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RECENT LITERATURE

Edited by Jerome A. Jackson

BANDING AND LONGEVITY

(see 3, 31)

MIGRATION, ORIENTATION, AND HOMING

(see also 5, 14, 24, 26)

1. **Autumn seabird migration at Manomet Point.** G. Yurkunas. 1985. Bird Observer of Eastern Massachusetts 13:252–257.—The author presents a tabular summary of unpublished "Operation Seawatch" data for 1967–1984, collected in over 2000 h of observation by personnel of Manomet Bird Observatory, Manomet, Massachusetts. On average, 41,000 southbound migrant seabirds have been recorded annually. The emphasis of the project has been on monitoring scoter populations, but relative abundance ratings, based on the mean monthly number of birds sighted per hour, are presented for 61 species for each month September through December. A table presents the probability of observing each species from Manomet Point in each of these four months. Individual dates of observation are given for the 28 of 61 species which were observed 10 or fewer times. Six Manomet Bird Observatory unpublished Operation Seawatch Summaries and scoter reports are referenced.—William E. Davis, Jr.

2. **The 1984 spring migration watch.** J. Andrews. 1985. Bird Observer of Eastern Massachusetts. 13:72–77.—Andrew presents a preliminary analysis of data collected from 1980–1984 of warblers (Parulinae) censused from 15 April to 6 June at 8 sites in eastern Massachusetts by different observers. Birds/hour comparisons between the 1984 and 1980–1983 combined data indicate significantly ($P < 0.01$) lower numbers in 1984 for the Tennessee (*Vermivora peregrina*) and Black-throated Green (*Dendroica virens*) warbler, with higher values for Cape May Warbler (*D. tigrina*), Black-and-white Warbler (*Mniotilta varia*), and Ovenbird (*Seiurus aurocapillus*). The author presents an analysis of the timing of the spring warbler migration for the combined 5 years of data, including a figure showing abundance curves for the census period for the early migrant Yellow-rumped Warbler (*D. coronata*), principal breeding species, and all other warbler species. For one site, the weekly birds/hour data for the combined 5 years are given for each of 28 warbler species, including a total of 5205 sightings for 180 h of observation.—William E. Davis, Jr.

POPULATION DYNAMICS

(see also 15, 16, 24, 25, 28)

3. **Differential survival by sex in juvenile Sage Grouse and Gray Partridge.** J. E. Swenson. 1986. Ornis Scand. 17:14–17.—European studies of the highly sexually dimorphic Common Capercaillie (*Tetrao urogallus*) and Eurasian Black-Grouse (*Lyrurus tetrix*) have shown that during poor years, juvenile males have higher mortality than juvenile females. Poor survival of males may be related to their large size, which requires more rapid growth and higher energy intake compared with smaller females. Swenson tested this idea in North America by comparing autumn juvenile sex ratios of size-dimorphic Sage Grouse (*Centrocercus urophasianus*) and monomorphic Gray Partridge (*Perdix perdix*), reasoning that Sage Grouse, but not Gray Partridge, would have distorted sex ratios during poor production years and in poor habitats. Sex and age data came from birds killed by hunters in Montana from 1965–1981. Reproductive success was measured as the ratio of juvenile wings : 100 adult female wings in the samples. Habitat quality (i.e., relative bird density) was assessed for each county by calculating the average number of birds harvested per hunter day from 1975–1980. As expected, survival of juvenile male Sage Grouse decreased significantly in poor production years and in poor habitats, whereas survival of juvenile male Gray Partridge showed little or no trend in the predicted direction. This suggests that juvenile sex ratio data from size-dimorphic grouse species could be used to

monitor yearly and long-term variations in juvenile survival and in habitat quality.—Jeffrey S. Marks.

4. Territory size in a Willow Warbler *Phylloscopus trochilus* population in mountain birch forest in Swedish Lapland. B. Arvidsson and P. Klaesson. 1986. Ornis Scand. 17:24–30.—Territory size in birds is thought to be a function of food availability and intruder density. In this study, the authors measured territory size (4 yr) and productivity (5 yr) of Willow Warblers in central Sweden from 1974–1978. A separate study monitored relative insect abundance in the birch forest where the warblers foraged. Mean territory size (0.52–1.14 ha) and mean reproductive output (1.6–4.4 fledglings/female) were highly variable among years, but neither was correlated with insect abundance. Territory size was negatively correlated with previous year's reproductive output ($r_s = -1.0$) and with present year's breeding density ($r_s = -0.8$), suggesting that territory size was determined by density of conspecifics rather than by food abundance. The authors concluded that for Willow Warblers, "defence of food resources is of little adaptive value."—Jeffrey S. Marks.

5. Is the Snow Goose coming back? (Vozvrashchenie belogo gusia?) I. A. Ryabtsev, 1986. Priroda (Nature) 3 (March):35–38. (Russian.)—Until the 19th century, Snow Geese (*Chen caerulescens*) nested across much of the north shore of the northeastern Asian mainland, and wintered in South Asia, Japan, and the Caspian. In the mid-1800s their numbers began to decline, and their range shrank. Today the only nesting area remaining on Soviet territory is Wrangel Island in the Arctic Ocean; from here the birds fly to the Pacific Northwest and to California in winter. The Wrangel population fell from about 400,000 in 1960 to 46,000 in 1976; by 1981 it had recovered to 85–90,000.

From at least the turn of this century, there are occasional records in the USSR of individual Snow Geese or small flocks as far west as the Ukraine, and recently some have shown up [locations not given] where Snow Geese were never known before (these probably are offspring of birds released in a nature reserve on the Soviet coast of the Sea of Japan). This author reports his field team encountered at least 6 Snow Geese in Mongolia in summer 1985. They saw 6 almost white geese on a sandbar and managed to shoot one, a male. Because, save a few gray feathers, it was completely white with black wing-tips, they identified it "unquestionably" as a young Snow Goose. The author speculates hopefully that such records, so remote from the nesting area and migration route used today, indicate the Snow Goose is attempting to re-establish itself in its former range.—Elizabeth C. Anderson.

NESTING AND REPRODUCTION

(see also 12, 15, 17, 20, 30)

6. Food provisioning, nestling growth and experimental manipulation of brood size in the African Redbreasted Sparrowhawk *Accipiter rufiventris*. R. Simmons. 1986. Ornis Scand. 17:31–40.—The Redbreasted Sparrowhawk is a little-known species of montane subtropical Africa. Simmons monitored 2 nests (one for 826 h and the other for 16 h) during the 1983–1984 breeding season and herein reports on general aspects of breeding biology and on experimental brood-size manipulations.

Copulations were only observed after food deliveries by the male. Both sexes participated in nest building. Egg laying occurred during the third week in October; one clutch had 2 eggs and the other 3. On average, males delivered 3–4, 5–6, and 2–3 prey items per d during the incubation, nestling, and fledgling periods, respectively. Only females incubated, and they first provisioned young 3–4 wk into the nestling period. Females delivered significantly larger prey than did males. The combined daily biomass delivered by both parents peaked during the last week of the nestling period.

Experimental brood manipulations consisted of alternately adding and removing 1–2 chicks to a single-chick nest for 2–3 d over a 46-d period. Because parents provisioned young at the same rate regardless of brood size, daily growth rates per chick were highest for broods of 1 and lowest for broods of 3. Daily provisioning rates of Redbreasted Sparrowhawks and 3 other subtropical *Accipiter* species were much lower than those of 2 temperate *Accipiter* species of comparable size, suggesting that some subtropical raptors are reproductively limited by food availability.—Jeffrey S. Marks.

