

ORED (for example, on the right wing only, left wing only, belly, both wings, and so on). Please give us your name and address so that we may tell you where your heron came from. Your help will be greatly appreciated and will contribute to the success of this project.

Heron Project, Encephalitis Research Center, 4001 Tampa Bay Boulevard, Tampa, Florida 33614

NEST CARD PROGRAM

The North American Nest Card Program is winding up the 1965 nesting season, and many cards have already been returned. There are still many cards in the hands of the individual recorders, however, and these should be returned to us as quickly as they are completed. We are preparing the data for transferral onto IBM cards, and a large bulk of material is needed for the first run, to be started soon.

Regional Centers may determine for their members whether their cooperators should return the cards to the center first, in order to complete local records, or whether they may be sent directly to us as they are completed. Laboratory of Ornithology, 33 Sapsucker Woods Road, Ithaca, N. Y.

ATTENTION BANDERS OF ROYAL TERNS AND LAUGHING GULLS

From the Bird-Banding Lab I have received duplicates of the IBM cards for all recoveries of Royal Terns and Laughing Gulls, and am analyzing them with a view to writing papers on these species. Would anyone who prefers that I do *not* use his recoveries in a paper please notify me forthwith.—Jeremy J. Hatch, Department of Zoology, Duke University, Durham, North Carolina, 27706.

RECENT LITERATURE

BANDING

(See also 8, 9, 10)

1. **Report on Bird-ringing for 1963.** Robert Spencer. 1964. *British Birds*, 57 (ringing supplement): 525-596. This report, like its 26 predecessors, cannot be adequately summarized or reviewed. It is simply a lengthy listing of species and individuals banded along with recoveries. In 1963, 311 species and 435,925 individuals were banded, and there were 14,397 recoveries. All of these figures show significant increases over 1962. The very fine recoveries are legion; perhaps the most remarkable of these was a Knot which flew some 3,500 miles from England to Liberia within eight days.—David W. Johnston.

2. **A Method of Trapping European Swallows.** A. F. Hallett and A. R. Brown. 1961. *Ostrich*, 35 (4): 293-296. A nylon net, 4 x 30 ft. was carefully folded lengthwise and laid on the ground, pegged down along one side. Through the top of the net a thin rope was threaded and extended 25 ft. on either side of the net. Operators on either end of the rope waited for swallows to fly low over the ground. As a swallow approached, the net was lifted about three feet, then thrown over the bird as it hit the net, trapping the bird under the net. From 1958 to 1963, 2,042 swallows were caught in this fashion.—David W. Johnston.

MIGRATION

3. **Bioenergetics of Bird Migration.** V. R. Dolnik and T. I. Blumenthal, 1964. *Uspekhi Sovremennoi Biologii* (Progress in Modern Biology), 58(2, 5): 280-301. This is a review and summarizing paper in a series specializing in such; all the points covered could not be noted in a briefer review. Among the more important findings are: for small birds a very high and active metabolic level is characteristic; the main source of energy is fat; the glycogen reserve is insignificant; fat utilization as fuel is maintained at a low respiration coefficient during

migration (0.65-0.80). The metabolism of small birds at rest fluctuates per various authors' data between 3.0-7.0 kcal/g, being elevated several fold by various forms of activity. The general metabolic level herein cannot be represented by the algebraic sum of the components (expenditure at rest, in feeding, flight, etc.); for example, with great expenditure of energy in flight, there is simultaneous economy of maintenance temperature owing to heat production by the active muscles, and the respiration normally associated with flight. The metabolic level varies seasonally; it is enhanced during summer, and postnuptial molt, and is at a minimum in winter, especially in small birds wintering in high latitudes, an adaptation for survival in that inclement season. The reduction of energy requirement during winter permits a greater number of individuals to feed in one area, without which the migration phenomenon would not have any practical advantage because winter ranges would not have sufficient food for resident and newly-arrived small birds. It is determined that existence energy is about twice higher than "resting energy," and "flight energy" exceeds "existence energy" 3-4 times. For migrants surmounting barriers (such as seas and deserts) greater energy reserves are required. The rate of fat accumulation in small birds is 0.1 to 0.5 g per day, the fat reserve storage requiring 7-10 days. During migration there is an established difference between the daily feeding cycles of fat and lean birds. The correlation between the fat reserve level and migration intensity is high (0.65-0.98). The authors note that the literature on this subject now embodies over a thousand titles, of which they cite 96 here.—Leon Kelso.

4. Migration and Wintering of Lapland Longspurs in Northwest Europe. (Laplandsvaerlingens (*Calcarius lapponicus lapponicus* (L.)) traek og overvintring i Nordvesteuropa.) Joes Ramsøe Jacobsen. 1963. *Dansk Ornith. Forenings Tidsskr.*, **57**: 181-220. (English summary.) The main Palaearctic wintering area of the Lapland Longspur is in central Asia, but small numbers also winter in northwest Europe. The climates of the two areas are very different: central Asia is cold and dry, northwest Europe warm and wet. The common factor appears to be lack of snow-cover, for the two areas are separated by a wide belt which is unsuitable for wintering because of deep snow.

This paper reviews the status of the species in Europe. It breeds commonly in north and central Scandinavia, but is only a scarce autumn migrant in Denmark and south Sweden; small numbers winter in north Germany, the Netherlands, and south England. The picture is confused because migrants from Greenland visit Europe in larger numbers, occurring in the British Isles and Norway, and probably also in Denmark. However the Greenland birds appear to pass on to unknown wintering areas, and there is good evidence that the birds wintering in Europe are from Palaearctic breeding grounds.

Records in northwest Europe have become much more frequent since 1952. Jacobsen interprets this as an increase in the number of birds wintering there, and suggests that this is part of a change in the habits of the species, which is establishing a new wintering area and a radically new direction of migration. However, it was not until after 1950 that the field-characters of this elusive species became widely known in Europe. The reviewer, having been among the first to report longspurs in numbers at that period, is skeptical that the new records represent anything more than the discovery of a long-established wintering population. The speculations in this paper would have been more convincing if they had included discussion of the status of the species in the New World, where its pattern of migration shows striking parallels with that in the Old World, but does not appear to be changing.—I. C. T. Nisbet.

5. Bird Migration at Knudshoved. (Fugletraekket ved Knudshoved.) Jørgen Rabøl. 1964. *Dansk Ornith. Forenings Tidsskr.*, **58**: 49-97. (English summary.) In detailed observation of diurnal migration on the east coast of the Danish island of Fyn, special attention was paid to the directions of migration and to the spread of individual directions about the mean. Rabøl suggests that the heading of an individual bird (after allowing for wind-drift) can be interpreted as the resultant of three directional tendencies (*Trackkraefter*, literally but unsatisfactorily translated as "migratory forces" in the English summary). These are: (1) a tendency to fly in the standard direction (southwest in autumn, northeast in spring, but occasionally reversed); (2) a tendency to follow the local topography; (3) a tendency to fly up-wind. By means of a detailed analysis, Rabøl shows that,

for the very low-flying birds that he studied, the up-wind tendency was usually much the strongest of the three. He "assumed that continuous transitions exist between migration at lower altitudes . . . and migration at higher altitudes, e.g. migration observed by radar where standard direction and wind-drift apparently are the only factors at work." The reviewer believes, however, that the influence of the wind on the altitude of flight is an important feature of the problem, which is therefore more complex than Rabøl's analysis allows. This is an interesting paper with original ideas, but they are difficult to follow in the English summary, and they do not seem to be clearly explained even in the Danish text.—I. C. T. Nisbet.

6. Orientation of Migratory Restlessness in *Zonotrichia*. L. Richard Mewaldt, Martin L. Morton, and Irene L. Brown. 1964. *Condor*, 66(5): 377-417. Forty-four birds of three species of *Zonotrichia* sparrows were studied during a period of four years. The birds were kept in circular Kramer-cages, arranged to record automatically the activity of each bird and its directional tendencies. This paper presents a detailed analysis of the behavior of the birds under natural skies with little or no disturbance. This was intended to be a preliminary to an experimental study of the factors affecting orientation; as such, it reveals the complexity of the behavior which must be understood before such a study can be started.

