

**An Observation of Storm-Killed Migrants in Costa Rica.**—A severe tropical storm on the night of October 19, 1964 forced down hundreds of migrating birds in the vicinity of Puerto Limon, Costa Rica. Early on the morning of October 20, 1964 one of us (E. McC.) observed hundreds of dead and dying thrushes (*Hylocichla ustulata* and *H. minima*) lying everywhere in parks, yards, and streets. Vireos (*Vireo olivaceus*), and warblers of several species, although much less numerous than the thrushes, were also found scattered throughout the area. Examination of several thrushes showed that most had adequate stores of fat remaining, indicating that the birds were not out of fuel, but rather were forced down by the storm. Rogers reported (*Bird-Banding* 36: 115-116) a similar storm kill from Panama in October, 1963.

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## RECENT LITERATURE

### BANDING

(See also 13, 15, 22, 25, 39, 46, 53)

**1. The Use of Mist Nets in Australia.** S. J. Wilson, S. G. Lane, and J. L. McKeen. 1965. *C. S. I. R. O., Div. Wildl. Research Tech. Pap.*, No. 8:1-26. Notwithstanding the several fine American publications on the use of mist nets in banding operations, the present paper is really a set of instructions for bird-banders using mist nets in Australia. Among the interesting techniques set forth are the details on construction of telescopic poles. Instructions are provided for wooden poles in sections, dowels, cane and metal poles, saplings, and galvanized pipes at permanent sites. I suspect that, all things being considered, the use of conduit tubing and an iron base spike driven into the ground would provide the best results. Additional useful remarks are directed toward repair of nets, casualties in nets, and public relations. Copies of the paper may be obtained from Mr. Wilson at 2 Scott St., Narrabundah, A. C. T., Australia.—David W. Johnston.

**2. Bird Banding.** R. W. Smith. 1965. *Broadsheet No. 5* (Gosse Bird Club, Jamaica): 7-9. This is essentially a summary of recent banding operations in Jamaica. Included in this report are returns of 32 North American warblers representing eight species. More than 2,000 Sooty Terns were banded in 1965 on the Morant Cays just south of Jamaica, the adults being marked with colored plastic leg streamers. Two banded Royal Terns have recently been taken in Jamaica. Both had been banded on Smith Island, Virginia on July 28, 1964 and were obtained in Jamaica in December 1964.—David W. Johnston.

**3. Indigo Buntings at Montego Bay.** Audrey Downer. 1965. *Broadsheet No. 5* (Gosse Bird Club, Jamaica): 9-10. For many years it has been known that large numbers of Indigo Buntings overwinter in Central America, but now, through the observations of Mrs. Downer, concentrations of these buntings have been found in Jamaica. During the 1963-1964 winter and spring period, she banded 172 buntings and in 1964-1965 (through May 8) 30 of these were retrapped in her yard. Actually, more than 30 different birds returned: some that had been color-banded were observed but not caught. In the 1964-1965 season an additional 58 buntings were banded.—David W. Johnston.

**4. Plastic Adhesive Tape for Color-marking Birds.** Don Fankhauser. 1964. *J. Wildl. Mgt.*, 28: 594. The color-marker is fashioned by wrapping Scotch-brand plastic adhesive tape twice around the tarsus, but not so tightly as to exert pressure. Over 100 birds, mostly blackbirds and gulls, have been marked in 3 years; no cases of loss, and little wear or color-change, have been noticed.—Robert S. Hoffmann.

## MIGRATION

(See also 37, 38, 39, 53)

**5. On the Influence of Environmental Factors on the Autumn Migration of Chaffinch and Starling: a Field Study.** Elisabeth M. Gruys-Casimir. 1965. *Arch. Néerland. Zool.*, **16**(2): 175-279. Dutch research on diurnal migration, which was so vigorous and significant in the 1940's and 1950's, languished somewhat following the death of L. Tinbergen in 1955. It is a pleasure now to welcome its revival in this paper, which not only summarizes and puts into perspective the earlier Dutch work, but extends it in several important ways. In this study, observations were made of both the numbers and behavior of migrants in relation to both topography and weather. It is a credit to the insight and thoroughness of Tinbergen, who started and planned the observations in 1950, that this paper is the most convincing attempt yet made to disentangle the inter-relationships of these four factors.

Observations were made on 92 days during ten autumns by a network of observers. In the area selected, autumn migrants pass successively over forest, lightly wooded areas, flat open country, and sea. As the weather becomes less "favorable," the total number of birds reaching the area decreases. At the same time the height of flight decreases, the birds show a progressively greater tendency to hesitate or turn at the edges of the unfavorable habitats, the spread in the flight directions increases, and the percentage of reversed migration increases.

Detailed analysis, using multivariate non-parametric statistics, gave the following results. The volume of migration over the forests was correlated with low temperatures and with lack of rain, but not with following winds. The spatial pattern of migration, however, was influenced by wind-direction, more birds crossing the sea with following winds. The spread in the flight directions was influenced only by the visibility of the sun; the percentage of reversed migration increased with decreasing visibility of the sun and with high temperatures. The height of flight depended mainly on the direction and speed of the wind.

The mean directions of flight varied from day to day, tending to deviate towards the direction of the wind: in other words the birds tended to over-compensate for drift. This tendency, most pronounced late in the morning and on windy days, may be due to turbulence, the birds compensating for the drifting effect of the maximum wind during gusts, rather than that of the average wind.

It is unfortunate that Miss Gruys-Casimir does not discuss fully the discrepancy between her conclusions and those of Lack (*Ibis*, **105**: 1-54 and 461-492, 1963) and of other authors whom she does not quote (Axell *et al.*, *Bird Notes*, **30**: 181-186, 1963; Wilcock, *Ibis*, **106**: 101-190, 1964). Using radar in England to study the same stream of autumn migration, Lack concluded that most migrants fly too high to see from the ground, that the volume of migration is correlated primarily with wind-direction and not with temperature, and that birds do not compensate for lateral drift. It is possible that Lack, by concentrating on high-flying migrants, was primarily observing different species, and it is quite likely that he was wrong in dismissing the low-level migration as insignificant and misleading. However, it is also likely that the Dutch observers overlooked part of the high-level migration detected by radar. In fact, they regularly searched for high-level migration by pointing binoculars vertically upwards, and at times they saw birds flying almost as high as the maximum reported by Lack. However, it is not clearly stated in this paper how often, or how efficiently, this search was carried out; nor is there a complete analysis of the differences in behavior between high-flying and low-flying birds. Without such an analysis, the importance of wind-drift in diurnal migration will probably remain controversial, although the influence of other weather factors now seems to be clarified.—I. C. T. Nisbet.

**6. On the Autumn Migration of the Blackpoll Warbler.** Bertram G. Murray, Jr. 1965. *Wilson Bull.*, **77**(2): 122-133. This is a destructive criticism of the hypothesis (put forward by the reviewer and others) that the Blackpoll Warbler makes a long autumn flight across the western North Atlantic to South America. Murray favors instead Cooke's theory that birds from all parts of the Blackpoll's range converge on the southeastern United States before turning south-east towards South America. It is a pity that he quotes no direct evidence for this

old theory, because published accounts of the birds of the southeastern states suggest that the Blackpoll Warbler is not in fact very common there in autumn.—I. C. T. Nisbet.

**7. A Review of Sharp-shinned Hawk Migration Along the North-eastern Coast of the United States.** Bertram G. Murray, Jr. 1964. *Wilson Bull.*, 76(3): 257-264. The spectacular flights of Sharp-shinned Hawks at various places on the Atlantic coast have traditionally been attributed to drift from inland migration routes. Murray points out difficulties raised by this simplified theory, and proposes instead that the birds regularly migrate along the coast, but are made conspicuous by their behavioral responses to offshore winds. In fact, some compromise between the extreme theories seems to fit the observations better than either alone. Indeed, such compromises were in fact put forward by more than one of the proponents of the drift theory, whose arguments Murray criticizes.—I. C. T. Nisbet.

**8. The Resting Period of Migrant Robins on Autumn Passage.** Bogumita Szule-Olech. 1965. *Bird-Study*, 12(1): 1-7. European Robins (*Erithacus rubecula*), which are nocturnal migrants, were studied at several netting stations in northern Poland. Most birds stopped for only one or two days, and tended to lose weight during their stay. A small number of birds remained for longer periods (up to twelve days) and could be divided into two distinct groups. One group, heavier and fatter than average on arrival, established feeding-territories and put on large amounts of fat before departure. The other group, underweight on arrival, were excluded from the best feeding-areas by the territory-holders, and had difficulty in regaining enough weight to continue migration.—I. C. T. Nisbet.

**9. Bird Migration at Skagen's Lighthouse in Northern Vänern, Sweden, 1962-63.** (Fågelsträcket vid Skagens fyr i norra Vänern 1962-63.) Björn Ehrenroth. 1965. *Vår Fågelvärld*, 24: 12-25. (English summary.) Although the formation of the land, a peninsula and a group of islands jutting out from the northernmost end of Sweden's largest lake, ought to have suggested an important point of migratory concentration in the fall, the locality has until quite recently remained unknown or bypassed by ornithologists. Observations during 34 days in 1962 and on 93 days in 1963 produced records of 339,221 birds of at least 79 species and 214,929 birds of at least 92 species, respectively. The remarkable difference between the totals of these two years, despite the much prolonged period of observations in 1963, is discussed. The main causes appear to have been an incursion-like movement of crossbills in 1962 and the severe winter of 1962-63 resulting in greatly decimated populations of migrants wintering within the borders of Europe.—Louise de K. Lawrence.

**10. Homing Experiments with Yellow-faced Grassquits.** Audrey Downer. 1965. *Broadsheet No. 5* (Gosse Bird Club, Jamaica): 14-15. Twenty color-marked grassquits were transported 33 miles east of Montego Bay and released during the nonbreeding season. Within four days one male returned to Montego Bay and a female in eight days. Another 20 birds were carried 18 miles to the west and released. In two days two birds had returned to Montego Bay, and another bird returned within three days. An interesting feature to these accounts is the fact that the grassquits were homing to a feeding area which may or may not have been their natal region.—David W. Johnston.

## POPULATION DYNAMICS

(See also 9, 25, 44)

**11. A Count of the Gannets on Grassholm in 1964.** John H. Barret and M. P. Harris. 1965. *British Birds*, 58(6): 201-203. A colony of *Sula bassana* has been known on Grassholm, off the coast of Pembrokeshire, since the 1860's. The 1964 count was made in June from a series of aerial photographs. In 1883 there were 20 pairs on the island, in 1933 about 4,750 pairs, and in 1964 about 15,500 pairs!—M. M. Nice.

**12. The Effects of Biocides on Two Bird Populations at Järvafältet, North of Stockholm, 1964.** (En biocidundersökning på Järvafältet 1964.) Anders Bjärvall. 1965. *Vår Fågelvärld*, **24**: 1-11. (English summary.) The investigation was aimed at measuring the influence, if any, of biocides upon the reproduction of certain birds. Forty-four nests were studied, 28 of these within an agricultural area sprayed and baited with various chemicals, principally "Betoxin 61", and 16 within an uncontaminated control area.

In the treated area the data obtained from 37 Starling (*Sturnus vulgaris*) nests disclosed a fledging average of one young less per nest than in the control area. This was caused not by nest mortality but by a reduction in clutch sizes and hatching success. In three nests only 7 young Jackdaws (*Corvus monedula*) hatched out of 13 eggs. From the remaining four nests involving three raptors and one owl not enough data were obtained to draw any useful conclusions. The study is continuing.—Louise de K. Lawrence.

**13. Dynamics of a Population of European Blackbirds.** (Dynamique d'une Population de Merles Noirs, *Turdus merula* L.) Jean-Pierre Ribaut. 1964. *Revue Suisse de Zoologie*, **71**(4): 815-902. (Summary in English.) Four years (1959-1962) were devoted to a study of a resident population of Blackbirds in a very favorable environment in a 15-acre park at Imede in Lausanne, Switzerland. A total of 262 individuals was color-banded: 96 males, 88 females, and 78 young in the nest. Each spring 27-28 pairs nested; territories were small, ranging from 0.15 to 0.75 acres, averaging 0.35 acres, but considerable food was collected outside of the territories. The males settle on their territories in fall or winter and "conquer" them the following spring.