7. **Nest-site fidelity of Malachite Sunbird and parasitism by Klaas's Cuckoo.** W. R. Siegfried. 1985. Ostrich 56:277.—Observations of a banded female Malachite Sunbird (*Nectarinia famosa*) and her mate were made as they nested in a rural garden near Stellenbosch, South Africa, from 1980 through 1982. Possibly the same pair nested the 4 yr previous to banding the female. In all this time, only one Malachite Sunbird chick was seen to be raised; all other observed nestings over the 7-yr period produced only Klaas's Cuckoos (*Chrysococcyx klaas*). Several questions are posed by the author concerning these observations, which will hopefully encourage an in-depth study of the relationship between these species.—Malcolm F. Hodges, Jr.

8. **Notes on breeding of *Cisticola brunnescens* and *C. juncidis* in Zambia.** E. H. Penry. 1985. Ostrich 56:229–235.—Observations of a nest of *C. brunnescens* and 8 *C. juncidis* nests are detailed from fieldwork done in Kitwe, Zambia, from December 1979 through January 1980. Included are sections on finding the nests, nest-site selection, nest construction, incubation periods, chick development, nestling period, nesting success, and clutch size. Comparisons are made between the species, although the validity of these may be in question due to the small sample size for *C. brunnescens.* The paper includes the first published record of the incubation period for *C. brunnescens.* Other published nesting records for the species are summarized.—Malcolm F. Hodges, Jr.

9. **Aspects of the breeding biology of the Fierynecked Nightjar.** H. D. Jackson. 1985. Ostrich 56:263–276.—A population of 55 Fierynecked Nightjars (*Caprimulgus pectoralis*) was marked and studied from 1972 through 1975 near Mutare, Zimbabwe. Males were faithful to home areas, but female site fidelity is apparently mate fidelity. Some qualitative data suggest site defense of territories by males, but this requires substantiation. Egg-laying coincided with full moons occurring during the breeding season. The author suggests this affords a period of increasing moonlight when feeding of chicks is most crucial. Fierynecked Nightjars were successively double-brooded at least occasionally, probably as a response to excessive predation (about 60%). The male and female split incubation duty on a day/night cycle, the duller female incubating by day.—Malcolm F. Hodges, Jr.

10. **Breeding of the Barn Owl, *Tyto alba,* in the district of Delemont (canton of Jura, Switzerland) during 1982 and 1983, and the years that followed.** (La reproduction de la Chouette effraie, *Tyto alba,* dans le district de Delémont (canton du Jura, Suisse) en 1982 et 1983, et les années suivantes.) J.-P. Luthy, J.-C. Schaller, M. Monnerat, and A. Georgy. 1985. Nos Oiseaux 38:161–178. (French, English summary.)—In the early 1980s, when it appeared that populations of Common Barn-Owls in the district of Delémont were threatened, the authors began putting up nestboxes there and examining them regularly. The data in this article are the result of their visits to the nestboxes.

Nesting success was high in 1982 and 1983, thanks to an abundance of nest sites (142–173 nestboxes alone) and food (peak years for voles in Delémont). At least 42 pairs of owls bred successfully in 1982, and 38 in 1983. First clutches were laid between March and August, second clutches between May and August. Mean clutch size (5.25 in 1982; 5.15 in 1983) was largest in June. Second clutches were smaller than first clutches (5.39 vs. 3.85 eggs). The most common clutch sizes were 4–5 eggs. Second clutches did not exceed 7 eggs, whereas some first clutches consisted of 8–10 eggs. Only 17.1% of 484 eggs failed to hatch, and most significant losses occurred during periods of heavy precipitation. Only 28 (or 7%) of 401 chicks failed to fledge. The average number of young fledged per nest was 4.04 in 1982 and 3.97 in 1983. Chick loss was due to cannibalism and premature fledging, but not to weather. The data also show clearly that Barn Owls can colonize nest sites above their "normal" altitudinal limits (<600 m), at least when voles are abundant, since many nested successfully at elevations as high as 973 m during both years.

By contrast, only 19 clutches were laid and only 31 chicks fledged (1.94/nest) in 1984, a year when vole populations dropped sharply. Failure rates increased to 37% for eggs and 31% for young that hatched. In 1985, following a cold and snowy winter in which many owls died, and when voles continued to be scarce, only 2 pairs of owls bred and only 12 chicks fledged.—Michael D. Kern.

11. Successful late nesting of House Wren in Grady County, Oklahoma. William H. Hunt. 1986. Bull. Okla. Ornithol. Soc. 19:13–14.—House Wrens (*Troglodytes aedon*) nested successfully during July and August 1980 in Chickasha, Oklahoma.—Malcolm F. Hodges, Jr.

BEHAVIOR

(see also 6, 9, 15, 34, 38, 39, 40, 42)

12. Ethological adaptations in the reproductive system of the Barn Owl (*Tyto alba* Scop., 1769). [Ethologische Anpassungen im Fortpflanzungssystem der Schleiereule (*Tyto alba* Scop., 1769).] W. Epple Ökol. Vögel (Ecol. Birds): 7:1–95. (German, English summary.)—Epple studied 2 naturally-nesting and 8 aviary-nesting pairs of Common Barn-Owls between 1977 and 1982. Emphases of his observations were mating system, courtship, pair formation, ethological adaptations associated with opportunistic breeding, and the annual cycle of the species' reproductive system under natural photoperiod and a good food supply. The article is well-illustrated with drawings from movie frames and all figures and tables have English as well as German captions. Courtship is discussed in the classical sense of mutual synchronization of the mates and reduction of aggression. Only the male defends the nest site and territory. Of primary interest are major behavioral differences between *Tyto* and Strigiform owls: female choice cannot be influenced by courtship feeding, because copulation occurs earlier during courtship and the pre-laying phase. It also continues through incubation and care of the nestlings. Frequency of copulations during egg-laying correlated with final clutch size, and Epple suggests that copulation frequency controls clutch size via intrapair-stimulated induced ovulation. Two groups of captive Common Barn-Owls exhibited cooperative biandry.—Jerome A. Jackson.

13. Capercaille hold "master classes" before lekking. (Preliudia glukharnogo toka.) A. Romanov. 1985. Okhota i okhotnich'e khoziaistvo (Hunting & Game Management) 6: 13. (Russian.)—When on the lek in April, male Common Capercaille (*Tetrao urogallus*) are not at all friendly to potential rivals; but earlier in the spring, groups of males display with no evidence of antagonism. This may allow young male Capercaille to learn or perfect lekking behavior by watching and imitating the postures of older males in the couple of months before lekking really gets underway. Then some of the yearling birds participate fully, while others watch from the sidelines, as if "continuing their studies."

In February 1984 the author saw a male Capercaille, wings drooped and tail fanned in courtship posture, parading over the snow; close behind him followed 3 others, copying him. From time to time the leader turned around and paused "as if checking that everyone was in order" and then unhurriedly resumed his progress. A fifth Capercaille surveyed this all with obvious interest, craning his neck as he perched in a tree. Another analogous incident involved 10 males who watched and imitated the motions (but not vocalization) of a leader, while a female sat nearby. Other instances of "friendly" group displaying had been recorded in the snow by the footprints and drooped-wing tracks of small groups of birds all walking in the same direction.

