND REPRODUCTION

(see also 9, 10, 12, 13, 31, 32, 46, 51, 64, 70)

14. **Breeding biology of the Pied and Yellow wagtails.** C. F. Mason and F. Lyczynski. 1980. Bird Study 27:1–10.—A straightforward report of reproduction in *Motacilla alba* and *M. flava,* this paper summarizes data from nest record cards collected throughout the British Isles. The analysis addresses nesting habitats, breeding seasons, clutch sizes, and nest failure due to egg or nestling mortality. Yellow Wagtails laid slightly more eggs per clutch on average, and experienced significantly higher hatching success and higher nestling mortality than Pied Wagtails; overall the proportion of eggs that produced fledglings was about the same in the two species.—Scott R. Robinson.

15. **Temporal spacing of broods, brood size, and parental care in Song Sparrows (*Melospiza melodia*).** J. N. M. Smith and D. A. Roff. 1980. Can. J. Zool. 58:1007–1015.—From 1975 to 1978, Smith studied the breeding biology of a small (30–65 breeding pairs) but dense population of Song Sparrows living on Mandarte Island, British Columbia. All birds could be identified as individuals by color bands; hatchlings were color-banded after 6 d. Modal clutch size was 4 and modal number of clutches was 2, although three broods were common. Stepwise multiple regression identified brood size at fledgling (12–16 d) and the number of previously successful nestings to be the best predictors of interbrood interval. Pairs producing 3 broods tended to have lost some eggs in an early brood and to be experienced. Smith and Roff note the need for experimental brood size manipulations and for the development of a useful measure of resources available to the birds in order to enhance the interpretation of their results.—A. John Gatz, Jr.

16. **Breeding success of the Black-crowned Night Heron in the St. Lawrence Estuary.** J. Tremblay and L. N. Ellison. 1980. Can. J. Zool. 58:1259–1263.—Reported here are data on reproductive output of *Nycticorax nycticorax* for 2 yr on each of 2 islands in Quebec. An average clutch size of 3.9–4.2 eggs resulted in 2.1–3.0 fledged young per

successful nest. Major losses were apparently caused by predation at the egg stage and by intrabrood competition for food at the nestling stage. Residues of toxic chemicals were low and apparently had no detrimental effect on reproduction. Data are compared with earlier studies.—A. John Gatz, Jr.

17. Spacing and timing in the nesting ecology of a tropical blackbird: comparison of populations in different environments. R. H. Wiley and M. S. Wiley. 1980. Ecol. Monogr. 50:153–178.—Wiley and Wiley provide a detailed account of the breeding biology of the Yellow-hooded Blackbird (*Agelaius icterocephalus*) at three sites in northern South America. Extended nesting occurs during the rainy months at 2 moderately seasonal sites studied, Trinidad and Surinam, whereas all eggs were laid within a 3-wk period at an extremely seasonal site, the llanos bajos in Venezuela. Data on laying dates, clutch size, mass of young, frequency of feeding trips, and survival of young are provided. Differences among sites are discussed in relation to balancing selective pressures including predator avoidance, Shiny Cowbird (*Molothrus bonariensis*) nest parasitism, and the need to find food. Comparisons between this tropical species and several well-studied species of temperate, marsh-nesting blackbirds are made.—A. John Gatz, Jr.

18. Nesting on a boat: the White-winged Swallow, *Tachycineta albiventer*, in French Guiana. (Nidification sur un bateau de l'hirundelle à ailes blanches, *Tachycineta albiventer*, en Guyane française). O. Tostain. 1979. Gerfaut 69:393–395.—The nest was on a ferry boat at Mana. The observer saw it only once and did not follow its success; it probably had eggs.—R. B. Payne.

19. Breeding performance of Puffins *Fratercula arctica* in relation to nest density, laying date and year. M. P. Harris. 1980. Ibis 122:193–209.—Breeding biology of these puffins was studied on Dun, an island in the outer Hebrides (57°N). Breeding success was influenced by laying date, climatic factors, density of nest-burrows, and predation by gulls.—Cynthia Carey.

20. The annual cycle in a tropical wet forest hummingbird community. F. G. Stiles. 1980. Ibis 112:322–343.—Although bird-flower co-evolution has been a popular topic for research, few studies have addressed the relevance of flower availability to timing of energy-demanding activities such as breeding and molt. This study is a valuable step in that direction. The climate of the study area in the humid, Caribbean lowlands in Costa Rica, includes a dry season between January and April and a wet season for the duration of the year. Flower availability peaks in the dry and early wet seasons and reaches a low in November and December. When hummingbird flowers are scarce, some species leave the area, while others turn to flowers that are not normally pollinated by hummingbirds. Testes remain enlarged all year, but females are reproductively active only in the dry and early wet seasons, coinciding with the peak in flower availability. Molt and breeding appear to be mutually antagonistic. Maximal body masses and fat storage occur in the early wet season and reach a minimum in the late wet season when flowers are scarce. Therefore, the seasonality of breeding, molt, and fat storage appear to be highly correlated with flower availability.—Cynthia Carey.

21. Penguin proportionate egg weight. A. J. Williams. 1980. Notornis 27:125–128.—Lack's studies of proportionate egg weights have been important in guiding studies of breeding adaptations. For penguins, the results have indicated that proportionate weight was typical of birds with altricial, rather than semi-altricial, chicks. However, this relationship seems based on weights of heavy (pre-laying) females, and thus the results are not strictly comparable with those from other taxa. Using weights of molting females, Williams found that the proportionate weights were typical of heavy birds with semi-altricial young.—J. R. Jehl, Jr.

22. Oystercatcher nest in a tree (Gnezdo kulika-soroki na dereve). A. Tsvelykh. 1980. Okhota Okhot Khoz 6:12–13. (Russian)—Each spring, water released by a dam along the Dnepr River in the Ukraine floods a meadow where many Lapwings (*Vanellus vanellus*), Black-tailed Godwits (*Limosa limosa*), and Oystercatchers (*Haematopus ostralegus*) nest, but the birds have accomodated to this by nesting colonially on the remaining high ground. In the wet spring of 1979, the dam kept the water level in this area so high for so long that these usually noncolonial birds crowded even closer together, with as little as 1 m between nests. One pair of Oystercatchers laid 2 eggs in an old stork nest in a tree. That they nested so high is less remarkable than the small (1-m) diameter of the supporting structure, and the evidence this provides of birds' adaptability to man's changes in the environment.—Elizabeth C. Anderson.

23. Breeding success of the Black-headed Gull *Larus ridibundus* in relation to the nesting time. J. Viksne and M. Janaus. 1980. Ornis Fenn. 57:1–10.—Breeding success was studied in Latvia within several fenced experimental areas. The average numbers of chicks fledged (or surviving to day 25, when they could cross the fence) per clutch were 1.06–1.55. In all 5 years of study, early nests were more successful in having a higher clutch size, percent hatching, percent survival to fledging, and overall breeding success. The variation (SD) in the mean date of hatching was higher later in the season, and the authors suggest that the less synchronized hatching may have affected the survival of later-hatched chicks, perhaps through loss of information about the location of food. However, the larger SD's may be a statistical artifact of the smaller samples late in the season. The lower percent survival of chicks to fledging later in the season may also be due to aggressive interference: "predation is insignificant on Lake Engure and the losses are mainly due to aggressive neighbours." This hypothesis could be tested by designing the experimental plots to compare success and aggressive behavior in sparse and dense areas of the breeding colony.—R. B. Payne.

24. Nest sites of the Common Gull *Larus canus* in relation to ice age geology and other factors. L. von Haartman. 1980. Ornis Fenn. 57:11–16.—A local breeding population of gulls nested mainly on the NW side of small islands off the coast of SW Finland. Nest-site selection was an indirect effect of the direction of movement of Pleistocene glaciers, as the NW sides of the islands were more scoured and polished and are now less densely vegetated than the glacial lee.—R. B. Payne.

25. Breeding biology of Blyth's Reed Warbler *Acrocephalus dumetorum* in SE Finland. P. Koskimies. 1980. Ornis Fenn. 57:26–32.—Blyth's Reed Warblers have increased in numbers in SE Finland in recent years, and Koskimies has begun an intensive population study in an area with 25 territories/km^2. Only 68% of local territorial males nested; some nesting males were apparently bigamous. Males ceased singing at night when they had paired and ceased singing in the daytime when the females were incubating. Some males sang for only a day; the range of singing periods was 1–47 days. Average clutch size was 5.5, the incubation period lasted 12–14 days, and the young fledged in 10–12 days and were dependent upon their parents for another 10–22 days. Of all eggs, 84% hatched and 68% produced fledged young.

Three mixed species pairs were found, identified in the hand, banded, and observed nesting. Each involved a male Blyth's Reed Warbler and a female Marsh Warbler (*A. palustris*). Two of the pairs fledged young that appeared to be indistinguishable from *A. dumetorum*, and the third was like a young *A. palustris*. In no case was the mixed pair seen actually mating, but the details of their association at the nest certainly indicate mixed pairings. This is only the second known instance of pairing between *Acrocephalus* species. Koskimies notes that the two have similar songs.—R. B. Payne.

