A Five-egg Herring Gull Nest.—Bent (*Life Histories of North American Gulls and Terns*, 1923, p. 106) says of the Herring Gull (*Larus argentatus*) that "three eggs constitute a set, although the number is sometimes only two, and in very rare cases one or four." In fact, in a survey of clutch sizes of the gull species, Hailman (*Behaviour Supplement*, in press, Appendix A, Table II) found no reports of five-egg nests for the Herring Gull and only a few other reported five-egg nests among other species (e.g., Laughing Gull, *L. atricilla*).

About six pairs of Herring Gulls nest at wide intervals in a large colony of Laughing Gulls in the coastal marshes of Brigantine National Wildlife Refuge, north of Atlantic City, New Jersey. On 27 May 1966 we discovered an active Herring Gull nest with three eggs on the southern shore of Great Bay, on a point of dry land near a dense concentration of Laughing Gull nests. The Herring Gull nest was checked daily from 27 May through 12 June. A fourth egg was laid on 5 June and a fifth egg on 7 June.

Tinbergen (*Herring Gull's World*, 1953, p. 133) says "although I have repeatedly seen clutches of four . . . I very much doubt whether in any of these cases the four eggs were from one female." We trapped and color-banded one incubating bird (sex unknown), but did not succeed in capturing others before the nest was destroyed by a predator on 12 June. The nine-day or greater interval between laying of the third and fourth eggs and the normal two-day interval between laying of the fourth and fifth eggs does suggest two separate clutches.

This note constitutes Contribution No. 3 from the Brigantine Field Station of the Institute of Animal Behavior. The work was supported in part by U. S. P. H. S. Grant GM 12774 to Dr. C. G. Beer, and completed during tenure of U. S. P. H. S.-NIMH Postdoctoral Fellowship to J. P. H. We thank Steve Galitzer for helping in the field and Dr. Collin G. Beer, John Gerlach and Elizabeth D. Hailman for reading the manuscript.—Amelia Segré, Ralph Noble and Jack P. Hailman, Institute of Animal Behavior, Rutgers—The State University, Newark, New Jersey 07102 (Present address of JPH: Department of Zoology, University of Maryland, College Park 20740).

RECENT LITERATURE

BANDING

(See also 24, 41, 45)

1. Bird Banding. R. W. Smith. 1966. *Broadsheet No. 6* (Gosse Bird Club): 7-10. This is a summary of birds banded in Jamaica in 1965, principally by groups of banders associated with the Institute of Jamaica. In 1965, 4, 175 individuals of 67 species were banded. Returns of banded North American warblers include records from eight species, chiefly the American Redstart and Worm-eating Warbler. Several recoveries are mentioned: American Coot (banded in Iowa) and Royal Terns (banded in Mississippi and South Carolina).—David W. Johnston.

2. Fourth Annual Report on the Bird Ringing for the Year Ending 31st March 1965. Masashi Yoshii and Yoshitake Hasuo. 1965. *Misc. Rep. Yamashina's Inst. Ornith. Zool.*, **4**: 163-171. In Japanese, with English summary. In the year reported here, 6, 141 individuals among 75 species were banded. Tables present data on birds both banded and recovered in Japan and birds banded in Japan and recovered abroad. Of the eight foreign recoveries, five were *Egretta alba* and *E. intermedia* recovered in the Philippines. Other recoveries were in U. S. S. R.—David W. Johnston.

3. Bird-Banding in 1961 and 1962: 1. Results of the Bird-Banding Carried Out by the Ornithological Department of the Biological Institute of the University of Zagreb, XVth Report; 2. Foreign Recoveries Made in Yugoslavia, XIth Report. Ljubica Stromar. 1965. *Larus*, **XVI-XVIII** (1962-1964): 4-37. As the title suggests, this paper is divided into two parts. The first part contains lists to show the following: in 1961, 8,695 birds of 31 species were banded with 91 recoveries outside of Yugoslavia; in 1962, 11,906 birds of 36 species were banded with 64 recoveries. The second part lists 75 recoveries in Yugoslavia of foreign-banded birds in 1961 and 54 foreign-banded birds in 1962. Many of the foreign-banded birds were Black-headed Gulls (*Larus ridibundus*).—David W. Johnston.