These "classes" or "rehearsals" seem to be part of a previously unrecognized pre-lekking preparatory period in the Capercailles' reproductive cycle.—Elizabeth C. Anderson.

14. Canada Geese flying in formation with Sandhill Cranes. Jack L. Orr. 1986. Bull. Okla. Ornithol. Soc. 19:12.—Canada Geese (*Branta canadensis*) were dispersed throughout V- and line-formations of Sandhill Cranes (*Grus canadensis*) on 7 December 1985 near Tipton, Tillman County, Oklahoma. Noted also are other areas where this behavior has been observed.—Malcolm F. Hodges, Jr.

ECOLOGY

(see also 3, 4, 9, 21, 27, 31)

15. Introduction to the biology of the Black Wheatear (*Oenanthe leucura*) in France. (Introduction à la biologie du Traquet rieur (*Oenanthe leucura*) en France.) R.

Prodon. 1985. Alauda 53:295–305. (French, English abstract.)—The Black Wheatear is now a rare species in France, found only on the rocky coast of the Albères Mountains (district of Pyrénées-Orientales) bordering Spain. Between 1974 and 1984, the population of wheatears in the French Albères has remained a stable 16 ± 2 nesting pairs. This is the first paper that has been written in the last two centuries about Black Wheatears in France. The author describes the size and plumage coloration, behavior, habitat, and diet of the French birds, and includes information about their reproduction, displays, aggression, territoriality, interspecific relations, and migration.

Black Wheatears generally forage on open ground; have large territories (3 nests on one inhabited crest were 600 and 400 m apart) on rocky coasts or near the crests of hills, preferentially on south slopes where the vegetation is low; and use cracks in shale outcroppings as nest and roost sites. They are monogamous, mostly sedentary, and the two members of a pair remain together year-round. Their diet consists of arthropods and berries.

Reproductive behavior is first evident in February with song and chases; copulation begins in March; nest construction at the end of March or early April; first clutches in mid-April. Second clutches are rare, but replacement clutches are common. Black Wheatears nest between sea level and 670 m elevation. The clutch is 3–7 eggs, or 4.57 on average. Incubation (by the female) usually lasts 14–18 days. The female spends considerable time with her chicks during the first few days after they hatch (9.5 min/stay on day 1), but much less time later (<1 min/stay on day 5). Both parents feed the young (9.5 times/h on average). The brood period lasts 15–19 days, or 16.5 days on average. In the Albères, nesting success was 60% and the number of young fledged 3.5/nest. Chicks leave the nest before they can fly and hide in cracks in the rocks where the parents continue to feed them. They can fly short distances 3 days after fledging. They stay with their parents for several weeks to months after fledging.

Black Wheatears perform "intimidation displays" (which are described) and are often very aggressive toward other thrushes during the breeding season. In contrast, they are often accompanied by other thrushes, especially Black Redstarts (*Phoenicurus ochruros*) and rock thrushes (*Monticola* sp.), while foraging during autumn and winter.—Michael D. Kern.

16. Effect of density and concealment on American Crow predation of simulated duck nests. L. G. Sugden and G. W. Beyersbergen. 1986. J. Wildl. Manage. 50:9–14.—In Saskatchewan, experimental nests using chicken eggs dyed to look like Mallard (*Anas platyrhynchos*) eggs showed that *Corvus brachyrhyncos* predation increased with greater nest density. Nests were concealed at varying levels by the experimenters. Density-dependent predation was maximum at 6 nests per ha in plots containing a highly exposed "decoy" nest that served to initially attract crows to experimental plots. Nests were usually found by crows searching on foot after initially detecting the decoy nest by flying; nest concealment offered little protection from walking crows. Results "supported the hypothesis that spacing out decreases nest predation by crows."

Habitat patchiness caused by intensive agriculture results in high duck nest densities, vulnerable to density-dependent predation. These results "indicate that nest losses could be reduced by land-use practices that allow ducks to disperse their nests." An expensive solution is to provide large areas of nesting cover; alternatively, some duck species may benefit from tall, dense cover that impedes walking crows and conceals nests.—Richard A. Lent.

17. Seasonal micro-habitat relationships of Ruffed Grouse in southeastern Idaho. D. F. Stauffer and S. R. Peterson. 1985. J. Wildl. Manage. 49:605–610.—Characteristics of *Bonasa umbellus* micro-habitat in Idaho's Caribou National Forest are described for all seasons. Grouse flush locations formed centers of circular plots in which vegetation structure was measured. Principal components analysis (PCA) of 150 additional randomly located vegetation plots allowed a multivariate comparison of habitat selected by grouse to what was available. Hypotheses on habitat preferences of drumming males, broods, and birds in each season were also tested.

Grouse preferred aspen (*Populus tremuloides*)-dominated sites. Male drumming sites had high vegetation density. Hens with broods used open sites with much herbaceous cover. In spring, habitat of drumming sites was significantly different from that of other sites.

Brood habitat was significantly different from non-brood habitat in summer. PCA derived four habitat gradients explaining 84% of the variation in randomly-measured habitat. Grouse selected relatively open sites on a gradient of canopy density. Fall birds selected areas with smaller aspen. Areas of high density of small stems were selected by drumming males and by birds in spring and fall.

Grouse basically selected habitat with characteristics of early successional aspen forest. Such habitat "will provide for the breeding, brood rearing, cover, and foraging needs of a Ruffed Grouse population."—Richard A. Lent.

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

(see 3, 16, 17, 27, 41)

CONSERVATION AND ENVIRONMENTAL QUALITY

(see also 3, 16, 25, 27)

18. An outdoor experiment on the ecology of contamination of birds by chlorinated hydrocarbons—and comments on the use of organisms as pollution monitors. [Ein Freilandexperiment zur Ökologie der Schadstoff-Kontamination von Vögeln und Folgerungen für die Verwendung von Organismen als Biomonitoren.] R. May and H. Ellenberg. Ökol. Vögel (Ecol. Birds) 7:97–112.—The authors used control and cross-fostered nestlings of Great Tits (*Parus major*; 23 nests) and Eurasian Tree Sparrows (*Passer montanus*; 19 nests) to examine the relative importance of heredity and food chain origin on pesticide uptake. Some chicks were taken from nests for cross-fostering the day after hatching, and chicks were collected for analysis on the day before fledging. Foods brought to the young differed between species and locality, and pesticide levels were highly correlated with levels in food taken from chick stomachs. Liver tissues of chicks were examined from two localities by gas chromatography. Cross-fostered chicks showed pesticide (PCB, HCB, β-HCH, Lindane, HE, p,p-DDE, o,p-DDT) levels more similar to those of other chicks from the same food chain than to those of siblings from a different food chain. The authors make the excellent point that further sophistication of pesticide residue analysis is useless without developing an understanding of the variability related to food chain and the species being examined. Suggestions are given for standardization of sampling within complex predator-prey systems.—Jerome A. Jackson.

