RECENT LITERATURE

BANDING

1. "Recovery" - By Telescope. Audrey Downer. 1966. *Broadsheet* No. 7 (Gosse Bird Club): 2-3. On 17-18 April 1966, a banded Indigo Bunting appeared at the feeding station of the author in Montego Bay, Jamaica. Carefully using a 20X telescope, Mrs. Downer was able to make out the band number, even though the bird could not be caught in a mist net. Checking the number with those on file in the U. S. Fish and Wildlife Service Banding Office, she learned that this bunting had been banded by R. K. Bell in Clarksville, Pennsylvania on 29 September 1963. This apparently constitutes the first long-distance or overseas recovery for this species.—David W. Johnston.

2. Records of Birds Ringed Abroad (1960-63) XXIV. Report on Bird-Banding. (Külföldi Gyurusmedarak Kezrekerülese (1960-63) XXIV. Gyuruzesi Jelentes). Andras Keve. 1964-65. *Aquila*, **71-72**: 149-163. This report summarizes the data for 171 birds of 48 species banded "abroad" and recovered chiefly in Hungary (a few recoveries were in Rumania and Jugoslavia). Interesting recoveries include *Pandion* from Sweden, *Muscicapa hypoleuca* from USSR, and *Pyrrhula pyrrhula* from Finland.—David W. Johnston.

MIGRATION

(See also 1, 29, 30, 48)

3. A Continentwide View of Bird Migration on Four Nights in October. George H. Lowery, Jr., and Robert J. Newman. 1966. *Auk*, **83**(4): 547-586. This long-awaited paper summarizes moon-watching observations throughout North America on four successive nights, 1-5 October 1952. Data from 265 stations are summarized onto a series of well-presented two-color maps. The volume of information obtained was so large and complex that a large part of the paper is devoted to technical problems of reducing and presenting it. These problems are very successfully overcome (although it is irritating to find south winds referred to as 'northerly' and 'northward' on successive lines), but at the expense of detailed analysis of factors affecting migration. Hence the data in the paper, although uniquely valuable, require prolonged study.

Migration around the Rockies and near the Pacific coast was generally of low volume and in varying directions; it is not discussed in detail. Southward migration in large volume was recorded on at least one night throughout the area east of the Missouri River, except in coastal New England where densities were generally light, even on a night (3-4 October) when large movements were seen over New Jersey and southward. There is some evidence that some Canadian birds detoured around the Great Lakes, but large southward migrations were seen over the states immediately to the south. Likewise, dense migrations were seen both setting out across the Gulf coast of Louisiana, and detouring SW through Texas or SE through Florida.

On the night of 1-2 October a cold front extended from Lake Erie to Arkansas; S or SE movements were dense behind the front, but *also in many places ahead of the front*; in New England, ahead of an advancing warm front, migration was generally westward. On 2-3 October the front had advanced beyond the Atlantic and Gulf coasts; S or SSW migration was dense over most of the area east and south of the high pressure center in Missouri. On 3-4 October the high had advanced to the Appalachians; dense migration was seen mainly in the Atlantic states to the east and south. On 4-5 October a new cold front had advanced to the same position from Lake Erie to Arkansas, but *there were no records of dense migrations behind it.*

The two observations italicized above are perhaps the most noteworthy in the paper. Lowery and Newman suggest that "no meteorological rationalizations . . . can be constructed to account for the fall-off of migration [on 4 October] in such areas as eastern Kansas and western Missouri, where similar wind flows of similar speeds were recorded on both nights. One reasonable assumption is that after three successive nights with heavy flights somewhere east of the Great Plains,

the eastern United States was largely drained of birds in a condition to migrate." This is not necessarily convincing, however, because their contention that the weather was similar on the two nights is not supported by data on other weather factors, such as temperature, cloud cover, humidity, or precipitation.

The effect of upper-air winds on migration is examined in detail. In general following winds favored migration, headwinds tended to inhibit it, and sidewinds tended to deflect it, but a number of exceptions were found. There was a tendency in many areas for the mean flight direction to coincide with the direction of the wind, but Lowery and Newman cautiously point out that this can be interpreted either as conscious downwind drift or as the directional preferences of the birds concerned. Winds from the south or SW usually (but not always) suppressed migration, leading in most cases to confused movements in varying directions; there was little evidence of widespread reversals of orientation. There was no indication that high wind speeds as such deterred migration.

On the whole, therefore, the migration pattern appeared to be better correlated with high pressure systems than with cold fronts or with winds. Only two other weather factors were discussed: temperature was quickly dismissed (with a statement that a detailed study is contemplated), and atmospheric instability was found to be weakly correlated with migration (in contradiction to Raynor's hypothesis).

It is not derogatory to say that the contributions of this paper to the understanding of migration are largely negative. Extensive studies of migration are subject to peculiar difficulties, primarily those of assimilating large quantities of data which cannot be strictly compared. Even without strict comparison, this paper has presented many awkward facts and anomalies that must be considered in any intensive study undertaken in the future.—I. C. T. Nisbet.

4. Comparison of the Periods of Residency of some Migrant Birds Common to Japan and Malaya. H. Elliott McClure. 1965. *Misc. Reports Yamashina's Inst. Ornith. & Zool.*, **4**(3/4): 149-162. Fourteen migrant species that occur both in Japan and Malaya were counted in systematic weekly or twice-weekly tallies during 1950-1962. Population fluctuations of each species in each country are summarized in diagrammatic form. McClure does not comment on the results, but for many species there is a striking overlap in the periods of residency in the two countries.—I. C. T. Nisbet.

5. The Mathematical Representation of Migration. F. W. Preston. 1966. *Ecology*, **47**(3): 375-392. The first part of this paper discusses mathematical ways of summarizing the seasonal pattern of migration of a species through one observation point. A Gaussian distribution is often adequate, but a cosine-power distribution may fit better and has the advantage that spring and autumn movements can be combined into a single formula. Bimodal patterns can be detected by plotting on probability paper. The second part of this paper uses data from Pennsylvania to show that, for a wide variety of species, the midpoint between spring and autumn migrations falls in mid-July; early spring migrants tend to migrate late in autumn. Swallows are the main exception.

Both halves of the paper suffer from the crudeness of the data used; dozens of bird-banders must have better data in their files (which they should publish). The second half of the paper does not refer to more detailed discussions of the timing of migration, which data are available in the European literature.—I. C. T. Nisbet.

6. Collections of Migrating Birds at Michigan Television Towers. Larry D. Caldwell and George J. Wallace. 1966. *Jack-Pine Warbler*, **44** (3): 117-123. Reported here are summaries of kills at three towers in spring from 1962-64 and at seven towers in fall from 1959-64. The total number of victims picked up and listed in the table is 7026 individuals of 92 species. Families most affected were: vireos, 390 (257 of them Red-eyed Vireos); thrushes, 1572 (870 Swainson's, 613 Graycheeked) and wood warblers, 4549 (1063 Blackpolls, 628 Ovenbirds, 442 Magnolia Warblers with three other species ranging from 438 to 218). Proportions in the total kill were: vireos, 6 per cent; thrushes, 22 per cent; warblers, 65 per cent; and all other species 7 per cent. Is there nothing that can be done to lessen this frightening toll of some of our choicest birds?—Margaret M. Nice.

7. Migration across the Mediterranean Observed by Radar. M. B. Casement. 1966. *Ibis*, **108**(4): 461-491. Radar observations were made intermittently during 1961-1963 from an aircraft carrier in various parts of the Mediterranean Sea. Dense movements were seen across all parts of the Mediterranean except the central region (Ionian Sea), which the observer traversed twice; there was no evidence of a concentration at the Straits of Gibraltar (traversed twice) or the other short crossings. West of the Ionian Sea the predominant directions were NE in spring, SW in autumn; east of the Ionian Sea the predominant directions were NNW and SSE. Most echoes were observed at heights of 4,000-6,000 feet.

Casement summarizes his records in a map of the main directions of migration. Although broadly consistent with earlier observations (some of which are overlooked or inadequately quoted), this map is decidedly over-generalized, being based on observations on only 40 days. However, radar tracking from a moving ship is very laborious and time-consuming, and this is the most important single contribution to knowledge of migration through the area.—I. C. T. Nisbet.

8. The Navigation of Penguins. John T. Emlen and Richard L. Penney. 1966. *Sci. Amer.*, **215**(4): 104-113. In Antarctica the authors sought answers to navigational problems in Adelie Penguins, a flightless species that frequently locomotes long distances over a featureless landscape. By marking and releasing penguins far from the rookery, Drs. Emlen and Penney demonstrated that ". . . under clear skies our penguins characteristically selected and followed a straight line of travel . . ." and "when the sun was veiled by thin clouds . . . , the performance of the departing penguins become erratic. When heavy clouds obscured the sun, the birds were completely disoriented and their selection of departure directions became random." Thus it appears that these penguins not only are guided by the sun but also can compensate for changes in the sun's azimuthal position; hence the birds evidently possess a timing mechanism or biological clock.