Searching for nesting sites was observed 29 times: in 21 cases it was performed by the female alone, in 3 cases by the male alone, in 5 cases jointly by the pair. The interval between the fledging of a brood or its destruction and the laying of the first egg of the next set averaged 12.7 days. The average size of the sets was 3.61 eggs; this is smaller than any reported elsewhere; 10 other studies of Blackbirds range from 3.78 to 4.35, the average being 4.03 eggs per set.

At Imede the outcome of 197 nests was known: 116 (58.9%) were destroyed by predators, 53 (26.9%) were deserted, whereas only 28 (14.2%) succeeded in fledging young. (The chief predators were Crows (*Corvus cornix*), Jays (*Garrulus glandarius*), and red squirrels (*Sciurus vulgaris*.) The author examined 609 nest records of this species from all over Switzerland at the Ornithological Station at Sempach. He found that 345 (56.7%) were destroyed by predators, 90 (14.7%) deserted, and 174 (28.6%) succeeded. Here the loss from predators was about the same as in his study, the loss from desertion was one-half as heavy and success twice as large, but still low in comparison to other studies on this species. He believes that desertion was the crucial factor at Imede; this took place early in the season, mostly in April with fewer cases in May and June. Adult mortality was low: of the banded, nesting adults 69% of the males and 60% of the females survived from one year to the next. The author concludes: "In the park under study, the highly favourable habitat and the abundance of food available give rise to a high density of nesting pairs. The intensive territorial activity of the birds very likely disturbs the nesting of the various mating pairs; consequently the reproduction rate is remarkably low." (p. 901).

A very interesting paper.—M. M. Nice.

**14. Annual Population Changes in California Quail.** Ian I. McMillan. 1964. *J. Wildl. Mgt.*, **28**: 702-711. A long-continued study (1946-62) on reproduction and age ratios. Proportion of juveniles in hunter-kills ranged from 6% (1951) to 81% (1952), and reflected equally variable reproduction. In the spring of 1951, following the driest year (July 1, 1950-June 30, 1951) of the study, there was general abandonment of first nesting attempts, few re-nesting attempts, and general post-breeding molt by mid-June. Adult birds in the fall and winter population, however, were in good condition. The following spring was "mild with an abundance of late precipitation," producing abundant annual vegetation, and quail reproductive success was outstanding. Broods from first nestings were apparently tended by the cocks while the hens then laid another clutch and reared this second brood alone. Throughout the study there was a general though not exact correlation between reproductive success and annual rainfall. Early breeding

season weather, rather than conditions during the actual nesting season, or availability of green food, was thought most important in controlling re-nesting drive.—Robert S. Hoffmann.

**15. Overcrowding as One of the Causes of Dispersal of Young Tree Sparrows.** Jan Pinowski. 1965. *Bird Study*, 12 (1): 27-33. In the population study of *Passer montanus* near Warsaw, Poland, 5,855 individuals were ringed in three years (see *Bird-Banding*, 36 (4): 275, 1965). At the time of autumn sexual activity twice as many Tree Sparrows were seeking nest-boxes than were available. Late-hatched birds search for nesting-boxes two to four weeks later than those from early broods; at this time all the best boxes have been claimed, so the late-comers have to disperse to other localities.—M. M. Nice.

## NIDIFICATION AND REPRODUCTION

(See also 14, 32, 35, 42, 54)

**16. The Breeding Biology of the Black-faced Dioch *Quelea quelea* in Nigeria.** Peter Ward. 1965. *Ibis*, 107(3): 326-349. Another installment of Prof. Ward's intensive studies on *Quelea quelea*, the paper on feeding ecology having been reviewed in *Bird-Banding*, 36: 279-280, October 1965. A very large nesting colony in a grove of acacias was studied in September 1961. High success was found in these enclosed nests in thorny trees. In 253 nests 622 eggs were laid; of these 588 (95%) were hatched and 541 young fledged (87% of the eggs). The incubation period was short, about 10 days; fledging occupied 11½ days. By day the eggs were heated to 34-37° C (92-99° F.) by the sun; at night the females incubated. Adults gained weight during incubation but lost weight while feeding offspring. Prof. Ward concludes that the most common clutch size of this species (three eggs) "corresponds to the largest number of young the parents can normally nourish."—M. M. Nice.

**17. A Guide to Age Determination of Bobwhite Quail Embryos.**—John L. Roseberry and Willard D. Klimstra. 1965. *Ill. Nat. Hist. Surv. Notes*, No. 55. 4p. Excellent photographs of *Colinus virginianus* embryos for each day from 0 to 23 days of age. There is also a detailed description of each day's stage.—M. M. Nice.

**18. The Smallest Gallinaceous Bird: the Painted Quail.** (Der kleinste Hühnervogel: Die Chinesische Zwergwachtel.) Otto von Frisch. 1964. *Vogel-Kosmos*, 7: 159-162. A delightful account of the nesting in captivity of this tiny quail. (*Excalfactoria chinensis*), 5 inches in length, 50 grams in weight. During courtship the male calls his mate to tidbits; she incubates her dozen eggs for 17 days; both parents call the chicks to food and both hover them. Charming photographs of the family, taken by the author, are given.—M. M. Nice.

**19. Wilson's Plover: Some Egg Weights.** Ivan R. Tomkins. 1965. *Oriole*, 30(1): 67-68. For three eggs in a nest of the Wilson's Plover, Mr. Tomkins obtained weights from April 26 until May 19. The eggs were slightly pipped on May 17 but did not hatch until May 21. Each egg uniformly lost approximately 2.0 g. over a 23-day-period, the eggs being weighed every other day.—David W. Johnston.

**20. On the Growth of the Nestlings of the Tree Sparrow.** Hsia Wuping and Chia Hsiang-kan. 1965. *Acta Zoologica Sinica*, 17(2): 121-136. (In Chinese, with English summary.) An interesting paper covering relative growth rates of the body, bill, wing, tarsometatarsus, middle toe, and its nail. There are three principal stages in the growth of nestlings: (1) 0.5-3.5 days old, rapid growth and organ formation; (2) 4.5-8.5 days old, accumulation of body materials and medium growth-rates; (3) 9.5-14.5 days old, body weight "decreasing so that the rate of exhaustion of body materials exceeds that of their accumulation, and may be considered as a preparing period for leaving the nest."—David W. Johnston.

**21. Habitats, Territory, and Nesting of the Catbird.** Walter P. Nickell. 1965. *Amer. Midl. Nat.*, **73** (2): 433-478. An important contribution to the life history of this species. It involved "an intensive study of 4,085 nests . . . in Michigan, Ohio, Kentucky, and Ontario during the 27-year period 1934-1960," with most of the study being done in Michigan. The author concentrated on preferred habitats, nidification, and behavior.

The Catbird appears to have increased in numbers since colonial times because of the increase in habitats not available before man's settlement. Although the species nests in a variety of habitats, it is especially numerous in forest-edge communities, some of these being the result of man's landscaping of urban areas. In one area studied, nesting density reached three pairs per acre. Some data are given for relationships between Catbirds and nesting associates such as Brown Thrashers, Cardinals, and Red-winged Blackbirds.

Catbirds are usually double-brooded, the nests being at an average height of 5.2 feet. Incubation period averaged 13.4 days and the nestling period, 11.3 days. The young dispersed quickly from the nest site as soon as they were fledged. "Only one young of the more than 1000 nestlings banded has been recaptured later in the nesting area." Although cowbirds parasitize Catbird nests, usually the Catbirds remove the cowbird eggs.—David W. Johnston.

**22. Breeding Biology of Temminck's Stint.** (Zur Brutbiologie des Temminckstrandläufers, *Calidris temminckii* (Leisl.)) Olavi Hildén. 1965. *Ornis Fennica*, **42**(1): 1-5. Little reliable information has previously been published on parental care in this small shorebird. Dr. Hildén is making a careful study, based on trapping, banding and close observation, of some dozen pairs of this species nesting on a sandy peninsula off the coast of Bottonwieck. In 1963, 24 nests were found and in 1964, 25. Dr. Hildén discovered that each female laid *two* sets (8 eggs in 10 days in one case); her mate usually incubates the first set, and she the second. Dr. Hildén says he knows of no such behavior in any other European bird, but it has been shown to occur in three European partridges—*Alectoris rufa*, *barbara*, and *graeca*, as reported by Derek Goodwin (*Ibis*, **95**: 581. 1953). Incubation lasted 21-22 days; fledging 15-18 days. Some males were slow in starting to incubate, while some never did take over. A strange and fascinating situation.—M. M. Nice.

**23. Nesting of a Pair of Canada Warblers.** Herbert Krause. 1965. *Living Bird*, **4**: 5-11. Report on 39 hours spent in 8 days at a nest of *Wilsonia canadensis* during incubation. The female alone incubated, her periods of inattentiveness averaging 7 minutes, of attentiveness 32 minutes. (Prof. Krause writes me that this figure as given on p. 8 is the correct one, rather than the 28 minutes stated in the summary.) The male visited the nest 10 times during the 8 days, each time bringing food and attempting to feed it to the eggs. That this was an unusually strong manifestation of "anticipatory feeding" of the young seems clear for only once did the bird offer the caterpillar to his mate. A fine contribution.—M. M. Nice.

**24. Kelp Geese and Flightless Steamer Ducks in the Falkland Islands.** Olin Sewall Pettingill, Jr. 1965. *Living Bird*, **4**: 64-78. Pairs of both *Chloephaga hybrida* and *Tachyeres brachypterus* are common, sedentary, and strongly territorial on their seashore domains. Pairs were inseparable; the males helped with the care of the young. Indifferent to man, both species were aggressive towards members of their own species.—M. M. Nice.

**25. Dove Production and Nest Site Selection in Southern Michigan.** Larry D. Caldwell. 1964. *J. Wildl. Mgt.*, **28**: 732-738. Doves were nest-trapped on a 514-acre study area and simultaneously observed on a 32-acre control area. Doves preferred red pine and Norway spruce cover types as nesting habitats; white, jack, and Scotch pine were not used. Intervals between re-nesting were as short as 4-9 days. Four marked pairs re-nested with their original mates. Successful nestings were equally common on both areas. However, the study area had 70% eggs hatched and 46% of the nestlings fledged, whereas these respective values were 35% and 83% on the control area, resulting in similar productivity (2.2 and 2.5 young fledged/pair) for both.—Robert S. Hoffmann.

**26. Chemical Inhibitors of Ovulation in the Pigeon.** William H. Elder. 1964. *J. Wildl. Mgt.*, **28**: 556-575. This paper consists largely of negative results, but is nonetheless most valuable. Captive *Columba livia* proved able to maintain fertility when given a wide variety of compounds of proven contraceptive worth in other birds. Gametocides (TEM), tranquilizers (Stelazin), thyroid inhibitors (tapazole, carbamizole), hypophyseal inhibitors (Lithospermum), estrogenic hormones (hexestrol, diethylstilbestrol), antiestrogenic compounds (ethanoxytripheptal, provera), insecticides (DDT, kepone, dodecachloropentacyclodecane), fungicides (arasan, ethylene dibromide), and coccidiostats (enheptin, nicarbazin, histostat) were all tested. Most were ineffective, or inhibited ovulation only at lethal dosages. Only provera at 0.1% and arasan at 0.35% inhibited egg production without harm to the pigeons, but fertility was regained rapidly when the substances were withdrawn from the diet. Practical results were obtained only with hypocholesterolemic agents. Both SC - 12937 and the less potent analog, SC - 11952 (22, 25 - diazacholesterol dihydrochloride) caused complete cessation of ovulation at the 0.1% dietary level. Full fertility was not regained until 5 - 6 months after treatment stopped, and in some birds even longer.—Robert S. Hoffmann.