26. Seasonal changes in nest site selection of the Fieldfare *Turdus pilaris*. R. K. Furrer. 1980. Ornis Scand. 11:60–64.—The essence of this paper is that Fieldfares preferred conifers for nesting before deciduous trees had leafed out, and later showed nearly equal selection of both tree types. Conclusion: concealment of nests is important and conifers are the only tree type that offers adequate concealment early in the season. The data are not convincing. First, the availability of the 2 types is not measured. Second, the author rather hastily dismisses the possibility that later nesters are simply excluded from conifers by those nesters already there. He felt predation and subsequent desertion were frequent enough to permit late nesters to choose coniferous sites. This may be partly true, but the average length of occupation of a coniferous site was 2 to 3 wk, ample time to permit exclusion of later nesters. The exclusion hypothesis is also supported by the fact that phenology of leaf growth was significantly retarded in one of the 2 years. Despite this, the timing of occupation of deciduous sites was the same in both years. This suggests that later nesters are being forced into deciduous sites before the latter are offering adequate concealment.—Marshall A. Howe.

27. The Japanese Shearwater (Pestrogolovii burevestnik). N. M. Litvinenko. 1979. Priroda (Mosc.) 9:98–100. (Russian)—A nesting colony of about 100 pairs of the Japanese Shearwater (*Puffinus leucomelas*) was discovered in 1967 on a small (0.6 km × 0.1 km) island near Vladivostok; it is the only nesting colony of *Puffinus* in the USSR.

The Japanese Shearwater nests in a burrow 1–1½ m deep or in a rock niche; the nest is made of the coarse stalks of ground cover plants. Both parents incubate the single egg (laid in mid to late June); sometime in August, the gray chick with bluish beak and pink feet hatches. The parents feed the chick daily for 2 months; then the feedings taper off. The chick grows to or beyond adult weight. For 10–15 days before fledging the chick is not fed. It starts coming out of the nest at night to climb one of the boulders used as take-off points by the shearwaters (which cannot fly from a level surface). Here the chick preens, exercises its wings, and starts taking short flights in preparation for the night when it will leave the island for the south.

Adult and sub-adult shearwaters spend the day at sea, returning 40–50 min after sunset and leaving before dawn. There were as many young pre-breeders as breeders on the island; some of the pre-breeders would gather every night in August in small areas, exchange loud calls (even though the rest of the colony was fairly quiet), and scrape incomplete burrows.—Elizabeth C. Anderson.

28. The Spotted Greenshank (Okhotskii ulit). V. A. Nechaev. 1980. Priroda (Mosc.) 4:102–106. (Russian)—The Spotted Greenshank (*Tringa guttifera*), a medium-sized sandpiper distinguished by a heavy, slightly recurved beak, is known to nest only on Sakhalin Island in the Soviet Far East; it winters in southeast Asia. On Sakhalin, the bird favors littoral, swampy larch forests with many small lakes and tidal lagoons where the trees are low-growing, deformed by the prevailing wind, and hung with beard lichens. Small fish, polychaete worms, and small crustaceans are sought among the sedges and mares' tails at the water's edge. The Spotted Greenshank is very much at home in trees, in which it builds its nest of twigs and lichens to hold the 4-egg clutch. The young fall unharmed out of the nest tree a day after hatching and the parents coax them to the water. The family remains a unit until migration. Though inconspicuous while on the nest, the birds defend nest, young, and selves fearlessly and noisily, thus attracting the assistance of other Spotted Greenshanks. Inadequate observation of hunting regulations and development of habitat seriously affect this species in spite of—or thus accounting for—its listing in the Red Data Books of the IUCN, the USSR, and Japan.—Elizabeth C. Anderson.

29. Sonar signaling and behavior of precocial birds *Galliformes and Anseriformes* in early prenatal development. [Akusticheskaya signalizatsiya povedenie vydvokh ptits (kurinye i plastinchatoklyuvyye) v raniem ontogeneze]. A. Tikhonov. 1980. Vestnik Mosk. Univ. Biol. 16:47–55. (In Russian)—The emission of acoustic calls during embryonic development was recorded for 6 and 15 species of these orders respectively. The calls were characterized by transitions from random to rhythmic series of impulses. Peeps and clicks were the earliest heard. The principal "distress" and "pleasure" calls began at hatching. All this falls under the topic of "Behavioral Embryology." Cited within are 20 English titles in addition to the Slavic. So expands a new topic in the modern world.—Leon Kelso.

30. The Waxwing Shrike (*Hypocolius ampelinus*) nesting in USSR fauna. [Sorkoputov sviristel (*Hypocolius ampelinus*) (Aves, Bombycillidae) gnezdyashchiisya vid fauny SSSR.] A. Peklo and O. Sopyev. Vestn. Zool. 1980:47–52. (In Russian with English summary)—Once considered a rarity, the first nests of the Waxwing Shrike were found in the USSR May–June 1979, near the Murgab River, Turkmen, Sov. Soc. Republic. Nestlings and nesting routines for 6 nests are detailed. For example at one nest containing 5 eggs there were 20 visits (12 by the male, 8 by the female) between 0530 and 1100. From 1100 to 1700 the male made 4 visits and the female 2. From 1700 to 2000 the male made 4 visits and the female 3. Parents alternated at the nest, one always being present. Food included locusts, antlions, and cicadas. Nestlings were also fed berry juices pressed out and dropped into their mouths. Operating along with associated passerines, the adults aggressively repelled snakes invading the nest thickets.—Leon Kelso.

BEHAVIOR

(see also 4, 11, 43, 54, 76, 77, 82)

31. The behaviour of the Black Sparrowhawk (Accipiter melanoleucus). L. H. and B. E. Brown. 1979. Ardea 67:77–95.—This study was carried out over 7 years at Karen near Nairobi, Kenya and may be the fullest available study of any tropical *Accipiter* species. The Black Sparrowhawk is very seldom seen outside the forest, but clearly kills prey in open country also. It specializes on pigeons and doves but apparently selects larger species more often than expected. The breeding season differs little from that of other accipiters, but the same nest is used for unusually long periods in this genus (7–22 years). Nest building is protracted and sporadic, beginning up to 125 days before egg-laying which may reflect the fact that it is a tropical species. Unlike temperate accipiters the female takes no part in feeding the young until they can fly and she does molt in the 90 days from before egg-laying until fledging of the young. Because of differences in anatomical proportions, food preferences, and some aspects of their breeding behavior, the authors suggest that the taxonomic placement of this species in the superspecies with the Northern Goshawk (*Accipiter gentilis*) is incorrect.—C. M. White.

32. Young guillemots (*Uria lomvia*) leaving their arctic breeding cliffs: a daily rhythm in numbers and risk. S. Doon and J. Tinbergen. 1979. Ardea 67:96–100.—At 3 weeks of age young guillemots [Thick billed Murres] (*Uria lomvia*) jump from their breeding ledges to reach the sea. Some do not glide far enough and drop on the slopes under the colony. These struggle on down the slope on foot and are vulnerable to predation at this time. Under conditions of continuous daylight the jumping activity has a distinct peak between 2000–2400. Predation by the Glaucous Gull (*Larus hyperboreus*) varied considerably during the night. The combined results of jumping activity and predation show that the predation risk for young guillemots is smallest at the time that most jumps occur. Thus, predation as a selection pressure favors synchrony in jumping activity.—C. M. White.

33. Bigamy in Jackdaws. A. Roell. 1979. Ardea 67:123–129.—This is the study of 2 case-histories of the Jackdaw (*Corvus monedula*) observed in the Netherlands. A "third" bird has been recorded in a number of corvid species, though they may be males in some species. The author suggests that kinship selection can probably be ruled out to explain this phenomenon in most species since there are no indications that followers were closely related to the members of the pair they followed. What most of these species have in common is that only mated pairs possess nesting territories, often throughout the year. Hence, non-mated birds can either join a pair holding an essential resource for breeding, or join a flock of "landless" birds. The more restricted these are, the more often non-mated birds may be expected to join settled pairs. Jackdaws breed in natural cavities, hence suitable nestsites may often be in short supply and trios therefore may be common.—C. M. White.

34. The bathing behaviour of Eleonora's Falcon. D. Ristow, C. Wink, and M. Wink. 1980. Bird Study 27:54–55.—The occurrence of sun-, dust-, and rain-bathing is briefly described for a population of Eleonora's Falcon (*Falco eleonorae*) in a xeric habitat on an Aegean island. Perhaps most interesting is the discussion of dust-bathing, which may not occur as frequently in other populations of this species with access to surface fresh water. The paper left me wondering whether dust-bathing has been reported among other falcons or hawks.—Scott R. Robinson.