All adults taken from the Cape Crozier rookery and released at different points many miles away generally escaped in a north-northeast direction. These observations and others led the authors to conclude that the penguins "homed" on food-rich waters and that by moving east of north the birds were compensating for the westerly coastal currents.

Here, then, is an interesting and novel approach to navigational problems in a specialized group of birds occupying a unique ecologic niche.—David W. Johnston.

POPULATION DYNAMICS

(See also 24, 25)

9. Densities of Birds in Alpine Heaths. Bengt Alm, Harry Myhrberg, Erik Nyholm and Sören Svensson. 1966. *Vår Fågelvärld*, **25:** 193-201. (In English.) This census, the second of a series, was conducted from 16 June to 5 July 1965 on two plots representing low and intermediate alpine zones. A total of eight Charadriiformes and six Passeriformes were recorded. Three tables give interspecific dominance values, nests found, and the 1964 figures compared with the 1965 results. Snow conditions most significantly influenced the fluctuations and activities of these birds.—Louise de K. Lawrence.

10. Bird Fauna of the Finnish Forests in Relation to Forest Succession. II. Antti Haapanen. 1966. *Ann. Zool. Fenn.*, **3**(3): 175-200. In this paper emphasis is placed on annual population variations in 1959-1963 and species favoring nine biotypes. Observations on population variations center about coniferous birds and deal with correlations between food supply and population size. "*Loxia curvirostra*, which is dependent on the spruce in spring, was found to change from spruce stands to pine stands. *Carduelis spinus* is dependent on spruce seed. When the pine seed begins to fall, part of the population shifts to pine stands, but because the whole population in the spring is at first dependent on the spruce seed crop, the density variations of the bird species largely follow the variations in the spruce seed crop."—David W. Johnston.

NIDIFICATION AND REPRODUCTION

(See also 22)

11. Incubation Periods of Some Subarctic Birds. Joseph R. Jehl, Jr. and D. T. Hussell. 1966. *Can. Field-Nat.*, **80**(3): 179-180. Data are given for 15 species at Churchill, Manitoba, eight of them shorebirds. Their incubation periods ranged between 19 and 25 days. For six species no previous records appear to have been published. Four of these are Limicolae, and the others are Bonaparte's Gull (*Larus philadelphia*), 24 days, and Smith's Longspur (*Calcarius pictus*), 11 1/2, 11 1/2, 12 days.—Margaret M. Nice.

12. The Behavior and Ecology of the South African Ostrich. E. G. Franz Sauer and Eleonore M. Sauer. 1966. *The Living Bird, Fifth Annual*: 45-75. Dr. and Mrs. Sauer spent two years studying *Struthios camelus* at different localities in "the wilderness of South West Africa." To observe the alert, shy birds the Sauers constructed blinds in imitation of termite mounds. The ostriches are highly adaptable and respond quickly to environmental changes. The mature cocks and hens confidently lead the social groups in familiar territory, but in unfamiliar country or where the water-hole is bare of animals, they sense danger and all stand crowded and watchful. A major hen may then give "a most significant display of 'sacrificing the socially lower ranking companion: ' . . . She will turn around and walk back to get behind one or several inexperienced immatures, utter muted threat calls, ram, kick, and push them to advance first and presumably 'spring the trap.' ". "Immatures, however, learn from repeated experience;" they may quickly turn around and speed away in the opposite direction. "This usually makes the whole group follow in 'blind terror.' "

Among large populations of mature birds, hens are usually three times as numerous as cocks; the chief mating bond consists of one major hen, two minor hens, and one cock. Hens come into breeding condition before the cocks; the major hen begins to make herself conspicuous, posturing before her mate, pecking and kicking other members of the flock and driving them off. The cock establishes his territory with booming cries; here he and his major hen perform symbolic nesting ceremonies in exaggerated fashion. Each of the three hens lays in the nest from four to eight eggs; the cock incubates from late afternoon until the following morning; then the major hen incubates during the rest of the day. Eggs hatch in 39-42 days; the chicks are led by both adults, which, in case of danger, put on a spectacular injury-feigning display.

This notable paper is illustrated with 33 informative photographs. The authors are working on a monograph of their findings, one which is certain to be a major contribution to our knowledge of this unique bird.—Margaret M. Nice.

13. Observations on Some Kenya Eagles. L. H. Brown. 1966. *Ibis*, **108**(4): 531-572. Here is another important paper by this authority on African eagles, a paper giving data on the breeding of six species. One pair of each of these nested on "Eagle Hill," 4.2 square miles in extent. Much information is given on each of these species. For instance, with the Crowned Eagle (*Stephanoaetus coronatus*) incubation takes 48-49 days, fledging 105-116 days, post-fledging care 330-350 days. "The elder of two young hatched invariably kills the younger . . . . Female adults are dangerously aggressive, especially during days 30-60 of the fledging period." The male feeds his incubating mate about once every 3.3 days, but after the young have hatched he brings prey about once every 1.7 days. The main prey is antelope, followed by hyrax. This is but a small sample of the wealth of biological and ecological information given on the six eagle species involved.—Margaret M. Nice.

14. Nesting of the Hudsonian Godwit at Churchill, Manitoba. Joseph A. Hagar. 1966. *The Living Bird, Fifth Annual*: 1-43. *Limosa haemastica* has been erroneously considered a rare and disappearing species. On the contrary it is a common nester in places in the tundra in central and subarctic Canada; in fall it migrates in large flocks down the west shores of Hudson Bay and James Bay and is not reported again until it reaches its wintering grounds in southern Argentina and Chile. Adults leave in late July, the juveniles a month later. All apparently

make the 3,000-mile flight nonstop—a truly extraordinary performance.

Mr. Hagar reports that the first nest of the species to be studied was found near Churchill in 1948. He made two trips to concentrate on this little-known bird: from 31 May to 31 July in 1962 and from 9 to 30 July in 1964. "Information in this paper on the nesting cycle is based on 14 nests with eggs, at least 30 broods of chicks, and upwards of 80 pairs of breeding adults." The males indulge in spectacular song-flights, particularly when incubation is in progress. The female incubates during the day, the male at night. Near hatching time the parents become very demonstrative; "the female comes straight for your head with a harsh heron-like squawk . . . . A moment later she is shrieking at the top of her voice," thereby exciting the neighbors of her own and four other species who add to the clamor. Incubation lasts 22-23 days. Thirty chicks hatched from 10 nests, a success of 83 per cent. The chicks develop very rapidly and are guarded by both parents for about ten days. This notable paper is illustrated with 10 photographs by the author and a fine painting of a newly-hatched chick by George Sutton.—Margaret M. Nice.

15. On the Egg-rolling Movement of the Arctic Tern. (Zur Eirollbewegung der Küstenseeschwalbe (*Sterna macrura* Naum.) Helge Klaus Körner. 1966. *Z. Tierpsychol.*, **23**(3): 315-323. (Summary in English.) Three series of experiments were carried out on the island of Norderoog; the results are shown in eight photographs, two tables, and a chart. "The greatest distance from which the terns returned an egg to the nest was 70cm, or 50cm when one egg remained in the nest. When two eggs were dislodged together, the tendency to brood the clutch outside of the nest was intensified at a distance of 35 cm."—Margaret M. Nice.

16. The Nesting and Behavior of Mockingbirds in Northern Lower Michigan. Curtis S. Adkisson. 1966. *Jack-Pine Warbler*, **44**(3): 102:116. Two nesting pairs of *Mimus polyglottos* were found in 1965 and 70.5 hours were spent in a blind at one of the nests. Each pair, isolated as it was from other members of its species, roamed over some 45 acres, in contrast to the maximum of 2.5 acres of a pair in Tennessee (Laskey, 1935). Both males had rich repertoires of imitations in their songs. Routines of incubation, brooding, and feeding young are shown in three tables. The vexed question of the function of "wing-flashing" is discussed; the author saw it only in connection with catching insects.—Margaret M. Nice.

17. Some Figures on the Breeding Biology of the European Nuthatch. (Einige Zahlen zur Brutbiologie des Kleibers (*Sitta europaea*)). Hans Löhrl. 1966. *Anz. orn. Ges. Bayern*, **7**: 717-722. This species readily takes to the provision of nest boxes. The clutch size of 80 broods in southwest Germany ranged between 5 and 9 eggs, averaging 7.1. From the 565 eggs laid, 445 young fledged—79 per cent success, a somewhat higher figure than the average of 66 per cent characteristic of other hole-nesters.—Margaret M. Nice.