**27. Duck Brood Behavior at the Senej National Wildlife Refuge.** Elizabeth B. Beard. 1964. *J. Wildl. Mgt.*, **28**: 492-521. A long paper, full of descriptive detail, and based upon observations made in the summers of 1950 and 1951. *Mareca americana* (14 - 21 broods) and *Aythya collaris* (8 - 10 broods) were studied while undisturbed on a 20-acre rearing marsh; one to several broods of *Anas rubripes*, *A. platyrhynchos*, *A. discors*, *Aix sponsa*, and *Lophodytes cucullatus* were also observed. Feeding occupied 3/4ths of total observation time, and specific differences were noted. Wood duck juveniles were most agile, frequently jumping from the water after insects. Hooded mergansers were also vigorous, but fed below the water surface, often diving after minnows (or arthropods?). Widgeons and the *Anas* species were "essentially dabblers and surface gleaners." Finally, ring-necked ducklings resorted to both dabbling and diving. Sleeping and loafing accounted for the rest of the brood's observed activity. A variety of sites were used for this, but two mud bars were particularly preferred, and competition for their use was observed. Hen and broods in possession defended the spots, but occasionally an intruding brood hen (always a ring-necked duck) successfully drove off the prior occupants. No regular schedule of feeding or use of loafing sites were found. The approach to the loafing site, defense of site, preening, brooding, and other behavior at the site are described. Mobility of the broods was indicated by the constantly changing number of broods on the marsh. Also, while no ducks nested in the immediate vicinity of the marsh, many of the broods first appeared as downy young led to the marsh by the brood hen, indicating that rearing marshes need not include nest sites. However, "it is quite probable that the number of such loafing spots in a marsh, suitable in all other respects for brood rearing, has a limiting influence on both the number of broods using the marsh and on the length of time they remain in it." When rearing marshes become overcrowded, broods become mixed, leading to strife between brood hens, especially widgeons, and to straying and increased mortality of ducklings. In contrast, ring-necked and wood ducks tolerated or even adopted strange young. Intra-brood behavior, brood bond, and its dissolution, and intra- and inter-specific social antagonisms are described in detail. In conclusion the author recommends the establishment of "many well-protected, small marshes" to reduce crowding and conflict and thereby increase duck productivity.—Robert S. Hoffmann.

## BEHAVIOR

(See also 48, 51, 52)

**28. The Comfort Movements of Anatidae.** F. McKinney. 1965. *Behaviour*, **25**(1-2): 120-220. (Summary in German.) A meticulously detailed, intensive and extensive study carried out in Great Britain, Manitoba, and Alaska. No less than 114 species were carefully observed; these included representatives of all the tribes except the Torrent Ducks (*Merganetta*). The comfort movements of this family are first described in their "basic situations," where they are ap-

parently serving their original functions, and later considered in "secondary situations (where the movements appear irrelevant)." The comfort movements are classified into seven main categories: 9 shaking movements; 3 stretching movements; 5 cleaning movements; oiling preening; nibbling preening; washing; and 3 bathing movements. While watching seven species incubating eggs, Dr. McKinney saw no oiling, but when the eggs hatched females of five species were recorded as oiling vigorously, presumably for the benefit of the ducklings. Social preening occurs in some tropical water-fowl especially in several species of *Dendrocygna*. Several comfort movements seen in other groups of birds appear to be absent in the Anatidae: wiping the bill on a branch, stretching both legs, dust-bathing, anting, and extreme sun-bathing postures.

Comfort movements probably have signal functions in the following situations: before flight, before copulation, during copulation, during pair-formation, during and after hostile encounters.

Comfort movements are illustrated with sketches by Peter Scott and by 19 striking photographs. Dr. McKinney is to be congratulated on his masterly presentation of a subject that demanded so much keen and tireless watching. It is a milestone in the study of the behavior of the Anatidae.—M. M. Nice.

**29. Displays and Songs of a Hand-raised Eastern Meadowlark.** Margaret Morse Nice. 1965. *Living Bird*, 4:161-172. A male *Sturnella magna*, completely imprinted on human beings, performed two symbolic nesting displays (nest-invitation and nest-molding) and these do not seem to have previously been reported for male Meadowlarks. He was a diversified and talented singer, his songs largely learned from Starlings (*Sturnus vulgaris*), but many of them changed and amplified. There are 9 line drawings by Dr. William C. Dilger from sketches by the author.—M. M. Nice.

**30. Courtship Display in the Waxwing.** F. M. Meaden and C. J. O. Harrison. 1965. *British Birds*, 58(6): 206-208. The courtship display as seen in a small group of Bohemian Waxwings (*Bombycilla garrulus*) that have nested in an aviary is described in detail and illustrated with three photographs.—M. M. Nice.

## ECOLOGY

(See 21, 37, 43, 64)

## PARASITES AND DISEASES

**31. Case Report: Epizootic of Fowl Cholera in the Common Eider Duck.** M. Gershman, J. F. Witter, H. E. Spencer, Jr., and A. Kalvaitis. 1964. *J. Wildl. Mgt.*, 28: 587-589. The first report of this disease on the Atlantic coast of the U. S., although it occurs regularly on the Pacific and elsewhere. It was estimated that over 70% of the nesting female eiders at Goose Island, Maine, had succumbed in June, 1963. No dead males were found, they probably having already moved to molting grounds, but dead *Larus argentatus* and *L. marinus* were discovered. Several small rocks nearby supported eider colonies, but no mortality was noted.—Robert S. Hoffmann.

**32. The Brown-headed Cowbird, with Old and New Hosts.** Harold Mayfield. 1965. *Living Bird*, 4: 12-28. Originally a bird of the short-grass plains of North America, *Molothrus ater* has spread in the wake of the destruction of forests and tall-grass prairies. Birds of the western grasslands have had long ancestral experience with this parasite and are fairly unresponsive to it (for example, the Dickcissel (*Spiza americana*) and Vesper Sparrow (*Poocetes gramineus*)). Two Vireos—Bell and Black-capped (*Vireo bellii* and *V. atricapillus*)—are heavily parasitized but raise few Cowbirds. In contrast, seven species of new hosts, nesting in the Eastern Forest, fledge from 22 to 41% of the Cowbird eggs inflicted upon them. Mr. Mayfield concludes that: "The cowbird represents a particularly dangerous type of enemy because, unlike most predators, it is not density dependent; that is, cowbird pressure does not relent when a prey species gets scarce. Since the cowbird does not specialize on any one species, it is not therefore dependent on a continued abundance of that host." A very interesting presentation.—M. M. Nice.



## CONSERVATION

(See also 12, 56)

**33. The Current Status and Welfare of the California Condor.** Alden H. Miller, Ian I. McMillan, and Eben McMillan. 1965. *Research Report of the National Audubon Society*, No. 6: 61pp. This investigation, financed by the National Geographic Society, is based on a year and a half of intensive work by two experienced rancher-naturalists under the scientific direction of Dr. Miller of the Museum of Vertebrate Zoology. They took the problem from where Dr. Carl B. Koford (1953) left it. They found that the population of *Gymnogyps californianus* has decreased one-third in the last 12 years; it now numbers about 40 birds. There is plenty of food—carcasses of deer, cattle, and sheep. The greatest loss comes from shooting, which, of course, is illegal.

This report is a clarion call to action. "We reaffirm our purpose to preserve this natural and inspiring esthetic resource." "Condors need the opportunity that only dedicated protection can provide. If they get it they will increase, at least modestly, and can long provide to our successors inspiration from their remarkably perfected powers of flight—a 'Nature Monument,' a living monument from the past."—M. M. Nice.

**34. Bird Mortality Following DDT Spray for Dutch Elm Disease.** Doris H. Wurster, Chas. F. Wurster, Jr., and Walter N. Strickland. 1965. *Ecology*, 46(4): 488-499. Bird populations were assessed in Hanover, New Hampshire and Norwich, Vermont. For many years DDT has been used in Hanover in an attempt to control Dutch elm disease, but not in Norwich. "Severe mortality of both resident and migrant birds occurred in Hanover during spring 1963, and the evidence implicates DDT as its cause." Especially high were Robin losses, estimated at 70% of the resident population. Following a change from DDT to Methoxychlor in 1964, mortality of Robins was reduced but not eliminated.—David W. Johnston.

## WILDLIFE MANAGEMENT

(See also 14, 25, 27, 44)

**35. Relative Value of Natural Cavities and Nesting Houses for Wood Ducks.** Frank C. Bellrose, Kenneth L. Johnson, and T. Udell Meyers. 1964. *J. Wildl. Mgt.*, 28: 661-676. Several areas adjacent to the Illinois River were studied in 1938-40 and 1958-62. Some had only natural cavities, some both natural cavities and nest houses, and some had houses but few, if any, natural cavities. The authors state that wood ducks preferred natural cavities with small entrances, less than 5000 cubic inches in size, less than 50 inches deep, with a basal area between 40 and 110 square inches, and 30 feet or more above the ground (however, tests of significance are lacking for these and other data in the paper). Additionally, nest sites successful the previous year were more frequently chosen. Use of natural cavities and nest success was greater in 1938-40 than in 1958-62. Increased nest losses were due to heavier raccoon predation. Tanglefoot or 14-inch metal bands around trunks reduced raccoon predation, but losses to other predators increased, and overall nest losses (50-60+%) were not much reduced. Nests in board houses had equally high rates of nest destruction (63.6%) due principally to fox squirrels and raccoons. This led to the development of a galvanized pipe house, with an elliptical, 4 x 3-inch opening, and conical metal top. Acceptance by wood ducks of metal houses was initially low, but increased to high levels of usage after a few years. Although losses due to desertion remained at about 10%, predation on metal houses was much lower, and total nest losses were cut to 22-27%. "After initial use of metal houses by wood ducks, high nesting success is usually followed [if hunting loss is not excessive] by increased usage as homing adults and yearlings swell the local breeding population . . . Yearling hens nest later than older hens, and . . . are influenced to nest nearby and in similar accommodations."—Robert S. Hoffmann.

**36. Waterfowl Mortality in the Coeur d'Alene River Valley, Idaho.** Norman R. Chupp and Paul D. Dalke. 1964. *J. Wildl. Mgt.*, **28**: 694-702. Recurring mortality, primarily in the spring, has occurred in swans, geese, and ducks wintering on or migrating through the lower Coeur d'Alene River Valley. Spectroscopic analysis of sick birds revealed chronic lead poisoning, and accumulations of lead and other heavy metals in apparently healthy birds as well. Analysis further showed large amounts of Pb, Zn, and Cu in soils and plants in the valley, resulting from decades of pollution by mine waste products.—Robert S. Hoffmann.

## MORPHOLOGY AND ANATOMY

(See also 20)

**37. Ecologic Aspects of Lipid Deposition in some Postbreeding Arctic Birds.** David W. Johnston. 1964. *Ecology*, **45** (4): 848-852. Birds of five species, including Golden Plover and Western Sandpiper, were collected on and near their breeding grounds in Alaska. A few adult Western Sandpipers were found with moderately large fat deposits (up to 20% of their total weight). Otherwise, no birds were found with important deposits of premigratory fat, although the observations were continued throughout the departure period of the adult shorebirds.—I. C. T. Nisbet.

**38. The Fat Condition of Some Island Birds.** P. R. Grant. 1965. *Ibis*, **107**(3): 350-356. Working on the Tres Marias Islands and the adjacent mainland of Mexico over a period of three years, the author collected a large number of birds on which the fat condition was noted by using the McCabe scale. Among the conclusions reached was "that in the months just prior to and at the beginning of the breeding season island birds are in a fatter condition than their mainland counterparts. This is essentially a difference between the residents; migrants are fat before the breeding season in both regions."

There then follows a physiological discussion of these conclusions. The significance of fat reserves in the insular resident species remains to be investigated.—David W. Johnston.

**39. Notes on Yellow Wagtails *Motacilla flava* Wintering in Central Nigeria.** V. W. Smith and D. Ebbutt. 1965. *Ibis*, **107**(3): 390-393. The chief aim of the authors is to report on weights of the wagtails in Nigeria from January until early April. Especially at a large roost birds were caught in mist nets, weighed, banded, and released. Until the end of March, there was no significant increase in weight, but a dramatic increase, reported as 23.5% per week, was evident in early April.

The total number of birds banded in this study is not given but some birds were retrapped in the area in March. This would indicate that at least a small number remains there until late March, or early April, before migrating northward across the Sahara Desert. Still, the 102 birds caught in April and having the greatest weight could have been intramigrants as well as premigrants in the opinion of the reviewer. Perhaps the wagtails that overwintered in Nigeria migrated before April—before the great increase in weight was detected in the sampling—and the April birds were birds arriving from farther south. This possibility cannot be ruled out especially because of three recoveries—wagtails banded in Nigeria, one in January, two in March, all recovered in April in Malta or Italy.—David W. Johnston.