Except occasionally during early mornings in autumn, oriented activity was observed only during the hours of darkness. In spring the birds were more restless in the hours before midnight, but in autumn they were most restless between midnight and dawn. In spring the birds were usually well oriented towards the north; in autumn they oriented southwards more often than not, but orientation to the east, west, and north was also observed at times. The quality of orientation was generally worse in autumn than in spring, perhaps because the birds were tested in their normal wintering area. There was great variation in behavior between individuals: some birds exhibited strong nocturnal restlessness but did not orient their activity in any direction.

Orientation was affected by the moon and lights in the sky, and it appeared to be based on astronomical features. However, an important discovery was that the birds at times maintained their orientation by means of minor irregularities in their cages. When the cages were rotated the direction of the birds' orientation usually changed with the cage, and often did not return to the original compass direction for several nights.

This is an important paper which should be read in detail by anyone who wishes to conduct orientation experiments with caged birds, or to evaluate the experiments of others.—I. C. T. Nisbet.

POPULATION DYNAMICS

(See also 24, 27)

7. Reproductive Success of Birds in a Deciduous Habitat. Val Nolan, Jr. 1963. *Ecology*, 44(2): 305-313. A remarkably thorough investigation (totalling 611 hours) of the nesting of birds on some 90 acres at Bloomington, Indiana on every day but one from April 18 to September 21, 1961. To avoid the sampling errors of many studies on success of open nesters, as pointed out by Harold Mayfield (*The Kirtland's Warbler*, 1960; *Wilson Bull.*, 73 (3): 256-261. 1961), Dr. Nolan followed the whole reproductive history of 97 nests from before the start of laying and of 73 nests before the start of incubation. The success of these nests, ranging from one to 55 examples of 11 species, varied between 10 and 100% and averaged 21.2%. "The 170 nests contained 598 eggs, of which 17.6% yielded young that left the nest." Success increased steadily as the season progressed; the percentage of "probability of nest success" being .08, .13, .25, and .41 for the four periods April-May, June, July, August-September. Failures were mostly due to predation, 118 of the 134 unsuccessful nests having been lost in this way. Dr. Nolan suspects snakes and chipmunks as probably responsible for many of these failures. Not one of the 25 Brown-headed Cowbird (*Molothrus ater*) eggs produced young.

Mr. Mayfield claims that in studying open nests the usual method of including

all nests found, regardless of the stage to which they have progressed, gives too high a percentage of success, as many nests not found have already failed. Dr. Nolan's results are decidedly lower than those usually reported for open-nesting passerines.—M. M. Nice.

8. **The Tree Sparrow as Potential Carrier of Infections.** (Der Feldsperling (*Passer m. montanus* L.) als potentieller Ueberträger von Krankheitserregern.) Jan Pinowski, 1964. *Schriftenreihe der Landesstelle für Naturschutz und Landschaftspflege in Nordrhein-Westfalen*, 1: 109-114. Eight breeding colonies of *Passer m. montanus* were established near Warsaw, 4 km from one another, by the erection of 475 nest boxes. From January 1960 until 25 November 1963 5,855 Tree Sparrows were ringed, the birds from each colony receiving a distinctive color ring. The adults spent their entire lives in their particular colony. The young, however, mingled freely with the young from the nearest colony, and occasionally with those from the colony 8 km distant, but not at all with those birds raised 12 km away. Dr. Pinowski refers to a number of papers that report diseases spread by Tree Sparrows.—M. M. Nice.

9. **Territory and Food of the Song Thrush.** P. W. Davies and D. W. Snow. 1963. *British Birds*, 58(5): 161-175. For three years a color-ringed population of *Turdus philomelos* was studied in the Oxford Botanic Garden and comparisons made with a woodland population nearby. Few males remained on their territories for more than two years, apparently due to death. Females disappeared within a year, presumably because of moving elsewhere. A detailed study was made of the food of the species, especially earthworms, fruit, and snails.—M. M. Nice.

10. **Reproduction and Mortality in a Natural Population of a Tropical Passerine, *Lagonisticta senegala*.** (Natalité et Mortalité dans une Population Naturelle d'un Passereau Tropical, le *Lagonisticta senegala*.) Marie-Yvonne Morel. 1964. *La Terre et la Vie*, No. 4: 436-451. (With English summary.) A total of 7,759 Senegal Fire-finches were banded at the Ornithological Station of Richard-Toll, Senegal from 1954 to 1964. A juvenal male and juvenal female raised two young in September; the parents then took different mates and the first male and his new mate raised four young in October, four young in December, and four in February. In 112 nests in 1963-64, 388 eggs were laid, 177 (45%) hatched and 111 young were fledged—28% of the original eggs—a low figure for a bird with an enclosed nest. Adult mortality is calculated at 70 to 75% a year. Two banded birds reached the age of four years and one seven years. Predators were numerous: genets, domestic cats, the Coucal (*Centropus s. senegalensis*), two hawks, and two snakes, whereas domestic chickens picked up newly fledged young.

The Fire-finch is parasitized by the weaver *Hypochera chalybeata* as shown in Table 4. In 63 nonparasitized nests averaging 3.5 eggs, 46% of the eggs hatched and 33% fledged, an average of 1.19 young per nest. In 49 parasitized nests averaging 3.3 of Fire-finch eggs, 46% of these hatched, but only 21% were fledged—0.73 young per nest. The weaver chick weighs 10 grams at fledging and the host young but 7 grams, so the latter chicks cannot compete successfully with the larger parasite.

A very interesting paper. It is to be hoped that it will be reported elsewhere in greater detail.—M. M. Nice.

NIDIFICATION AND REPRODUCTION

(See also 7, 10, 13, 14, 21)

11. **Observations on Nest Building and Brood Care of Ravens (*Corvus corax*) in Captivity.** (Beobachtungen über Nestbau und Brutpflege des Kollkraben (*Corvus corax*) in Gefangenschaft.) Eberhard Gwinner. 1965. *J. f. Ornith.*, 106(2): 145-178. (In German with English summary.) This is a fine contribution to extant knowledge on breeding Ravens. Five pairs were kept in large aviaries. Rather detailed observations are reported for courtship behavior, nest building,

incubation, and nestling activities. Among the interesting results of this study are the following—only the female incubates, incubation period was 18-19 days, young may be brooded by either parent until they are about 18 days old, insects comprise the principal food for the first two days, nests are defended against other ravens, and in hot weather the young are given water by the parents. An important function is assigned to the nest lining, for "at low ambient temperature the small nestlings are buried in the bottom of the nest."—David W. Johnston.

12. On the Nesting of the Himalayan Leucosticte in Tuva. D. I. Berman and G. V. Kolonin. 1963. *Ornitologiya*, 6: 268-271. A summary of three summers of brief field observations of *Leucosticte nemoricola* Hodgson, this is of interest as another discovery of food pouches in the genus, with the food brought to the young being predominantly vegetable. (Additional occurrence of paired food pouches in *Leucosticte* was reported by B. K. Stegmann, 1954. "On the Birds of the Upper Montane Zone of Zhalinsko Alatau." *Trudy Leningradskogo Obshchestva Ispovedovspitatelei* (Translations of the Leningrad Naturalists' Society), 72 (4): 269, 270, for *Leucosticte brandti brandti* Bonap. and *L. nemoricola altaica* Eversm.) The nests were located "several hundred meters apart," so, contrary to previous reports, the species is not colonial.—Leon Kelso.

LIFE HISTORY

13. Studies of Less Familiar Birds. 133, Long-tailed Skua. D. G. Bell. 1965. *British Birds*, 58(4): 139-145. *Stercorarius longicaudus* (Americans call it the Long-tailed Jaeger) is a rare bird both in its arctic nesting grounds and on migration. In the breeding season it depends largely on lemmings for food. In "seven instances peak numbers of Long-tails and full clutches coincided with lemming maxima (which occur about every four years), while in 25 cases no Long-tails at all nested in years of lemming minima." Both sexes incubate the eggs which hatch in about 23 days. Food, migration, and identification are discussed. Eight photographs are given, two showing light and dark Arctic (Parasitic) Skuas (*S. parasiticus*) as aids in distinguishing the two species.—M. M. Nice.