18. Breeding of the Cattle Egret, (Bubulcus ibis). Kurt Kolar. 1966. *Avic. Mag.*, 72. The staff at Dr. Otto Koenig's *Biologische Station*, Wilhelminenberg, Vienna, have had marked success in breeding this interesting heron. "The Cattle Egret is the only species of heron able to breed in its first year. This fact is some explanation of their rapid spread over America and Australia." This species is a colonial breeder, the pairs stimulating one another. Some 30 to 40 birds nest each year at the institute; since 1952 74 eggs have been hatched there. Full details are supplied as to the food supplied to the birds.—Margaret M. Nice.

19. Age at Which Cattle Egrets First Breed. W. R. Siegfried. 1966. *Ostrich*, **37**(3): 198-199. Until now the age at which Cattle Egrets first breed has been largely a matter of speculation, based upon plumage characters. (See review No. **18**) In 1964 a number of juvenile egrets were leg-banded and color-marked for individual recognition in South Africa. Four of these birds were observed (two of them shot) breeding within a year, and they still had dyed feathers, showing that some Cattle Egrets retain elements of the juvenal plumage for at least one year.—David W. Johnston.

20. Birds Breeding on the Island Dynan in Southwestern Scania, an 11-year Study. (Häckfåglar på ön Dynan i sydvästra Skåne, en ll-årig observationsserie.) Sven Mathiasson. 1966. *Vår Fågelvärld*, **25:** 253-268. (English summary.) This small sandy island (276 x 96m) harbored a comparatively large number of birds of 20 species (4 Anseriformes, 13 Charadriiformes, and 3 Passeriformes). Black-headed Gulls (*Larus ridibundus*) dominated all the others, followed by Common Gulls (*L. canus*), Arctic Terns, (*Sterna paradisaea*), and latterly the Sandwich Terns (*S. sandvicensis*).

A notable increase in the numbers of breeding pairs occurred after 1960, especially in the species mentioned. This increase was related to the ousting from the surrounding islands of the Black-headed Gulls by the expansion into these areas of the Herring Gull (*Larus argentatus*). It is not clear whether or not the arrival on Dynan of the first breeding pair of Herring Gulls in 1964 (in 1966 increased to three) had anything to do with the marked population decline following the peak in 1965. Significantly, the sympatric tendencies based on adaptive behavior that allowed the gulls and the terns to coexist with little or no antagonism within this small area did not extend to the Herring Gulls, because their territoriality and their depredations on eggs and young prevented it.—Louise de K. Lawrence.

21. Observations on the Sexual Behavior of the Common Scoter on the Breeding Grounds, with Special Reference to Courting Parties. (Observationer rörande sjöorrens (*Melanitta nigra*) sexuella beteende på häckplatsen med speciellt avseende på lekgruppsbeteenden.) Sven-Axel Bengtsson. 1966. *Vår Fågelvärld*, **25:** 202-226. (English summary.) This study, conducted from May to July in the years 1960 through 1965 at Lake Myvatn in northeastern Iceland, is a significant contribution to the knowledge of pair formation in this species. Descriptions of movements and vocalizations are given and discussed. The behavior of the social group is an important component of pair formation. Three types of such gatherings are recognized: (1) the Normal Party involving one or a few unpaired females with a number of males; (2) the Roving Group, a gathering of males courting an already paired female; (3) the "Rape" Group when a female, unavailable for mating because she is not in breeding condition or incubating, is attacked by a number of males, sometimes with such violence that she is in danger of being drowned. The paired male establishes a portable defended territory around the female.

The inclination to use two- or three-letter abbreviations to designate the different movements seems to be highly overdone and certainly does not contribute to the readability of an otherwise interesting and fine study.—Louise de K. Lawrence.

LIFE HISTORY

(See also 47)

22. The Desert Sparrow in the Kara-Kums. O. V. Sopyev. 1965. *Ornitologiya*, **7:** 134-141. The Desert Sparrow of Asia (*Passer simplex*), dwelling in about the same severe conditions in the Kara-Kum desert of Turkmen, and at the same latitude as the American species of that common name (*Amphispiza bilineata*) and on about the opposite side of the earth, while classed in the Ploceidae instead of Fringillidae, has much the same coloration, even to the black patch on the foreneck and chest. Therefore data for possible comparison with the American species are significant. Observations were made in the Repetek area in the spring and summer seasons of 1959-1963.

The fortunes of 23 nests of this resident species were followed. Two nestings occur each year, the first clutches being found in late April and early May and the second clutches in late May and early June (the very latest, June 21). The nests are usually placed in shrubs at an average height of 2.85 m. and are somewhat spheroid thatched structures, always opening laterally toward the northeast. Often they are attached to the underside of larger birds' nests; nine were under crow nests, and seven were beneath Golden Eagle nests. Theoretically this is for protection from excess heat. There is no tendency to form colonies. Both sexes

work at nest-building, and it is the only Kara-Kum desert species that continues to add nesting material through the egg-laying and incubation periods until the hatching of the first young. As many as 57 additions of nest material per day were noted. It is suggested that this continued addition of new material is another adaptation against excess solar heat.

Both parents incubate and bring food to the young, the male contributing less time than the female. On a cooler day, (20-30°C) an average of 9 hrs., 30 min. was spent incubating; on warmer days (25-35°C.), 4 hrs. 45 min. and in an extreme case, near the end of the incubation period, (31-42.6°C), only 1 hr, 43 min. Incubation lasts 12-13 days. Measurements of 57 eggs averaged 13.2 X 18.7 mm.; average weight of 43 eggs was 1.8g. The eggs lose 21-22% of their weight during incubation. The average number in the first clutch is 5.5 eggs, in the second, 4.4. The time spent in the nest by the young is variable and undetermined. The temperature in the nest (30-40.6°) is more constant than that of the surrounding air (24.7-42.6°C). The total mortality of eggs and young is 43%.—Leon Kelso.

BEHAVIOR

(See also 12, 15, 16, 21, 42)

23. Effect of Experimental Color Marking on Pairing of Captive Mourning Doves. W. Reid Goforth and Thomas S. Baskett. 1965. *J. Wildl. Mgt.*, **29**(3). 543-553. Experiments with penned *Zenaidura macroura* showed that, during a pair's first attempt at nesting in a season, marking the female's head with a yellow plastic tape broke up the pair. Firmly established pair-bonds (following a successful nesting) were not disturbed by marking females in this manner. Green, white or red headmarks on the females were ignored by their mates. Females paid no attention to yellow head marks on their mates. The authors are unable to suggest any explanation for this aversion by the males. Eight tables and eight charts illustrate the number of perch coos given in an hour by various males during different experiments.—Margaret M. Nice.

ECOLOGY

24. The Place of Ecology in Science and Affairs. H. N. Southern. 1965. *Proc. New Zealand Ecol. Soc.*, **12**: 1-10. It was Charles Elton's *Animal Ecology* (1937) that really opened up new horizons for the animal ecologist, as shown by the quantitative surveys by English ornithologists that were stimulated by this book—"the index to the heron population, the surveys of heathland and woodland bird communities, organized by the initiative of E. M. Nicholson, David Lack and others." After pointing out that "one of the most highly productive of terrestrial ecosystems in terms of animal flesh . . . is the East African savanna [where] recent estimates put the standing crop of these ['big game'] animals in one locality at about 13,000 kg/km^2," the author continues: "But, if we compare the figure for one species of animal alone—namely man—in England and Wales, we find it soars to 18,000 kg/km^2. This is quite a lot of man and, indeed, as many of us believe, a dangerous lot of man. The world at this moment has far more energy fixed in the form of human flesh than is found in natural ratios of animal: plant biomass or is healthy for the equilibrium of the world ecosystem." This is a sobering discussion of the perilous situation mankind is facing in this senseless over-population of the earth. I urge all those interested in this stimulating, important paper to write to Dr. Southern at the Bureau of Animal Population, Department of Field Studies, Oxford, England, requesting a reprint.—Margaret M. Nice.

25. Interspecific Competition and the Foraging Behavior of Plain-brown Woodcreepers. Edwin O. Willis. 1966. *Ecology*, **47**(4): 667-672. The observations and discussion in this paper revolve around competition between woodcreepers and antthrushes in tropical America. Generally speaking, the woodcreepers restrict the foraging-zone dimension of their habitat when inter-

specific competition is low. Upper zones in the habitat are left unoccupied at such times, a partial explanation of which is that ". . . available food supplies are frequently left by biological or physical irregularities in time or space, since exploitation of food always lags behind its appearance."—David W. Johnston.

PARASITES AND DISEASES

26. Two New Mallophaga Species from the Territory of the Fauna in Chile (Ket Uj Mallophaga Faj a Chilei Faunatartomany Teruleterol). Lajos SasvariSchäfer. 1964-1965. *Aquila,* **71-72:** 211-219. The author pictures and describes two new mallophagans as follows: *Menacanthus kevei* from *Turdus falcklandii* and *Ricinus capensis* from *Zonotrichia capensis.* Because these birds and their mallophagans were collected in 1960 at El Bolson, Argentina, the title of the paper is in error.—David W. Johnston.