35. Sexual recognition and anticuckoldry behaviour in Savannah Sparrows. P. J. Weatherhead and R. J. Robertson. 1980. Can. J. Zool. 58:991-996.—Barash (Am. Nat. 110:1097–1101, 1976) was among the first to suggest avoidance of being cuckolded as a selective force leading to certain aggressive and territorial behavior in birds. This paper reports field experiments similar to those of Barash, but done with a species lacking secondary sexual dimorphism, *Passerculus sandwichensis.* Throughout the breeding cycle, territorial males were confronted with "models" of intruders; both a freeze-dried male in upright song perch posture and a freeze-dried female in precopulatory posture were used. Territorial males attacked both models prior to nesting, only the male model early in nesting, and neither model late in the nesting period. Although these results are concordant with an anticuckoldry hypothesis, the experimental design does not allow one to reject alternative explanations. For example, as Weatherhead and Robertson note, a similar pattern of responses toward the male model might be expected merely through habituation to the model as 10 to 20 trials were run per individual territorial male. In that Barash's results, too, suggest habituation as a possible alternative explanation, some investigation of this factor alone seems desirable. For instance, a male model could be repeatedly introduced to individual territorial males during an early stage in the breeding cycle and the number of exposures required to bring about any possible extinction of the attack behavior could thereby be determined.—A. John Gatz, Jr.

36. Removal and replacement of male Blue Grouse on persistent and transient territorial sites. R. A. Lewis and F. C. Zwickel. 1980. Can. J. Zool. 58:1417–1423.—Zwickel and co-workers have monitored 76 breeding territories of *Dendragapus obscurus* on a 485 ha breeding area on Vancouver Island every year since 1969. They define territories occupied at least 9 of the last 10 yr as persistent and territories occupied 8 yr or fewer as transient. During 1978 and 1979, Lewis and Zwickel shot resident males and also any replacement males from 11 territories of each of these 2 types. A surplus of males was found to exist, and these males—by a 4 to 1 margin—moved onto "persistent" territories. The authors conclude that territorial behavior limits breeding density in Blue Grouse and suggest that non-territorial males may normally wait one or more years after reaching sexual maturity before acquiring a territory in order to get one of high quality. The most disturbing aspect of this work is the similarity, bordering on circularity, of their definition of high quality territories and their results; a finding that male Blue Grouse preferentially occupy territories with certain physical features would be more satisfying than a finding that they preferentially occupy territories that other birds have occupied over the years.—A. John Gatz, Jr.

37. Snow Petrels at Point Geologie. (Le Petrel des neiges à Point Géologie). M. Guillotin and P. Jouventin. 1980. Gerfaut 70:51–72.—Snow Petrels (*Pagodroma nivea*) in the Point Geologie Archipelago were marked and recaptured over 15 yr. The average age at sexual maturity is 7 yr. The annual adult mortality is estimated at 5.3%, and the average longevity for adults is 18.3 yr, similar to other Procellariiformes. Annual mortality of eggs and chicks is high (53%).

Pairing of marked petrels was followed across seasons and the results were similar to Coulson's (J. Anim. Ecol. 35:269–279, 1966) study of Kittiwakes (*Rissa tridactyla*) in the prevalence of remating of old pairs and in the occurrence of mate switches between years. The proportion of returning birds that divorced and then selected new partners was 17%. Experienced pairs had a higher reproductive success than new pairs; unsuccessful pairs tended to separate the following year. Birds were slightly more faithful to their nest sites than to their mates. Apparently either he or she took the old nesting site after a pair divorced.

Audiospectrograms of the songs are shown and described, and the authors suggest that the songs may be involved in individual recognition between mates. No experimental playbacks were carried out. No differences in voice were found between breeding populations of Terre Adelie and the South Orkneys on the other side of Antarctica.—Robert B. Payne.

38. Behaviour of the Aleutian Grey-crowned and Brown-capped rosy finches *Leucosticte tephrocotis*. D. F. Shreeve. 1980. Ibis 122:145–165.—This comprehensive study compares the visual and vocal displays of Brown-capped Rosy Finches (*Leucosticte tephrocotis australis*) studied in Rocky Mountain National Park, Colorado, and Gray-crowned Rosy Finches (*L. t. griseonucha*) on Adak Island, Alaska. These displays are contrasted extensively in long tables with similar behavior of other Carduelinae, Fringillinae, and Emberizinae. The visual displays of the two subspecies do not differ significantly, but the vocalizations of the two are quite different. The flock call of *L. t. griseonucha* is concentrated in a single band of frequencies, whereas that call of *L. t. australis* consists of 3 major band frequencies, a characteristic that may enable the call to carry over distance despite high background noise. The breeding season of *L. t. australis* is compressed into 2 months but that of *L. t. griseonucha* may extend 7 months. Males feed the incubating mate and participate in the care of nestlings.—Cynthia Carey.

39. Social status, external signals and colonic temperature in the captive Willow Grouse *Lagopus lagopus lagopus*. G. Myhre. 1980. Ornis Scand. 11:77–80.—Randomly selected pairs of male, captive-raised ptarmigan were simultaneously introduced into an unfamiliar cage containing 2 perches and a pile of netting, to which the birds were known to be attracted. A bird was considered dominant if it attained exclusive control of the netting. Progress of molt into spring plumage, height of comb serrations, and frequency of defecation were significantly greater in dominant individuals. Subordinates had higher body temperatures than dominants before, during, and after the encounters. This was attributed to stress in subordinates, a condition which is known to stimulate secretion of calorigenic hormones in humans. Separate studies of molting individuals showed that body temperature differences were independent of molt stage. The temperature studies are interesting because they suggest that subordinate social status can be reinforced or aggravated by physiological feedback mechanisms. The higher defecation rates in dominant birds were not adequately explained. The authors did not indicate if the rate differences were a function of the encounters or if they persisted in isolation. Their comparison with similar results in experiments with mice seem far-fetched, almost implying a scent-marking function.—Marshall A. Howe.

40. Signals for food: reinforcers or informants? J. J. Cherfas. 1980. Science 209:1552–1553.—Ring Doves (*Streptopelia risoria*) were used. A cage had either one key which would bring a food cup into the cage or 2 keys opposite each other, one or both of which would bring a food cup. The cup might or might not contain food. With 2 keys the bird settled upon that which produced the greater amount of food, switching to the other when the first no longer provided food. With 1 or 2 keys, pecking at the keys stopped after food was no longer forthcoming. Cherfas concludes that the estimate of a food resource's profitability is revised after every act that should produce food.—C. H. Blake.

ECOLOGY

(see also 10, 20, 26, 28, 81, 88)

41. Foraging behavior and activity budgets of Curlew Sandpipers. G. M. Puttick. 1979. Ardea 67:111–122.—Curlew Sandpipers (*Calidris ferruginea*) in South Africa spent 55–65% of daylight hours foraging in spring and summer, and up to 80% foraging in winter. Adult birds foraged faster and more efficiently in autumn and winter than in spring and summer. Immature birds foraged more slowly and less successfully than adult birds, which possibly explains why immatures do not return to the breeding areas in their first year. Foraging was faster but success rate lower on incoming than on outgoing tides. Foraging and success rates decreased progressively from the upper to the lower shore, related to the density and potential availability of prey.—C. M. White.

42. Bird populations of 70-year spruce stands in Moscow environs. (Naselenie ptits 70-letnikh kultur eli v Moskovskoi oblasti.) M. Merzlenko. 1980. Byull. Mosk. Ovd. Ispyt. Prir. Ota. Biol. 85:50–53. (In Russian)—Twenty-one species were recorded in planted spruce areas in densities of at least 3.87 per ha. The dominant species were fringillids and Goldcrests (*Regulus regulus*) comprising 48% and 18%. One may be optimistic about the survival of birds in ancient and artificial urban centers. Notably absent were woodpeckers, Pied Flycatchers (*Ficedula hypoleuca*) and nuthatches (*Sitta europaea*). Woodpeckers for example prefer to excavate in aspen and birch. In planted wooded areas, species' diversity was consistently lower, and numerical abundance was half that of native forests.—Leon Kelso.

43. Foraging behaviour of migrant Pied Flycatchers, *Ficedula hypoleuca*, on temporary territories. C. J. Bibby and R. E. Green. 1980. J. Anim. Ecol. 49:507–521.—Pied Flycatchers from Scandinavia fly direct to Portugal in autumn where they fatten for a second flight to their sub-Saharan wintering area. Marked birds studied in a cork oak plantation on the stop-over in Portugal were holding territories, although only nest holes are defended in the breeding season. Weight gain was 0.34 g per day. The diet was mainly ants, wasps, and beetles, prey that were assumed to be patchily distributed since the birds' capture attempts were clumped. In poor feeding conditions one bird stayed longer within a patch than when feeding was better. Feeding rate declined exponentially the longer a bird fed in one tree, but after its departure prospects recovered in 10–15 min. The flycatchers circuited their territories non-randomly, revisiting trees after about 12 min. Pied Flycatcher behavior on passage is consistent with optimal foraging theory.—P. J. Belman.

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

(see also 1, 68, 69, 90)

44. Notes on avian rodent foraging and epizootic effect on tularemia in Yakutiya and European boreal tundras. (Materialy po pitaniyu ptits miofagov i viyavlennyu epizootii tylyaremyi v tundrryakh Yakutii i evraipaiskogo severa.) L. Tekrasova, T. Duncleva, and R. Kolesnikova. 1980. Byull. Mosk. Ova. Ispyt. Prir. Biol. 85:3–12. (In Russian)—The excreta of murine feeding birds, chiefly pellets of Rough-legged Hawks (*Buteo lagopus*) and Snowy Owls, (*Nyctea scandiaca*) from diverse tundra areas and over several years showed that lemmings (*Lemmus sibiricus* and *Dicrostomyx torquatus*) carried tularemia virus. The virus exists throughout the tundra and is of decided human hygienic significance.—Leon Kelso.