19. The outlook for the endangered Lammergeier (Borodachi v opasnosti). I. Sosnovskii. 1985. Okhota i okhotnich'e khoziaistvo (Hunting and Game Management) 7:47–48. (Russian.)—The Lammergeier (*Gypaetus barbatus* [?*aureus*]) is listed in the Red Data Books of the IUCN and of the USSR. Shot because of the misconception that it is a predator (it eats carrion, even the "junkiest"—mummified carcasses, bare bones, hide) and because of its folk reputation as an evil omen, the Lammergeier has suffered also from indirect poisoning and from lack of food, as dead stock are removed from pastures for sanitary reasons, and wild ungulates get fewer.

The Lammergeier lives in several montane areas of southern Europe, eastern and southern Africa, the Near East, and Central Asia; in the USSR there are at least 150 wild pairs. Everywhere it is rare, and captive breeding has not been particularly successful. Only the zoo in Sofia (Bulgaria) has had any success: from 1916 to 1930 one Lammergeier pair produced 11 chicks. No others were hatched anywhere until 1973, when the Alma-Ata (USSR) zoo hatched and raised a young Lammergeier. Since then this zoo has had a chick every year.—Elizabeth C. Anderson.

20. Organochlorine pollutants, eggshell thickness, and reproductive success of Black-crowned Night-Herons in Idaho, 1979. S. L. Findholt and C. H. Trost. Colonial Waterbirds 8:32–41.—This article reports on data collected in three Black-crowned Night-Heron (*Nycticorax nycticorax*) colonies in southeastern Idaho. Thirty-eight eggs were collected, one per nest, for organochlorine analysis and eggshell thickness measurements. Nests were checked every 7–10 days and chicks monitored for about 18 days to determine nesting success for both nests from which eggs were removed and for 66–99% of other nests. Reproductive success was estimated by the Mayfield method.

Eight organochlorine pollutants were found in the eggs analyzed, with DDE present in all eggs, DDT in 37%, and DDD in 21%. Eggshell thickness was inversely correlated with DDE and DDD concentrations, and one egg had the highest concentration of DDE yet recorded in a night-heron egg from the U.S.A. The authors state: "Hatching success, percent of successful nests, number of chicks per successful nest, and shell thickness decreased, while number of eggs that disappeared or broke increased at high concentrations of DDE." The eggshells were significantly thinner than pre-1947 shells from nearby Utah. Clutch sizes were significantly lower in two of the colonies than pre-1947 clutches, and this may reflect egg loss through breakage resulting from thin shells. The nesting success rates were between 1.05 and 2.31 chicks per nesting attempt and the authors suggest that this may be below the population maintenance rate.

High DDT:PCB ratios in the night-heron eggs compared to ratios for Idaho fish suggest that the source of the DDT and DDE is the wintering grounds in Mexico, where DDT is widely used, and/or is the southwestern United States (where the birds pass during migration), where DDT-DDE concentrations are still relatively high. The seven band returns for night-herons banded in Idaho have all been from Mexico.—William E. Davis, Jr.

21. Environmental pollutants as possible factors in the survival of the Openbilled Stork in Southern Africa. I. A. W. Macdonald. 1985. Ostrich 56:280–281.—After a toxaphene spill on the Hluhluwe River, South Africa, in 1978, and subsequent gathering of Openbilled Storks (*Anastomus lamelligerus*) to feed on mussels there, a bird of this species was collected in November 1979 to test for organochlorine residues. No toxaphene was detected in 4 of 5 tissues analyzed. A comparatively low level of toxaphene (0.671 ppm) was present in the fat of the bird. DDE and dieldrin were present in all tissues sampled, as well as in the gizzard contents; DDT was detected in ovary, heart, and fat tissues. DDE and dieldrin levels were lower than those found in other South African waders tested. Given the concentrations of toxaphene in Hluhluwe River mussels (0.07–0.31 ppm) and the persistence of this chemical, it seems likely that the Openbilled Stork collected had not been feeding long, if at all (no toxaphene present in gizzard contents) on local shellfish, a possibility mentioned by the authors.—Malcolm F. Hodges, Jr.

22. Organochlorine residue levels in Bateleur eggs from the Transvaal. A. C. de Kock. 1985. Ostrich 45:278–280.—Contents of 3 Bateleur (*Terathopius ecaudatus*) eggs collected from 1981 through 1984 in the Transvaal, South Africa, were analyzed. DDE and DDD were detected in all eggs, and DDT in two eggs; levels of all were below those found to be critical for other raptors. Shells of these eggs were 10% thicker than those measured before 1946, when DDT was apparently first used in South Africa.—Malcolm F. Hodges, Jr.

PARASITES AND DISEASES

(see 7)

PHYSIOLOGY

(see 36)

MORPHOLOGY AND ANATOMY

(see also 15, 31, 38, 44)

23. The structures of the gastrointestinal tracts of honeyeaters and other small birds in relation to their diets. K. C. Richardson and R. D. Wooler. 1986. Australian J. Zool. 34:119–124.—The gastrointestinal tracts of 8 Australian honeyeaters (Meliphagidae) and 12 insectivorous Australian passerines were examined and compared. Those of the nectarivorous Honeyeaters were different from the insectivores: gizzards were smaller and more thin-walled, and intestines were shorter than those of the insectivores. Significant relationships between gizzard width and body weight were found for the insectivores, but not the nectarivores. Intestinal length and body weight were significantly related for both groups. These findings mesh well with those of previous studies. Variations within the nectarivores relative to the insect content of their diet suggest that gastrointestinal structural differences are functional and not phylogenetic.—Malcolm F. Hodges, Jr.

PLUMAGES AND MOLTS

(see 31)

ZOOGEOGRAPHY AND DISTRIBUTION

(see also 5, 10, 19)

24. Water birds in the Italian part of Switzerland and frontier sectors, mid-January 1985 (32nd census). (Les oiseaux d'eau en Suisse romande et secteurs limitrophes, mi-janvier 1985 (32e recensement).) P. Géroudet. 1985. Nos Oiseaux 38:179–184. (French.)—On Lake Léman, Common Pochards (*Aythya ferina*), Tufted Ducks (*A. fuligula*), Common Goldeneyes (*Bucephala clangula*), White-winged Scoters (*Melanitta fusca*), and Common Eiders (*Somateria mollissima*) were numerous this winter. However, there were fewer Eurasian Coots (*Fulica atra*; 20,257 individuals!) and Common Gulls (*Larus canus*) than previously. Unusual sightings included an Oldsquaw (*Clangula hyemalis*), Black Scoter (*M. nigra*), 3 Little Gulls (*L. minutus*), 2 Common Sandpipers (*Actitis hypoleucos*), and 23 Common Kingfishers (*Alcedo atthis*). Numbers for loons, grebes, mergansers, and cormorants are unreliable (too small) because of adverse weather during the census.

At Lake Neuchâtel, diving ducks were abundant, numbers of the two dominant species (European Pochards and Tufted Ducks) exceeding 49,000. In contrast, the number of Great Cormorants (*Phalacrocorax carbo*; 52) was the lowest it has been in 15 years. On Lake Morat, the Mallard (*Anas platyrhynchos*; 850) was again the dominant species and the number of diving ducks (156) was again small. On Lake Bienne, Great Crested Grebes (82) were scarce compared to the number of Little Grebes (*Tachybaptus ruficollis*; 81); there were many *Aythya* (10,842) and Common Gulls (230); and Goldeneyes (274) and coots (1705) were much commoner than in the previous winter.