CONSERVATION

(See 39)

MORPHOLOGY AND ANATOMY

(See also 31)

27. Functional Peculiarities and Evolution Factors of the Sound-Transmission System in Birds. V. D. Ilychev. 1966. *Zool. Zhurn.,* **45**(9): 1421-1435. (In Russian, with English summary). This is a functional-morphological study of the avian middle ear (ear drum, extracolumella, auditory ossicles) based on 43 species in 19 orders emphasizing correlations to ecological conditions. The main evolutionary trend is toward the generalized ear in passerines, Galliformes, and other groups which have well developed vocal intercommunication. The harriers (*Circus*), the owls, and other more or less nocturnal groups with better developed sound-localization have a distinctive, decidedly specialized middle ear, which shows parallel development in diverse orders, i.e. in Strigiformes, Caprimulgiformes and nocturnal Charadriiformes. A lever-like action in the, ossicles is more prominent with transition to the crepuscular and nocturnal habits and also in species emphasizing sound communication. Aquatic groups manifest poorer hearing, with less lever-like ossicle action, with an increase of ear drum area, of its external convexity, and eccentric attachment of extracolumella to it, with flattened synchondroses, enlargement and elongation of the clipeolus. With electrophysiological instrumentation the effect of surgical trauma of the middle ear on potentials of acoustic nuclei in the medulla elongata was shown; a cut through the extracolumellar process at its attachment to the tympanum resulted in a loss of response amplitude. Perforation of the upper absorbing area of the ear drum gave the same result. Diagrams show the main variations of middle ear structure in palaearctic bird species.—Leon Kelso.

28. Anatomic and Physiological Bases of Speciation in Birds. I. D. Strelnikov. 1966. *Zool. Zhurn.,* **45**(9): 1336-1354. (In Russian with English summary). The interrelationships among body size, relative brain size, oxygen consumption, heat production, motor activity and bird speciation are elaborated. For some species frequency of heart pulsation, by cardiograph, and motor activity, by electromagnetic counter, were determined. There is a much higher ratio of brain weight and metabolic rate to body weight in smaller birds particularly in Passeriformes. The number of species, or rate of speciation, rises as weight declines, in genera, families and orders. The plumage weight ratio also rises with reduction of size (see review No. **32**). There is thus a multiple parallelism, although not geometrically accurate, of increase of brain weight, metabolic rate, motor activity, and rate of speciation in relation to decline of body weight, indicating a mutual dependence in a variety of environmental conditions. Of birds in the Leningrad region, 78 species in 10 orders were analyzed.—Leon Kelso.

29. Autumn and Spring Weights of some Palaearctic Migrants in Central Nigeria. V. W. Smith. 1966. *Ibis*, **108**(4): 492-512. Some 700 birds of 19 Palaearctic species were weighed at Vom, 500 miles south of the edge of the Sahara Desert. The intervening zone is favorable for insectivorous migrants in autumn, but unfavorable in spring (at the end of the dry season), although Vom itself has spring rains. In all species for which data were adequate, spring weights were higher than autumn weights, the mean differences ranging from 21 to 47 per cent. Individual gains were higher.—I. C. T. Nisbet.

PHYSIOLOGY

30. Oxygen Consumption of a Flying Bird. Vance A. Tucker. 1966. *Science*, **154**(3745): 150-151. The author succeeded in the doubly difficult task of training budgerygahs to fly in a sealed wind tunnel, and of measuring their oxygen consumption while they flew. The results averaged about 42 ml. oxygen/hour per gram of body weight, a figure which is close to Lasiewski's measurement for a flying hummingbird, and much greater than most indirect estimates for migrating passerines. Oxygen consumption appeared to be inversely proportional to flight speed over a range of 19-32 km/hr.—I. C. T. Nisbet.

31. Physiological Correlates of Habitat Selection in Australian Cormorants. J. A. Thomson and N. W. Morley. 1966. *Emu*, **66**(1): 17-26. Habitat, food preferences, size of nasal glands, and adrenal glands were studied in five species of cormorants found in Australia. Four of the species (*Phalacrocorax carbo, P. sulcirostris, P. varius*, and *P. melanoieucos*) occur in both fresh-water and marine/estuarine habitats, whereas *P. fuscescens* is strictly marine/estuarine. All five species are chiefly piscivorous, but *P. melanoieucos* also eats many crustaceans especially in fresh-water situations.

Between the contrasting aquatic habitats in both *P. carbo* and *P. melanoieucos*, the average relative nasal gland weights are significantly different (smaller in fresh-water birds). In these two species evidently there is little if any movement of birds from fresh-water to marine/estuarine habitats or vice versa.

No significant correlation was found between relative sizes of adrenal and nasal glands. The authors suggest that ". . . those Cormorant species which can utilize either of these habitats must possess sufficient adrenal tissue to permit appropriate hormonal regulation of extrarenal excretion under normal conditions in either environment."—David W. Johnston.

PLUMAGES AND MOLTS

(See also 49)

32. On Plumage Quantity in Birds. Frantisek J. Turček. 1966. *Ekologia Polska—Seria A* (Komitet Ekologiczny—Polska Akademia Nauk), **XIV** (32): 617-634. (In English; a study aided by the Chapman Memorial Fund.) If anyone should wonder what the weight of a bird's plumage is, the answer is more than that of the liver, or the head, or usually more than any three internal organs combined. And another surprising fact is that the plumage of water birds, which theoretically should be proportionally the largest, is actually among the least in volume and weight.

Although thermoregulation, locomotion, and insulation against exterior factors would seem to be the primary functions of plumage, yet there are other features, biological and physiological (feather lipids, steroids, vitamins and waxes) that are of appreciable significance.

The purpose of this paper is to develop certain facts on the ratio of plumage weight to body weight (i.e. the weight of the bird as a whole, including plumage but without stomach content) and to discuss the physiological import of those facts. The subject material included the weights of 249 individual birds of 91 species, in 34 families (about 20 per cent of the world total of bird families recognized by Wetmore). Except for some contributions from collaborators the data were all taken by the author personally. Birds were weighed soon after collection, the stomach contents removed, the plumage plucked by hand, the bird without

stomach contents and plumage weighed again, and the plumage alone weighed to nearest 0.01 g. The ratio of plumage weight to total weight was calculated and the result rounded to the nearest integer. Only adult birds were used.

A ± 20 per cent variation of individual weight due to sex or season results in only 1-3 per cent variation in plumage weight, thus minimizing the effect of individual variation. The mean total weight of all individuals taken was 539; of their plumage, 36.4 g. A significant negative correlation was found between the logarithm of total weight and relative weight of plumage (coefficient of correlation of r = −0.795 ±0.02, at 0.01 probability level). The mean percentage of plumage weight to total body weight is M ± 3 SM = 5.97 to 6.63 per cent. Thus the heavier a bird species the smaller is the ratio of plumage weight to total weight. And conversely, the smaller the bird the higher the ratio of plumage to total weight. Curiously, as brought out by I. D. Strelnikov in a contemporary article (see review No. **28**) the smaller the bird species the higher the metabolic rate, a fact which should necessitate less instead of more plumage, unless plumage has a dynamic rather than a passive protective function. For each 1.0 per cent increase of total weight the plumage weight increases 0.95 per cent. The mean ratio of plumage weight for all species examined was 6.0 per cent; for smaller birds (2-100g) the mean was 7.1 per cent. An increase of 100 per cent in total weight means an increase of 95 per cent in plumage weight.

The growth of plumage as an organ shows a negative allometry in mature birds. During molt the total weight of feather pulp is about 25 per cent of total bird weight; the weight of the pulp of an individual growing feather is 3-4 times that of the feather.

According to the author the evolution of plumage in birds has halted at about an even level, in accordance with the Weber-Fechner law of diminishing returns. Any further evolution would raise the bird's entropy. Between families closely situated in the classification system there are differences in relative plumage weight of as much as 5 per cent, indicating a mosiac, rather than linear evolution. Evolutionary trends are strongly correlated with ecological conditions within the various taxa. Migrants have relatively less plumage mass while sedentary species have more than the average for birds as a whole. Aquatic birds show a decidedly lower ratio of plumage weight. To the author this indicates insufficient effectiveness of plumage as an insulator in the aquatic habitat. In a companion study, analyzing 83 birds of 47 species, it was found that the avian body is roughly 32 per cent dry matter and 68 percent other components. This paper is a most welcome contribution and may somewhat counteract the oft-repeated statement that the feather is dead and dry and of no consequence to the birds' physiology. There is a valuable bibliography of 46 titles.—Leon Kelso.