14. On the Biology of the Pamir Leucosticte (*Leucosticte arctoa pamirensis* Sevastyanov) in Pamir. R. L. Potapov. 1963. *Zoologicheskii Zhurnal* (Zoological Journal), 42(5): 716-727. This form is the most abundant resident bird in the Pamir highlands, frequenting alpine and subalpine meadows, where herbaceous seeds in various stages of ripening are its main food. It breeds only in the alpine zone at altitudes of 4,400 to 5,500 meters, and sometimes higher. Nesting begins in early July, the nests being placed beneath stones and in rock clefts. The normal clutch is four, less often three white eggs. Incubation is by females exclusively, they being fed by the males. Both sexes, during breeding season only, develop paired sublingual pouches (figured) for food transportation. Comparison is made with those described by A. H. Miller (*Condor*, 43(1): 72-73, 1941.) for *Leucosticte tephrocotis littoralis*, noting that in comparison with the American form the pouches have a common opening instead of individual sublingual openings, and that the food is more exclusively vegetable, almost entirely of seeds. The young depart the nest on the 15th day. The comparison is of moment to American ornithology in that our forms of the genus have been regarded as subspecies of *L. arctoa*. Although not colonial in nesting, the species associates in flocks the year round.—Leon Kelso.

15. The Biology of the Nutcracker (*Nucifraga caryocatactes macrorhynchos*) in Southern Yakutiya. A. A. Mezhenyi. 1964. *Zoologicheskii Zhurnal*, 43(11): 1679-1687. (In Russian with English summary). Research on the biology of the Nutcracker was part of the work carried on by the Yakut Affiliate of the Academy of Sciences, USSR, on the topic "Migration of the Yakut Squirrel and measures for maintaining its stock." This species was studied as a possible food competitor of the squirrel. The Nutcracker is a sedentary species, dwelling year to year in a given restricted area of the taiga; seeds of *Pinus sibirica* and *Pinus pumila* are its principal food. The bird gathers vast amounts of these

seeds for storage in a considerable variety of open and sheltered areas on the ground. For an average crop of pine seeds their harvesting requires one to two weeks. The storage accomplished during this time supplies the bird for fall, winter, spring, and the nestling-feeding period of the following summer. In order to secure ample food for a year the bird must make not less than 2,000 caches. The provisioning of these caches is performed in two stages: (1) a preliminary storage not far from the site where the pine seeds are harvested, (2) a final storage after the crop is harvested, the seeds being transported in the sublingual pouch over distances up to ten miles. Large seeds are the first to be extracted from the cones. Those seeds lost or unused by the birds sprout and grow and serve as a means of forest restoration and maintenance. A considerable proportion of the nutcracker caches is appropriated by rodents.

The author observes that the capacity to make caches and recover them is widespread in the Corvidae and that it is not extraordinary that this habit should be developed to an extreme in one member of the family. Its ability to locate and dig down to a cache under 80 cm. of snow in an open area seems almost miraculous. Probably, according to the author, a very acute visual sense combined with locomotor sensation type of memory accounts for this ability.

According to J. L. Brown (*Condor*, 65(2): 142. 1963) the Mexican, Scrub, Steller, and Blue jays store food in the ground, and Davis and Williams (*Wilson Bull.*, 76(1): 10. 1954) accept food storage as a characteristic of the Clark's Nutcracker. Nonetheless, the habit has not been worked out in field study for any corvid in this country in anything approaching the detail of the Russian and Scandinavian studies of the Eurasian species. (It has been the subject of studies by botanists, plant ecologists, and foresters as well as bird students.)—Leon Kelso.

BEHAVIOR

(See also 11, 38)

16. Sexual Imprinting in Ducks. (Sexuelle Prägung bei Anatiden.) Friedrich Schutz. 1965. *Z. f. Tierpsychol.*, 22(1): 50-103. (Summary in English.) Through a variety of carefully planned and executed experiments on 232 individuals of 10 different species (mostly Anatids) carried out at Konrad Lorenz' Institut at Seewiesen, Germany, Dr. Schutz has shown the basic differences between imprinting "the following-reaction (child-mother bond)" and the sexual bond or species-recognition. The sensitive period of the former lasts only a few hours after hatching; for the latter it occurs later and lasts much longer. The technique used for sexual imprinting was to leave the chick for one to three weeks with its own species and then place it with the imprinting species for the next five to six weeks. "Sexual imprinting lasts many years."

Male Mallards (*Anas platyrhynchos*) were readily imprinted on other members of the family Anatidae, but rarely on domestic chickens (Phasianiae) and not at all on coots (Fulicinae), although these last two species were easily imprinted on Anatids. Female Mallards "are almost incapable of becoming imprinted, as they act innately to the releasers of the male courtship dress." In the Chilean Teal (*Anas flavirostris*), however, "where the sexes are alike and inconspicuous, the females are just as easily imprinted as are the males." Five of these females, raised with Mallards, paired with males of this species, while two others courted males of both species. Four other females raised normally paired normally with their own species.

Most drake Mallards "which were raised with a hetero-specific partner (either sibling or mother) later paired, or attempted to pair, with a member of the species with which they were raised (22 out of 34)." "The remaining individuals paired exclusively with their own species." "A whole series of facts shows that sexual imprinting cannot be explained by habituation." It was found easier to imprint by using a foster mother than a foster sibling.

Some 20 photographs strikingly illustrate the behavior of the imprinted birds in their semi-wild situation which offered them great freedom of action. With this brilliant and painstaking research Dr. Schutz has made a major contribution to clarifying the problem of imprinting.—M. M. Nice.

17. The Triumph Ceremony of the Grey-lag Goose. (Das Triumphgeschrei der Graugans (*Anser anser*)). Helga Fischer. 1965. *Z. f. Tierpsychol.*, **22**(3): 247-304. (In German with English summary.) An extensive article discussing motivation of the triumph ceremony. This ceremony is a combination of two different elements, rolling and cackling. "The triumph ceremony plays an important role in maintaining the social structure of a grey-lag goose population. Cackling serves in keeping the family together, while rolling probably prevents attacks from occurring [*sic*] within the family and contributes to maintaining the rank order relationships."—David W. Johnston.

ECOLOGY

(See also 7, 27, 28, 37)

18. The Role of Animals in Baring and Soil Erosion on Karst-Land. F. J. Turček. 1965. *Acta Zoologica Academiae Scientiarum Hungaricae*, **11** (1-2): 205-215. A report on eroded regions in Czechoslovakia whose surface features are produced by the solvent action of water on limestone. A dismal report of eroded and impoverished land is presented. Calculations of the pressure exerted by each footprint of cattle, sheep and swine give a shocking picture of soil damage. Mammals—domestic and wild (mostly rodents)—are chiefly destructive to plant cover, whereas birds are mostly helpful through preying on the rodents and through seed dispersal. The author recommends "the elimination of grazing . . . protection of carnivores and birds of prey . . . and permanent afforestation."—M. M. Nice.

PARASITES AND DISEASES

(See 8)

CONSERVATION

(See also 28)

19. Organo-chlorine Residues in Some Raptor and Corvid Eggs from Northern Britain. D. A. Ratcliffe. 1965. *British Birds*, **58**(3): 65-81. "Analysis of eggs suggests that there is general contamination of the populations of the Buzzard *Buteo buteo*, Merlin *Falco columbarius*, Kestrel *F. tinnunculus*, Raven *Corvus corax*, Carrion Crow *C. c. corone*, Rook *C. frugilegus* and Magpie *Pica pica* in northern England and southern Scotland by residues of DDT, dieldrin, heptachlor and BHC." The raptors are more heavily contaminated than the corvids. Grain-feeding birds are suffering less than formerly due to a voluntary ban on pesticides used as cereal seed-dressings, but birds that eat sheep carrion are still suffering from dieldrin used in sheep dips.—M. M. Nice.