45. Status and conservation of the Woodlark in upper Belgium. (Statut et conservation de l'Alouette lulu Haute Belgique). J.-P. Ledant and J.-P. Jacob. 1980. Gerfaut 70:95–103.—Woodlarks (*Lullula arborea*) have decreased drastically in numbers in less than 20 y and occupy a few refuge heaths. The reduction of suitable habitats is mainly responsible. Management measures are recommended.—Robert B. Payne.

CONSERVATION AND ENVIRONMENTAL QUALITY

(see also 7, 9, 16, 22, 42, 45, 88)

46. A study of Lapwing breeding population changes in the New Forest, Hampshire. R. Jackson and J. Jackson. 1980. Bird Study 27:27–34.—Contrary to the overall trend in Britain, a population of Lapwings (*Vanellus vanellus*) at Beaulieu Heath in Hampshire declined from 1971 to 1979. Hatching success dropped and chick mortality rose most sharply during 1976–1978, and by 1978 no chicks survived more than 30 d after hatching. Part of this dramatic decline can be attributed to the unusually dry, sunny weather during 1976–1978, which dried out the breeding habitat. An unexpected side-effect of this sunny weather was to draw vacationing Britons to overflow camping sites and model airplane pilots to the airfield adjacent to the study plot. The result was a dramatic increase in losses due to "predation" (in the sense of predatory humans trampling eggs and chicks in ground nests).—Scott R. Robinson.

47. House Sparrows down coal mines. D. Summers-Smith. 1980. Br. Birds 73:325–327.—House Sparrows (*Passer domesticus*) can survive and breed in coal mines. Several records of House Sparrow occupation of coal mines exist; the best-documented record is from Frickley Colliery, Yorkshire, where 2 and later 3 sparrows lived at a depth of 640 m for at least 3 y. In November 1977, a pair nested in the mine and raised 3 young which did not survive.—Patricia Adair Gowaty.

48. PCB and organochlorine pesticide residues in birds of prey found dead in Belgium from 1973 to 1977. C. Joiris, K. Delbeke, E. Martens, M. Lauwereys, and A. Vercruysse. 1979. Gerfaut 69:319–337.—Contamination was highest in the Sparrowhawk (*Accipiter nisus*) and the Long-eared Owl (*Asio otus*). Differences among species paralleled differences previously reported for pesticide contents in the eggs and were explained in terms of the differences in their food. Pesticide levels were generally heavier in northern Belgium than in the south, but were higher in the south for Tawny Owls (*Strix aluco*). Other pesticides identified in the dead raptors were HCB, Lindane, Dieldrin, and Heptachlor epoxide.—R. B. Payne.

49. Notes on the birds of Liberia. (Note sur les oiseaux du Liberia). J. Verschuren. 1979. Gerfaut 69:379–391.—Field notes for 7 months in Liberia record only 50 species. "Birds and mammals are very rare in this country, due to excessive hunting. Most bird species bigger than a sparrow are killed, the Cattle Egret being a(n) exception. 'Until recently, anyone killed anything, anytime, anywhere, anyhow.'"—R. B. Payne.

50. Golden Eagles on Rhum. P. Corkhill. 1980. Scott. Birds 11:33–43.—The Inner Hebridean island of Rhum supported 3 to 4 breeding pairs of Golden Eagles (*Aquila chrysaetos*) from 1957–1976. Breeding success, 0.37 young per attempt, was low compared to other Scottish areas (0.58). Rhum is one of the areas where seabirds form a major part of the eagles' diet, and the poor breeding success is attributed to chemical contamination from the marine food chain. Egg analysis showed DDE and PCB levels to be higher than for inland localities.—P. J. Belman.

PARASITES AND DISEASES

(see also 44, 87)

51. Passerine nestling losses to parasitic fly larvae. (O gibeli ptentsov vorobinnykh ptits ot paraziticheskikh mykh.) S. Bakka. 1980. Vestn. Leningr. Univ. Biol. 9:106–108. (In Russian)—In the Lapland Reserve 23 nests of Redwings (*Turdus iliacus*) were infested by *Protocalliphora* spp. The fate of 2 clutches is detailed. Most vulnerable to parasite attack were the breast and abdomen. Adult loss was far less than that of the nestlings. Wet weather aggravated the losses.—Leon Kelso.

PHYSIOLOGY

(see also 20, 21, 39, 63)

52. Surface waxes and integumentary permeability. N. F. Hadley. 1980. Am. Sci. 68:546–553.—One paragraph on birds (p. 551) concludes that birds lose much water through the skin, that the stratum corneum is the principal barrier, that the preen wax on the feathers prevents inward water penetration but the resistance of the feathers to outward diffusion is small compared to that of the skin.—C. H. Blake.

53. Metabolic and thermal responses to heat and cold in Streamertail Hummingbirds (*Trochilus polytmus* and *Trochilus scitulus*, Trochilidae). K.-L. Schachmann and D. Schmidt-Marloh. 1979. Biotropica 11:123–126.—The metabolic rate and body temperature of both species were measured at ambient temperatures from 0°–41°C. Both species showed homoiothermia from 15°–33°C, and a metabolic plateau from 20°–29°C. Below these temperatures the metabolic rate increased and body temperature decreased. At higher ambient temperatures the reverse was true. Because both species occur in tropical Jamaica, one would expect them to show adaptations to warm ambient temperatures.—Robert C. Beason.

54. Changes in plasma levels of luteinizing hormone, steroid, and thyroid hormones during the postfledging development of White-crowned Sparrows, *Zonotrichia leucophrys*. J. C. Wingfield, J. P. Smith, and D. S. Farner. 1980. Gen. Comp. Endocrinol. 41:372–377.—One of the most exciting developments in avian endocrinology in the past few years has been the use of new techniques for testing levels of circulating hormones in birds captured in the field. This paper shows that transitory increases in plasma luteinizing hormones (LH) and 17β-hydroxy-5α-androstan-3-one (DHT) occur during the post-juvenal molt in fledged White-crowned Sparrows. Testosterone and corticosterone levels remain exceptionally low during this period. The paper hypothesizes that the increases in LH and DHT may function in the development of song and social behavior.—Cynthia Carey.

55. Autumn and early winter weights of waders in north-west Africa. W. J. A. Dick and M. W. Pienkowski. 1979. Ornis Scand. 10:117–123.—This study compares weights and weight changes of shorebird migrants in Africa and England in fall migration and winter. Because shorebirds of the species examined exhibited similar morphometric attributes in both areas, weight differences were believed to reflect differences in fat, protein, or water reserves. Weights of most species were substantially lower after arrival in Africa than before departure from England. In some species, especially the Bar-tailed Godwit (*Limosa lapponica*), arrival weights were often much lower than lean weights of English birds, indicating the probability of weight loss in the muscles during migration. This difference was as much as 40% in juvenile godwits. Presumed long-distance migrants like the Knot (*Calidris canutus*) sometimes arrived in Africa in emaciated condition, suggesting that nutritional stress during migration may be a normal cause of mortality in such species. Most species experienced no weight gain in fall and early winter in Africa. The same species wintering in England show fat build-ups during the same period, indicating an anticipatory mechanism for withstanding the colder winter conditions there. This paper is one of many by the European "morphometric school" of shorebird researchers illustrating the insights into bioenergetics that can result from interpreting large comparative samples of simple weight data in an ecological perspective.—Marshall A. Howe.

56. Energetic responses to various ambient temperatures in the hummingbird *Ocreatus u. underwoodii*. [Energieumsatz in Abhängigkeit von der Umgebungstemperatur beim Kolibri *Ocreatus u. underwoodii*.] K.-L. Schuchmann. 1979. J. Ornithol. 120:311–315.—The metabolic rates of 1 male and 2 females were measured at rest and while flying. In both cases there was a linear increase in the rate of metabolism associated with decreasing ambient temperature from 3°–34°C. There was no thermoneutral zone.—Robert C. Beason.

57. Cells isolated from the embryonic neural retina differ in behavior *in vitro* and membrane structure. J. B. Sheffield, D. Pressman, and M. Lynch. 1980. Science 209:1043–1045.—Cells from 14-day chick neural retina were dissociated and in suspension were divided into 4 fractions of differing specific gravity and sizes. Each of these fractions when cultured separately aggregated in a partcular way. The fractions interacted with each other in different ways. The cells in each fraction showed somewhat different numbers of intramembrane particles per square micrometer.—C. H. Blake.

58. Thermoregulation in doves (Columbidae): a novel esophageal heat exchanger. S. L. L. Gaunt. 1980. Science 210:445–447.—Observations made on the Ringed Turtle Dove (*Streptopelia risoria*) showed a dense, subcutaneous, vascular rete extending from the hyoid bone to the level of the crop. Subjected to heat stress above about 36°C, the bird inflates the esophagus down to the crop. This largely retards the rise of body temperature which is not prevented by panting or gular flutter. If the esophagus is ligated the body temperature rises nearly in step with the external temperature. It is not stated how the esophagus is inflated against the pressure of surrounding tissues. This would seem to require a valve.—C. H. Blake.