33. Black Little Egrets [Egretta g. garzetta (L.)] in Europe. G. Fabian and I. Sterbetz. 1964-65. *Aquila*, **71-72:** 109-112. Exceptionally rare in Europe are the "dark-phased" or "melanistic" Little Egrets. Herein the authors summarize occurrences of these birds, the first three being recorded between 1869 and 1888. After an interval of more than 50 years several other black individuals turned up between 1952 and 1962, and fortunately a few breeding records between black and white individuals are known. Based on these breeding records and known heredity of plumage colors in domestic fowl, the authors propose several genotypes for white and black *Egretta garzetta*. Whereas these genetic explanations might be correct, more breeding records are needed for substantiation.—David W. Johnston.

34. Notes on the Different Populations of the House Sparrow. (Váriaciós Tanulmányok a Házi Verében) A. Keve. 1964-65. *Aquila*, **71-72:** 39-65. This article, written in Hungarian and translated into English, has been intended by the author to answer the question, have the introduced sparrows undergone any alteration since their acclimatization in new localities? To answer the question he has studied temporal features of colonization and specimens from most of the world.

Discussions are grouped geographically—North America, South America, Australia and Oceania, and South Africa. The contemporary North American population, according to the author, "does not display essential deviations from the European one" insofar as wing-length and color are concerned. Some attention is given to conformity with Bergmann's and Gloger's "rules".—David W. Johnston.

35. Studies on the Feather Waxes of Birds. I. On the chemical composition of the wax in the free flowing secretion from the preen gland of domestic geese. Goran Odham. 1964. *Arkiv for Kemi,* **21**(5): 379-393. *idem.* II "of Peiping Ducks (*Anas platyrhynchos* L.)" **22**(5): 417-445. This series from Inst. of Medicine and Biochemistry, Univ. of Goteborg, Sweden, is the result of extremely detailed analyses by the most advanced methods and equipment, for which ornithological science should be grateful, but a question arises as to its integration with modern knowledge of feather physiology. Purporting to be a study of feather waxes, yet dealing with preen gland products, it is apparently assumed that preen gland waxes are spread to the feather notwithstanding that some birds have no preen gland, that in some it is non-functional, and that in some the waxes present on the feather could not all have come from the preen gland. The methods employed in these studies if transferred to the actual surface products of the feather would certainly reveal much of importance.—Leon Kelso.

36. Determination of Plumage Colours, Feather Pigments and Structures by means of Reflection Spectrophotometry. Jan Dyck. 1966. *Dansk Ornithologisk Forenings Tidsskrift,* **60**(2): 49-76. Those interested in objective methods for measuring colors of birds especially in systematic studies should be aware of this important article. Herein the author reviews the literature, experimental methods, relationships between absorption and reflection, plumage colors and reflection curves. Reflection curves are presented for a variety of birds that have "white pigmented plumage areas", blue feathers, iridescent colors, melanin, and carotenoids. One conclusion reached in the paper is that "it is possible to measure the diffuse reflection of birds and from this to calculate the values of hue, purity and lightness and to use these as a measure of the colour".—David W. Johnston.

ZOOGEOGRAPHY

(See also 6, 34, 44)

37. The Sibling Species and Some Problems of their Study as Applied to Ornithological Material. L. S. Stepanyan. 1966. *Zhurnal Obschei Biologii,* **27**(2): 233-243. Here the sibling-species concept is applied to some forms of the genus *Calandrella* Kaup in an attempt to establish their taxonomic status. *Calandrella rufescens* Vieillot and *C. chelensis* Swinhoe are regarded as distinct species as the result of an analysis of morphological characters, geographic distribution, and ecology. Conspecificity of forms within a species may be proven only by constancy of functionally important structural characters. In the sympatric zone of their range these species conform to the Gause rule: of biotopic separation. Notwithstanding much morphological similarity, the subject pair of species appear distinct, intergrades and hybrids being unknown. The isolation mechanism is obscure, but their distinctness is far more constant than in many other morphologically distinct species that readily hybridize. The greatest divergence is shown by their species pair in the sympatric zone; the allopatric populations show less divergence, particularly in coloration. This seems to hold true for sibling species in general. The sibling-species phenomenon involves genetic, systematic, ecological, ethological, and biogeographic aspects, and is of significance for studies of initial and advanced stages of speciation.—Leon Kelso.

38. The Occurrence and Distribution of the Oriole in Sweden 1944 to 1964. (Om sommargyllingens (*Oriolus oriolus*) förekomst och utbredning i Sverige 1944-1964.) Tore Ernholdt. 1966. *Vår Fågelvärld,* **25:** 227-252. (English summary.) Based on 101 records, this investigation shows that, although the Oriole breeds on the east side of the Baltic Sea as far north as central Finland, on the Scandinavian Peninsula it is a regular summer resident only in a small part of southernmost Scania. Accidental occurrences, however, are known northward along the coasts into central Sweden, even as far north as Lapland, and in a few cases nestings have occurred over one or two years, although never with any indication of bona fide colonization. These records must therefore be considered cases of prolonged migration, mostly by non-breeding birds presumably because no mates were available. Southward migration of Orioles has been recorded as early as June. The Oriole's rather specific habitat requirements might have a

bearing on the bird's failure to establish itself farther north on the Swedish side of the Baltic.—Louise de K. Lawrence.

39. A Revised Systematic List of the Bird Species of Turkey. (Liste systématique révisée des espèces d'Oiseaux de Turquie.) H. Kumerloeve. 1966. *Alauda*, **34**(3): 165-186. This list with its abbreviations indicating breeding and migration should be termed "preliminary" because so many records are questionable. The author states (p. 168): "as the total number of breeding species 262 or more must be acknowledged, and at least 384 species seem to be sure in Turkey." At another place in the paper we find that "the total number may be about 402 bird-species," the actual number found in the listing.

Of further value is the addendum: list of bird species being in danger in Turkey. A plea is given for the protection of the 57 species especially menaced in the country.—David W. Johnston.

FOOD

(See also 10, 13)

40. More on the Feeding of the Bank Swallow. O. M. Myasoedova. 1965. *Ornitologiya*, **7**: 481,482. This account attracts attention, not only for the varied, largely dipterous and hymenopterous, contents of 71 stomachs of *Riparia riparia* from the vicinity of the Dneiprov-Samar water reservoir, USSR, but for the purported examination of the food contents of the "sublingual pouches" in the same birds. Pouches such as these have been described for some species of Alcidae, Corvidae, and Fringillidae, but apparently they have not been noted in the previous studies of the comparatively well-known Bank Swallow. This strongly implies that closer examination for this feature in specimens of birds collected is desirable as a general ornithological practice in the future.—Leon Kelso.

BOOKS AND MONOGRAPHS

41. Titian Ramsay Peale. Jessie Poesch. 1961. *Memoirs American Philosophical Society*, **52.** 214 pp., 77 figs. Philadelphia, Pa. So much has been written on the members of the Charles Willson Peale family, the artists of the American Revolution, that it was inevitable that some attention should fall to that son who has many firsts or near-firsts on his record in American natural history, if given due credit. So utterly fragmented and scattered were the results and evidence of his life and work in form of unpublished journals, paintings of birds and mammals, and collected specimens, dispersed in various museums and institutions, that no adequate impression of him could register with readers or researchers in American natural history. Not only the numerous scattered notes in print in many places but also much additional material available only in the city of the family residence has been assembled for a unified whole, including an extensive and sympathetic account of his life. Many animal portraits, and even family photographs (T. R. P. was a pioneer in photography) are published for the first time; most if not all of the Long Expedition journals, and all of his journals from the U. S. Exploring (Wilkes) Expedition are deciphered, edited, and published herein. These latter have long been of necessity consulted for clarifying the characterization of various forms of birds and mammals whose typification rests on Peale specimens.

In brief, this collation is a "must" for any library seriously concerned with the history of American mammalogy or ornithology, early American art, anthropology, or ethnology, or even American history in general. Naturalists concerned with vertebrate zoology and ethnology of the equatorial parts of the world will find much of interest in this publication. This volume is an excellent example of book publishers' art, as well as a monument to the unexcelled devotion of its author and editor. "Not a giant of his time, his life and work nonetheless have a compelling interest. Perhaps his very failures make him worthy of study. He experienced both the joy and satisfaction of achievement as well as the bitterness of defeat; the account of his life illuminates the story of the stumbling, faltering development of natural science and art in nineteenth century America."—Leon Kelso.