20. Radioactive Contamination in a Wild Bird Population. J. Van Den Hoek and J. A. Eygenraam. 1965. *Ardea*, **53**: 1-8. In 1962 and 1963, 10 first-year White-fronted Geese were captured in the Netherlands and tested for Strontium 90 (Sr^{90}). The average Sr^{90} level for birds hatched in 1961 was 10 pCi Sr^{90} /g. Ca, and for individuals hatched in 1962, 29 pCi Sr^{90} /g. Ca. The increase in 1962 was attributed to nuclear explosions in the autumn of 1961.—David W. Johnston.

MORPHOLOGY AND ANATOMY

(See also 12, 14, 23, 30, 37)

21. Growth Studies of the Megapodes (Alectura and Megapodius). (Zum Wachstum der Grossfusshühner (*Alectura und Megapodius*)). Ernst Sutter. 1965. *Orn. Beob.*, **62**(2): 43-60. (English summary.) Observations are reported on body weight, wing, and tarsal growth of young Brush-turkeys (*Alectura lathamii*) raised in the Basel Zoological Garden. Additional but limited growth data were available from some specimens of *Megapodius reinwardt* and some phasianids.

Logarithmic graphs of weight for *Alectura* indicated maximum growth rate between 5 and 15 days after hatching. Birds 200 days old were 80 per cent as heavy as their parents, and full adult weight was attained only in the second year of life. At hatching the precocial *Alectura* weigh 155-215 g, or 8-11 per cent of the adult body weight, and hatching weight of *Megapodius* was 10 per cent of adult weight (cf., 4-5 per cent in *Bonasa*, *Phasianus*, *Numida*, and *Pavo*).

The forearm and manus in *Alectura* reached full length in 110-120 days, the tarsus in 150. In the embryonic period wing and tarsus grew at nearly the same rate and had the same proportions as adults, but for a short time after hatching there is a higher relative growth of forearm and manus. "This means, that the size of the wing skeleton relative to the tarsus remains increased during the greater part of the postembryonic development." On the other hand, in newly hatched *Numida melagris* the forearm and manus were relatively short when compared with the tarsus.

Comparative growth studies between megapodes and phasianids are to be continued.—David W. Johnston.

PHYSIOLOGY

(See 3)

ZOOGEOGRAPHY

(See also 4, 28, 29, 32, 33, 36)

22. The Avifauna of Wrangel Island. S. M. Uspenskii, R. L. Beme, and A. G. Velizhanin. 1963. *Ornitologiya*, 6: 58-67. Avifaunal literature and exploration of this island are sparse. It is the locality of the greatest concentration of the Snow Goose, over 200,000 pairs, plus about as many nonbreeding individuals, as well as the final stronghold of that species in the Palearctic. This paper summarizes a survey of the status of the Snow Goose there by the authors in 1960. There are notes on the status of 28 species, with many data on the Fork-tailed Gull. These include evidence that when the subcutaneous fat layer is thick (2-3 mm.) there is more rosy tint on the breast. There are also numerous notes on the ecology and measurements of the Snow Goose. Two new records, supported by specimens, and incidentally extensions for the AOU Check-list ranges, are *Brachyramphus brevirostre* and *Passerculus sandwichensis*.—Leon Kelso.

SYSTEMATICS

(See also 33, 34, 36, 37)

23. An Electrophoretic Component from the Lens Proteins of the Passeriformes as an Important Taxonomic Characteristic. H. Gysels. 1965. *J. f. Ornith.*, 106(2): 208-217. (In English with German summary.) This paper is an effort to stress the importance of some avian lens proteins in taxonomy. Initially, here and in previous papers on the subject, Gysels has identified a Typical Song-bird Component (TSBC) in the agar-electropherograms of 84 species of Passeriformes representing "the most different families of the Oscines" (20 families in all). A fraction, at least similar to TSBC of Passeriformes, has been identified in a few representatives of the Strigiformes, Gruiformes, and Psittaciformes. Turning to other taxonomic characters (myology, osteology, etc.), the author discusses and diagrams some interordinal relationships, most of these suggested and defended by earlier investigators such as Gadow, Stresemann, Wetmore, and others.—David W. Johnston.

FOOD

(See also 9, 11, 12, 14, 15)

24. Feeding Ecology of the Black-faced Diach *Quelea quelea* in Nigeria. P. Ward. 1965. *Ibis*, 107: 173-214. This species is "notable for its highly gregarious behaviour, and also for being the most destructive and possibly the

most numerous bird in the world. *Quelea quelea* inhabits all the dry regions of Africa south of the Sahara and affects, to a varying degree, the economy of at least seventeen nations by its attacks on cereal crops—rice, millet, guinea-corn, and wheat." After an intensive, three-year study Prof. Ward presents a clear picture of the feeding habits of this weaver. He finds considerable mortality due to food shortage. Communal roosting appears to function as an "information centre" for sources of food supply; in the morning small hungry flocks follow the direct, "purposeful" flights of those birds heading for feeding grounds already known to them. A valuable paper.—M. M. Nice.

SONG

25. Song Variation in Maine Song Sparrows. Donald J. Borror. 1965. *Wilson Bull.*, 77(1): 5-37. A detailed analysis by means of a sound spectrograph of 7,212 tape-recorded songs of 120 individual *Melospiza melodia*; the recordings were made from June to August from 1953 to 1963. Dr. Borror found the songs incredibly complicated and elaborate. He concluded that the Song Sparrows he studied had local dialects, but a few had such individual "introductory phrase types" and "trill phrase types" that they "probably hatched and grew up somewhere outside the study area." Of the 120 birds 16 were recorded for two years, 8 for three years, 5 for four years and 1 for six years. Once developed, the song patterns remain constant throughout the Song Sparrow's life.—M. M. Nice.

26. The Llano Vibrates. (Vibra el Llano). Paul Schwartz. 1964. Instituto Neotropical; available in U. S. from Laboratory of Ornithology, 33 Sapsucker Woods Rd., Ithaca, N. Y. Nos. 2 and 3, high fidelity, 12-inch records, 33 1/3 r.p.m. Price \$7.75 each. Here are two new records of nature songs from Venezuela. The first number in this series, "Bird Songs from the Tropics," was reviewed in *Bird-Banding*, 35(3): 218-19, 1964. These two new records are somewhat more restrictive in the geographical area covered, because they contain sounds from the llano (plains) of Venezuela. Number 2 in the series has an English narration to the 70-odd bird songs, many of these being common widespread neotropical species. Interspersed among these songs are a few other sounds, such as the howler monkey, bees, and even a tropical storm. Number 3 has an entirely different approach because there is no narration, and the many songs are grouped into temporal and environmental scenes. Thus, on this last record one can listen to the sounds of the llano without the distraction of a human voice.

Both records are of the highest quality. A helpful guide is included so that the reader can gain some impressions of the area and will have at his finger-tips a list of all the species as they appear in order on the records. Unless the listener is thoroughly familiar with songs of the tropics, the list accompanying the record without narration will be invaluable.

To this reviewer especially attractive are the sounds as darkness sets in—limpkin, parauque, great horned owl, and common potoo. Nonetheless, both records and their entire complement of songs provide long hours of listening pleasure, and are a worthwhile investment.—David W. Johnston.

BOOKS AND MONOGRAPHS

27. Bird Life in Switzerland. II. The Nesting Birds in Their Habitats. (Schweizer Vogellenben. II. Die Brutvögel in ihren Lebensgebieten.) 2nd Ed. Hans Noll. 1963. Verlag Wepf & Co. Basel. 282pp. Price SF. 26. This second edition of a delightful book is 75 pages longer than its predecessor published in 1942 (see *Bird-Banding*, 19: 46, 1948, for review.) This is an admirable book for the bird watcher, describing the nesting birds according to their habitats: house and garden; fruit orchards; meadows and fields; hedges and copses; deciduous woods, coniferous woods; the Alps; streams; marsh and lake. In simple, genial style Dr. Noll tells of the different species, drawing on his own experience of many years, as well as quoting other observers and including data from banding.