MORPHOLOGY AND ANATOMY

59. Weight, fat class, and wing measurements of Ruby-crowned Kinglets during migration. K. W. Prescott, 1980. Jnl. Bird Banding 52:1–7.—This paper reports weights, fat deposits, and wing lengths for 149 migrating Ruby-crowned Kinglets (*Regulus calendula*) over a 6-year period in New Jersey. Age (juvenile, adult) was determined by visual examination of skull ossification under water-soaked crowns, and fat deposition by visual examination of the furcula region. Males were heavier, had longer wings, but had less fat than females. Spring adults had more fat but weighed less than fall adults.—Richard M. Zammuto.

60. An attempt to age pigeons using layered structure of tibia. S. Manikowski and K. Walasz. 1980. Ornis Scand. 11:73–74.—In 1971 Van Soest and Van Utrecht described a method of aging bird specimens by counting "annual rings" in the periosteal regions of appropriately stained bone material. They knew in advance the ages of the birds in their studies. Manikowski and Walasz decided to test the utility of the technique by preparing bone material from pigeons aged 2–7 y, and having the age of the sample material determined by subjects experienced in microscopic technique and familiar with the original paper. Estimates of age varied so much that the technique was deemed essentially useless. The experiment should have been repeated after providing the subjects with an opportunity to study the known-age material in detail. Nonetheless, determinations of the precise ages of adult pigeons should, for the time being, be supported by birth certificates.—Marshall A. Howe.

PLUMAGES AND MOLT

(see also 20, 88)

61. Observations on the breeding plumage and prenuptial moult of Dunlins, *Calidris alpina*, captured in Britain. P. N. Ferns and G. H. Green. 1979. Gerfaut 69:286–303.—Three subspecies of Dunlin occur in migration in Britain. This study summarizes the characteristics of each in plumage and measurements, and compares the fresh breeding plumage in terms of the Munsell color code notation and in a color photograph of hand-held netted birds. Many *C. a. alpina*, which breed in northern Scandinavia and Russia, undergo the entire molt in the Severn estuary, whereas the other 2 races (*C. a. schinzii*, from Iceland, the British Isles, and the Baltic; *C. a. arctica* from northeastern Greenland) arrive in almost complete breeding plumage but change appearance through wear of the feathers.—R. B. Payne.

62. The pterylosis of five European corvids. M. L. Morlion and P. Vanparijs. 1980. Gerfaut 69:357–378.—Detailed descriptions and illustrations were made for the Rook (*Corvus frugilegus*), Jackdaw (*C. monedula*), Carrion Crow (*C. corone*), Magpie (*Pica pica*), and European Jay (*Garrulus glandarius*). The *Corvus* species were similar to each other, and the magpie to the jay.—R. B. Payne.

63. Overlap between breeding and moulting in the Great Tit *Parus major* and Willow Tit *P. montanus* in northern Finland. M. Orell and M. Ojanen. 1980. Ornis Scand. 11:43–49.—No great revelations leap from this paper, but the data provide additional support for a general model of passerine molt schedules at high latitudes. In both species studied, males began postnuptial molt earlier than females but females molted at a slightly faster rate. On a population level there was slight overlap of primary molt with first nestings and considerable overlap with second nestings. On the average, birds that raised second broods began the molt later than birds raising only one brood. There was a slight increase in body weight during molt, but not as much as in some other passerines studied.

Both species are non-migratory but Great Tits have only recently expanded their range into northern Finland. The latter exhibit no autumn weight gain anticipating cold winter conditions but Willow Tits do. The molt schedule of Willow Tits is also 3 weeks earlier than that of Great Tits despite no difference in breeding schedules. The authors conclude that Willow Tits must molt earlier in order to allow adequate time for the autumnal weight gain, with which the molt process might be incompatible.—Marshall A. Howe.

ZOOGEOGRAPHY AND DISTRIBUTION

(see also 6, 17, 24, 72, 74, 79, 85, 89)

64. Nesting requirements, food and breeding distribution of Rhinoceros Auklets (*Cerorhinca monocerata*) and Tufted Puffins (*Lunda cirrhata*). K. Vermeer. 1979. Ardea

67:101–110.—The fieldwork in this study was accomplished in the Scott Islands, British Columbia, though the author reviews the distribution and abundance of the species throughout their ranges. He found, in the Scott Islands, that Tufted Puffins nested predominantly in tufted hairgrass, on steep slopes and cliff tops. The nesting pattern of puffins suggests that they benefit from high elevations and steep slopes for taking off. In contrast, Rhinoceros Auklets nested at a wide range of slope gradients and in vegetation other than hairgrass. Rhinoceros Auklets and Tufted Puffins showed latitudinal differences in principal food items along the eastern Pacific, except for sandlance which was important for both species at all localities. The two species are largely sympatric in the southeastern Alaskan and Canadian portions of their ranges and again in the Kuril Islands and Sakhalin Island, Asia. The center of abundance for the puffin is seemingly Alaska while the center for the auklet is British Columbia. Factors that determine differences in breeding distribution are suggested to be (1) availability of suitable nesting sites, (2) food, and (3) predation by fox, especially on the easily accessible auklet. He suggests that the nocturnal feeding habits of the auklets may cause it to be scarce in the northern Bering Sea because of long summer photoperiods.—C. M. White.

65. An analysis of Razorbill movements away from the breeding colony. P. M. North. 1980. Bird Study 27:11–20.—Beginning with a modest base of data gathered through recoveries of dead Razorbills (*Alca torda*), this paper proceeds to examine the distances of movement of first-year and adult birds away from colonies after the breeding season. In the first analysis, the distribution of distances away from the breeding colony is fitted to a theoretical exponential distribution, with adjustments being made for those distance categories that deviated most from expectations. Subsequent analyses employ similar techniques on subsets of the data that take causes of death and locations of recovery into account. The author concludes that first-year birds showed a greater tendency than adults to move away from the breeding colony, but cautions that great care must be exercised in interpreting data from recoveries of dead birds. I agree with this advice, and would urge further caution in interpreting the results of such model-fitting exercises as are exemplified in this paper.—Scott R. Robinson.

66. The European atlas: owls. M. Everett and J. T. R. Sharrock. 1980. Br. Birds 73:239–256.—A continent-wide mapping project by the European Ornithological Atlas Committee is planned for 1985–1988. Provisional distribution maps of breeding birds of various species are being produced based on fieldwork for national atlas schemes. In this report dot-distribution maps of 12 European owls are shown. These include: Barn Owl (*Tyto alba*), Scops Owl (*Otus scops*), Eagle Owl (*Bubo bubo*), Snowy Owl (*Nyctea scandiaca*), Hawk Owl (*Surnia ulula*), Little Owl (*Athene noctua*), Tawny Owl (*Strix aluco*), Ural Owl (*Strix uralensis*), Great Gray Owl (*Strix nebulosa*), Long-eared Owl (*Asio otus*), Short-eared Owl (*Asio flammeus*), and Tengmalm's Owl (*Aegolius funereus*).—Patricia Adair Gowaty.

67. Possible future Palearctic passerine vagrants to Britain. D. I. M. Wallace. 1980. Br. Birds. 73:388–397.—The observed numbers of extralimital vagrant passerines from Eurasia to Britain have increased in recent years. This article indicates that a further 38 passerine species may also reach Britain. This handy guide contains a key to assist the identification of those species least known. These are reported in 3 sections as vagrants from Europe, southwestern Asia, and central Asia and Siberia. The report is based on a search of patterns of breeding distributions, migratory ranges, and distances that match those for known vagrants.—Patricia Adair Gowaty.

68. Census methods for Murres, *Uria* species: a unified approach. T. R. Birkhead and D. N. Nettleship. 1980. Can. Wildl. Serv. Occas. Pap. No. 43. 23 p.—This paper delineates methods for estimating Common Murre (*Uria aalge*) and Thick-billed Murre (*U. lomvia*) population size for northern Atlantic Ocean colonies. Breeding colonies are distributed on 4 major substrates (cliff, flat-top, boulder scree, and cave). This causes individuals to be dispersed 4 different ways and thus necessitates censusing technique adjustments for each substrate. The authors conclude that cliff and flat-top colonies are best estimated by direct counts (using photographs and/or field personnel), while no reliable methods exist for estimating colonies on boulder screes or in caves. Individuals of the latter 2 colony types are hidden by the substrate. Step-by-step methods are provided for counting murres in cliff and flat-top colonies using plots. True population status is best assessed by an observer present at the colony for about 10 d since birds in photographs in incubating positions may not have an egg. Overall, the methods for estimating population size delinated in this report are expensive and time-consuming and in my opinion will seldom be used.—Richard M. Zammuto.