## PHYSIOLOGY

(See also 64)

**40. Capacity for Photoperiodic Response and Endogenous Factors in the Reproductive Cycles of an Equatorial Sparrow.** Alden H. Miller. 1965. *Proc. Nat. Acad. Sci.*, **54**(1): 97-101. Six Andean Sparrows (*Zonotrichia capensis*) were brought from Dr. Miller's study area in the Western Andes of Colombia

(lat.  $3\frac{1}{2}^{\circ}$  N.) and installed in outdoor aviaries in Berkeley, California (lat.  $38^{\circ}$  N.). They bred freely and three of their young were hand-raised and records kept of them also. In Colombia where day-length remained constant at  $12\frac{1}{2}$  hours the males regularly show 4 months of sustained reproductive capacity, followed by 2 months of regression and regrowth of the testes, followed by another breeding cycle. In California with day-lengths ranging from 10 to  $15\frac{1}{4}$  hours the males bred for 7 to 10 months a year. In females ovulation is repressed by short days of 10-11 hours, but is stimulated and extended by long days. "There is no mechanism in this sparrow for effectively blocking late summer and autumnal breeding such as does exist adaptively in its congeneric relatives of the temperate region." An important contribution.—M. M. Nice.

## PLUMAGES AND MOLT

**41. The Number of Feathers on Birds.** M. B. Markus. 1965. *Ibis*, **107** (3): 394. Markus made the following counts: Green White-eye, 3,307 feathers; Yellow-fronted Tinker Barbet, 2,210; Black-collared Barbet, 3,104; Crested Barbet (two birds), 2,653 and 2,904. No seasonal variation in numbers of feathers (average of 4,192) was detected in 11 specimens of the Laughing Dove. Some of the data have been previously published in the *Ostrich*, **34**: 92-94, 1963.—David W. Johnston.

## ZOOGEOGRAPHY

(See also 3, 46, 50, 57)

**42. The Incursion of the Snowy Owl into Southern Scandinavia During the Winters 1960-1963 and Notes on Behavior at the Wintering Localities.** (Invasionen av fjällugglan (*Nyctea scandiaca*) i södra Skandinavien vintrarna 1960-63 samt något om artens beteende på övervintringslokalerna.) Björn Nagell and Ingemar Frycklund. 1965. *Vår Fågelvärld*, **24**: 26-55. (English summary.) In the summers of 1959 and 1960 nestings occurred in the mountains along the border of Sweden and Norway as far south as the alpine plateau Hardanger Vidda. During the winter 1960-61, 27 reports of owls were received, most of them from the east coast of Sweden. No nestings occurred the following summer or in 1962. But in the winter of 1961-62 the incursion reached its peak with 92 owls reported, 80 percent of these from the east coast and southern parts of Sweden, and in the winter 1962-63 30 owls were observed, all except three in Sweden.

The lemming population reached a peak in the southern part of the Scandinavian mountain range in 1959 and in the northern portion, as well as in Russia and parts of eastern Siberia, in 1960. In 1959 the nesting success in Scandinavia was excellent, but in 1960 it was very poor, apparently due to a sudden decrease of prey animals, which occurred after the nesting began. Hence it is believed that most of the owls present during the winter 1960-61 originated from the Scandinavian breeding grounds. In 1961-62, however, a concentration of owls in the Åland Archipelago in the fall prior to the peak invasion gave strong indication of having originated from the east, and then crossed over to Sweden and southwards.

The notes on behavior cover in the main territoriality and hunting. The owl rests in the daytime but, like most nocturnal animals, it becomes active in the late afternoon and evening and may be seen hunting also in the early morning. The bird is able to catch prey apparently detected by hearing by diving under the snow. One of the owls reacted to an approaching dog by lying down flat on the ground, where it was practically invisible, and to airplanes by adopting the "pole pose." Maps, diagrams, and a detailed list of the nesting and occurrence records, illustrate this interesting paper.—Louise de K. Lawrence.

**43. Observations of Seabirds in the Tasman Sea and in New Zealand Waters in October and November, 1962.** A. Y. Norris. 1965. *Notornis*, **12**(2): 80-105. Although this paper is a report of sightings of 38 species of seabirds from a

submarine, it contains some very interesting miscellaneous information. For example, the underwater speed of a Little Penguin (*Eudyptula minor*) was found to be approximately 15 ft./sec. of 10.2 m.p.h. Many helpful identification hints are given: characteristic differences among "problem" shearwaters (*Puffinus carneipes*, *P. pacificus*, *P. griseus*, *P. tenuirostris*, *P. assimilis*, and *P. gavia*), storm-petrels, and prions. Factors affecting distribution are discussed for many of the seabirds.—David W. Johnston

**44. The Influence of Calcium on the Distribution of Pheasants in Illinois.** James A. Harper and Ronald F. Labisky. 1964. *J. Wildl. Mgt.*, **28**: 722-731. This is a paper comparing soil, vegetation, and pheasant populations in two areas, one optimum pheasant habitat on glacial till of Wisconsin age, and the other on older Illinoian till, on which pheasants could not maintain self-sustaining populations. In grit from fields, both areas had 0.2 g Ca/100 g total grit; road gravel yielded 5.5 g Ca/100 g total grit on both areas. Calcium in soil, excluding grit, measured higher on Illinoian till (0.23%) than Wisconsin (0.15%); food removed from pheasant crops contained only 0.11% and 0.21% Ca from these respective areas. Therefore, calcareous grit must supply most of the pheasants' requirements, and grit from gizzards of both hens and young contained similar amounts of Ca on both areas. Carcasses also showed no differences in Ca content. Finally, clutch size, hatching rate and juvenile survival were better, if anything, on the Illinoian till than in the optimum habitat. In view of the above results, and the demonstrated ability of pheasants to select grit of maximum available Ca content, absence of permanent pheasant populations in many areas outside the margins of Wisconsin glaciation cannot be attributed to Ca deficiency.—Robert S. Hoffmann.

## SYSTEMATICS

(See also 57, 65)

**45. The Families and Genera of the Petrels and their Names.** Fifteen authors. 1965. *Ibis*, **107**(3): 401-405. A group of systematists, including Murphy, Watson, Kuroda, and Serventy, have become concerned over the existing confusion in the nomenclature of the Procellariiformes. Thus, they "put forward an agreed statement to indicate the classification we prefer . . . in an attempt to perpetuate a more stable nomenclature for the petrels . . ." They urge the adoption of the following families and genera in the order Procellariiformes: Family 1, Diomedidae; *Diomedea*, *Phoebastria*. Family 2, Procellariidae; *Macronectes*, *Fulmarus*, *Thalassoica*, *Daption*, *Pagodroma*, *Pterodroma*, *Halobaena*, *Pachyptila*, *Bulweria*, *Procellaria*, *Calonectris*, *Puffinus*. Family 3, Hydrobatidae; *Oceanites*, *Garrodia*, *Pelagodroma*, *Fregatta*, *Nesofregatta*, *Hydrobates*, *Halocyptena*, *Oceanodroma*. Family 4, Pelecanoididae; *Pelecanoides*. Justifications, in the opinions of the authors, are given for this classification and nomenclature of petrels.—David W. Johnston.

**46. A Mixed Population of Redpolls in Northern Norway.** M. P. Harris, F. I. Norman, and R. H. S. McColl. 1965. *British Birds*, **58**(7): 288-294. Among the most perplexing problems facing the systematist are the redpolls. Opportunity was afforded in 1961 and 1963 to catch, examine, and band 237 redpolls (*Carduelis flammaea* and *C. hornemannii*) in Norway, and from these birds the authors present data on plumages, wing and bill lengths, and sex and age characteristics. In the past rump coloration has been used as a diagnostic species characteristic, but these authors caution that "it was noticeable that the appearance of the rump in the field gave no indication of the real colour as seen in the hand." Their conclusions agree with the views of Salomonsen in 1928 and Williamson in 1961 that the redpolls not only form a hybrid swarm but also that there is only one species of redpoll with varying ecotypes. Some evidence for the mixing of various redpolls in northern Europe came from the recovery of a bird banded in Norway and caught at Rjazan, U.S.S.R.—David W. Johnston.

## FOOD

(See also 44)

**47. The Consumption of Natural Foods by Captive Canvasbacks and Lesser Scaups.** Jerry R. Longcore and George W. Cornwell. 1964. *J. Wildl. Mgt.*, **28**: 527-531. Immature *Aythya valisineria* and *A. affinis* were maintained in captivity on natural foods harvested from the lower Detroit River. The diet during the 72-day experiment consisted of *Vallisneria americana* (63.7%), *Elodea canadensis* (15.1%) and invertebrates, principally molluscs (13.3%), with small amounts of other vegetation. Mean food consumption was 0.78 lbs/bird/day (dry weight 0.05 lbs.) for canvasback, and 0.49 lbs/bird/day (dry weight 0.03 lbs) for scaup. Mean body weight of the canvasbacks was 2 lbs; of the scaups, 1 1/4 lbs. Food consumption markedly increased with declining air temperature.—Robert S. Hoffmann.

**48. Blood-eating in a Galapagos Finch.** Robert L. Bowman and Stephen L. Billeb. 1965. *Living Bird*, **4**: 29-44. Wenman Island is a remote, volcanic island very difficult to land upon from the sea. In January 1964 two U. S. Navy helicopters landed a small party of scientists safely atop the island. Here they found the Sharp-beaked Ground-finch (*Geospiza difficilis septentrionalis*) piercing the skin in the elbow region of nesting Masked and Red-footed Boobies (*Sula dactylactra granti*; *S. sula websteri*), and drinking the blood. Two other races of this finch were studied on two other islands, and no trace of this strange behavior was seen. "The habit is probably learned and is transmitted by tradition from one generation to another" (p. 42).—M. M. Nice.

**49. Caloric Values of Plant Seeds Eaten by Birds.** S. Charles Kendeigh and George C. West. 1965. *Ecology*, **46** (4): 553-555. Caloric values are reported for seeds of 51 species of plants, the seeds supposedly being consumed by a variety of birds. In terms of gross energy content of the seeds and expressed as calories per gram of seed, the values were quite variable, ranging from 4317 to 6088. Unfortunately the data presented are of limited use because in many cases only one sample for each kind of seed was determined.—David W. Johnston.

## SONG

(See 29)

## BOOKS AND MONOGRAPHS

**50. China's Economic Fauna: Birds.** (Chung-kuo Ching-chi Chih-Niao Lei.) Edited by Cheng Tso-hsin. 1963. Science Publishing Society, Peiping. 694pp. English translation available from Office of Technical Services, Joint Publications Research Service, Building T-30, Ohio Dr. and Independence Ave. SW, Washington, D. C. \$11.50. In spite of the deplorable translation and production of the English version, this book is of great value and interest. Its primary purpose is to evaluate the economic significance of each of the commoner birds of China, and to recommend measures for protection or control.

Western research on Chinese birds is quickly dismissed for reasons that may embarrass present-day specialists in taxonomy. "Following the nineteenth century when the various capitalist nations were trying to dominate China, their exploration of China's fauna and flora became even more competitive. . . . As their work was to serve imperialist aggression, their scattered data was incomplete and slanted mostly towards pure classification, without any mention of ecological distribution and benefit-harm relationships, particularly the latter."

Nevertheless, China's isolation from the ideas of the Old Established Forces is in this case to her disadvantage, for this book's analysis of "benefit-harm relationships" is fifty years out-of-date. Here insects are "bad" because they eat crops; flycatchers are "good" because they eat insects; hawks are "bad" because they eat flycatchers. Few quantitative studies of ecology or distribution are

quoted, and there is no mention of the concept of a natural balance between populations. Nor is there any discussion of animal populations as natural resources, or as crops to be harvested; indeed, waterfowl seem to be regarded more as agricultural pests than as a source of food.

Each species account ends with a brief assessment of its economic significance. The relative "benefit" and "harm" of each species are carefully weighed, with the benefit of any doubts invariably being given to the birds: even the notorious Tree Sparrow is admitted to be beneficial during part of the year. Protection is recommended for some species on purely aesthetic grounds. However, in these sections there is an alarming vagueness about the potential productivity of the species designated as valuable. For example, there is repeated emphasis on the economic value of ornamental feathers, especially those of such endangered groups as herons birds of prey, waterfowl, and pheasants. The comment "two tons of white swan's down for export is sufficient exchange for one tractor" is juxtaposed with "the numbers of the swan *cygnus* in nature is rare", with only the vaguest recommendation for restraint. In fact, the only definite information given about the size of the export trade in feathers and birds is years out-of-date, and the reader can only guess at the current threat to the species involved.