In general, populations of Mute Swans (*Cygnus olor*) on these major Swiss lakes are apparently declining, especially in Léman. Numbers of Gadwalls (*Anas strepera*) continue to increase slowly, while those of Green-winged Teal (*A. crecca*) and Mallards have backed off. Malacophageous divers, especially Tufted Ducks (at least 110,000), were abundant this year. Populations of Common Coots fluctuated in size, increasing at Lake Neuchâtel, but decreasing at Léman.

The number of diving ducks that overwinter in this part of Switzerland apparently depends on the abundance of striped mussels (*Dreissena polymorpha*) of medium size (9–20 mm). Because the reproduction of this mollusc can be inhibited significantly if the waters in these Swiss lakes do not rewarm adequately during the summer, Géroudet suggests that the small populations of *Aythya* observed in winter 1983–1984 (see J. Field Ornithol. 56: 305, 1985) were a result of cold summers in 1980 and 1981. In contrast, summer 1982 was rather warm and this may explain why diving ducks were again abundant this (1984–1985) winter. As usual, the paper includes a tabular summary of census data for 40 species at each of the 4 Swiss lakes mentioned above and in other sectors considered as a group.—Michael D. Kern.

25. Distribution and numbers of waterbirds on the coast of Guyana. (Distribution et effectifs d'oiseaux d'eau sur le littoral guyanais.) J.-L. Dujardin and O. Tostain. 1985. Alauda 53:287–294. (French, English abstract.)—This paper details the results of aerial and ground (Cayenne I. only) censuses of coastal birds, mostly Ciconiformes, in Guyana during early April 1984. Cocoi Herons (*Ardea cocoi*) were found in all types of Guyanese wetlands, but preferred forested edges of large remote marshes or lagoons that were partly overgrown by mangroves. Because they foraged in forested parts of coastal creeks, the 75 individuals that were counted probably do not represent the actual size of the Guyanese population. Great Egrets (*Egretta alba*; 1200 birds) occupied a variety of habitats, and, like Cocoi Herons, ascended large rivers to the interior of Guyana.

Small egrets—Snowy Egrets (*E. thula*), Little Blue Herons (*E. caerulea*), and Louisiana Herons (*E. tricolor*)—numbered nearly 28,000 and accounted for most of the herons and bitterns on coastal Guyanese sandspits. They roosted in young mangroves at the edge of the sea and near Kourou. Night-herons, both Black-crowned (*Nycticorax nycticorax*) and Yellow-crowned (*N. violaceus*), were frequently encountered in coastal marshes, but are poor subjects for aerial censuses, and few were seen.

Roseate Spoonbills (*Ajaia ajaja*) are rare in Guyana, but the authors counted 51 in a particularly inaccessible area between Approuague and Oyapock. One Jabiru (*Jabiru mycteria*), 9 Wood Storks (*Mycteria americana*), 300 Blue-winged Teal (*Anas discors*), 200 Bahama Pintails (*A. bahamensis*), and 10 Ospreys (*Pandion haliaetus*) were also seen.

The most disturbing data in this census concern Scarlet Ibises (*Eudocimus ruber*), which were very common along the coast 15 years ago, but which have almost disappeared (3000 in the census) because of continuous, high hunting pressure. Most were seen in Sarcelle marsh and among mangroves at Iracoubo and Sinnamary. Only 800 of them were found on the entire coast in 1985 (300 pairs were in a single colony). This population is now only $1/15$ as large as it was in 1974.—Michael D. Kern.

26. Differences in winter range among age-sex classes of Snowy Owls *Nyctea scandiaca* in North America. P. Kerlinger and M. R. Lein. 1986. Ornis Scand. 17:1–7.—At least 3 hypotheses have been proposed to explain latitudinal segregation of age and sex classes in migratory birds: (1) the body-size hypothesis predicts that the larger sex will winter farthest north owing to its greater tolerance of low temperatures and food shortages; (2) the social-dominance hypothesis predicts that territorial or agonistic behavior will force subordinate individuals to winter farther from the breeding grounds; and (3) the arrival-time hypothesis predicts that the sex establishing the nesting territory will winter farthest north to shorten arrival time on the breeding grounds in spring. Snowy Owls are ideal subjects for a test of these hypotheses because they are migratory, sexually dimorphic in size (females are larger than males), and their age and sex classes are easily identified.

Kerlinger and Lein examined 824 skins and frozen specimens and grouped them into 1 of 3 longitudinal zones divided by 4 latitudinal regions in North America. Although there was much overlap in distribution of the 4 age-sex classes, on average (1) immature males wintered farthest south, (2) adult females wintered farthest north, and (3) adult males wintered north of or at the same latitude as immature females. These data, coupled with field observations that female Snowy Owls appear to be dominant over males in winter, suggest that social dominance is the best explanation for age and sex differences in the winter distribution of North American Snowy Owls.—Jeffrey S. Marks.

27. Distribution, abundance, and habitat of the Florida Grasshopper Sparrow. M. F. Delany, H. M. Stevenson, and R. McCracken. 1985. J. Wildl. Manage. 49:626–631.—Once relatively abundant in south-central Florida, the Florida Grasshopper Sparrow (*Ammodramus savannarum floridanus*) is now classified as endangered by the state of Florida. Conversion of native prairie to improved pasture (by clearing, burning, herbiciding, liming, fertilizing, and irrigating or draining the natural vegetation) may be responsible for this decline. Delany et al. conducted surveys of *A. s. floridanus* in known and potential range, and sampled habitat within territories of male birds in Glades, Hendry, Charlotte, and DeSoto counties in the dry plains of south-central Florida.

Ninety-three sparrows were found at one former and 6 new locations during the 1980–1982 breeding seasons. *A. s. floridanus* was not detected at 7 formerly-occupied sites and 6 sites containing potential habitat, although "Several large areas of seemingly suitable habitat remain unsearched." A quantitative analysis of *A. s. floridanus* habitat is presented as well as a comparison of *floridanus* habitat structure with that of the eastern race, *A. s. pratensis*. *A. s. floridanus* generally occurred "on treeless, relatively poorly drained sites that have been burned frequently." Habitat structure within territories was highly variable, largely related to the amount of pasture improvement. *A. s. floridanus* was found on some improved pastures, suggesting that the species may be adapting to managed habitat. However, these sites "were in various stages of mismanagement" with native vegetation beginning to re-invade. Improved pasture habitat was often found at former sites that were unoccupied when surveyed. "Alteration and loss of habitat due to range management is the greatest threat to the Florida Grasshopper Sparrow." The authors describe pasture management practices that would benefit *A. s. floridanus,* and call for a status survey of the species, suggesting that Federal listing as threatened or endangered may be warranted.—Richard A. Lent.

28. The Cape Cod lake and pond waterfowl census. B. Nikula. Bird Observer of Eastern Massachusetts 14:69–74.—This article reports the results of an early December, 1985 waterfowl census of 239 ponds on Cape Cod (excluding Monomoy Island). Thirty-one observers recorded 10,521 individuals of 29 species of loons, grebes, geese, ducks, and coot. Numbers of each species observed in each township are compared with a similar census in 1984. Nikula briefly discusses the distribution patterns of several species and points out a tendency for some species to cluster in a few large flocks (e.g., 93% of the 91 Common Pintails (*Anas acuta*) were at one site). Seventy of the ponds had no waterfowl at all. After discussing some questions raised by a preliminary analysis of the data, Nikula suggests that this type of census is valuable because it shows distributional patterns and species associations, and over time may document changes in these patterns as well as changes in local populations.—William E. Davis, Jr.