42. Mechanisms of Animal Behavior. Peter R. Marler and William J. Hamilton III. 1966. John Wiley & Sons, Inc., New York. 771 pp., illustr. The title suggests that the authors, professors at Rockefeller University and at the University of California in Davis respectively, envisioned an approach to the physiology of animal behavior in writing "about the processes that determine when behavior will occur and what form it will take." The book is even more. Containing a nearly encyclopaedic terminology of ethology, as well as descriptions of methods and results of recent research, it is an extremely useful reference book for students in general ethology. But it should not be mistaken for an ethology textbook; the authors willfully omitted many topics and the selected ones are not presented in order to form a logical framework for a comprehensive course in ethology. There is no chapter, for example, on the social behavior of animals, yet all the fundamental mechanisms and rules underlying social behavior are thoroughly discussed. There is no chapter on phylogenetic lineages of behavior nor any comparative treatment of behavioral phenomena that traditionally characterize an ethological approach. Such treatment was simply not wanted by the authors and, therefore, the reader should not expect to find such information. However, each chapter provides substantial ethological reading in containing a solid compilation of facts as well as stimulating speculations on current ethological issues and research trends. Selected references allow the student to find his way to greater depth in the study of animal behavior.

As one reads through the book, a not quite sufficient treatment of foreign literature becomes evident and, partially as a result of this, essential historical aspects of the development of modern ethology and of recent research accomplishments are lacking. Alfred Kühn, to mention an example, is listed not once in any chapter on orientation, and otherwise his name is given only once, misspelled and without reference.

The book deserves acclaim and wide use on the advanced undergraduate and graduate student levels, as introductory reading, reference to current ethological literature and nomenclature, and for its excellent treatment and illustrations of research methods. It is written in simple enough terms to make it a stimulating guide and source book for anyone seriously interested in animal behavior. Needless to say, the behaviorists' great and continued interest in avian behavioral phenomena, such as flight, celestial navigation, activity rhythms, or social communication by visual and acoustic signals, makes this a most desirable book for ornithologists interested in the living bird.—E. G. Franz Sauer.

43. Fundamentals of Ornithology. J. Van Tyne and Andrew J. Berger. 1966. Science Editions, John Wiley & Sons, New York, N. Y. 624 pp. $2.95. Insofar as I am able to determine, this "Science Edition" is nearly an exact reprint of the original book published in 1959. The only apparent changes are a new cover design, a new address for Dr. Berger, and a few corrections in captions to illustrations and scientific names.

Ornithologists who felt that the price of $11.75 for the hard-backed 1959 edition was too high will welcome this unbelievably low price. Furthermore, the present "edition" is a paperback and is somewhat smaller in overall size than the 1959 edition. All things considered, the publisher should be commended for reprinting this scholarly, comprehensive book and making it available at such an economical price.—David W. Johnston.

44. Birds and Mammals of the Southern Taiga of Central Siberia. (Ptitsy i mlekopitayushchie yuzhnoi taigi srednel Sibiri.) N. F. Reimers. 1966. "Nauka" Publishing House, Moscow-Leningrad. 420 pp., 74 figures, 36 tables, 1 zoogeographic map in color, bibliography of 466 titles. 2 roubles, 10 kopecks (about $3.80 U. S.). Rarely if ever has a combined account of the birds and mammals of an area gone beyond the expectations and requirements of an annotated list than has this well-printed, hard cover book. It is the result of five years of exploratory work, with supplemental investigations lasting 12 years (1950-1963), conducted by the author for the Institute of Geography of Siberia and the Far East, Siberian Division of the USSR Academy of Sciences. The author, a resident of Siberia, has published previously on taiga life at popular, popular-science, and technical levels and is one of the most able expositors of it, particularly on the ecological effects of forest fires, the forest renewal role of the Nutcracker, and the depredations of the Siberian pine moth.

Not since the monograph of Taczanowski in 1893 has there been a comprehensive faunistic work on Central Siberia. The author defines the purpose of this book: to elucidate the faunistic conditions of only the forest biocenoses of South Central Siberia, with more attention to the hitherto less well-known non-commercial species (the sable, muskrat and mink are the subjects of new books almost every year); to evaluate the results in light of their practical significance to humanity. The area covered includes nature's great reservoir of the life of past ages, Lake Baikal, now the center of concern to many Russian biologists because of the threat of polluting its waters by waste from proposed factories.

The author proceeds first to present his own system of ecogeographic typology for all Siberia, defining therein eight zoological formations subdivided into 58 territorial variants. Then he presents his system of major zoogeographic divisions for all Siberia with a large map in color. There follows a discussion of the biogeographic features of the taiga of the subject area, with a description of his original and ingenious pattern for mapping the population density of individual species. The annotated account of 263 species of birds and 68 mammals emphasizes distributional and life history notes for the less known species, with special attention to their ectoparasites and possible roles as disease vectors. Specimens of about 2200 birds and 11,500 mammals were available for this study. In another chapter there are data and discussions of the effects of human disturbance on the taiga and its birds and mammals; of the value of these taiga animals as a food supply for valuable fur-bearers; the disruption of forests as uncovering natural nidi for disease infection; the effect of vertebrates on forest renewal (elaborated previously in the author's papers on the Nutcracker); and vertebrates as enemies of agriculture.

The book closes with a forthright concluding statement: due to human activity the "dark-conifer" (cedar-pine, spruce and fir) taiga is disappearing from southern Siberia and is being replaced by light or Scotch pine forests (taiga composition is about 36 per cent Scotch pine, 22.6 larch, 20.4 birch, 7.8 spruce, 7.2 cedar-pine, 3.2 aspen, and 2.8 fir); that "nature" is not a good-natured lender, but rather, a harsh creditor; that the original state of nature cannot be restored by a system of reserves or propagation and reacclimatization of disappearing species. "Siberia does not face a Sahara desert-like fate, but its transformation into an economic (biological) desert or semidesert is quite likely." "Humanity is more powerful than nature, but not necessarily wiser." All in all this is a very outstanding book and one of the most original of its kind in the present day.—Leon Kelso.

45. Environment of the Cape Thompson Region, Alaska. 1966. Norman J. Wilimovsky (editor) and John N. Wolfe (associate editor). U. S. Atomic Energy Commission, Div. of Technical Information; available as PNE-481 from Clearinghouse for Federal Scientific and Technical Information, National Bureau of Standards, Springfield, Va. 1250 pp. $9.25. Early in 1958 the AEC authorized environmental studies of a remote Alaskan area (Cape Thompson) preliminary to an experimental harbor excavation to be called Project Chariot. For the next several years teams of scientific investigators (geologists, anthropologists, botanists, zoologists) swarmed over the area, chiefly during the summer months, gathering as much information as possible in their chosen fields. The present tome summarizes their findings in 42 chapters, these being grouped into sections on physical features, bioenvironment, people, and radioactivity.

Attention is called here to the two important chapters dealing with birds., For three years a team of investigators from the University of Alaska dwelled (literally) with seabird colonies on the Cape Thompson cliffs, these studies being summarized here by L. G. Swartz. Some 400,000 seabirds of nine species regularly occupied these cliffs, the most abundant birds being the Thick-billed and Common murres. The chapter contains (1) phenologies of the most important species, (2) breeding biology, (3) avian contributions to the trophic structure of the ecosystem, and (4) nutritional data. The latter might be summarized as follows: "nutrition for the sea-cliff colonies is drawn principally from the sea and is calculated to be about 13,000 metric tons wet biomass per breeding season." Doubtless this chapter represents a significant contribution to studies on breeding biologies of colonial birds.

The second chapter, "Avifaunal Investigations," was prepared by F. S. L. Williamson, Max C. Thompson, and John Q. Hines. It represents the most intensive published investigation on terrestrial arctic avifauna and as such will be extremely valuable to ornithologists and ecologists with an interest in the Arctic. Investigations were planned to determine species composition, ecological distribution, density, productivity, and seasonal movements of birds at Cape Thompson. Because the paper is packed with so many valuable data presented partly in tabular form and partly in well-expressed observations and explanations, a quotation of its resumé (p. 437) is in order here.

"One hundred and twenty species were recorded, and evidence of breeding was obtained for 65 of these. Twelve ecological formations based on characteristics and vegetation and physical features of the environment were used to analyze the distribution of birds. The density of breeding birds ranged from a low of 24 pairs per 100 acres in marshy *Carex* meadows to 194 pairs per 100 acres in riparian willows. The densities in open habitats were not unlike those observed in similar situations in temperate climates. Nest success of altricial birds building open nests was 43%, only slightly less than the 49% success recorded from a large number of studies at lower latitudes. Birds nesting in the Cape Thompson area rear a single brood each year; a few of the common redpolls attempt a second nesting Passerine birds have larger clutches than the same or related species in temperate areas, and this compensates to some extent for the failure of these species to produce a second brood Birds arrive suddenly in spring, and many species are already paired when they arrive. The onset of nesting is rapid, and considerable synchrony is manifest in the breeding and molt programs."

It is my understanding that reprints of these chapters will not be available. This is extremely unfortunate because all the chapters contain data that should be widely disseminated.—David W. Johnston.