A similar vagueness surrounds many of the other recommendations in the book. The short chapters on hunting, controlling, and deterring birds contain a few picturesque ideas, but nothing that will seem plausible to the western expert. There are no clear accounts of the success or failure of any of the methods of control which are described. And the many proposals for protection or limited exploitation of useful species read more like pious hopes than authoritative recommendations.

In its declared purpose, this book is thus little more than a beginning: its authors are much better as naturalists than as economists. However, the book is much more than an economic survey. In fact, the greater part of the volume comprises a handbook of Chinese birds, covering the 241 commonest species (of which more than 30 occur also in North America). For each species there is a detailed description, with measurements and weights of different subspecies and in most cases a colour plate, followed by detailed accounts of behavior, food, ecology, and breeding, and by a summary and a map of geographical distribution. These sections, drawn largely from Russian and Chinese sources which are not generally available, make the book an indispensable reference for anyone interested in Asiatic birds. They are primarily a monument to the industry of T. H. Cheng, who was responsible for an impressive proportion of the thorough field-work on which the book is based.—I. C. T. Nisbet.

**51. A Comparative Study of Some Social Communication Patterns in the Pelecaniformes.** Gerard Frederick van Tets. 1965. *Ornith. Monographs*, No. 2. Published by the American Ornithologists' Union. Paper. 88pp. \$1.60 to Members of A. O. U.; \$2.00 to others. Animals that live in colonies have an urgent need to communicate with one another. "The more explicit this information is, the less likely it will be that energy is wasted in the form of either inappropriate responses or conflict, as a result of misunderstanding. Many of the Pelecaniformes nest in colonies and many of them show marked and peculiar signals to other members.

This exhaustive, detailed study is based on intensive observation of 14 species of five families of Pelecaniformes in North America, Central America, and Europe. The species observed were four pelicans; a gannet and a booby; an anhinga; six cormorants; and a frigatebird—from one to six examples of each family in this order except that of the tropicbirds, and these are dealt with from the literature. A striking device for clarity lies in the use of more than 175 excellent line drawings of displaying birds; these were redrawn from photographs.

"Most, if not all, pelecaniform birds have a basic courtship sequence in common, which serves to establish the nest-bond and pair-bond for one season if not more. It consists of the male selecting the nest site and the female selecting a male that is advertising for a female on his nest site. When a male accepts the advances of a female, he eventually surrenders the nest site to her, and leaves to fetch nest material to present to her. She then alone, or assisted by the male, weaves and secures this material into a nest structure."

"Due to the prominence of the nest in the courtship of these birds, they are not only sexually but also positionally diethic, for the behavior of the 'in' or 'sit-

ting' bird differs markedly, irrespective of sex, from that of the 'out' or 'standing' bird."

"Functionally the social signals of the 'in' bird have been divided in this study into threat, recognition, and male advertising displays. Threatening tends to frighten other animals away, while recognition displays have the opposite effect. . . . Male advertising displays occur normally only during the pre-egg stage (*sensu* Richdale, 1950) in males when they are alone on the nest, and do *not* occur when a female is also present at the nest."

The author concludes: "It was found that the signal patterns are combinations of a limited number of discrete postures, movements, and sounds, and that they are mainly derivatives from four main sources: locomotion, fighting, nest-building, and begging."

An impressive piece of work, well organized and well documented with a long bibliography of pertinent references in six languages dating from 1819 to the present.—M. M. Nice.

**52. On Animal and Human Behavior. The Development of Theories on Behavior.** Collected Writings. Vol. I. (Ueber tierisches und menschliches Verhalten. Aus dem Werdegang der Verhaltenslehre. Gesammelte Abhandlungen. Band I.) Konrad Lorenz. 1965. Munich. R. Piper & Co. Verlag. 412pp. Paperback. D. M. 14.80. This reprinting of six of Dr. Lorenz' writings will be warmly welcomed by all those seriously interested in animal behavior. The first article is "Beiträge zur Ethologie sozialer Corviden (1931)", whereas of the second there is an interesting story. On February 24, 1935 Dr. Wallace Craig wrote me:

"Some months ago you wrote and asked me to send Dr. Lorenz one of my reprints. I sent him one reprint, then a whole set. He wrote me a seven-page letter, and I wrote him a five-page letter. I told him that his "Betrachtungen über das Erkennen der arteigenen Triebhandlungen der Vögel (1932)" is to me the most interesting paper I ever read on bird behavior. His work reminds me of that of my revered master, Professor Whitman."

The longest paper is the epoch-making "Der Kumpan in der Umwelt des Vogels (1935)." Dr. Francis H. Herrick was so impressed by this contribution that he persuaded Dr. Lorenz to prepare a summary of it for the *Auk*; this appeared in 1937 as "The Companion in the Bird's World."

The fourth article "Ueber die Bildung des Instinkbegriffes (1937)" also has a noteworthy history. In answer to a letter from me, Dr. Lorenz wrote on July 19, 1965:

"That first exchange of letters which Craig mentions in his letter to you had consequences which determined the whole course of my scientific development. This is absolutely no exaggeration! From that correspondence with Wallace Craig resulted my first theoretical paper on instinctive behaviour in the *Naturwissenschaften* which actually lays the foundation of most of my later work. Through Craig I came to know the work of Charles Otis Whitman whom I also claim as my revered master."

The last two articles are: "Taxis und Instinkthandlungen in der Eirollbewegung der Graugans (1938)" with N. Tinbergen; and "Induktive und teleologische Psychologie (1942)."

The volume closes with two pages of notes and five of bibliography. In the next to last reference to G. K. Yeates, London, 1934, "The Book of Rocks" should be "The Life of the Rook." A notable reprinting.—M. M. Nice.

**53. The Migrations of Birds and Mammals.** (Migratsii Ptits i Mlekopitayushchikh). G. P. Dementiev, editor. 1965. (Academy of Sciences USSR, Division of General Biology). "Nauka" Publishing House, Moscow. 160 pp. 71 kopecks, about \$1.50. This book, commemorating the 40 years of work of the Russian Banding Bureau (now Banding Center) is a symposium or "collage" of papers based on recent work carried on by that division. A preface gives a brief history of their work, followed by a memorial to V. P. Teplov, a pioneer in banding work and later chief of research work at the important Pechora Reserve, by A. N. Formozov. The succeeding articles contain many original details based on both banding and field observation. "Bionic Problems in Ornithological Investigations," by G. P. Dementiev discusses and evaluates the latest and most advanced methods, instrumentation and theories developed in other, chiefly physical, fields of science which have prospective value for problems in bird migration

and orientation. "On the Seasonal Movements and Kill of Snow Geese," by V. P. Teplov and T. P. Shevareva, summarizes the history of the species in Asia, then presents the results of 543 banding returns, showing that their population (about 400,000 nesting on Wrangel Island) migrates to the western United States, pointedly indicating that the fate of their share of the species is in the hands of the game commissions of western U. S. and Canada. "Post Summer and Fall Migration of Some Marsh and Aquatic Birds in Northwestern Ciscaucasus," by A. A. Vinokunov reports on miscellaneous gulls, herons, and ducks. "A Study of the Seasonal Movement and Migrations of USSR Birds by Banding, Part 1," by T. P. Shevareva contains extraordinarily detailed studies of *Larus ridibundus*, *L. melanocephalus*, and *L. argentatus*, and also of *Coturnix coturnix*, some cases of secondary poisoning of humans through eating the latter being pinpointed through banding to a certain migratory population. "On the Spring Migration of Geese in the Central Areas of European USSR and in Northeastern Yakutiya," by S. G. Priklonskii, among various points, dwells on the anomalous phenomenon of almost exclusively east-west, rather than north-south, migration on the northern coast of eastern Siberia, manifested by passerines as well as waterfowl. "Population Dynamics of Migrant Brant and Old-Squaw in the Eastern Baltic," by E. V. Kumari, an observational study, finds but little decline in the large numbers of the latter species in recent years. "Migration of the Manchurian Pheasant [*Phasianus colchicus pallasii*] in the Amur Region," by L. M. Barancheev details mass migrations for short distances correlated to weather conditions. "Notes on the Wintering of Waterfowl and Marsh Birds in the Dunaya Delta in 1959-1961," by G. Andone *et al.* gives data based on banding returns for numerous species. "The Application of Synoptic Meteorology Data to the Study of Bird Migrants," by I. I. Puzanov and L. F. Nazarenko is a survey of the correlations between weather and migration in Russian Europe. "The Tagging of the Saigak [*Saiga tatarica*] in the Barsa-Kelmes Reserve," by V. L. Rashek is a mammal study in which movements were traced by bird-bands attached to the animals' ears; it concludes the volume.—Leon Kelso.

**54. North American Birds Eggs.** Chester A. Reed. 1965. Revised edition, Dover Publications, Inc., New York. 372 pages, 51 plates, 566 photographs of eggs, other illustrations. \$3.00. When W. DeWitt Miller reviewed Reed's original edition of this book in 1904 (*Bird-Lore*, 6: 135-6, 1904), oology was still in its heyday, and the book was given an enthusiastic welcome. Though "times have changed" and egg-collecting is now out of style, the reprinting of Reed's egg-guide by Dover is another service to ornithology. It illustrates in natural size, or nearly natural size, the eggs of virtually every species of North American bird, and will therefore be of assistance in the identification of nests and eggs in the field. According to the back cover, the book is "thoroughly revised by Paul A. Buckley of Cornell University's famed Laboratory of Ornithology, with all material brought up to date in accordance with the American Ornithologists' Union 1957 Check-list. . . ."

Basically the revised version has the same format. For each species (and many subspecies as well) there are remarks on range, description of the bird, and general life history, but stress is given to nests and eggs, the descriptions of which are rather general in nature. Occasional photographs of nests and tiny marginal figures of the birds are helpful. Photographs of individual eggs attract the most attention, but unfortunately these are not in color. Rather, below each egg in brackets is a terse description of the egg's ground color, such as "creamy white" or "pale greenish blue."

As is true of many so-called "thoroughly revised" books, this one perpetuates many errors from the first edition. For the Fish Crow (p. 236) one finds the erroneous statement that "their nesting habits are like those of the Common Crow . . ." Concerning the Black Swift (p. 204), it is no longer true that "little is known of their nesting. . . ." Some readers will be disturbed to find that this revised edition does not follow the sequence of bird families and orders as currently suggested by the *A. O. U. Check-list* (1957). Certainly the book could have been improved by including ranges in egg measurements, not just an average or a single measurement each for length and width. Indeed, more complete data on nests and eggs can now be found in the Bent Life History Series.—David W. Johnston.



**55. The Hawking of Japan / The History and Development of Japanese Falconry.** E. W. Jameson, Jr. 1962. Published by the author at Davis, Calif. 97pp., illustrated. \$15.00. This is a fine contribution to the history of one of the noblest field sports man has ever pursued, the ancient art of hunting with trained hawks. Hawking is believed to have originated somewhere in the Orient early in the Christian era, for the first trained Goshawks were brought to Japan from Korea about 355 AD, long before the practice was carried westward to Europe. The written record of hawking goes back in Japan to about the 6th century.

In their isolated island empire the Japanese developed and maintained the sport through the centuries. They made it a special prerogative of the nobility, who formalized it, gave it its own unique trappings, and established vast game preserves to assure its perpetuation. Thus hawking remained one of the dominant factors in Japanese wildlife conservation until the end of the Tokugawa Shogunate a century ago.

When Japan was opened to the west with the establishment of the Meiji Restoration in 1868, a number of factors contributed to the rapid decline of hawking. First was doubtless the introduction of modern firearms, accompanied by a dwindling of interest in the sport among the nobility. More damaging was the marked decrease of game—and of hawks as well—as the human population exploded following Japan's industrial revolution.

Hawking is practiced today in Japan mainly by the Imperial Household, which still has on its staff an imperial hawk-keeper, a functionary reputedly dating back to the Emperor Nintoku (XVI) in the 4th century, and who now maintains the imperial stable of Goshawks at the duck-netting preserve in Saitama. Also a few private citizens, dedicated amateurs born several centuries too late, still help keep alive the old customs and traditions. These are the only hawkers in the world who train and fly the little Japanese Sparrow Hawk, *Accipiter gularis*, and the formidable Hawk-eagle, *Spizaetus nipalensis*.