4. Report on Bird-ringing for 1964. Robert Spencer. 1965. *British Birds*, **58** (Ringing Supplement): 533-583. Attention must be called to this the 28th report of the Ringing and Migration Committee and the British Trust for Ornithology. Contents of the report are presented chiefly in tabular form: "numbers of birds ringed and recovered," "ringing and recovery totals to 31st December 1964," and "selected list of recoveries reported during 1964." In 1964, 449,237 birds were banded and 12,665 recovered (2.8%). Between 1909 and 1964, 4,156,257 birds have been banded and 116,689 recovered (also 2.8%).—David W. Johnston.

5. Recoveries in Great Britain and Ireland of Birds Ringed Abroad. Robert Hudson. 1965. *British Birds*, **58** (Ringing Supplement): 584-596. In 1964, 773 recoveries were reported: these involved 74 species. The selected list includes the following species recovered in Britain: a Spoonbill (*Platalea leucorodia*) banded in Yugoslavia, Razorbill (*Alca torda*) banded at Arkhangel (U. S. S. R.), Swallow (*Hirundo rustica*) from Italy and one from Morocco, and a Willow Warbler (*Phylloscopus trochilus*) from Germany.—David W. Johnston.

6. Capturing Columbids at the Nest with Stupefying Baits. R. K. Murton, A. J. Isaacson, and N. J. Westwood. 1965. *J. Wildl. Mgt.*, **29:** 647-649. Wheat, coated with white mineral oil as a carrier, and treated with 3% by weight of alpha-chlorolose ($C_8H_{11}Cl_3O_6$), produces deep anaesthesia in wood-pigeons (*Columba palumbus*) and feral rock doves (*C. livia*). Baits placed on traps next to nests were eaten, affording easy capture. Released birds did not desert, although about 5% mortality occurred through excess bait consumption.—Robert S. Hoffmann.

MIGRATION

(See also 30, 45)

7. Population Features of Bird Migration. (Populyatsionnye osobennosti migratsii ptits). T. P. Shevareva. 1965. *Ornitologiya*, **7:** 318-327. Partial migration and loop migration are distinguished and examined in detail. Partial migration is characteristic of about half of the avian species of the Soviet Union, principally waterfowl and other species associated with waterways, synanthropes, and raptors. These species show abrupt fluctuations in seasonal behavior and are influenced by factors such as non freezing areas of water and human settlements. Natural selection plays a part: the surviving element of the population, sedentary or migratory, progressively increases. In determining the route of fall migration of birds of the year the geographic location of birthplace is of decisive significance. Loop routes of marine and continental species were developed under the influence of external factors which fluctuate over the years.—Leon Kelso.

POPULATION DYNAMICS

(See 21, 36)

NIDIFICATION AND REPRODUCTION

(See also 12, 14, 20)

8. Observations on the Behaviour and Ecology of the Flightless Cormorant Nannopterum harrisi. Barbara K. Snow. 1966. *Ibis*, **108**(2): 265-282. A bird with one of the smallest breeding ranges of any species, the Flightless Cormorant of the Galapagos was undiscovered until 1896 and, even today, the published literature on it is confined to a very few papers. The present account is really the first major attempt to describe reproductive activities, the observations being made over a two-week period. Courtship behavior, breeding activities, and raising the young are topics consuming most of this account.

Evidence from Mrs. Snow's observations and other reports in the literature indicate that factors limiting the distribution of Flightless Cormorants include the following: (1) cold water currents that are rich in plankton and bottom fauna (fish, octopi, etc.), (2) shallow waters with rocky bottoms, and (3) sheltered shores and "boulder beaches" for nesting. Because the birds are so heavy, they encounter difficulty getting out of the water safely and for this they require a sloping beach of small boulders. On the west coast of Albemarle Island, in a distance of about three miles, three "boulder beaches" were utilized as landing places for access to nine nesting groups. Along the three-mile shore approximately 40 pairs of the cormorants nested in 1963. Although breeding success in the main study area was low in 1963, ". . . there is no good reason for thinking that it is a disappearing species, as has often been suggested."—David W. Johnston.