46. Birds in Our Lives. Alfred Stefferud, editor. 1966. Department of the Interior, Fish and Wildlife Service, Washington, D. C. Obtainable from Supt. of Documents, Washington, D. C. 560 pp.; illustrated. $9.00. Two lines of an old rhyme about the sovereigns of England are applicable with changed tenses to the 61 authors of this book: "Some are good and some are bad but most of them are in-betweens." Most of the 54 separate articles grouped into nine chapters are also in-betweens, neither very good nor very bad. Forty-one of the authors were or are federal government employees, 28 quite logically from the Bureau of Sport Fisheries and Wildlife, as is the artist, Bob Hines. The others range from Roger Tory Peterson, Olin Sewall Pettingille, Jr., and Ernst Mayr, whose three articles form the first chapter "In Perspective", through Audubon Society employees and members, museum curators, university people, and journalists, to Barbara Vayo, public relations consultant to a bird food company. The last named does a very fine job for her company, but not for "Birds in the Home," her subject. Her statement that "the canary is now a naturalized, firmly established resident" of the United States is a blatant absurdity.

The editor of this massive undertaking and the managing editor, Arnold L. Nelson, should be heartily congratulated on combining in any order at all such a heterogeneous collection of authors and subjects. The book is designed to inform readers of the influence of birds on their lives. This it will do very well, and it will not often misinform them. It will also show them where and how taxpayers' money is spent by the Bureau of Sport Fisheries and Wildlife and various other federal agencies.

After a simple foreword by Secretary of Interior Stewart Udall on the "Web of Life" and a short preface and list of acknowledgments by the editors, *Birds in Our Lives* proceeds to subjects such as fine arts, philately, photography, folklore, feather usage (fans and folderols), flight, flying fatalities, flyways, falconry,fisheries, fire, firearms, feeders, farming, forestry, phonics, physiology and futurity, and also poetry, pigeoneers, poultrymen, poisoning, pesticides, pollution, punchcard information, and psittacosis. A surprising omission is archery and the large group of bow-hunting buffs whose arrows have been fletched with the feathers of birds from time immemorial. Although archers might be disappointed to find their hobby missing from *Birds in Our Lives*, they and all readers will find a revelation in many aspects of birds in other peoples' lives even to the well informed.

Outstanding in this book of many authors is an essay by Roland C. Clement entitled "Mark What You Leave." I would like to see this made "required reading" for every high-school student in the United States, read into the Congressional Record, and particularly made prescribed reading for the Corps of Army Engineers.

Outstanding expositions are "To See. To Record" by Allan D. Cruickshank; "Birds and Bugs" by P. B. Dowden and R. T. Mitchell; "To Fly Like a Bird" by Clarence D. Cone, Jr.; "Where Do They Go?" by Allen J. Duvall; "Birds and Our Health" by Carlton M. Herman; "Birds and Pesticides" by Joseph J. Hickey; "We Are Warned" by R. E. Johnson; "Deathtraps in the Flyways" by John Vosburgh; "Amid Brick and Asphalt" by Irston R. Barnes; a delightful essay on "Sunday at the Zoo" by William G. Conway; and "Before It Is Too Late" by John W. Aldrich who has packed a great deal of information about our recently extinct and endangered species into a limited space. A fine article on poultry by William E. Shaklee and an amusing article on pigeons by W. F. Hollander tell me more than I thought I wanted to know about these domestic species.

Birds in Our Lives has its complement of errors, typographical and factual, and some bad writing. Durward Allen of Purdue University received the Wildlife Society award twice, but awkward sentence structure and poor choice of words probably had nothing to do with that honor. A sentence (page 341) that I dislike particularly is: "The bird hobbyist and many other outdoor-minded people place a premium on the seeing value of hawks and owls."

In "Birds of the Bible," E. A. Sherman could have identified the birds of prey in *Genesis* 15 and should have given credit for the picture of Noah's Ark on page 60 to Anton Koberger, the artist who made the original woodcut for "Biblio Sacra Germanica," Nurenberg, 1483, instead of to the Boston Public Library, which happens to have a copy. Other omissions I noted were: Arthur Singer's name among modern bird artists in John Kieran's article; turkey and eagle superstitions in Will Barker's "Tales Once Told", and the "Nene" and Hawaii from "Symbols of States."

Factual errors appear with several inaccuracies in "Symbols of States" by Shirley Briggs. In the flicker story (page 120) she says "the Alabama soldiers of the Confederacy were known as "Yellow Hammers," the colors of their cavalry uniforms recalling this woodpeckers' striking plumage." It was not the color of the uniforms that gave the Alabamians their nickname (they wore the usual confederate gray), but the bits of yellow cloth a Huntsville company wore on their gray sleeves, collars, and coattails. Known jocularly as the "yellowhammer company," their nickname was applied later to all Alabama troops, and confederate veterans wore flicker feathers in their caps or lapels during reunions. Delaware's blue hen story is also slightly garbled. History credits Captain Caldwell, a Revolutionary War officer from Delaware, with insisting that no fighting cock could be truly game unless its mother was a blue hen. Mrs. Briggs says quite a lot about the Brown Pelican, Louisiana's state bird, but fails to mention its shocking present status there; she was probably unaware that presticides have practically extirpated it from Louisiana.

The high point of the section "Sports and Recreation" is the fine photograph on page 146 captioned "Brownie Scouts display bird feeders they made to parents and leaders." Whoever wrote it may be a fine field ornithologist, but his ignorance of scout groups will doubtless alienate the affection of the Cub Scouts in the picture and embarrass all the boy scouts and ex-scouts in America.

"Long, Long Ago" by Henry B. Collins contains an error that might have been eliminated if this anthropologist had had an ornithological collaborator or a more erudite editor. The range of the Dovekie in page 281 is grossly incorrect.

Walter W. Ristow will find a more acceptable derivation of the name "turkey" (page 69) in Webster's New International Dictionary, 2nd Edition, unabridged, whose authority was Glover M. Allen.

In "Answers to Conflicts" a number of the writers use the word "control" as a synonym for "kill." This does not make a disagreeable subject any pleasanter.

In "Some Birds Like Fish" by some men who do too, J. E. King and R. L. Pyle, the authors, write of systematic shooting of herons, mergansers, and kingfishers to remove them or control them in the Maritime Provinces. This information will be a revelation to many readers. The authors describe the oriental cormorant fishing with enough inaccuracies to make me feel sure they have never seen it. A well-trained cormorant ejects the fish without having its neck rubbed,

and at the last fishing of the night the master has to remove the ring from each cormorant's neck, pack the throat with fish, and put the ring on top so it will swallow them. Cormorant fishing is no longer profitable commercially. That at Gifu in Japan is operated as a tourist attraction under the subsidy of the Imperial household.

The articles "Birds on Stamps" by W. F. Stanley of the State University College, New York and "Birds on Coins" by V. Clain-Stefanelli of the U. S. National Museum deserve special commendation. They will undoubtedly make bird-watchers out of stamp and coin collectors and vice versa.

All in all *Birds in Our Lives* is a very fine book, well illustrated and one of the best book-buys of the decade.—Elizabeth S. Austin.

47. The Whooping Crane / the bird that defies extinction. Faith McNulty. 1966. E. P. Dutton & Co., New York. 189 pages, illustrated. $4.95. The only fault I can find with this book is its blatantly anthropomorphic subtitle, probably foisted on it by its sales-minded publishers. A far more suitable one, "The thread remains very thin," was given it by the *New Yorker* magazine, which published much of the book's contents in slightly different form. This fits the circumstances much more accurately. As the book clearly and unmistakably points out, the Whooping Crane has not "defied" extinction, but is barely managing to survive, thanks largely to the efforts of the National Audubon Society, the Fish and Wildlife Service, and a handful of dedicated individuals, chief among them my friend, the late Robert Porter Allen, whom the author calls most fittingly the crane's "most ardent and learned champion."

While Mrs. McNulty does not claim to be an ornithologist, and so far as I know this is the only article on birds she has published, the book shows her to be a highly capable researcher, an excellent reporter, and a fine writer. She does not seem to have missed a single potential source of information, published or unpublished, and she reports a number of significant behind-the-scenes developments she could have learned only by interviewing those close to the events. Most revealing is her delineation of the activities of George Douglass, recently deceased director of the New Orleans zoo, whose maneuverings continually hampered efforts to propagate the species in captivity.

The book adds up to a fine contribution to ornithological literature, a clear and lucid exposition of the current status of the Whooping Crane and the species' recent history. The author's simple, straightforward prose maintains the drama and excitement of the case from start to finish, and thank goodness the end is not yet. The birds still have a chance, and efforts such as Mrs. McNulty's in arousing public opinion with such writing are certain to help. I wish every senator and congressman could be made to read it!—O. L. Austin, Jr.