The book is beautifully illustrated with reproductions of medieval paintings and woodcuts of hawks, hawking scenes, and hawking equipment, many of them in color, and it tells the story clearly, authoritatively, and well. Included are a chapter on the Japanese hawking literature, a short bibliography, and a glossary of Japanese hawking terms. I was rather surprised to find no mention of Sanmi Horiuchi's "Nippon Chorui Shuryoho Shashin Kiroku" (Photographic Record of Hunting in Japan) published in Tokyo in 1939, which contains some of the finest action photographs of modern hawking I have seen. Most of all I was delighted to see this evidence of the resurgence of the noble sport since the Occupation. When I last visited Saitama in 1950, its elaborate hawk houses, or "takagoya," were in sad repair, and their sole occupant was a decrepit old Goshawk that missed each of the several tame pigeons flown for it to instruct and amuse the visiting American brass.—O. L. Austin, Jr.

**56. Before Nature Dies.** (Avant que nature meure.) Jean Dorst. 1965. Delachaux & Niestlé S. A., Neuchâtel, Switzerland, 424 pp., 128 plates (18 color), 74 pen-drawings. The closer men are being packed together in swarming throngs of rapidly increasing densities, the more ominously looms the question of the impact of the mass of humanity upon the environment and the effect this may have on the destiny of mankind. Long since the problem of mere alimentary support and the carrying capacity of the earth seems to have receded, at least temporarily, before other and graver consequences of man's demographical transgressions. Against the lifting of natural population controls, brought about by increased medical knowledge and advancing civilization, the need for commensurate proactive discipline and restraint fails to be realized or even recognized. More significantly, excessive population density produces serious and surreptitious nervous stresses which, at least so far as mankind is concerned, hardly yet are being acknowledged, much less purposefully studied in relation to human population dynamics. These reactions adversely affect thinking and behavior in various ways. They represent in fact a highly significant regulatory mechanism which preconditions the subject to devastating responses even before famine and disease clamp the emergency brake on the run-away population explosion. "Swarming is always a sign presaging death." There is only one reason why this should not also apply to mankind.

In this light, above all, this book should be read and studied and the concept of conservation reformulated and redirected. There is no mincing of words in this remarkable dissertation, no juggling of facts on where man stands in relation to nature and how he got where he is today. The author serves it on a platter of objectivity, thoroughly thought over from all angles. Even the most anthropocentric sceptic can scarcely find a legitimate basis for rebuttal. "Man appeared as a worm in a fruit, as a larva in a ball of wool, and he gnawed away his habitat secreting theories to justify his action." Thus man emerged, first as a picker of the fruits of the earth, causing little damage because he remained in close "natural equilibrium" with his environment. From this innocent stage, with civilizations born, maturing, and vanishing, in Europe and Asia the progress of humanity advanced by stages significantly slowly over the centuries, thus allowing enough time between the stages for a readjustment, at least in part, of the natural balance. This considerably softened humanity's impact upon the environment and kept man's traditional attitude toward the functions and the creatures of nature largely within a framework of comparative moderation and compatibility. As time went on wherever the growth of human populations created stiffened competition, man entered upon a new stage of excessive exploitation of natural resources, living and inanimate, aided by his expanding mechanical skills and technology. In America and Africa where this evolutionary process was compressed into a very short period of time, some of it crammed into mere decades, man's intemperance surpassed hitherto reached limits of impetuosity and ruthlessness, a veritable "explosion of devastation." One needs to mention only the ravaging of the forests, the buffaloes, and the passenger pigeon.

The picture of man today is highly complicated by his inveterate proliferation and his anthropocentricity, the latter being unavoidably related to the first in sequence as well as intensity. While effective means and methods of conservation in the broadest sense have been and are being worked out and implemented with skill and ingenuity by men fired by a profound realization of the frightening necessity, they are being gravely hampered by humanity's constantly increasing encroachment. The biomass of a species so long as it yields neither to discipline nor control is like a morass that helplessly bogs down the efforts of extrication. It repudiates the skills, it frustrates the will. How to combat soil erosion when trees are counted for nothing, when growth and plants are recklessly uprooted, poison-sprayed, or burnt to give way to monocultures of various kinds dictated by whim and economics? How to protect wildlife when the value of life, other than our own, is not recognized? How to preserve parts of the wilderness untouched when they cannot be kept inviolate? But these problems too are part of the functions of nature, for nature cannot die. Nature takes the materials such as they are and remoulds that which cannot be controlled or subdued and makes thereof something new, something more pliable and law-abiding, something wiser and more coherent, and sometimes it extinguishes the flame.

With infinite patience and unassailable logic, backed by massive support of facts, Dorst proceeds to rebuild what has been torn down. Man cannot return to the era of the primitive. Man has got to go on, to build without over-building, to profit without living beyond his means, to preserve without the compromise of values. The second half of the book is entirely preoccupied with these problems, a kind of Shakespearian contemplation to die or not to die, opposites set up and envisioned for man to choose from. Through detailed sections dealing with pillage or the rational use of the resources of the seas, the dangers of the modern world, and the wise utilization of the earth, emerges a complete reassessment of values. Hope, though still partly veiled in pessimism, rekindles. Can the measures for man's survival really be extricated from the mire that is now engulfing them? Can the tides be reversed? The answer seems to hinge on one condition, namely man's urgent realization that "the conservation of nature is the *protection of our own species against itself*," conservation not just in part, or from only one standpoint, not just for its own sake, but totally encompassing nature and man as a part thereof, the whole earth. "The fire is in the whole house and it is not enough to save a few nick-nacks in the part of the house we attempted to save from the disaster; the total conflagration demands total measures."

In the eloquent Postface the main theme of the book finds its formulation: ". . . that man commits a mistake in attempting to build an entirely artificial world." In this effort to which humanity now seems to have dedicated itself the

curse of utilitarianism besets us to the exclusion of everything else. And what if man deceives himself? After all is expended, by what means will he then saved himself?

"Man has enough objective reasons to devote himself to the protection of the wild world. But nature will definitely not be saved except by our hearts. It will not be preserved except by a little love simply because it is beautiful and because we need beauty in whatever form to which we respond by the fact of our culture and intellectual structure."

This book belongs in every library, public or private, it belongs in the schools and the universities where the new generation does or should acquire its first impressions of the realities of life.—Louise de K. Lawrence.

**57. Speciation in Wrens of the Genus *Campylorhynchus*.** Robert K. Selander. 1964. *Univ. Calif. Publ. Zool.*, 74: iv + 1-259 pp., 22 pl. \$6.00—This ambitious study was undertaken to elucidate the evolutionary relationships in a group of birds that posed many problems to systematists. However, the scope is much broader than that involved in conventional revisionary studies in that many facets of the biology of certain of the species were investigated, and the results brought to bear upon evolutionary questions.

The genus *Campylorhynchus*, which stands somewhat apart from other wrens, had not been subjected to a thorough revision for half a century, and the status and allocation of many named forms remained in doubt. Selander conducted extensive field investigations at some 40 localities in México, in the years 1952-54, in which he placed emphasis on ecology (especially foraging habits and vegetational relations) and behavior. Attempts were made to investigate cases of suspected contact or sympatry of disputed forms. The author examined critically some 2,300 specimens exclusive of *C. brunneicapillus*, the variation in which was not included in this monograph. He made thorough use of the literature concerning diverse facets of this broad study.

The author divided the genus into two groups that had not been clearly delineated heretofore. Six species are assigned to each. The *Heleodytes* group, which includes the Cactus Wren of the southwestern United States, is chiefly Mexican in its distribution, with one species occurring interruptedly from Chiapas to extreme northern Brazil. Wrens of this group are short-winged and short-tailed, and are found in a variety of habitats. The *Campylorhynchus* group consists of long-winged, long-tailed inhabitants of forests or woodlands, with structure and habits somewhat jay like; their distribution is centered in northern South America, with two species found in México. The two groups are distinguishable on the basis of plumage patterns (both adult and juvenal), and Selander demonstrated that secondary simplification in pattern had occurred in members of both groups, obscuring their relationships.

Readers interested primarily in avian biology will find rewarding the sections dealing with the relationships of molts and plumages, iris color, and cranial ossification to the age of the individual. These matters in turn are related to deferral of breeding and to the problem of helpers at the nest. Maturation is more rapid in those species in which breeding occurs at one year, and delayed recruitment into the breeding population seems more prevalent in tropical populations. Selander suggests that individual survival is enhanced by longer association with the parents, and that the assistance to breeding pairs is a secondary result. With reference to "ossification" of the skull his term "unpillared" for the immature condition seems appropriately descriptive.

Students of evolution will find a wealth of material in the detailed accounts of Distribution and Variation in each species. Topics included in each account are Geographic Distribution, Morphologic Variation, Ecology, and Foraging. The Mexican species are emphasized (mostly the *Heleodytes* group), and the exclusively South American forms are not treated in detail. Of particular interest are the discussions of species limits involving allopatric forms. A table (p. 218) presents clearly the criteria applied, and gaps in our present knowledge are indicated. The decisions reached were based upon skillful evaluation of plumage patterns, vegetational relations, foraging capabilities, and vocalizations. Selander concluded that the only cases still questionable involve South American forms that are inadequately known in the field.

Thirty-four pages are devoted to a detailed treatment of the hybridization of

two morphologically distinct races of *C. rufinucha* on the Pacific coast of Chiapas. One form that is arid-adapted extends into the area from the northwest, the other occurring in scrub vegetation of a more mesic character to the southeast. The contact was established in an area where the coastal plain is narrowly constricted and the physiographic, climatic, and vegetational settings are skillfully presented. Prior to the removal of an extrinsic barrier by clearing of forests the parental forms were narrowly separated. The actual distances involved were not measured since roads did not exist there in 1954. In a subsequent visit precise measurements were obtained, and it was shown (*Auk*, 82: 206-214, 1965) that phenotypically "pure" parental populations were separated by only 20 miles. Further, the major shift in characteristics is abrupt, taking place within a 10-mile span. Thus introgression is sharply limited, probably through the agencies of counter-selection and the relatively small size of the hybrid populations. Another noteworthy feature of this situation is the increased sexual dimorphism in dorsal coloration (but not in size) in the hybrid populations. This condition is explained as a result of sex-influenced expression. The genes of the southeastern race controlling four color characters are thought to be partially dominant to those of the northwestern race in hybrid males but not in females. The reverse expression occurs in genes of the northwestern race controlling two color characters. Human activities in the area of contact have created an undiversified habitat suitable for individuals of either race, but not permitting habitat segregation. Hybridization of the habitat, therefore, is not considered important in the development and maintenance of this contact. An intriguing suggestion is that the hybrids are less effective in competition with the discontinuously distributed larger species, *C. griseus*, than are "pure" populations of the southeastern race beyond the hybrid zone.

Patterns of variation in the genus are analyzed, and evolutionary relationships within the two species groups are postulated. Where species of the same group are sympatric they are segregated by habitat (two cases) or they differ in size (one case). Nomenclature and locality lists are relegated to an appendix. No new races are proposed.

The reviewer was impressed repeatedly with the author's meticulous attention to detail which permitted penetrating analyses of critical problems. The account is well written, with frequent reference to pertinent tables, maps or photographs that facilitate understanding. I found the restricted ranges of some forms difficult to locate in figure 33, and the map of the hybridization area in Chiapas suffers by comparison to that in the more recent report (*op. cit.*). One reference is omitted from the bibliography, and, for the record, Almolonga, Guerrero, lies east, not west, of Chilpancingo (p. 123). The trivial nature of these criticisms only emphasizes the stature of this monograph. The entire volume reflects awareness of pertinent problems, careful planning, frequent re-appraisal, and vigorous prosecution of the study in the field, and painstaking examination and consistent evaluation of specimen material. We are greatly indebted to Dr. Selander for a truly monumental biosystematic study.—Keith L. Dixon.