The Crested Lark (*Galerida cristata*) according to the first edition followed the railroads; in 1815 it was a rare winter visitor; in 1859 it was first found breeding in

Switzerland; since 1912 it had become widely distributed throughout the country. In this edition, however, due to the paving of highways and disappearance of horse-drawn vehicles, it has become rare once more. The author rejoices over the finding of several of its nests in 1962 and 1963.

As to the White Stork (*Ciconia ciconia*) it had almost disappeared when Dr. Noll's first edition was published. In the 18th century there were as many as 20 to 30 nests in one village; in 1910 there were still 100 occupied nests in the country but in 1942 there were only ten. In this edition the story is told of the last brood of native storks raised in Switzerland; this took place in 1949. Since then, however, there have been attempts to bring back these birds. In 1948 an experimental enclosure was set up in Altreu near Solothern; it now contains 40 storks from Algiers, some of which are nesting. In 1955, 36 young storks were flown from Algiers and raised in Switzerland; one returned in 1958 and raised a brood. In 1959, 50 young storks from Algiers and the next year 106 were brought up in Switzerland in the hopes of re-establishing these well-loved birds.

A cheerful item concerns an addition to the Swiss bird list. The Collared Turtle Dove (*Streptopelia decaocto*) arrived in 1949; by 1960 it was established in many localities.

There are 16 plates of photographs and 38 excellent line drawings. The index supplies the scientific names of the birds discussed. This book can be highly recommended.—M. M. Nice.

28. Europe. A Natural History (The Continents We Live On). Kai Curry-Lindahl. 1964. Random House, Inc., New York. 299 pp., 264 illustr., including 108 in color; 12-1/2 x 9-1/2 inches. Price \$20.00. The author is Director of Natural History at the Nordiska Museum in Stockholm. As a renowned ornithologist, ecologist, and wildlife conservationist he has studied natural history in various parts of Europe, Asia, Africa, and the New World. His collaborators in this volume are the "top nature photographers of Europe" who have contributed a wealth of beautifully reproduced scenes of wildlife and nature portraits. Writing and illustration are of highest quality and present a substantial picture of glacial shaped Europe, the cradle of western civilization, as it stretches from the Mediterranean to the Arctic Ocean and from the Atlantic to the Caucasus.

Whereas Curry-Lindahl describes in popular terms the nature of Europe of today, his text is nevertheless of solid scholarly quality and reflects the author's intense knowledge of the geological and biological history of Europe. Twenty-five years of traveling on his home continent have given him an equally profound understanding of what has to be done to preserve the natural beauties of that continent and to restore many a ruined landscape for future generations; his call for action is heartfelt.

The author feels that his popular book cannot be thorough; it is nevertheless far from a mere show of some natural scenes of the Mediterranean, forest, alpine, grassland, tundra regions, and oceanic islands that are all covered in the book. One must agree that a personal selection of a limited number of places must speak for the whole continent. For one man's work the richness and number of examples are still amazing. And more so, the author has skillfully inserted in each chapter pertinent themes—biological successions, animal and plant adaptations, population dynamics (Norwegian lemmings), and ecological features of untouched European land as it still appears in a few delta regions, strips of coastline, and in the highest mountains. He traces historical records of extinct animals; once in historic times lions roamed the Mediterranean region. He refers to introduced animals and wonders, for example, about the origin and puzzling occurrence of the crested porcupine. He writes about conservation methods and success, the re-introduction and propagation of the European bison in the wilderness of the Bialowieza forest; this animal was once reduced to a handful of zoo specimens many of them not even thoroughbred. He pictures the musk ox long extinct in Europe but successfully introduced on Spitsbergen and in Norway.

Curry-Lindahl realistically confronts the reader also with depressing scenes in the beautiful Mediterranean countries where ruthless man has deforested mountains, where domesticated goats have ruined whole landscapes, where soils eroded, where the land—and man himself—are doomed to exhaustion.

Anyone concerned with wildlife anywhere will highly profit from the chapters on the still diverse but endangered European kingdoms of nature where animal and plant life is still abundant. The discussions and pictures of the Camargue in

the Rhone Delta or the wetlands of Las Marismas in Spain are to the delight of every ornithologist, and the author's interest in bird life shows up in every chapter. Curry-Lindahl writes about the mysterious movements of the Flamingo (*Phoenicopterus ruber*). He observes migrant birds in their wintering grounds and the jewels of European songbirds in their ecological niches. He reports first-hand on the rare birds. At Las Marismas he sighted unexpectedly one of the rarest ones in Europe, the Glossy Ibis (*Plegadis falcinellus*), guessing that its appearance so far west would involve westerly migration; this bird is otherwise found mainly in Asia. (Referent observed the Glossy Ibis in the Camargue giving support to this idea.)

Pictures of more of the rare animals are drawn—the lynx in one of its last strongholds in the Carpathians, the wild goat in the White Mountains of western Crete, the Monk Seal as the rarest Mediterranean animal. Again and again birds show up as the rarest ones in various habitats—the Whooper Swan (*Cygnus cygnus*) as the rarest breeding bird of Scandinavia, the few Bearded Vultures (*Gypaëtus barbatus*) in a remote place in the high sierras of Spain, the rapidly disappearing Great Bustard (*Otis tarda*) in the Hungarian puszta, to mention only a few. Beautiful photographs are shown of all of them.

Island life and nature from the Mediterranean to the polar zone are well described as are the towering mountains, remote coastal areas, erupting volcanos, hot springs, and geysers.

For those who already know parts of Europe or want to look up particular places, animals, and plants, a carefully prepared index permits quick reference, and bibliographies lead the reader to further information on every chapter.

Much is written today in popular books about the nature of all of the continents. This volume stands out among many with its reliability of scientific information presented in plain language by an enthusiastic and knowing author. Speaking to ornithologists who don't easily spend a twenty dollar bill for a book that is not all on birds: The book's contents of text and illustration pertain a great deal to birds, and with or without a trip to Europe in mind the book is worth its price. It is a most valid appreciation of Europe's natural treasures.—E. G. Franz Sauer.

29. The Bird Watcher's America. Edited by Olin Sewall Pettingill, Jr. 1965. McGraw-Hill, New York. 441 pp. Price \$7.50. In his Guides to Bird Finding East (1951) and West of the Mississippi (1953) Dr. Pettingill gave a most useful, detailed description of where to find birds in the 48 contiguous states of the United States. This book is different. Each of 46 notable localities in North America north of Mexico is dealt with by a naturalist who believes there is something very special about the birds in his favorite locality and who deeply loves the place and its wild life. The writers were told: "In 2,500 words, all an author can hope to do is to give the reader an impression—enough to stir his imagination and create in him an urge to go and see for himself."

Three of the authors unfortunately have died: Robert P. Allen wrote on "The Florida Keys; Past and Present," Paul I. Errington on "An Iowa Marsh," and Olaus J. Murie on "Arctic Alaska." Other distinguished chapters are by Roger Peterson on "The Pribilofs," Betty Cottrill on "Northern Spruce Bogs," Alfred Bailey on Colorado, Hugh Halliday on "Bonaventure Island," and George Sutton on "The Black Mesa Country of Oklahoma," to mention a few of those that especially delighted me.

A welcome feature of the book lies in the introductory vignettes written by the editor on the lives of the authors. John Henry Dick has contributed 50 fine line drawings of deserts, mountains, and cliffs as well as of characteristic birds in many of the chapters. A book to be greatly enjoyed at home and to lure one out into wild, strange places.—M. M. Nice.