69. An aerial survey of breeding geese and other wildlife in Foxe Basin and northern Baffin Island, Northwest Territories, July 1979. A. Reed, P. Dupuis, K. Fischer, and J. Moser. 1980. Can. Wildl. Serv. Prog. Notes No. 114. 21 p.—This paper reports an aerial reconnaissance of 1979 breeding waterfowl populations on the relatively unexplored western shores of Baffin Island and the northeastern shores of Melville Peninsula. Specific breeding distributions are mapped for Atlantic Brant (*Branta bernicla*) and each of the 2 subspecies of Snow Goose (*A. caerulescens caerulescens, A. c. atlanticus*). Information is also reported for other wildlife species.—Richard M. Zammuto.

70. Ornithological observations in Reunion. [Observations ornithologiques à la Reunion]. B. Jadin and F. Billiet. 1979. Gerfaut 69:339–352.—Barau's Petrel (*Pterodroma baraui*) was observed but its breeding habits are unknown; no nest has been found. Audubon's Shearwaters (*Puffinus lherminieri*) nested in sheer cliffs; nests with young were found in November and December. Wedge-tailed Shearwaters (*P. pacificus*) nested in the same cliffs but at higher elevations. Three nesting places were described for the Mascarene Swiftlet (*Collocalia francica*); except in the Seychelles, no nests had previously been found. The nests were attached to cave ceilings and were built of lichens, mosses, or liverworts glued together with saliva. Nests of the Mascarene Martin (*Phedina borbonica*) were also described.—R. B. Payne.

71. Notes on status, vocalizations and behaviour of Lidth's Jay, *Garrulus lidthi*. M. D. Bruce. 1979. Gerfaut 69:353–356.—Lidth's Jays have a very restricted range (the northern Ryu Kyu Islands). Little is known of their behavior.—R. B. Payne.

SYSTEMATICS AND PALEONTOLOGY

(see also 25, 31, 80)

72. Hybridization between the barbets *Pogoniulus bilineatus* and *Pogoniulus leucolaima* in Rwanda and Burundi. [Hybridation entre les barbions *Pogoniulus bilineatus* et *Pogoniulus leucolaima* au Rwanda et au Burundi]. A Prigogine. 1980. Gerfaut 70:73–91.—Examination of museum specimens of these barbets from Rwanda and Burundi shows that most individuals between Lake Kivu and northern Lake Tanganyika and also those southeast of Kigali are intermediate in color between the allospecies in the rest of their ranges. Nonintermediate individuals occur also but are uncommon. Prigogine concludes that the forms are conspecific and that the intermediate birds are in an area of secondary contact.—Robert B. Payne.

73. French nomenclature project of the birds of the world. 9. Alaudidae to Prunellidae. [Projet de nomenclature française des oiseaux du monde. 9. Alaudidae aux Prunellidae]. P. Devillers. 1980. Gerfaut 70:121–146.—This section continues the list of the scientific names and the French vernacular name for all species in each family of birds. It provides a world list and the author's opinions of species relationships. A commentary on each family includes a review of recent systematic work. Finally, a detailed bibliography is published with each section. Section 9 includes the Alaudidae, Hirundinidae, Campephagidae, Pycnonotidae, Chloropseidae, Irenidae, Laniidae, Vangidae, Bombycillidae, Dulidae, Motacillidae, Cinclidae, Troglodytidae, Mimidae, and Prunellidae.—Robert B. Payne.

74. Relation between the Banded Prinias *Prinia bairdii obscura* and *Prinia bairdii bairdii*. [Relation entre les Prinias rayées *Prinia bairdii obscura* et *Prinia bairdii bairdii*]. A. Prigogine. 1979. Gerfaut 69:305–318.—In 2 areas of eastern Zaire, central Africa, most museum specimens of this warbler complex are intermediate in plumage color between the lowland western form (*bairdii*) and the eastern form of the Albertine Rift mountains (*obscura*). In the Maboya region the range of variation includes a few birds of each extreme form, whereas in the Kamituga region one (*bairdii*) or both extreme forms are locally absent. The author concludes that the 2 forms are conspecific.—R. B. Payne.

75. The plasma proteins of some albatrosses and petrels as an index of relationship in the Procellariiformes. P. C. Harper. 1978. N.Z. J. Zool. 5:509–549.—Four hundred seventy-two individuals representing 29 species, 11 genera, and all 4 families of the order Procellariiformes were examined using electrophoretic analysis of blood proteins. Polyacrylamide gels were used; structural proteins were assayed using esterase and total protein stains, and immunoelectrophoresis. Patterns of genetic differences among species were analyzed by noting similarities and differences. Data are presented as a large figure showing sample gel patterns. The study would have benefited greatly from a more quantitative analysis; for example, genetic distances were not computed and no table of allelic patterns across species was presented.

The author concludes that the order is monophyletic with many old lineages; the 4 recognized families seem real. However, these results are based on similarities and not shared derived characters. It is interesting to note that the gel patterns for the 4 species of prions examined are all different. Distinguishing specimens of this genus has been notoriously difficult using traditional methodologies.—George F. Barrowclough.

EVOLUTION AND GENETICS

(see also 32, 35, 72, 74, 75)

76. Genetic variation among trait groups and apparent absence of close inbreeding in Grey-crowned Babblers. M. S. Johnson and J. L. Brown. 1980. Behav. Ecol. Sociobiol. 7:93–98.—The Gray-crowned Babbler (*Pomatostomus temporalis*) of Australia is a species with territories defended by groups apparently composed of a breeding pair and their offspring. These offspring remain in the group at least to maturity and "help at the nest." The dispersal pattern of the young is unknown; hence it is conceivable that there could be significant inbreeding due to incest or small population size if dispersal were severely restricted or nonexistent due to the social structuring. The authors used electrophoresis to investigate this possibility.

Eighty individuals from 14 groups distributed over about 10 km were examined at 8 variable loci to determine the degree of genetic variation among groups. The degree of inbreeding and genetic structure were assessed by measuring deviations from Hardy-Weinberg equilibria with pooled groups, and by looking for trends of genetic distance, *D*, with physical distance. The estimates of inbreeding (Wahlund effect) were small (0.015–0.031) and not significantly different from zero. There may be some increase in *D* with distance, but standard errors were large, and neither sample size nor the lack of independence of the *D*'s were taken into account.

The genetic structure of populations is a hierarchical concept. For birds like these there may be "inbreeding" at several different levels depending on the dispersal pattern. These levels include inbreeding within social groups (incest), among groups within regions (very restricted movement), and among regions (isolation by distance due to somewhat restricted gene flow). The data presented by these authors suggest that there is little inbreeding at least at the first 2 levels in this social species. Thus, through an indirect means not requiring a laborious long-term study, it was possible to infer that there is sufficient dispersal to avoid close inbreeding.—George F. Barrowclough.

77. Genetic variation in Lake Erie Great Blue Herons (*Ardea herodias*). S. I. Guttman, G. A. Grau, and A. A. Karlin. 1980. Comp. Biochem. Physiol. 66B:167–169.—Electrophoresis was used to examine the pattern of structural genetic variation in 2 Lake Erie colonies of Great Blue Herons. Forty-six individuals were examined for 28 loci; genetic heterozygosity was found to be low (0.7%).

An interesting result was that nestlings taken from 4 different nests in one tree shared a rare allele. In general, this kind of result could be due to: (1) chance, (2) an extreme degree of philopatry to individual trees within colonies, (3) cuckoldry or rape of several females by a single male, or (4) intraspecific nest parasitism. In this case the authors favor the possibility of rape. This could be checked relatively easily through some judicious taking of blood samples that need not involve sacrificing the individuals. The result itself points to the potential usefulness of electrophoresis in projects aimed at investigating some of these interesting social behavioral patterns.—George F. Barrowclough.

78. Gene flow, effective population sizes, and genetic variance components in birds. G. F. Barrowclough. 1980. Evolution 34:789–798.—Barrowclough presents us with the first comprehensive, but as he suggests still preliminary, treatment of the genetic structure of avian populations. Conceptually his method for approaching the problem is elegantly simple, though I found some of the underlying mathematics intimidating. Following Wright and others Barrowclough uses dispersal to estimate gene flow. Different procedures are used for species with different areal distributions. For "continuously" distributed species (all passerines) Barrowclough corrects the adult and juvenile dispersal distributions which, when combined with estimates of survivorship, allow calculation of a root mean square dispersal distance as a gene flow estimator. For "colonial" species (mostly seabirds), the proportion of individuals exchanged by neighbor breeding clusters is the important gene flow estimator. Both estimators are then combined with estimates of local densities to produce an effective population size (N_e). Barrowclough uses his calculated N_e to estimate Wright's F_{ST}, which as a fixation index here, is an estimate of the degree of local genetic differentiation (among deme variance) expected, in the absence of selection and mutation, to result from drift. The smaller the N_e, the more likely and pronounced the differentiation between local populations as a result of drift. Based on his assumptions and procedures, the N_e's for continuously distributed bird species ranged from 176–7678 (F_{ST} = 0.001–0.041), while for colonial species N_e = 17.0–64,580 (F_{ST} = 0.0001–0.705). He concluded that "effective population sizes are moderate to relatively large and that the magnitude of the among-deme component of genetic variance, in the absence of selection, is small for many avian species."