**58. The Lives of Desert Animals in Joshua Tree National Monument.** Alden H. Miller and Robert C. Stebbins. 1964. Univ. Calif. Press, Berkeley. 452 pp. \$10.00. Only the acutely observant biologist who has spent years on the deserts is able to comprehend the problems of existence confronting the plants and animals living there. Certainly Drs. Miller and Stebbins qualify in this regard because over a 15-year period they have spent considerable time in southern California's Joshua Tree National Monument, watching and collecting vertebrates and noting especially those characteristics permitting the animals to occupy successfully such a harsh environment. Species by species, the authors describe the problems of existence, along with some specific solutions, for 167 birds, 42 mammals, 5 amphibians, and 36 reptiles. The book, illustrated mainly by Gene M. Christman, contains attractive color plates, black-and-white drawings, and photographs not only of animals but also of habitat scenes.

Generally speaking, desert animals must cope with water shortage, high temperatures, limited shade, dust storms, and desiccating winds. Different birds (and other vertebrates) solve these problems in different ways, as the authors point out in their initial chapter, entitled "The solution of problems of desert life." Desert birds, for example, may travel many miles each day to and from springs; others subsist from plant or animal food with high water content; many are pro-

tectively colored; some seek shade during the intense heat of midday. It is unfortunate that this chapter contains a number of serious errors and implications. Contrary to the allusions on pages 9 and 10, birds and most terrestrial reptiles are known to excrete nitrogenous wastes chiefly in the form of uric acid and not as urea. The suggestion in this chapter, as well as elsewhere in the book, that fat "yields an especially high amount of metabolic water . . ." as "an emergency water reserve . . ." is without documentary evidence. As Schmidt-Nielsen (*Desert Animals*. Oxford Press. 1964) points out, 1 g fat may yield 1.07 g H<sub>2</sub>O, but this process requires oxygen which can be supplied only by increased ventilation of the lungs. The latter process would evoke increased evaporative water loss from the lungs, thereby negating any "gain" in metabolic water from fat oxidation. Lastly, it was disturbing to find no discussion in this chapter of salt balance among desert vertebrates. Certainly the recent investigations on this subject in marine and terrestrial vertebrates suggest some fascinating problems on the desert.

The accounts of the bird species are typical of Miller's careful observations and precise expressions. With few exceptions these accounts include behavioral adjustments of birds to the rigors of desert life—secreting themselves in midday, dry vs. succulent food consumed, panting, migratory habits. For the breeding birds there are data on nests, their positions, construction, and contents. Among the more intriguing discussions are those relating to problems facing migrants, such as flycatchers, warblers, and fringillids. Certainly for these birds, and probably other forms as well, autumnal migration is particularly strenuous because the migrants encounter not only extremely high ambient temperatures but also a potentially unreliable food supply (insects) in unfamiliar territory. As a result, the authors detected numerous casualties among migrant birds, especially immatures. Other fascinating accounts are those of the jays, phainopepla, and the several species of sparrows. In many of the species accounts, interesting questions of survival and adaptations to desert existence are raised. In other cases problems are dismissed too lightly, as in the roadrunner account where there appears the statement that it "is not bothered by heat or lack of water."

Mammals, some amphibians, and a host of reptiles are also encountered in this desert area, even though many of them are nocturnal or subterranean in nature. Discussions of these species follow the same format as that of the birds. The best-known mammal, from the standpoint of adaptation to desert life, is the kangaroo rat, and the account of this form includes much of the Schmidt-Nielsens' earlier work. For some unexplained reason, however, the authors did not include relevant data on temperature regulation and aestivation in the pocket mouse published by Bartholomew and Cade in 1957. In the various reptile accounts one might question the value of including data on body temperatures (averages and extremes)—do they really mean anything when virtually no correlations are made with substrate type and its temperature, air temperature, recent activity of the animal, wind currents, and other variables?

On the whole, this book achieves its avowed goal of presenting a resumé of physiological and behavioral adaptations to the severity of desert existence. No doubt it will be a valuable source book and guide to those interested in the desert vertebrates of southern California.—David W. Johnston.

**59. Black Brant/Sea Goose of the Pacific Coast.** Arthur S. Einarsen. 1965. University of Washington Press, Seattle. 142 pp. \$5.00. There are relatively few books devoted to North American bird species, in contrast to the steadily increasing number of such monographs from Europe, and especially Germany. The value of this approach, of gathering in one place all pertinent aspects of the Black Brant's biology, is well illustrated by this useful book, and a few of the pitfalls show up as well. In the author's words, the book was "written as an attempt to engender a better common understanding of the brant's living habits, the hazards to its survival, and the means by which better management of the species can be obtained . . ." The style employed is clearly for the layman, but the scope is broad and the approach sufficiently scholarly to interest the ornithologist.

Einarsen begins by describing his bird, and discussing its classification. He explicitly states (p. 4) that he will follow the A. O. U. Check-list, which considers *Branta nigricans* as a distinct species, but immediately contradicts himself by using the name *B. bernicla nigricans*, without, however, referring to Delacour and others who have grappled with this problem. A fuller discussion of brant systematics might have clarified what seems here to be a vague muddle. Breeding and

wintering distribution is discussed next. It is noteworthy that, although *nigricans* breeds as far west in the Soviet Arctic as the Taimyr Peninsula, the migration route passes down the east edge of the Pacific.

The author chooses to view this as a mystery ("logic must be cast aside"), but it parallels the migration pattern of other recent avian colonists of Siberia, such as *Grus canadensis* and *Hylocichla minima*, and clearly indicates a North American origin for the Black Brant. Winter distribution is discussed more fully than breeding, where several important references are not cited. There is also a brief section of Asian records, but unfortunately no Soviet sources were consulted. Chapters three, titled "Distinctive Characteristics," includes wing structure and flight power, flight mannerisms, and feather wear, the substance of which is that brant, ocean-adapted, are among the fastest anserine fliers, but exhibit extreme plumage abrasion also. They are wary but gregarious, and easily deceived if large spreads are set out. Voice and calls are discussed here, though with unnecessary anthropomorphism. A short chapter on feeding habits follows. When the brant are not breeding, they eat little besides sea lettuce (*Ulva*) and eel grass (*Zostera*), and the disastrous results of this near-monophagy is well-known in Atlantic brant populations. However, the information given on eel grass disease is scanty, and most readers would want to know more. Another gap in this section is the lack of data on brant food habits during the breeding season.

Having set the stage, the author proceeds to chronicle the life cycle of the brant, with detailed discussions of breeding behavior, mating, nesting, care of goslings, migration, and predation and other sources of mortality, including hunting. The book closes with chapters on the brant as a game species, and discussions of current management practices, with recommendations for future changes. Einarsen concludes that although most native hunting is not a threat to brant populations, unregulated harvest near population centers such as Nome is potentially dangerous, and urges closed season protection from Eskimo hunting in these places. Excessively large numbers of decoys, scull boats, and offshore blinds are hunting practices calling for prohibition or limitation. Most effective would be establishment of special brant refuges, with four sites recommended: nesting grounds on the Yukon Kuskokwim delta and migration and wintering areas at Izembek Bay, Alaska, Humboldt Bay, California, and the Scammons—Black Warrior lagoon complex in Baja California. Finally, the need for further intensive research on brant is made clear.

The book is somewhat marred by contradiction and repetition. Thus we read on page 3, that "the first flight of the black brant marks the opening of the [spring] hunting season", and on page 11, that "it [brant] arrives there the latest of all the birds, after nearly all the other geese have passed." The lead sentence of Chapter 4 reads "Unlike most other waterfowl, the brant do not include a wide variety of both plant and animal matter in their diet" (p. 28). On the next page, the reader is again told "Unlike most other waterfowl, their diet does not include a wide variety of both plant and animal matter." Much of this distracting lack of accuracy and conciseness might be due to insufficient editorial care on the part of the publishers. I have only one other general criticism; the ink sketches scattered throughout the text are disappointing. In happy contrast, the photographs are of good quality and add much to the book's usefulness.

In sum, although the reader must have patience with a certain amount of irrelevant, repetitive or contradictory detail, there is much interesting and valuable material brought together in Einarsen's work.—Robert S. Hoffmann.

**60. Birds in Florida.** Edited by R. J. Longstreet. 1965. Trend House, Tampa. Illustrated. 176 pp. \$4.95. This is apparently the fourth "edition" of the book, the first one appearing in 1931 as "Florida Birds: Biographies of Selected Species Occurring in Florida." The present volume differs little in format from the earlier issues except that Mr. Longstreet has attempted "... revision, adding and subtracting and . . . re-ordering the bird categories. . . ." It appears to me, however, that the greatest improvement has been the addition of Sam Grimes' beautiful color plates, 32 of these. No doubt these illustrations will help to sell the book.

Apparently, it has been the conception of the several authors of *Birds in Florida* that the general public is more interested in a few common birds than all the species occurring in the state. As stated in the foreword, "it was the original aim to present biographies of birds which the untrained observer would be likely

to see." Approximately 150 species are presented in the present work, only one-third of those listed in Sprunt's revision (1954) of Howell's *Florida Bird Life*. Usually each species account or "bird biography" contains miscellaneous information on identification, seasonal occurrence, migration, nesting, food, habitats, and habits. The combination of color plates, small number of species included, concise accounts, and perhaps other factors will make this an attractive book to the uncritical tourist and bird-watcher.

It is, however, unfortunate to detect gross errors throughout the book. Not only are some common names incorrect ("Ruby-Throated Kinglet") but also there are abundant factual errors. All grebes, even those found in Florida, don't have "short-cone-shaped bills." There is no definite evidence that the Sharp-shinned Hawk breeds in the state. Broad-winged Hawks are not in the family Falconidae. The Florida subspecies of the Sandhill Crane does not "breed only in Florida." To state that a towhee is "a bird without a single bad habit . . ." and is "on the honor roll of the U. S. Department of Agriculture as a defender of Florida truck crops . . ." is beyond my comprehension! Had these and many other errors and misspellings been corrected, the book would be far more attractive to this reviewer.—David W. Johnston.

**61. The Birds of Shakespeare.** James Edward Harting. 1965. A reprint of the first edition published in 1871. Argonaut, Inc. Chicago, Ill. 321pp. \$7.50. Just 100 years ago Mr. Harting, an English lawyer and naturalist, started to write this book which occupied his "leisure hours for six years." This is one of a dozen books, written by him between 1866 and 1906; they are mostly on birds, two of them devoted to falconry. In this volume the author cites and explains innumerable references to birds and other creatures in Shakespeare's writings.

It is a treasure trove of pleasant, informative reading. Many ancient superstitions, implied or referred to in the plays, are described and their authenticity debated. One opinion current in the plays is doubted by Mr. Harting, namely that snakes are deaf, but this belief was based on fact. In ancient times a vulture symbolized a compassionate person, "because during the 120 days of its nurture of its offspring, if food cannot be had, it opens its own thigh and permits the young to partake of the blood, so that they may not perish from want." "The ecclesiastical fathers transferred the Egyptian story from the vulture to the pelican."

Curiously enough, though, the author accepts the fantastic notion, "current in olden times" and based on a verse in Job and another in the 147th Psalm, that Ravens fail to care for or feed their young until black feathers begin to appear on the latter (see review of Gwinner's paper; *Bird-Banding*, 36: 275-276, 1965).

An appendix of 19 pages lists the ornithological allusions in all the plays and poems, while an index of 5 pages completes the volume. This unusual book inspired our family to renew our acquaintance with Shakespeare's plays, a laudable activity in our over-busy, present day lives.—M. M. Nice.

**62. John White and Edward Toppell / The First Water Colors of North American Birds.** Edited by Thomas P. Harrison. 1964. University of Texas Press, Austin. 59 pp., 10 colored plates reproducing 19 water colors. \$5.00. Were this book titled "Primitive Sixteenth and Early Seventeenth Century Water Colors of American Birds by Unknown Artists Presumably Based on Nonextant Paintings by John White" I would be less critical of its content. Mr. Harrison's text gives a short history of Edward Toppell (1572-1625), a British clergyman, writer of tracts and author of "The Historie of Four footed Beastes," 1607; "The Historie of Serpents," 1608; and an unpublished manuscript "The Fowles of Heaven" (The Historie of Birdes) which now reposes in the Henry E. Huntington Library in San Marino, California. Pasted into this manuscript are 124 bird pictures, among them 9 water colors which Toppell calls "Virginia birds."