29. Roseate Spoonbills near Deep Fork River in Lincoln County, Oklahoma. N. Erickson. 1986. Bull. Okla. Ornithol. Soc. 19:11–12.—Two Roseate Spoonbills (*Ajaia ajaja*) were seen on 26 August and 3 September 1984 near Chandler, Oklahoma. The author suggests these birds may have been adults, which would be the first such record for Oklahoma, all previous sightings and specimens being immature birds.—Malcolm F. Hodges, Jr.

30. Breeding of Eared Grebe in Kingfisher County, Oklahoma. A. Ratzlaff. 1986. Bull. Okla. Ornithol. Soc. 19:9–11.—Eared Grebes (*Podiceps nigricollis*) were found breeding in a large cattail (*Typha latifolia*) marsh near Lacey, Oklahoma on 23 June 1984. An adult bird was observed followed by 4 chicks. Previous summer sightings of Eared Grebe in Oklahoma are summarized. The area where the grebes nested is a cyclical wetland, inundated about 10 out of every 50 years.—Malcolm F. Hodges, Jr.

31. An avifaunal study in Kakemaga Forest, Kenya, with particular reference to species diversity, weight and moult. C. F. Mann. 1985. Ostrich 56:236–262.—Birds were mist-netted and banded in the Kakemaga Forest in western Kenya between January 1973 and January 1975. Captured were 964 individuals of 66 species, mostly understory or ground dwellers. Mann found that longevity was higher than that found for temperate birds, and suggests that this may be due to lower reproductive rates and prolonged parental care. Birds captured were generally heavier in molt than not, but no comparison could be made with breeding weights, as the author could not determine whether individuals were breeding or not. Molt followed an annual cycle in most species sampled, but in a few species, cycles other than annual were noted.—Malcolm F. Hodges, Jr.

SYSTEMATICS AND PALEONTOLOGY

32. Subspecies recognition in ornithology: history and the current rationale. J. Fjeldsa. 1985. Fauna Norv. Ser. C, Cinclus 8:57–63.—Suggestions of name changes tend to incite naturalists, amateurs and professionals alike. Although this paper includes an historical account of subspecies usage, its primary goal appears to be to argue against Cracraft's phylogenetic species concept (see Current Ornithol. 1:159–187, 1983).

Actually, Fjeldsa and Cracraft seem to agree, at least in part, on the *concept*: formal naming should be restricted to populations with distinct evolutionary histories, diagnosable by unique character states which evolved during isolation. For reasons now well known (see Wilson and Brown, Syst. Zool. 2:97–111, 1953), many currently described subspecies do not fulfill these criteria.

What to do? It is here, primarily a question of *mechanism* rather than concept, that Fjeldsa and Cracraft disagree. Cracraft (see also Barrowclough, Auk 99:601–603, 1982) believes that most currently named subspecies are of doubtful utility (lack "predictiveness" of Barrowclough) and actually impede phylogenetic and biogeographic analysis. He would raise all "good" evolutionary units to the species level (regardless of reproductive status) and discard subspecies entirely. There has been some tendency to follow this suggestion

(Rising, Current Ornithol. 1:131–157, 1983; Johnson and Johnson, Auk 102:1–15, 1985; Fitzpatrick and O'Neill, Wilson Bull. 98:1–14, 1986).

In contrast, Fjeldsa believes that current subspecies are useful and that "properly applied subspecies names serve the same purpose" as Cracraft's approach. Instead of identifying valid evolutionary units by promotion, Fjeldsa would demote invalid ones until a responsible system remained. His arguments are taxonomic conservatism and a belief in the information content of reproductive isolation.

These contrasting views suggest that a new era of lumping or splitting, promotion or demotion, but one or the other, is upon us. It would be desirable if sound theory and not tradition alone were the arbiter.—Peter F. Cannell.

33. **A subfossil Lapland Bunting *Calcarius lapponicus* feather from Vølvedal, North Greenland.** O. Bennike and J. Dyck. 1986. Ornis Scand. 17:75–77.—A subfossilized feather was found in a moss peat deposit of northern Greenland. Light microscopy examination indicated that its structures are closest to those of *Calcarius lapponicus*. Carbon-14 dating and sedimentation rate estimates place the age of the feather between 6000–8000 yr. This is apparently the earliest record of any bird from Greenland, and predates other avian subfossil remains by some 3000 yr.—George Kulesza.

34. **Further parallels between the Asian Bay Owl *Phodilus badius* and *Tyto* species.** D. R. Wells. 1986. Bull. Br. Ornithol. Club 106:12–15.—The affinities of *Phodilus badius*, to the Tytonidae or to the Strigidae, have been argued for a century without clear resolution. *Phodilus* has strong elements of resemblance to barn-owls, to which family it is most frequently assigned. But there are also differences, some of which are shared by strigids; hence the persisting argument and the occasional assignment to an "intermediate" (noncommittal) position.

Here, Wells describes a previously unreported behavior performed by a *Phodilus badius* which had been mist-netted and released. Interpreted as "defence/threat," it consisted of a repeated deep head bowing and shaking that concluded in the sudden presentation of a "cat-like facial outline" which Wells suggests may well be mimetic.

This adds to our knowledge of a poorly known species, but also contributes to our understanding of its relationships. No similar behavior has been described for strigid owls, but head shaking and bowing have been reported for two species of *Tyto*. Given that we still have worlds to learn about the behavioral repertoire of owls, this report corroborates the consensus view that *Phodilus* is most closely related to the Tytonidae.—Peter F. Cannell.

35. **The Orange-fronted Parakeet (*Cyanoramphus malherbi*) is a colour-morph of the Yellow-crowned Parakeet (*C. auriceps*).** R. H. Taylor, E. D. Heatherbell, and E. M. Heatherbell. 1986. Notornis 33:17–22.—The status of the very rare Orange-fronted Parakeet has been controversial. Although it has usually been considered distinct from the much commoner Yellow-crowned Parakeet, there are no consistent size differences between them. Captive breeding programs have confirmed an earlier suggestion that the two forms are color morphs. The differences are due to the action of a single gene, the factor for Yellow-crowned being dominant.—J. R. Jehl, Jr.

36. **Biochemical characterization of lysozymes present in egg white of selected species of anatid birds.** Comp. Biochem. Physiol. 82B:555–558.—Two distinct types of lysozyme, c and g, have been reported for bird egg white. Here, 8 genera of ducks and shelducks are reported to have type c, while *Cygnus, Coscoroba, Anser,* and *Chauna* have type g.

The separation of true geese and swans from other ducks is consistent with traditional views, although a proposed relationship between Coscoroba Swans and Whistling Ducks is not supported here. Further interpretation is difficult. Most birds have lysozyme type g, so type c might be derived within Anseriformes. But type c has also been reported in at least some Galliformes, a proposed sister group to Anseriformes. Also, a swan and a goose have previously been reported to possess both types. Broader knowledge of their taxonomic distribution must be compiled before the systematic implications of egg white lysozyme type can properly be addressed; this article is a step towards that end.—Peter F. Cannell.