Barrowclough's analysis follows directly from traditional treatments of the same problem in other taxa and is internally consistent. But since I agree with his assessment of the importance of N_e and F_{ST}, I would like to explore some of his assumptions, which could result in significantly different calculations if altered. For example, his method of correcting dispersal sampling bias (used here, but described in Bird-Banding 49:333–341, 1978) assumes a continuously suitable habitat and always increases the root mean square dispersal. If suitable habitat were patchily distributed, his method would overestimate true dispersal. Similarly, his use of Wright's isolation by distance model assumes that individuals are distributed homogeneously in space. If they are clustered, with expanses of more or less unoccupied habitat interspersed with the more densely settled areas, then his treatment will overestimate N_e. His density estimates use the number of territories and assumes one pair per territory. If some territorial males were unmated, as seems to be true in many passerines, then his method would again overestimate N_e. Finally, his use of the root mean square as a gene flow estimator assumes a bivariate normal distribution of dispersal distances. Observed dispersal distributions, however, are usually leptokurtic. As they become more and more skewed, Barrowclough's assumption of normality causes an increasing overestimation of the true N_e, though there is a correction available (Wright, Evolution and the Genetics of Populations V. 2, U. of Chicago Press, 1969:303). Since Barrowclough's assumptions consistently maximize gene flow estimations, the actual values may be smaller (N_e) and larger (F_{ST}), given altered, and perhaps more realistic, assumptions.

While I do quibble with his numbers, I applaud his assertion that, "the genetic structure of natural populations is of general interest because many current models in ecology and evolution involve assumptions about the viscosity of breeding populations." Barrowclough's work is important and should help stimulate the necessary fieldwork to explore the questions of interest in the desired detail.—William M. Shields.

79. G- and C-banding in four related *Larus* species (Aves). H. Ryttman, H. Tegelstrom, and H. Jansson. 1979. Hereditas 91:143–148.—The karyotypes of *Larus argentatus, L. fuscus, L. marinus,* and *L. canus* were examined using techniques (G-banding and C-banding) that reveal markers on the chromosome arms. These techniques have been useful in some groups of organisms for locating inversions and translocations among chromosomes that superficially appear identical. In this case, however, all 4 species were found to have identical karyotypes even using these banding techniques.

Immunoelectrophoretical comparison of sera from Herring Gull (*Larus argentatus*) and Lesser Black-backed Gull (*Larus fuscus*) (Aves). H. Ryttman, H. Tegelstrom, and H. Jansson. 1980. Hereditas 92:113–116.—Antisera were prepared to the blood sera from *L. argentatus* and *L. fuscus.* Immunoglobulins were isolated from the antisera, and crossed immunoelectrophoresis was used in an attempt to find immunological (hence genetic) differences between these congeners. There was no difference found between the homologous (within species) and heterologous (between species) reactions.

Isozyme differences among three related *Larus* species (Aves). H. Tegelstrom, H. Jansson, and H. Ryttman. 1980. Hereditas 92:117–122.—Approximately 40 genetic loci were examined electrophoretically in a search for genetic differences between relatively large samples of *L. argentatus* and *L. fuscus.* In addition a few *L. minimus* were examined. Six loci were variable. No "fixed" differences were found; that is, there were no loci in which the 3 species did not share common alleles.

L. argentatus and *L. fuscus* form one of the best known examples of a rassenkries. In this case the taxa form a ring of subspecies around the northern hemisphere with the ends of the ring meeting, without extensive hybridization, in northern Europe. Areas of contact and overlap, such as this one, have been extensively studied by ornithologists for several decades. Most of these studies have emphasized detailed *description.* What is needed, though, are *analytical* studies that offer the potential of understanding the evolutionary processes involved in these zones. One way to attempt this is through the search for some kind of information that can reduce the problem by linking it to some aspect of population genetics theory. In this potentially exciting example of such a reduction, the authors of the above 3 papers failed to find adequate genetic markers. However, this should not be unexpected to persons familiar with the last 10 years of research in avian genetics. If one thing has been learned it is that the extent of avian genetic differentiation is small by the standards of such taxa as *Drosophila,* salamanders, rodents, etc. It appears that searching for large differences, such as fixations between alleles or chromosomes, between sister species is usually going to fail. However, this does not mean that the sought after reduction will be a failure. It has been established that there are often differences in allelic frequencies among species. Thus, quantitative analysis of electrophoretic results from moderate to large samples of individuals frequently should be useful. Unfortunately, these authors have not yet tried this approach.—George F. Barrowclough.

80. Chicken teeth. T. Dunkle. 1980. Science 80 1:94–95.—Edward Kollar and Christopher Fisher incubated a minute portion of chick embryo jaw implanted on a mouse embryo tooth bud. The result was 4 peg-shaped teeth. It is concluded that the chicken lacks the inducing stimulus to produce teeth but retains the genetic apparatus.—C. H. Blake.

FOOD AND FEEDING

(see also 30, 31, 40, 41, 43, 64, 84, 88)

81. Comparative foraging behaviour and efficiency of adult and juvenile Great Blue Herons. T. E. Quinney and P. C. Smith. 1980. Can. J. Zool. 58:1168–1173.—This study of *Ardea herodias* adds to a growing body of literature that indicates foraging ability improves with age and experience in various species of piscivorous birds. Adults achieved approximately twice the captures per minute as did juveniles even though paces per minute and strikes per minute did not vary between adults and juveniles. Additionally, juveniles made nearly 10 times as many probes per minute as did adults. The authors suggest that probing may be a means of learning bill orientation; no swallowing was seen following probes. Adult birds took more medium- and large-sized prey than did juveniles. Small prey were swallowed with equal speed by both age categories of birds, but juveniles took 8 times longer than adults to swallow medium-sized items. Rain and/or high winds reduced foraging effectiveness for both groups of herons.—A. John Gatz, Jr.

82. Late summer time budget and feeding behaviour of Marbled Godwits (*Limosa fedoa*) in southern Manitoba. R. A. Wishart and S. G. Sealy. 1980. Can. J. Zool. 58:1277–1282.—In late summer, Marbled Godwits form post-breeding flocks (6–55 birds in this study) of both adults and juveniles. Flocks were observed to rush potential predators as a group and to have 74% of the birds engaged in the same activity at any given time. Time devoted to particular activities varied throughout the day, but overall averages were: 61.3%—foraging, 19.5%—sleeping, 17.2%—preening or bathing, and 2%—walking, flying, or inactive. Most birds did not forage in areas of strong winds; those that did showed an increase in rate of feeding attempts, but a decrease in both success rate and foraging efficiency.—A. John Gatz, Jr.

SONGS AND VOCALIZATIONS

(see also 25, 29, 37, 38, 54)

MISCELLANEOUS

83. Winter identification of Greater and Lesser sand plovers. J. C. Sinclair and G. H. Nicholls. 1980. Br. Birds 73:206–213.—This is another in the continuing series of identification papers typical of this journal. This one differentiates the Greater Sand Plover (*Charadrius leschenaultii*) and Lesser Sand Plover (*Charadrius mongolus*). Photographs and one excellent drawing by P. A. Clancey supplement the text. The Greater is larger and taller than the Lesser. The most important distinction is the longer and more robust bill size of the Greater.—Patricia Adair Gowaty.

84. Why woodpeckers don't need helmets. J. Hansen. 1980. Science 80 1(6):93–94.—By high speed photography, Philip May and colleagues showed that an Acorn Woodpecker's (*Melanerpes formicivorus*) beak moved 20–23 ft per second and decelerated at about 1000 *g* on striking a tree. The beak moves in a straight line and the neck muscles are tense at the moment of impact.—C. H. Blake.

BOOKS AND MONOGRAPHS

85. The Bird Year—A Book for Birders. J. Davis and A. Baldridge. 1980. The Boxwood Press, Pacific Grove, CA. 224 p. $5.95.—The choice of title is, I believe, unfortunate for this volume. The subtitle, "With Special Reference to the Monterey Bay Area," is somewhat helpful in revealing the contents. About 100 pages deal with bird habitats of the Monterey Bay area and how the birds of those habitats use them. I mention this first because this is the part I found most exciting. The first half of the book presents basic ornithological information on nomenclature, reproduction, breeding behavior, nesting, and molts and plumages in a very readable text. Treatment of the literature is outstanding. The book is written primarily for birders, however, it is not a book that will greatly aid birders in identifying species in the field. Once birds have been identified, birders will certainly find it useful for putting the Monterey Bay area birds in their proper ecological "place." The style and content can best be described as natural history gone scientific. It is a refreshing blend of the two.

As a person who has been through that part of California treated by the book only once, I would have found a map of the area most helpful. I also would have found an elaboration of certain, apparently original data satisfying, e.g. on p. 121 the wing/tail ratios of the Burrowing Owl (*Athene cunicularia*) and the Short-eared Owl (*Asio flammeus*) (2.11) are said to be "tied for third place among the nine species of owls found in our area." The ratios of the other owls are not given hence one is left wondering what they are and where one can find them in the literature. The chapter entitled "The effects of development on bird life" started me thinking about biological development but it treats cultural development as a lead into bird habitats. That particular chapter is brief but up-to-date, lucid, and succinct.