Mr. Harrison writes next about John White (died 1597?), artist with the Roanoke voyages (1584-90), also cartographer, surveyor, military engineer, governor of the lost colony on Roanoke Island, and grandfather of Virginia Dare, first child of English ancestry born in North America. Mr. Harrison then goes on to tell something about bird names, Indian and English, as used by Toppell and others in the 15th and 17th centuries. The remainder of the book is devoted to the reproductions of 19 primitive water-color paintings, 10 found in the possession of John White's descendants a hundred years after his death and purported to be copies made by an unknown hand of some of John White's work. Below 9 of these

pictures are copies of each made in the early 17th century by another unknown hand for the use of Reverend Topsell, his unpublished "Virginia Birds."

Water-color painting was a highly developed technique by the year 1500 and John White, born much later in the century, was an artist of stature. His original pictures as recently reproduced in "The American Drawings of John White" by David Beers Quinn (1964) show him to have been a man who gave great attention to detail. His water-color of a Flamingo is as fine and as beautiful as any painting by Fuertes or by Singer. To introduce his excellent work to an audience through reproductions of crude copies misrepresents the ability, technique, and talent of a fine artist.

We have no assurance that John White did the first water-color paintings of North American birds. Much untouched material still reposes in European archives, and the first water colors of birds may well have been done by some Spaniard or Frenchman before John White was born, though none has yet come to light. But John White was definitely the first English artist to paint North American birds. The first North American birds John White painted, of which the originals survive in the British Museum, were the Tropic Bird, the Frigate Bird, the Brown Booby, and the Noddy Tern.

The paired pictures in Mr. Harrison's book are identified by Roger Tory Peterson as Female Red-eyed Towhee, Eastern Bluebird, Yellow-shafted Flicker, Blue Jay, Common Grackle (without a Topsell copy), Red-wing, and Oriole (possibly Baltimore), Common Loon, Male Red-eyed Towhee, and Sandhill Crane. Of the oriole Mr. Peterson says, "But if it is actually a Virginia bird it would have to be the Baltimore—unless the boat stopped at tropical American ports." The ship did stop at tropical American ports. White did not label his paintings with place names or dates. He made at least five trips to Virginia and started painting flora and fauna when on his first voyage in 1585 the expedition stopped to trade with the Spanish in Puerto Rico and Haiti. During his fifth voyage in 1590 White spent months in the West Indies. As the oriole painting most closely resembles the Troupial, *Icterus icterus* (according to Oliver L. Austin, Jr.), it may well have been a cage bird brought from mainland South America to the West Indies, as so many birds were by Spanish aviarists.—Elizabeth S. Austin.

**63. The Personality of the Bird.** Edited by Brandt Aymar. 1965. Crown Publishers, Inc., New York, N. Y. 170 pp., 29 black and white illustrations. \$4.95. Mr. Aymar justifies his title by giving each of 37 bits and pieces of bird-inspired writing a new anthropomorphic super-title thus: "The Lovelorn Bird" is Percy Bysshe Shelley's "A Widow Bird"; "The Reliable Bird" is "To the Cuckoo" by Michael Bruce; "The Lonely Bird" is "Seekonk, the Sea Gull" by Paul Annixter; "The Harmonious Bird" is a tern (no species given) in a story called "Victory" by Herbert Evans; and "The Uncooperative Bird" is a Bald Eagle in an excerpt from Saul Bellow's novel "The Adventures of Augie March."

Mr. Aymar might be called a "downy bird" for finding a reason to put such authors as Alfred Lord Tennyson, Albert Payson Terhune, Emily Dickinson, Don Tracy, John Burroughs, Edward Lear, Ernest Thompson Seton, John Keats, Herbert Ravenel Sass, and Shelley and Bellow under one cover. The publisher's blurb on the jacket calls this book an anthology. Webster's Dictionary defines anthology as "a collection of flowers of literature." Mr. Aymar's collection of writings does not live up to this definition. In his choice of works by great literary names, he seems to have selected examples of their more mediocre writing.

In these articles, essays, verses, and short stories Mr. Aymar has collected an astonishing amount of misinformation about birds. According to Paul Annixter, for instance, gulls live to be close to a hundred years old, pelicans summer in Hudson Bay, a gull's voice croaks with age, and individual adult gulls of the same species vary as much as two inches in length! A talking chimney swallow, a philosophizing, conversational mockingbird, and an emotional gannet are the motifs for three stories.

Several accounts of the behavior of caged and tamed birds are factual and good. The excerpt from "Blind Jack" by Stephanie Ryder, although out of context, is among the best of these. "Good-by, Black Prince" by Elizabeth Waldo Wright and "Raff, the Jungle Bird" by Zetta and Carveth Wells are two more good ones. The articles by Ernest Thompson Seton, Herbert Ravenel Sass, and John Burroughs are what one would expect from these naturalist authors, well written, full of information, and factually correct.



I greatly enjoyed "Ismaques, the Fishhawk" by William Joseph Long, a well-told tale. Mr. Aymar gives no acknowledgment of the source of this story, but the Rev. Long (1866-1952), B. A. Harvard, Ph.D. Heidelberg, was a well-known clergyman and naturalist author at the turn of the century, whose works are apparently now in the public domain. No longer covered by copyright, this tale and twenty other involuntary contributions to this book can be legally republished without so much as a "thank you" to those who wrote them. As most of the illustrations are in the same category, Mr. Aymar and/or Crown Publishers are spared the expense of paying royalties to authors and artists. Under these circumstances they could have been more generous with words. A few biographical facts about each contributor, and the date and place of original publication of each article would have been a pleasing addition to the book and a courtesy to the authors.—Elizabeth S. Austin.

**64. Ecology and Bioenergetics of the Long-billed Marsh Wren *Telmatodytes palustris griseus* (Brewster) in Georgia Salt Marshes.** Herbert W. Kale II. 1965. *Publ. Nuttall Ornith. Club.*, No. 5, *xiii* + 142 pp. 61 tables and 22 figures. \$4.00. This book is the result of studying Long-billed Marsh Wrens for five years in Georgia, chiefly in the salt marshes of Sapelo Island. These wrens are not only residents in the marsh but also are one of the three avian species occupying a prominent ecologic position in the salt marsh community of Georgia. Hence, it has been the ultimate objective of Dr. Kale "to estimate the total energy flow through an avian population in its natural ecological system" especially because such data are generally scarce for any avian species.

Part I is concerned with breeding biology of the species, the results being summarized in 23 pages and numerous tables. The usual topics are covered—territorialism, start of breeding, song, nidification, and egg-laying. Average clutch-size decreased during the breeding season from 4.6 to 3.8, although nearly 60% of the nests contained five eggs. Eggs are laid between early April and mid-August, and one female has no more than two broods in a given year. The incubation period was found to be about 13 days and nesting period, 12 to 13 days. In most years the mean date of the start of nesting correlated with an environmental temperature of about 16°C. The conclusion "that clutch size increases with latitude with the Long-billed Marsh Wren . . ." is quite tenuous because of the admittedly scant data available for more northerly subspecies of *Telmatodytes palustris*.

Part II is entitled "Population Ecology and Bioenergetics" and embraces some 57 pages of text material. Herein the author presents valuable quantitative data on territory size, natality, mortality, nesting success, population densities, stomach contents, and energy aspects of individuals and populations of wrens. Average territory-size in the *Spartina* salt marshes was 100 m<sup>2</sup>, but it varied from 30-242 m<sup>2</sup>. Ecological density was found to be 18-23 pairs/acre of suitable nesting area; utilized area density (= territorial area actually occupied) was 41-45 pairs/acre. Feeding experiments suggested that individual caged wrens used 8.8 kcal of metabolizable energy per 10 g bird per day. Studies of oxygen consumption of caged birds indicated that "active birds" had a rate of metabolism of 8.2 kcal/bird/day. A summary of population energy flow for the wrens, expressed in kcal/m<sup>2</sup>/yr., yielded the following information—intake from food sources (chiefly arthropods and some detritus), 126; mean annual production, 0.5; loss through respiration, 88; loss through feces, 38. Although these are average figures and perhaps representative ones, the reader should be aware of likely annual fluctuations and the fact that many estimates, also subject to wide variations, were used in arriving at the figures.

The number of tables (61) in the book is formidable, and I found it quite disconcerting that some tables are located among the text material whereas others, certainly of no less importance, are in various appendices toward the end of the book. Precise data obtained on oxygen consumption suffered, I suspect, by the use of a relatively crude apparatus, a set-up which most contemporary vertebrate physiologists would not employ. Furthermore, had the author used a different King-Farner equation in predicting basal rates of metabolism, namely their formula suggested for birds weighing less than 0.125 kg, he would have found that his oxygen consumption data on wrens fit a point on the King-Farner curve rather closely. In fact, the "correct" King-Farner equation would have predicted a value of approximately 5.7 kcal for a 10 g wren's daily energy requirement. Kale pre-

sents a "mean basal metabolic rate of 5.8 Kcal/bird X day" for wrens in "near-basal condition." In this context, then, the King-Farner equation appears to be a better one for wrens at "near-basal conditions" than the Brody-Proctor equation, though it is dubious that the wrens investigated in Kale's metabolism chamber were ever at basal levels. To me the imprecision of the arbitrary and elusive expression, "active wren," simply introduces another variable in terms of population bioenergetics, because energy requirements of populations are based upon those of individual animals, a level at which precise measurements should be mandatory.

The value of this type of study is unquestioned. It is certainly indicative of a trend among some ecologically-oriented ornithologists investigating bird populations as integral components of ecologic communities and attempting to quantify avian population bioenergetics.—David W. Johnston.

**65. The Phylogeny and Classification of the Charadriiformes.** (Filo, *geniya i klassifikatsiya rzhankooobraznykh*). K. A. Yudin. 1965. Fauna USSR novaya seriya no. 91 (Vol. II, no. 1, part 1). Academy of Sciences USSR, Zoological Institute. "Nauka" Publishing House, Moscow-Leningrad. 262 pp. 125 figures. One ruble, 77 kopecks (\$3.75, U. S.). This is the fourth volume to appear in what is proving to be a monumental monograph of the Charadriiformes, including not only those of the USSR but in discussion at least bringing in its extraneous species on a worldwide basis for comparison. The three volumes to appear earlier were by Mme. E. V. Kozlova, new series nos. 65 (1957) on the Alcidae, and nos. 80 (1961) and 81 (1962) on the Rostratulidae and Charadriidae. The shorebirds are so prominent in the Russian fauna that they even figure in folklore and common proverbs, such as, "Vsyak kulik svoe boloto khvalit" ("Every snipe prefers his own swamp"). Any sizable area in the Russian north will have upwards of 20 resident shorebird species. Therefore special attention to the group is appropriate.

This book comprises a foreword; four chapters under the topics, "A history of the systems constructed for the order charadriiformes," "Information on comparative ecology," "Information on comparative and functional morphology," "Phylogeny and classification of Charadriiformes;" and a bibliography of 140 titles. As the result of the above studies the following system for charadriid birds and their relatives is worked out: Superorder Charadriornithes- I. Order Gruiformes; II. Order Charadriiformes- 1. Suborder Jacanae-Family Jacanidae- 2. Suborder Limicolae-Family Rostratulidae; Family Charadriidae- 3. Suborder Laro-Limicolae- Superfamily Glareoloidea- Family Glareolidae; Family Pluvianidae- Superfamily Chionidoidea- Family Chionididae; Family Thinocoridae- Superfamily Dromadidoidea- Family Dromadidae- Superfamily Lari- Family Stercorariidae; Family Laridae- Superfamily Alcae- Family Alcidae; III. Order Columbiformes.

The author is much impressed by the fact that most of the differences and resemblances in the various groups narrow down to skull structural characters which are closely correlated with shape, length, and curvature of the bill, which in turn are correlated with mode of feeding in the particular ecological habitat. Therefore functional morphology as related to ecology approach is emphasized. The figures, most of them by V. S. Rozhdestvenska, are sharply detailed studies of skulls and bills.—Leon Kelso.

#### MISCELLANEOUS

**66. Techniques in Bird Illustration.** Don Richard Eckelberry. 1965. *Living Bird*, 4: 130-160. An interesting discussion under the following headings: field work, other working aids, painting media and equipment, methods in painting and in line, reproduction, style. Quotations are given from other artists. Numerous illustrations add beauty and zest to the article.—M. M. Nice.