30. Avian Anatomy. W. M. McLeod, D. M. Trotter, and J. W. Lumb. 1964. Burgess Publishing Co., Minneapolis, Minnesota. 143 pp. Price \$5.75. This is, unfortunately, another of those books with a misleading title, for as stated in the preface, it is "a text-book and dissection guide to be used in a systematic study of the anatomy of a chicken" especially for ". . . the poultry husbandry graduate student . . ." The first 87 pages are devoted to various body systems, this part being followed by some 31 pages of illustrations. The last part of the book is "a

guide to the dissection of the chicken," with adequate space provided for the student's own drawings or notes. The dissection procedure is regional in some instances and systematic in others.

The drawings, though possibly of use to this type of graduate student, are not only over-simplified, but, in some cases, poorly executed and badly labelled. For example, on the vertebrae, centra are nowhere labelled, and the authors consistently avoid conventional terminology (zygapophysis, innominate bone, proventriculus, uncinat process, odontoid process) throughout the illustrations and text material.—David W. Johnston.

31. Domestic Birds. Derek Goodwin. 1965. Museum Press Ltd. 26 Old Brompton Road, London S.W. 7 141pp. Price 15s. This is Volume VI of the excellent series "Instructions to Young Ornithologists" of which Volume II on "Bird Behaviour" has already been written by the same author and reviewed in *Bird-Banding*, **33**: 57, 1962. Derek Goodwin has always been fascinated by domestic birds and has published papers on the behavior of some of them. He applies "domestic" and "domesticated" "to birds (or other animals) that are regularly kept and bred by Man." In simple, straightforward language he discusses "Why people keep birds" . . . "Multiple or single origin" . . . "What fits a species for domestication?" To this last question he answers that it is a matter largely of ease of feeding the captives, for the majority of domesticated birds are seed-eaters from the start.

The following birds are discussed: the Goose, Chinese Goose, Domestic and Muscovy Ducks; Domestic Fowl or Chicken, Peafowl, Guineafowl (which no one seems to have studied), Japanese Quail, and Turkey; Barbary and Diamond Doves, Domestic Pigeon, and Budgerigar; Canary, Bengalese and Zebra Finches, and Java Sparrow; and Cormorant.

Mr. Goodwin gives suggestions as to the care of the various birds. He deplores the fads of the bird fanciers who make monsters out of many of the birds they breed and points out the cruelty of producing *pâté de fois gras* from miserable Geese. "A great deal," he writes, "has been written about the behaviour of the Domestic Fowl, although some of it has been based on Fowls kept under very unnatural conditions or is written in very esoteric language" (p. 57). The mother Hen's behavior is instinctive and she "like other mothers, is satisfying *her* needs by caring for her young" (p. 62).

"Domestic Birds" is illustrated with 22 line drawings by the author and by 16 photographic plates; there is an index as well as references to seven "useful" books. This is a book full of interest and information.—M. M. Nice.

32. Birds of the Black Hills. Olin Sewall Pettingill, Jr. and Nathaniel R. Whitney, Jr. 1965. Special publication number 1, Cornell Laboratory of Ornithology, Ithaca, N. Y. 139 pp. The Black Hills, an area of some 4,500 square miles embracing parts of South Dakota and Wyoming, are a unique, isolated part of the Rocky Mountains. The highest peaks reach heights of over 7,000 feet. In addition to these geographic features, the Black Hills are characterized by having three biomes within their boundaries—grassland, coniferous forest, and deciduous forest. No doubt, the combination of these and other features was partly responsible for the authors' interest in the birdlife of the region.

As stated in the preface, the aim of this paperback is "to summarize all reliable information on the occurrence, local status, distribution, habitats, nesting, and migration of birds in the Black Hills and to provide a taxonomic judgment of the existing bird populations in that area." To accomplish these goals, the authors begin with a description of the area, seasonal distribution of bird species, ecological distribution, history of ornithological investigations, and a list of the competent observers who made important contributions to the species accounts. Subspecific determinations of specimens were made by John P. Hubbard. Approximately 100 pages are devoted to the species accounts, 226 of them, each containing data on seasonal status, habitat, and where applicable, migration times, nesting, and subspecies. A section on literature cited, a map, and a gazetteer terminate the book.

This appears to be a well-done regional list, one which will certainly be invaluable to any ornithologist visiting the area.—David W. Johnston.

33. A Key to Birds of the USSR. (Opredelitel Ptits SSSR). N. A. Gladkov, G. P. Dementiev, E. S. Ptushenko, and A. M. Sudilovskaya. 1964. Published by the State Committee of the Ministers' Council USSR (Yaroslavl) for Advanced Schools (Vishnaya Shkola). 536 pp., 221 fig., 4 color plates. Price 2 rubles, 40 kopecks (about \$5.00). Until recently a convenient and up-to-date key for bird identification covering all the far-flung territories of USSR was unavailable to Soviet ornithologists. This volume, well-printed on slick paper and bound in hard cover, fills that need. It is a replacement, totally revised, for what is there familiarly known as "the handbook," or "Dementiev," or Dementiev's "handbook," (*Rukovodstvo Opredeleyu Ptits SSSR*, by Dementiev, Gladkov, Ptushenko, and Sudilovskaya. 1948), now a rarity with the recent increase in numbers of workers in the field.

The book contains a table of contents, an excellent diagram illustrating the Russian terms used in bird description, a chapter on general characteristics of birds, followed by the section of keys which is the bulk of the book. Each order is introduced with a treatment of that group from the worldwide standpoint, under the format of external characteristics, biological (actually ecological and ethological) characteristics, a paragraph on food and another on the main divisions of the order with their world distribution; then follows a key to the USSR families of the order (if more than one). Each family is introduced by a paragraph on its distinctive characters, followed by a key to the genera. Each genus has a key to species followed by the species treatment: a moderately detailed account of adult plumages, maximum-minimum folded wing-measurements, weights, juvenal plumage (main features only), and the distribution of the species. Nonresidents and accidental occurrences are allowed one paragraph stating where and when they occurred. With few exceptions for unusual occurrences, no subspecific names are given, and even the table of contents lists only common names for orders, families, and genera. An alphabetic index of Russian common names and another of Latin names conclude the book. The 221 text figures and 4 color plates, as for most Soviet bird books, are by N. N. Kondakov.

The authors maintain that their book is intended for identification of birds "in the hand," and for the use of students and amateurs. Therefore comments on classification may be withheld except for the authors' statement (p. 10) that they follow the system used in "Birds of the Soviet Union" but for sequence of families in the Passeriformes they adopt that used by Vaurie.—Leon Kelso.

34. Introductory Ornithology. George Grube. 1964. Wm. C. Brown, Dubuque, Iowa. ix + 294 pp., 108 figures. Price \$4.75. This small volume has the worthy objective of serving as both a text and laboratory manual. Unfortunately, it falls short of achieving either goal.

As a text the book comes close to giving an adequate introduction to a number of aspects of ornithology, often including at least brief mention of recent developments. There are some inaccuracies, however, and although most of the figures are good (many are by William Dilger), some are poor sketches.

As a laboratory guide the book leaves more to be desired. External features of birds are reasonably well covered. However, the key to orders and families which, with the exercise on the characteristics and distribution of bird families makes up over one third of the book, demands innumerable hours of work with study skins and copying from other sources. These are exercises not calculated to stimulate beginning students.

Grube's book, in short, is informative and is carefully prepared for the most part, but one does wonder if in the present advanced stage of the ramifying fields of ornithology there is real demand for a brief elementary text unless it can intrigue students by unusual excellence.—Frank Richardson.

35. A New Dictionary of Birds. Sir A. Landsborough Thomson (Editor). 1964. McGraw-Hill Book Co., New York. 928 pp., illustrated. Size, 8 x 10 1/2 inches. Price \$17.50. Ponderous in size, encyclopedic in breadth, and authoritative in depth, this compendium is doubtless one of the most important ornithological works of our day. It is a fine supplement to the extant bird books—field guides, textbooks, technical treatises. The book was intended to be one of three special enterprises undertaken to celebrate the Centenary of the British Ornithologists' Union in 1959, and it has been through the tireless, conscientious efforts of Sir Landsborough Thomson that the preparation of this tome was brought to

its successful culmination. At the outset, ornithologists will recall Professor Alfred Newton's *A Dictionary of Birds* (1896), but the present work necessarily differs in its coverage. Obviously ornithology today is both wider in scope and considerably deeper in many areas. For these reasons, and perhaps others, Sir Landsborough enlisted the aid of 174 contributors from 22 countries. In the front of the book there is a list of these contributors and the special sections which they wrote. Even so, he prepared 42 signed and numerous unsigned items throughout the book.