The text is illustrated with black-and-white photographs which nicely supplement points in the text. Habitat photographs, especially, aid in creating a mental picture of this unique part of the country. An appendix gives binominals for those plants and animals mentioned in the text and a checklist of birds for the area. This is much more than a "birds of . . ." book and I hope others will consult it before preparing similar works.—Richard J. Clark.

86. "Ding": The life of Jay Norwood Darling. D. L. Lendt. 1979. Iowa State University Press, Ames. 202 p.—Numerous figures or cartoons drawn by "Ding" enliven the pages. The author, a career publicist and diplomat, shows his own abundant ability in his broad and inclusive approach, but there are questions of completeness and accuracy. "I never met Jay Norwood Darling." "I freely admit . . . . that Jay Darling is not captured within the following pages. The difficult writing decisions had nothing to do with what to include but what to leave out." What was excluded or avoided? "I lived with Ding," but not closely enough to hear or see such as the following: "He would have been appalled at my lack of ecological sophistication." He need not have been, the term was little or not used in Darling's time. "Probing the record of Darling's life also showed me that he was a fascinating combination of seemingly inconsistent beliefs and attitudes. A man who enjoyed prodigious power of expression, uncommon energy, and immense common sense intellect." The same combination was manifested by Hitler. For the former Biological Survey, and its work on food habits Lendt states that Ding selected and developed C. Cottam. Actually it was W. L. (not W. T.) McAtee who effected this. "If this biography is dull it is certainly not Ding's fault." That it is inexact may not be Ding's fault either.

"Sportsmens' heaven is hell for the ducks," one of Ding's memorable quotes, would have enlivened these pages. What else than ducks is appreciable? The times favored him. World War II was advancing, much to the disbelief and despair of all. It was the season for dictators; weekly newsreels displayed "Uncle Alf" Goebbels, "Unser Hermann," Franco, Mussolini, and Stalin. Darling saw around us corresponding personalities. It was not his success in cartooning that brought him income and renown. Yet for all his excitement and effort, he resigned a year and a few months after accepting his task in the U.S. Department of Agriculture, Biological Survey. His dictum, so he told his aides was: "So live that you can look any man in the eye and tell him to go to hell." But such diplomacy did not win support for what he demanded, nor for the food habits section. One appropriation anecdote: Senator X to Senator Y: "I see you cut out that $100,000 for x bird." Senator Y: "Yeah, we cut that out." X: "Well, I'd like to have that left in." Senator Y: "Oh, all right." So pulling out a pen he restored it. Ding lacked experience in such matters. He would properly bill appropriators for what was needed, only to learn that he should have applied for twice what he hoped to get.—Leon Kelso.

87. The Feather Mite Family Eustathiidae (Acarina: Sarcoptiformes). P. C. Peterson, W. T. Atyeo, and W. W. Moss. 1980. Monogr. 21, Acad. Nat. Sci. Phil. p. 143.—Major systematic monographs of this nature are often unknown to ornithologists, so this one, involving an ectoparasite family restricted to swifts and crested swifts, should be of interest. The appendices listing hosts and their parasites are of particular note because many of the parasite species are not host-specific; bird species often harbor 2, or as many as 8 feather mite species. Different subspecies of the same swift species often have different parasite species. All 64 mite species are described, illustrated, and keyed.—David W. Johnston.

88. The Life of Owls. (Zhizn Sov.) Yu. B. Pukinskii. 1977. In series: **Lives of our birds and wildlife. No. 1.** Leningrad University Press, Leningrad. 240 p. (In Russian.)—"*Oh how I love the twilight, especially when I'm borne away in thought to the past! Where are you golden days?*" (Goncharof.) Largely through these accounts twilight is the owls' "witching hour." What works deserve translation? This is definitely a candidate. There is a foreword, distinctive and engaging and not just a formal potpourri of words. Then follows: general features of owl biology; some history; owl adaptation to nocturnal life; feather details and plumage stages; noiseless flight; feather shedding and molt; owl vision; hearing; the expressive facial disc; food and modes of foraging; diurnal activity rhythms; food transportation and storage; prey pursuit; modes of food analysis; food chain lability; foraging and territorial competition; enemies and survival; territorial affinity and persistence; the sedentary and the transient; urbanization; owls' family life; courtship and vocalization; do owls build nests?; clutches and brooding; young growth and development; parental care; protection and conservation; owls of the Soviet Union; and owl diversity. Twelve species or species' groups are described. While illustrations leave something to be desired, the general accounts are very inclusive. Best are sections on vocalization and general ecology.—Leon Kelso.

89. Migration of Birds. F. C. Lincoln. Revised by S. R. Peterson. 1979. Circular 16. Fish & Wildlife Service, U.S. Department of the Interior. 119 p., paper, $4.00.—Lincoln's popular 1950 book of the same title has been largely rewritten by Peterson, although similar chapter headings have been retained. The many black-and-white maps of migration routes and patterns in the 1950 edition have been redone slightly and all are now in color, thereby making the book a very attractive one. As with the earlier edition, the strong points of the book are the emphasis on the various types of migration routes, as exemplified by maps of a number of species, and the timing of migration, as depicted through the use of isochronal lines on the maps. Peterson has vastly updated the literature, though one may wonder why a book published in 1979 has references only through 1973.

Although nearly all topics of migration are mentioned, the book focuses too much on migration at the species level and not enough on migration at the level of the individual bird or the "population" (a collection of individuals of different species migrating over the same area at the same time), both in terms of proximate and ultimate factors. Topics such as wind drift, the coastal effect on immature passerines in fall, morning reorientation flights, and nocturnal flight calls are not covered. I was particularly disappointed that there is so little emphasis on the importance of global or continental wind patterns in the shaping of migration routes. Peterson, in speaking of the American Golden Plover (*Pluvialis dominica*), states that the species avoids migrating north over the Atlantic Ocean because foggy conditions along the coast and frozen soil in the Northeast would be hazardous to its survival (p. 84). I strongly suspect that the primary reason that this plover, and essentially all other nonpelagic species of birds, avoid a long trans-Atlantic flight in the spring is that continental wind patterns are unfavorable (i.e., have a northerly component) for such a crossing at that season, yet these winds are favorable in the fall (see Richardson, Ibis 116:172–193, 1974).

Thus, the book is basically a static view of migration (looking at range maps and migration patterns) and not a dynamic one. The layman and the amateur ornithologist should find the book useful and enjoyable to read, but the professional ornithologist is looking for a more modern treatise that emphasizes *why* and *how* birds migrate.—Harry E. LeGrand, Jr.

90. Wildlife and people. C. M. Kirkpatrick (ed.). 1979. Purdue Univ., W. Lafayette, IN. 191 p. $10.75.—Sponsored by the Department of Forestry and Natural Resources and the Indiana Cooperative Extension Service of Purdue University, The 1978 John S. Wright Forestry Conference was held at Purdue University on 23 and 24 February 1978. The proceedings are presented in this book. Most of the papers presented dealt entirely or chiefly with wildlife other than birds; 4 papers dealt entirely with birds.

Particularly timely was a paper by B. L. Monroe and L. S. Cronholm on "Health and management problems of Starling-blackbird roosts" (pp. 58–62), based on studies in Kentucky and Tennessee where large-scale bird-killing programs have been conducted recently. Monroe and Cronholm concluded that killing the birds at roosting sites is only a short-term solution to problems caused by the birds in nearby livestock feedlots and wheat fields. Also noted was the fact that the possibility of dissemination by birds of hog virus or transmissible gastroenteritis (TGE) would not be eliminated by killing all blackbirds and Starlings since other birds also visit hoglots. Additionally, positive information is not available showing that birds act as vectors of TGE. Although exposure of humans to disease risks is often cited as an important justification for elimination of blackbird-Starling roosting congregations, Monroe and Cronholm noted that histoplasmosis, the disease considered to be most commonly associated with the congregations, is a problem only under a specific set of circumstances that can be managed without killing the birds. Local problems with noise and droppings of blackbird-Starling roosting congregations can be resolved most cheaply by harassing the birds and thus inducing them to change their choice of a roosting site.

In a paper on "Avian communities and habitat associations in cities and suburbs" (pp.

7–24), R. M. DeGraf reported on a study of bird habitat associations in suburban Amherst and urban Springfield, Massachusetts. Total bird density was almost 3 times higher in the urban than in the suburban area, but the number of breeding species was much higher in the suburban than in the urban area. In a paper on "Effects of a program for raptor research and rehabilitation on raptor management" (pp. 42–48), P. T. Redig reported on a program conducted by the College of Veterinary Medicine of the University of Minnesota providing medical treatment for birds of prey brought to their laboratory. Just under 40 of 80 eagles treated were returned to the wild. D. A. Manuwal presented a paper on "Effect of man on marine birds: a review" (pp. 140–160) and discussed the major interactions between marine birds and man. Manuwal concludes that oil pollution and chemical contamination of the oceans are now the most serious threats to seabirds. The paper cites nearly 60 references but must be judged a superficial treatment of its subject.

One can only hope that conferences such as the one reported on in these proceedings will do something to start needed research on the role of birds and other wildlife in maintaining a congenial environment for people.—Paul A. Stewart.