9. Birds in Australian Caves. E. Hamilton-Smith. 1965. *Emu*, **65**(2): 152-155. Australian species that roost or nest in caves include Peregrine Falcon, Nankeen Kestrel, Masked Owl, Grey Swiftlet, Welcome Swallow, Fairy Martin, Grey Shrike-Thrush, Rock-warbler, White-throated Tree-creeper, and Spotted Pardalote. Actually, most of these species are found at cave or mine entrances, but the swiftlet does regularly enter darker portions of caves. This bird (*Collocalia francica*) was reported by Busst (*N. Qld Nat.*, **116**: 1-3, 1956) as uttering a "characteristic clicking sound." Hamilton-Smith suggests that this species might echolocate as does *Collocalia brevirostris* of Ceylon (see *Listening in the Dark*, Donald R. Griffin, 1958, pp. 294-296).—David W. Johnston.

10. Biology of the Birds of Whero Island, New Zealand, with Special Reference to the Diving Petrel and the White-faced Storm Petrel. L. E. Richdale. 1965. *Trans. Zool. Soc. Lond.*, **31**: 1-86. Whero Island, off the southern end of New Zealand, is a waterless rock covered with only one-half an acre of soil. Dr. Richdale spent six seasons on the island studying five species of breeding petrels; his first report, that on the Sooty Shearwater (*Puffinus griseus*) was reviewed in *Bird-Banding*, April, 1964, **35**: 134.

The breeding biology of the Diving Petrel (*Pelecanoides urinatrix*) differs from that of the other petrels studied by the author: parents change over nightly when incubating the egg, and the chick, thinly clad in down, is brooded for 7-15 days. "Chicks never get tame with handling as was the case with other species of petrels." For the first three weeks the chick is a placid creature but after that becomes vicious and noisy. Chicks grow rapidly to a peak of 149 grams at 41-44 days, then gradually lose weight until at about 60 days they reach adult weight of some 134 grams and leave the burrows. This loss of weight occurs while the adults are still feeding the chicks. Survival rate of adult breeding Diving Petrels was about 70%. Of 186 chicks banded 41 (11.3%) were recovered, some were breeding at two years of age.

With the White-faced Storm Petrel (*Pelagodroma marina*) incubation spells lasted usually 4-5 days; eggs were often left unattended yet they hatched. Incubation lasted 6.5 weeks, fledging 8 weeks. Survival of chicks in burrows was good, although a number were found apparently torpid, probably due to enforced fasting. These all recovered when fed once more.

This paper is well supplied with tables, 43 in fact, covering a great variety of aspects of the biology of these two species but unfortunately lacks a summary of the chief findings. See Review No. 11.—Margaret M. Nice.

11. Breeding Behavior of the Narrow-billed Prion and the Broad-billed Prion on Whero Island, New Zealand. L. E Richdale. 1965. *Trans. Zool. Soc. Lond.*, **27**: 87-155. The Narrow-billed Prion (*Pachyptila turtur*), averaging 132 grams in weight as a breeding adult, "lives largely on crustaceans around 15 mm long." Incubation spells by each parent average 6-7 days; incubation takes 6.5 weeks, fledging about 7 weeks. The Broad-billed Prion (*P. vittata*), averaging 196 grams, is a filter feeder, having along each side of the bill "little comblike 'teeth' through which the water is filtered before the food is swallowed." It feeds chiefly on sea animals the size of a pinhead. When first handled the chicks bit freely and uttered harsh cries, but soon became very tame. Twenty-eight tables summarize a multitude of findings for both species on weights and measurements of adults and chicks, meals fed, and site tenacity of adults. These data are all statistically treated.