48. Flight Mechanisms and the Orientation of Birds. (Mekhanizmy poleta i orientatsii ptits). S. E. Kleinenberg, editor. 1966. Published for the A. N. Severtsov Institute of Animal Morphology by "Nauka" Publishing House, Moscow. 224 pp. Price 1 ruble, 10 kopecks (about $2.00 U. S.). This book consists of an introduction by the editor and eight substantial and well-documented review articles by various authors each with an English summary.

In "Some considerations on bionic investigations in ornithology", by N. V. Kokshaiskii the science of "bionics" is defined as a scientific trend attempting to elucidate and apply principles of structure and function evolved by biological systems to the solution of problems in human technology. The use of aims, methods, and prospects of bionically-oriented studies in ornithology is exemplified in the problem of flapping-flight. The author suggests that the significance of this problem (other than ornithological) is not so much in creation of flapping-wing aircraft as in the basic physical concepts of "thrust" and "drag." The author states that birds (and all other animals that fly or swim) have long since developed some "thrust generating mechanism" the essential features of which are still unknown. Several possible factors are discussed.

In "Mechanization and automation of the birds' wing" by V. E. Yacobi, structural devices presumably effecting increase of lift (wing-tip slots, features of wing surface and of particular feathers) are discussed. Wing automation is manifested in adjustments to aerodynamic conditions as afforded by structure of certain feathers, location of their ligaments, and structure of boundary between calamus and rhachis.

"Surface structure of the avian wing and its possible relation to life" by T. L. Borodulina and K. N. Blagosklonov describes the wing-surface microrelief for a few species of various life modes (aquatic, aerial, and terrestrial), finding that such features vary not only in different species but in the same bird. It is suggested that air-flow over the wing coincides with direction of the furrows, the latter accelerating air flow on the upper surface while retarding it on the lower surface. With a crude artificial model it was found that the plates with the gull-type of surface micro-relief have more lifting power than smooth ones.

"Morpho-ecological adaptations for swift flight in birds" by V. E. Yacobi finds that some factors evidently of importance for accelerated flight are: wing beat frequency, wing structure and profile, wing load, and muscle weight. Certain aspects of swooping flight are discussed and a method for determining flight velocity from motion picture film is described. The features of adaptation for swift flight in representative species of anatids, shore birds, and passerines are described.

"On the Reynolds numbers in bird flight" by N. V. Kokshaiskii is rather beyond those not trained in mathematical aerodynamics of which the reviewer is one. The Reynolds number (Re) values for "the mean chord of the wing with regard for its flapping movement" were obtained by means of 16mm films shot in the field, finding that the "Re" varies from 2.10^4 for wrens, to 5.10^5 for cranes, values much lower than those for airplanes. It is suggested that the critical range for bird wings, if it exists at all, falls to lower Re values than that for aircraft wings.

"On the morphology of filoplumes" by T. L. Borodulina is sufficient in details and timeliness to justify the whole book. It is emphasized that avian plumage is an important and complex formation of a multiplicity of feather types which are in a constant state of action and which serve a variety of functions. Filoplumes are found to be more closely associated with the more mechanically active (e. g. flight) feathers and the innervation around their bases is closer and finer (as shown by excellent histological sections and figures) than for other feathers, strongly suggesting a sensory receptor function for them. Filoplumes are more numerous on the ventral side of the primaries and the dorsal side of the secondaries especially in more aerial birds. No definite muscle fiber connections to the filoplumes could be found. Encapsulated nerve endings (sensory bodies) and densely pigmented cells are also much more numerous around the filoplume follicles. The author agrees with Pfeffer (*Zool. Jahrb.*, Abt. 2, **72,** H. 1, 1952) that filoplumes are specialized plumage receptors but believes that their function goes beyond that of signalizing order or disorder in the plumage. The article is illustrated by 13 figures and 6 tables.

"On orientation of birds when migrating" by V. E. Yakobi reviews early and modern hypotheses on bird migration, stating that experimental investigations as well as radar studies show that birds can maintain a constant direction of flight, the clues used apparently being azimuths of sun or stars. Flock migration is advantageous in orientation. The author describes his own, developmental hypothesis of orientation as follows: orientation by ecological clues during post-breeding movements is the primary basis; this is replaced by orientation on geophysical factors (magnetic or gravitational fields, celestial bodies) as local orientation is replaced by that serving for distances. The bibliography of 74 titles is mostly English and American.

"Morphology and behavior (as exemplified by herons' feeding activities)" by N. V. Kokshaiskii, with a bibliography of 98 titles, is also very comprehensive of non-Russian literature. The principal structural adaptations of herons for food-taking (neck and bill adaptations, position of eyes and visual fields) are discussed. From examination of morphological features only, it appears that herons would take only readily visible, however agile, prey, but field observations and a survey of the literature show that their food selection is more general. This is achieved through diverse behavioral reactions (habits) that are supplemented and reinforced by various morphological adaptations, with advantageous social redistribution of functions among and between individual birds and even species. Certain habits provide for perception or flushing of prey (with special foot and wing movements, employed by intra- and interspecific "beating associations" of the heron species involved), and attraction of prey, and various methods for locating prey assemblages have evolved. The role individual habits play in the species' ecology, their probable modes of origin and the their effects on the evolu-

tion of structural features are discussed. All in all this book should be very satisfying to mechanically and mathematically inclined ornithologists.—Leon Kelso.

49. The Feathers and Plumage of Birds. A. A. Voitkevich. 1966. October House Inc. (134 East 22nd. St., New York, N. Y.; also published by Sidgwick and Jackson, 1 Tavistock Chambers, Bloomsbury Way, London WC1) 335pp. $7.80. This book is presented as a translation of Voitkevich's *Pero Ptitsy* (1962), reviewed in *Bird-Banding*, **37**: 219, 1966. Although handsomely published in hard cover and contributing substantially to a comparatively neglected field, the book warrants certain reservations. A cursory review finds that of the 104 figures in the original book, 30 have been omitted; of 16 paragraphs in the introduction, 5 are absent in the translation; a paragraph of 115 words on p. 11 is missing. Such renderings as "helm" feathers for tail feathers or rectrices and "barrel" for calamus, betray non-biological translators or editors or both. While this does not detract very substantially from the value of the work as a whole, one can but wonder how meek science should be to management by those who are non-scientific in training and tendencies.

What editing of translations can mean may be noted in the dedication, opposite p. *xvi* where straight translation would read: . . . "to the memory of . . . Evgenii Svetozarov, killed near Voronezh in the war against the fascist barbarians," This section is amended to read: "killed near Voronezh in the war against the Germans."—Leon Kelso.

NOTES AND NEWS

Prices for mist nets sold by NEBBA have been maintained at the October, 1962 level, despite another increase in parcel post rates in January. This increase bears more heavily on NEBBA than on the average shipper because of the light weight of the nets. Increases of about ten cents in each postal rate bracket amount to as much as a 25% increase.

An active netter in North Carolina comments: "My observations indicate that the chief cause of deterioration of the nets is light, not heat or moisture. Some nets in full shade in the woods have been in fair condition after being out continuously for a year. In the open in the summer the limit is under three months." This suggests that nets which are not in use daily will last longer if taken down between periods of use rather than furled, particularly in the open in summer. The balance between the extra labor of taking them down completely and the longer life of course depends on the individual situation. And in some situations, involving rough net lanes or numbers of animals, the life of the net is determined by damage more than by gradual deterioration. Incidentally, nets stored indoors may last longer if completely covered from the light, even though the ultra-violet portion of sunlight, outdoors, is a much more significant factor.

Details on NEBBA nets may be obtained from Mr. E. A. Bergstrom, 37 Old Brook Road, West Hartford, Conn. 06117. All orders for delivery in the U. S. should include the zip code, as this is now the basis for determining parcel post zone.

Dates to remember: May 20, 1967, spring field meeting of NEBBA at Pleasant Valley Wildlife Sanctuary, Lenox, Mass.; October 28, annual meeting of NEBBA at Drumlin Farm, Lincoln, Mass.

The Long Point Bird Observatory will be conducting a continuous program of observations and banding of migrant and resident birds from April 1 to October 31, 1967 at Long Point on the Ontario shore of Lake Erie. The Observatory is situated at the eastern end of the Point, about 18 miles from the nearest road. Last year about 15,000 birds of 150 species were banded at the Observatory. Most of the birds are trapped in the Observatory's five Heligoland Traps. Accommodation is available at the Observatory for a limited number of experienced observers or banders who are willing to assist in the work of the Observatory for periods of *one week or longer*. Accommodation includes bunks and cooking facilities, but visitors must bring their own sleeping bags, air mattresses and food. A fee is charged for accommodation and transportation on Long Point. Further details may be obtained from Mrs. J. Woodford, 76 Glentworth Road, Willowdale, Ontario, Canada.