In his "Editorial Introduction" Sir Landsborough suggests (p. 33) that "this is a comprehensive work of reference on birds, and everything about them, on a worldwide basis." Although the "New Dictionary" might have been "intended for readers of several different types," it is purportedly "largely for the non-professional ornithologist." Certainly most of the entries in the "New Dictionary" are comprehensible to nonprofessionals, but only the specialist (and few of them) will ever need such terms as antepismatic, isoptesis, or miombo.

Entries in the "New Dictionary" vary greatly in length as well as depth. Some terms, such as capon, lumbar, and owl, are defined on a single line, whereas other entries, such as singing, hawk, and origin of birds, cover many pages. The longer entries are usually those prepared and initialled by specialists, the latter being wisely chosen. Who else but David Snow should write the sections on manakins and oil birds? Who else but Nikolaas Tinbergen on various behavioral topics?

More often than not, a given term will be cross-referenced, and frequently such cross-references are of real value. For example, when one looks up "hormones," he is directed to the extensive sections on "endocrine system" and "reproductive system." On the other hand, sometimes the cross-references lead to a frustrating cul-de-sac, especially to the "non-professional." Suppose one wants to know something about the common Indigo Bunting. He finds this merely listed under "indigo-bird," but is told to see "bunting." In this section, however, there is a scholarly discussion of the Emberizidae—much about towhees, finches, juncos, and sparrows, but no *Passerina cyanea*. Now the reader is directed to "cardinal-grosbeak," in which section he finally finds a mere statement that the Indigo Bunting is a North American member of the subfamily and the male is all blue.

Perhaps it is inevitable that errors appear in a work of this magnitude with its large number of contributors, but some of them are glaring. The attractive illustration (p. 315) of the Scissor-tailed Flycatcher is labelled "Eastern King-bird." Plate 12 b (facing p. 193) is that of a Fish Crow and not a Common Crow. Under the heading "crow," beginning on page 163, there is an extensive discussion of the family Corvidae. I personally felt that the sections on "metabolism," "photoperiodism," and "heat regulation" are not of the same high quality as other entries in the book. The section on metabolism is quite uneven and spotty, carrying the reader from cell metabolism to uric acid excretion to growth to muscle contraction. Furthermore, it is imprecise to state without qualification (p. 455) that "basal metabolism is roughly proportional to the surface area of a bird." Certainly (p. 361) "the body temperature of all species of birds is [NOT] about 106° F . . ."

An impression I gained is that the book is strongly slanted toward European ornithology and ornithologists. The term "ruby-throat" applies to certain *Luscinia*, but no mention is made of the common Ruby-throated Hummingbird of Eastern North America. The Great Horned Owl is called an "American Eagle Owl," but none of my colleagues use this appellation. Under "tit" the discussion is certainly slanted toward European species. There is no mention of the North American crested forms (titmice) for which there exist significant publications on breeding biology and hybridization (by Dixon, for example). And yet if one looks up "titmouse," he is referred to "tit." It would have helped, I believe, if some of the entries had been more cosmopolitan in scope.

The book is handsomely illustrated with 16 pages of colored plates, 32 pages of black-and-white half-tones, and numerous text figures, sketches, and diagrams. The illustrations are well chosen and wisely grouped to make certain points, such as plumage differences between adult and subadult birds, or characteristic African birds. Many of the entries are terminated by selected but useful references. There is, finally, a selective index of generic names, alphabetically arranged, and a measurement conversion table for British and metric systems.

One must, of course, stand in awe at this milestone in ornithological publications. It is difficult for me to envision any worthwhile library on birds where the "New Dictionary" is not a prominent member.—David W. Johnston.

36. The Birds of Arizona. Allan Phillips, Joe Marshall, and Gale Monson. 1964. University of Arizona Press, Tucson. xviii + 212 pp., illustrated. 9 by 12 inches. Price \$15.00. Arizona now joins the ranks of states with a "bird book," Brandt's *Arizona and Its Bird Life* (1951) hardly qualifying as such. My general impression is that this is a much more scholarly state book than most. It will certainly have more than local interest because of the interesting digressions that keep cropping up on such varied topics as evolution, conservation, museum technique and personalia. Moreover, Phillips' taxonomic remarks must be weighed by every systematic ornithologist.

A preface by Guy Emerson, who subsidized part of the work, and the introduction by Marshall explain that this is Phillips' book, "as told to Marshall and Monson." Phillips was responsible for most of the distributional matter, the classification, and many of the species accounts. Monson added data from southwestern Arizona and wrote the summarizing paragraph opening each species account; these are reprinted here, sometimes slightly amplified, from *A Checklist of the Birds of Arizona* (see *Bird-Banding*, **35**: 285, 1964, for a review). Phillips and Monson wrote a short summary of the destruction of habitats, illustrated by eight beautiful black-and-white photographs. Marshall wrote the rest, including "Phillips' Law," a restatement of Bergmann's rule on geographic and altitudinal variation in size of birds.

The treatment under each species includes a paragraph summarizing its occurrence and status in Arizona, a paragraph on the bird's aspect and general natural history, dates of migration and nesting where pertinent, and records and taxonomic notes on subspecies for geographically variable species. In the case of non-passerines represented by a single subspecies in the state the subspecific name is sometimes given but is omitted in some 50 cases. Species of hypothetical occurrence are given in square brackets in phylogenetic order.

The illustrations include 45 colored plates, comprising a frontispiece of the Masked Bobwhite by William J. Schaldach, 12 paintings by George Miksch Sutton, and 51 colored photographs by Eliot Porter. Sutton's plates, called field sketches because the backgrounds are unfinished, are uniformly beautiful and make the frontispiece seem ordinary. One-half of the species illustrated by Sutton are duplicated in Porter's photographs. Some of the latter had been published previously by the National Geographic Society although no acknowledgment is made. Porter's photographs have sharp focus, but their color reproduction is of extremely uneven quality, especially for the blues and grays. Particularly unfortunate are two photographs of Bell's Vireo on the same page: the birds in the top figure are blue, those in the bottom figure brown. The long tail and the type of nest suspension suggest that the upper figure represents the Gray Vireo (*V. vicinior*).

The 126 range maps are useful in giving spot records of occurrence of certain species and races, mostly passerines. It is, however, hard to see why the full page map of the (major) Arizona State Highway System was included, when a better one may be obtained from any gas station attendant. Of the first ten localities mentioned in the species accounts, all occur on free road maps, but only three major towns show on the published map.

The editing is irregular. The typography is pleasing and misprints few. Ordinal heads are given for only three of the 18 orders treated. The captions of the photographs of the female Pyrrhuloxia and Cardinal are reversed. The collation is sloppy: the range maps are numbered separately by family; only four of the eight black-and-white photographs are numbered; Sutton's plates are numbered, Porter's unnumbered; the index is unpaginated; there are two separate, unpaginated indices to the colored plates, inserted in the middle of the book. More serious is the omission of a bibliography, although a few references are given in the text.

Between 1914 and 1964 Arizona gained 102 species of birds. During six months in 1964 (from May 2, when our copy of the "Checklist" was mailed, to November 12, when our copy of the larger book was received), the state lost 11 full species. This loss resulted from sinking as subspecies the following A. O. U. species: Mexican Duck with the Mallard; Red-shafted and Gilded flickers with *Colaptes auratus*; Brown-throated and House wrens; Virginia's and Nashville warblers; Audubon's and Myrtle warblers; Black-headed and Rose-breasted grosbeaks; Lazuli and Indigo buntings; White-winged, Oregon, and Gray-headed juncos with *J. hyemalis*.