EVOLUTION AND GENETICS

(see also 26, 32, 35, 36, 42)

37. **Parental investment and sex differences in juvenile mortality in birds and mammals.** T. H. Clutton-Brock, S. D. Albon and F. E. Guinness. Nature 313:131–133.—Juvenile mortality is higher among males than females in a wide variety of mammalian and avian species. The sons of subordinant female red deer (*Cervus elapus*) suffered higher juvenile mortality than daughters, whereas no sex differences were found among the offspring of dominant females. Juvenile male mortality increased disproportionately with red deer population size. The authors use these findings to hypothesize that sex differences in juvenile mortality are due to sex differences in growth and nutritional needs, especially among sexually dimorphic polygynous (and presumably promiscuous) species. The hypothesis may extend to birds, as some data *suggested* a similar relationship between sex differences in nestling mortality and sexual dimorphism in birds. In contrast to Trivers and Willard's (Science 179:90, 1973) interpretation that sex differences in juvenile mortality are a result of maternal manipulation of postnatal sex ratio, the authors argue that the reduced viability of the young males can be attributed to sex differences in growth rates and the greater nutritional needs of young males. This hypothesis is heuristically rich, most especially since the data on which it depends (the growth and nutritional requirements of male and female young) have rarely been studied in nature.—W. A. Montevecchi.

38. **Flightlessness in steamer-ducks (Anatidae: *Tachyeres*): its morphological bases and probable evolution.** B. C. Livezey and P. S. Humphrey. Evolution 40:540–558.—Of 4 species of steamer-duck, 3 are flightless, while most individuals of the fourth (*T. patachonicus*) retain the ability to fly. Through quantitative morphological comparison, the authors describe the morphological effects of flightlessness on *Tachyeres* and develop an adaptive explanatory model. Although flightlessness has received much comment, little of it has been quantitative or theoretical. Hence, this paper is a welcome contribution.

Although proposed causes are quite different, primary morphological trends associated with flightlessness in *Tachyeres* appear similar to those in other taxa: increased mass and reduced wing area. Selection for larger size of flightless species and of males within each species is associated with the group's extremely aggressive territorial behavior. Decreased wing area results in part from shorter wing bones and in part from shorter stiffer remiges. Both are said to enhance steaming ability and underwater maneuverability, while, of course, compromising flight. The threshold of flightlessness coincides with an equation estimated in 1951 from mass and wing area (Meunier, Biol. Gener. 19:403–443) although the precision of this agreement is not discussed. Whereas many flightless taxa show reduction of the carina and pectoral muscles, these remain fully developed in *Tachyeres* because of their role in steaming. The most fundamental cause of flightlessness in *Tachyeres* is attributed to "the year-round habitability and high productivity of the South American marine littoral, which made migration unnecessary."

The analysis is handicapped by absence of a well-formulated phylogenetic hypothesis. It is proposed, but not documented, that flightlessness arose once in a common ancestor of the 3 flightless species. This would appear to be an important point in any morphological interpretation of this group. Also, although the within-genus comparison includes considerably more detail than implied above, there is little comparison to other flightless aquatic taxa. What, for example, are the morphological effects on the wing of surface steaming vs. underwater swimming (e.g., Spheniscidae)? Such questions are presumably the next step, to which this reviewer looks forward.—Peter F. Cannell.

FOOD AND FEEDING

(see also 6, 15, 18, 23)

39. **Foraging at patches: interactions between Common and Roseate terns.** D. C. Duffy. 1986. Ornis Scand. 17:47–52.—Feeding and flocking behavior were compared in the Common Tern (*Sterna hirundo*) and Roseate Tern (*Sterna dougalli*) in the Long Island Sound region, New York. Common Terns were more successful at catching fish than were

Roseate Terns in dense feeding groups, but the reverse was true in small and medium groups. Roseate Tern feeding plunges appeared to be deeper, and were of longer duration, than the plunges of the Common Tern. Prey species and prey size were not significantly different in the two species. Roseate Terns had more aggressive encounters than Common Terns, which might have interfered with foraging, and may explain the reduced foraging success of the Roseate Tern in dense groups.—George Kulesza.

40. Owl predation on desert rodents which differ in morphology and behavior. B. P. Kotler. 1985. J. Mammal. 66:824-828.—The desert rodents *Dipodomys* and *Microdipodops* have hyperinflated auditory bullae that improve hearing, and elongated hind legs that allow bipedal locomotion. Both characteristics enable these rodents to forage in open areas where they would otherwise be at high risk to predation by owls. Other desert rodents lacking such anti-predator morphology (e.g., *Perognathus, Peromyscus, Reithrodontomys*) must restrict their foraging to the safety of cover. Do these morphological and behavioral differences influence predation rates on the 2 groups of rodents? Kotler thinks so, reasoning that rodents with anti-predator morphology should suffer lower predation rates than those without such morphology. He tests this idea by comparing the proportions of different rodent species in live-trapping samples with those in Long-eared Owl (*Asio otus*) pellets from a 6-km^2 study area in southwestern Nevada.

Over a 2-yr period, 1320 rodent skulls were recovered from owl pellets. *Dipodomys* and *Microdipodops* constituted 65% of the owl diet and about 80% of the trapping samples, suggesting that owls selectively fed on species lacking anti-predator morphology. Kotler concludes that desert rodents without anti-predator morphology were "heavily preyed upon despite rarely leaving the safety of bushes." This may be so, but other scenarios could have yielded similar results. For example, *Perognathus, Peromyscus,* and *Reithrodontomys* may have spent more time in the open than Kotler's data suggest. It's also possible that owls sampled small rodent populations in a manner incomparable to that of humans. Kotler's interesting suggestion deserves further testing.—Jeffrey S. Marks.

SONGS AND VOCALIZATIONS

41. Desirable vocal qualities of a decoy duck (Posadnaya utka i ee golos). S. Fokin and I. Kostin. 1985. Okhota i okhotnich'e khoziaistvo (Hunting and Game Management) 5:10-12. (Russian.)—To attract wild Mallard (*Anas platyrhynchos*) drakes in spring, Russian hunters have long used specially-bred Mallard hens as decoys. In the past 15-20 yr this popular traditional method has been restricted by limits on (or closure of) spring hunting. Claiming that the USSR's waterfowl resources are extensive enough that a brief and carefully regulated spring drake season would do no harm, the authors set about determining which qualities of a duck's voice are most effective for attracting drakes, so that breeders could identify and selectively breed "quality" decoys.

Using sonograms and field observations, the authors studied 2 of a Mallard duck's calls: one by which she makes her presence known to any drakes that might be in the area, and the other given as if in greeting when a drake comes into her view. The first is a series of rhythmic unhurried quacks; the second is a series of quick quacks with emphasis on the first or second quack.

Drakes were most attracted to hens whose "advertising" calls were clear, loud, "rich" in lower frequencies, and audible at considerable distances and in windy weather. Drakes also came readily to ducks whose calls were as described but possessing overtones in higher frequencies which made their voices resonant. A third sort of voice was also effective: medium tonality but with the lower frequencies more expressed, giving the voices a little huskiness.

Decoy ducks uttering high quacks, wheezy quacks, or flat, staccato quacks drew the interest of few drakes.

Among the "more effective" voices, some seemed suited more to one type of hunting situation than another. For example, the louder, more sonorous quacks worked better—attracted more drakes—in wooded areas, where they could be heard through the sound of wind in the trees, while the slightly husky voice was more effective in open marshy places.