Additional lumpings of nominal A. O. U. species as races of extralimital species include: the Snow and Blue geese; White-tailed Kite with *Elanus caeruleus*; Arizona Woodpecker with *Dendrocopos stricklandi*; Black-eared and Common bushtits; Pigmy and Brown-headed nuthatches; Colima and Nashville warblers; Bullock's and Baltimore orioles; Black and Gray-crowned rosy finches.

Nearly all the changes in the above two paragraphs are based upon interbreeding. The few exceptions (such as *Elanus*, *Sitta*, *Vermivora*, and *Leucosticte*) are united on the basis of close morphological and behavioral similarity. Although most of these changes have been proposed previously by Phillips or other authors, some critics will deery their adoption in a state book. This reviewer, on the other hand, commends the authors on their fortitude, for biological knowledge does not advance by the constant repetition of outmoded or disproven dogma.

No less than 25 A. O. U. genera are synonymized. They include sinking the heron genera *Butorides*, *Casmerodius*, *Leucophoyx*, and *Hydranassa* in *Ardea*, and *Nyctanassa* in *Nycticorax*. Among the waterfowl *Chen* is relegated to *Anser*, *Mareca* and *Spatula* to *Anas*, and *Lophodytes* to *Mergus*. In the hummingbirds *Calypte* is united with *Archilochus*, and *Atthis* with *Selasphorus*. The cotinga *Platypsaris* is combined with *Pachyramphus*, and the flycatcher genus *Nuttallornis* with *Contopus*. Changes in the swallows include *Iridoprocne* to *Tachycineta* and *Petrochelidon* to *Hirundo*. Perhaps through oversight no change was made in the jays, with *Aphelocoma* and *Cissilopha* retained in quotation marks as in the Arizona checklist. The wren genus *Telmatorhynchus* is included in *Cistothorus*, and the thrush genus *Hyllocichla* in *Catharus*. In the fringillids *Pyrrhuloxia* is combined with *Cardinalis* (the latter replacing *Richmondia* following a recent request to the International Commission), *Guiraca* with *Passerina*, *Hesperiphona* with *Coccothraustes*, *Chlorura* with *Pipilo*, *Passerculus* with *Ammodramus*, *Amphispiza* with *Aimophila*, and *Rhynchophanes* with *Calcarius*. Although the generic concept involves more subjectivity than in the case of species, one who has tried to devise generic keys or to set up diagnostic characters for genera will be in sympathy with most of these changes, nearly all of which have been proposed by other authors.

Other changes from A. O. U. nomenclature include the recognition of the Cackling Goose as a full species. The old names *Empidonax pusillus* (Swainson), *Contopus musicus* (Swainson), and *C. mesoleucus* (Deppe) are adopted for the Least, Coues's, and Olive-sided flycatchers. *Helminthophila* is used in place of *Vermivora*. Following William George's work, the Olive Warbler is transferred to the Sylviidae. Numerous subspecies are included that are not afforded recognition by the A. O. U., but these are not listed here.

Three new names are proposed by Phillips. *Chelidonias* (p. 40) is used as the generic name of the Black Tern, on the basis that *Chlidonias* Rafinesque is an obvious misprint. *Agelaius phoeniceus sonorensis* (p. 166) is given as the "corrected spelling" for *sonoriensis* Ridgway. "*Pooecetes gramineus altus* Phillips (in press)" is characterized on page 195; a formal description has since been published elsewhere, in June 1965.

From this review it should be clear that *The Birds of Arizona* does two jobs. It gives accurate, well-documented data on the distribution of Arizona birds. In a wider view, it revises their taxonomy and nomenclature and thus is an important contribution to the systematics of North American birds.—Pierce Brodtkorb.

37. A Preliminary Study of Avian Blood Groups with Special Reference to the Passeriformes. Robert A. Norris. 1963. *Bull. Tall Timbers Research Station*, No. 4: 71 pp. Through the years the tools of the avian systematist have been legion, ranging from minute mensural characteristics to behavioral patterns. Dr. Norris in the present novel work considers his studies of immunohematological characters as a kind of physiological or biochemical tool in avian systematics. Indeed, his studies of blood-group serology in the Passeriformes appear to be the first serious approach of this nature, and the author is to be commended for striking out on his own.

The chief objectives of this preliminary report are to (1) provide evidence for antigenic polymorphism, (2) describe and compare antigenic phenotypes, (3) demonstrate incidence of antibodies by cross-matching cells and sera, and (4) discuss this approach as it might apply to studies of avian populations. To accomplish even these tentative objectives the author examined blood samples from 658 passerines representing 94 species from California, Florida, Alabama, Georgia,

and South Carolina. By using ordinary commercial anti-sera as employed in human blood-typing, the author's methods appear to be relatively unsophisticated.

For the many species investigated, including some non-passerines, an ABO-FR sum is calculated from a formula. This ABO-frequency-reactivity sum "is the weighted mean antigen-reactivity index based on the ABO-like blood group or groups demonstrated for a given species." In addition to this sum, accompanying many of the species "accounts" are polymorphograms in which per cent positive reactions are plotted against mean antigen-reactivity indices. One of the tentative conclusions reached from these data is that the genera *Junco* and *Zonotrichia* are not closely related, notwithstanding the proposals of some systematists. Moreover, among all the birds tested, B types were rare and AB the commonest; some birds, such as crowned sparrows, were "antigen-poor" and others, such as vireos and juncos, were "antigen-rich."

In attempting to relate these hematological studies to avian populations, the author coins a new expression, "immunoecology," as "the study of interrelationships between living organisms and their environment, with special reference to the abundance, distribution, and relations of immunobiological substances." With the assembling of more data, no doubt this phase of the study can be expanded in time.

One must commend the author not only for employing this new taxonomic technique but also for his cautious attitudes associated with this preliminary report. He states (p 43) that notwithstanding earlier, able contributions by Beecher, Tordoff, and others, "we cannot begin to achieve the best possible classification of the Fringillidae or of other large passerine families until additional characters will have been discovered, assessed, and utilized." Let us hope that these investigations will continue to bear fruit and help shed light on problems of avian biosystematics—David W. Johnston.

38. Bird Display and Behaviour. Edward A. Armstrong. 1965. Dover Publications, Inc., New York. 431 pp. Price \$2.50. Another classic in ornithological literature has been reprinted by Dover. However, the present volume is more than a reprint: it is a revised, corrected edition of Armstrong's second edition (1947). According to Armstrong's preface to this Dover edition, "although the text has been carefully revised and many corrections made, extensive alterations have not been possible and in only a few contexts would they have been desirable." Instead, for a more up-to-date vista of avian ethology the reader is directed to Armstrong's *A Study of Bird Song* (see *Bird-Banding*, **35**: 220, 1964, for a review) and W. H. Thorpe's *Learning and Instinct in Animals*. Nonetheless, I suspect that students of bird behavior would welcome a thorough revision of Armstrong's earlier book.—David W. Johnston.

NOTES AND NEWS

Current prices of mist nets sold by NEBBA (*Bird-Banding*, **34**: 175, July 1963) indicate an additional charge of 10% for nets shipped outside the U. S. by surface parcel post. It has been brought to our attention that in Canada (and perhaps elsewhere) the import duty payable applies to postage charges but not to handling charges. Therefore we are restating this 10% charge as a 5% charge for postage and a 5% charge for extra handling (such as making out customs forms to accompany the shipment), for greater accuracy.

For details of the nine types of mist nets sold by NEBBA, write to Mr. E. A. Bergstrom, 37 Old Brook Road, West Hartford, Conn. 06117. We continue to receive favorable comments on type H nets (specifications like type A except 30mm - 1 1/4" — mesh; procs like type C). One user writes: "I find them excellent for warblers and kinglets. Have taken up to Cuckoo in them and had a large run of Whitethroats last fall."

Like other periodicals, *Bird-Banding* will soon be required by the Post Office to show zip codes on magazines sent through the mail. When sending Mrs. Downs dues or subscriptions, or a change of address, please let her have your zip code if it does not already appear on our mailing.