The greeting call given when a drake appears is more effective when it is short (3–7 quacks) and only given "for good reason"—when a drake actually is seen nearby or in response to his calls and the noise of his wings.

The most desirable "femme fatale" ducks turned out to be those who combined good vocal qualities with appropriate accompanying movements (characteristics apparently not always found together in one bird).—Elizabeth C. Anderson.

42. Mixed singing and interspecific territoriality—consequences of secondary contact of two ecologically and morphologically similar nightingale species in Europe. J. Sorjonen. 1986. Ornis Scand. 17:53–67.—The habitats, morphology, and songs of the Thrush Nightingale (*Luscinia luscinia*) and Nightingale (*L. megarhynchos*) were compared in their narrow zone of sympatry in central and eastern Europe, and also in allopatric populations. The habitat of the Nightingale, as determined from tree species composition, was increasingly similar to the Thrush Nightingale where the 2 species are sympatric. The possibility of morphological divergence in the zone of sympatry was suggested, but the data were not statistcally significant. The 2 species maintained interspecific territories. Playback experiments revealed interspecific responses, especially to songs that were similar to a male's own song. Principal component analysis of structural song characters suggested some song convergence from allopatry to sympatry in male Thrush Nightingales. There is little evidence for interspecies hybridization in these species.

Sorjonen used these data to tentatively support Cody's (Condor 71:222–239, 1969) character convergence hypothesis. The criteria outlined by Brown (Can. J. Zool. 55:1523–1529, 1977) to demonstrate character convergence appear to be satisfied, but the results are complex enough to be interpreted in various ways.—George Kulesza.

BOOKS AND MONOGRAPHS

43. Ornithology in laboratory and field. Fifth Edition. O. S. Pettingill, Jr. Academic Press, New York. 403 pp. $32.40.

The fifth edition of Pettingill's venerable text, though largely the same in organization as previous editions, is considerably streamlined. The fourth edition contained 524 pages, compared with 403 in this new edition. Gone are the check lists and plumage chart tucked in the back cover flap. Gone also are many of the attractive pen-and-ink illustrations that garnished the previous editions, and the fourth edition's full color plates of the pigeon digestive and urogenital systems are reproduced in black-and-white in the fifth edition. In general, these changes make the book less attractive, but certainly no less useful. This is still an excellent introductory text, generally well-balanced in content (but see below), ideal as a lab text for a basic introductory ornithology course.

The book begins with chapters on bird anatomy, flight, feathers, physiology, and external structural characters, all of which make good companion reading for a laboratory examination of the avian body form. Chapters follow on lab and field identification, plumage and plumage coloration, and avian distribution, serving to prepare the student for the field work chapters which follow. Ten chapters take the reader through the natural history and population biology of birds, including: behavior; migration; territory; song; mating; nests and nest-building; eggs; egg-laying and incubation; young and their development; parental care; and longevity, numbers, and populations. A final chapter is included on ancestry, evolution, and decrease of birds. Four appendices include a survey of ornithological methods (recording vocalizations, banding, preparing specimens, etc.), preparation of a scientific paper, current ornithological journals, and books for general information. Throughout the book, emphasis is placed on "hands on" ornithology. To teach well using this text, the course must be a lab course with a strong field component.

Each chapter is concise, well-written, and includes selected references from primary sources. Many chapters have been substantially revised compared with previous editions. The chapter on behavior is authored by Jack P. Hailman and the chapter on migration is authored by Sidney A. Gauthreaux, Jr., not Pettingill, as in previous editions. Where appropriate, chapters conclude with summaries of "selected studies" which direct students to possible avenues of field research.

Though this text is highly suitable for a short introductory course, or as a lab supplement, or as a basic primer on ornithology, it lacks the depth needed for serious study. For instance, the chapter on avian evolution contains no mention of the hypothesis that *Archaeopteryx* evolved directly from coelurosaur dinosaurs. Instead, the older hypothesis that birds owe their origins to pseudosuchians is retained as the only suggestion. The origin of flight is explained using the arboreal gliding hypothesis, with no mention of the terrestrial running hypothesis. The section dealing with nest helpers contains no discussion of the possible role of kin selection. There is no mention of the controversy over the effects of interspecific competition versus specialization in determining patterns of foraging in bird communities, nor is there any discussion of foraging patterns or optimal foraging studies, a curious omission for a text with a strong field orientation. Indeed, avian community ecology is largely omitted (the term "niche" is explained only briefly, sandwiched between edge effect and altitudinal distribution, in the chapter on distribution). A chapter on the ecology of bird communities ought to be added to subsequent editions. The recent work on systematics, using DNA/DNA hybridization, is, I believe unfortunately, omitted; and there is no discussion of the problems generated by convergence and/or parallel evolution, in determining classification. Cladistic analysis is never mentioned.

Though Pettingill's fifth edition fails to treat many of the most exciting areas of current ornithological research, I can nonetheless recommend it as a suitable introductory or supplementary text.—John C. Kricher.

44. Revised world inventory of avian skeletal specimens, 1986. D. S. Wood and G. D. Schnell. 1986. Am. Ornithol. Union and Oklahoma Biol. Survey. 296 p. $40.00 (paper).—The world inventory of skeletal bird specimens appeared in 1982 and detailed for the first time the skeletal holdings of each of 89 museums. That and the accompanying spirit specimen inventory provided an invaluable research tool and also specified the urgent need for increased anatomical specimen representation. The revised edition is an improvement in format and coverage. Instead of computer printouts, it is a crisp and manageable 8½″ × 11″ laser-printed document. Coverage is increased to 105 museums.

Most remarkable is the dramatic increase in specimens reported. In the 1982 inventory the 45 largest collections reported 243,494 complete skeletons; in 1986 this number has jumped 20% to 303,130. The Royal Ontario Museum, already the largest collection, added 9000 specimens (more than the permanent holdings of all but the largest museums)! The National Museum of Natural History added nearly that number of specimens, but also increased its species representation by 572 species to a total of 4151! The Field Museum of Natural History increased its skeletal collection by 45%! These are remarkable statistics with healthy implications for future anatomical studies.

Anyone working with anatomical specimens should have access to this.—Peter F. Cannell.

45. The Oxford dictionary of natural history. M. Allaby (ed.). 1985. Oxford University Press, Oxford and New York. 688 p. $45.00—Between "aa" (a jagged lava) and "zymogenous" (an ecological transient) 12,000 terms receive an average of 50 words of description. The result is a useful, informative, and eminently browsable volume. The terms come from natural history in the broad sense including geology, geography, and climatology as well as life sciences. Astronomy and statistics (dust jacket notwithstanding) are excluded, but cellular and biochemical jargon receive good coverage. Common names of taxa are cross-referenced to scientific names. The level of detail depends on the size and familiarity of the group; some species and many genera (of birds and other classes) are included as single entries.

I found no typos or clear errors of fact and almost every term I looked for was there. In a few cases, I wished more information about a structure's taxonomic distribution. The absence of illustrations is disappointing but not critical, and keeps the price within reach (?). If your interests are primarily avian this is not your best buy; if they are broader (cf. Immelmann's I.O.C. plenary lecture) this should be kept as handy as possible.—Peter F. Cannell.