The last 13 pages are devoted to a "Discussion of breeding biology in petrels." As to feeding rhythm, the Diving Petrel chick was left unfed on only 2% of its nights, the Storm Petrel on 25%, the Narrow-billed Prion on 18%, and the Broad-billed on 29%. With the Sooty Shearwater 33% of the nights were missed and with a Royal Albatross Chick this was true of 29% of the days (Richdale, 1952.) "The petrel chick is adapted to take . . . large meals even if they are as great as its own weight. After a meal, even of medium size, the chick becomes 'glued' to the nest and lethargic with the belly extending sideways all round. Thus fortified the chick can fast without ill effects for some time." "The chicks of the five species on Whero Island and the Royal Albatross were definitely not forced to leave their nest and take wing because they were starved."

These two papers (Review No. 10 and 11) represent an incredible amount of precise, devoted labor. They are well and clearly organized, each provided with a table of contents but each regrettably lacking a summation on the findings on the four species studied. Dr. Richdale is to be congratulated on this scholarly presentation of his studies.—Margaret M. Nice.

LIFE HISTORY

(See also 10, 11)

12. On the Biology of the Pacific-ocean Eagle. (K biologii tikhookeanskogo orlana.) E. M. Chernikin, 1965. *Ornithologiya*, **7**: 272-275. So remote is the limited breeding range of *Haliaeetus pelagicus* Pallas that even scattered fragmentary notes can make a contribution to the little that is known of its life history. These observations, spread over three years, indicate that its habitat is chiefly rock-birch stands along the seacoast of northeastern Asia; that it is rather nomadic, its travels influenced by runs of spawning salmon, which it may follow for some distance upstream inland; and that the incubation period exceeds 32 days. The structure of three nests is described. The bird is extremely wary, offering no threat to human visitors at the nest.—Leon Kelso.

13. Observations on Wood-swallows. (Beobachtungen an Schwalbenstaren.) Klaus Immelmann. 1966. *J. f. Ornith*, **107**(1): 37-69. (English summary.) Very interesting study on the life history and behavior of three species of the Artamidae in Australia: *Artamus cinereus*, *A. leucorhynchus*, and *A. minor*. The males have a low, swallow-like song which has no significance either as a territory proclamation nor in courtship. "Wood-swallows are extremely sociable birds. They feed together, bathe together, they roost in communal roosting places clustering together very tightly, they jointly attack flying predators, and may even breed in loose colonies. During all group encounters, there are special social behavior patterns, such as allopreening, mutual feeding and aerial displays ('screaming parties')."

"Pair-bond seems to be very tight." The pair searches together for a nest-site and builds the nest together. Both incubate; both feed the young. Incubation and fledging each last 12 days. "Sometimes other adults (neighbours or youngsters from a previous clutch) will participate in feeding the nestlings." Some pairs were found incubating eggs before completing the juvenal molt. "Such early maturation

is known in several northern and central Australian bird species and may be an adaptation to the irregular breeding season," due to protracted droughts. This excellent paper concludes with a discussion of the function, origin, and motivation of the social behavior patterns of these species.—Margaret M. Nice.

14. The Flamingos on Bonaire (Netherlands Antilles). Habitat, Diet and Reproduction of *Phoenicopterus ruber ruber*. Jan Rooth. 1965. *Pub. Foundation for Scientific Research in Surinam and the Netherlands Antilles*, Utrecht, Holland, No. **41:** 1-151. f 16. The purpose of the year of study on Bonaire Island by Mr. and Mrs. Rooth was to gather information on the food and reproduction of these notable birds with the view of further protection for them. The investigators certainly "carried out the field and laboratory work with great skill and perseverance" as stated in the Foreword. The habitat and climate of the salinas, as well as the diet of the birds, were exhaustively investigated. The chief food was larvae and chrysalids of the salt fly (*Ephydra gracilis*) which exist in enormous numbers in the shallow hypersaline waters of the salinas. (The chrysalids of other species of this fly were gathered by Indians in California and Mexico, dried and eaten by the people) Seven different methods of food-searching were employed by the flamingos; imitation of these procedures by the Rooths showed "the type of food searched for under the given circumstances."

Incubation, performed by both sexes, lasts about 30 days. The chicks leave at about 3-4 days and wander about together, returning to the nest to be fed by their own parents, sometimes to the age of 4 months. On Bonaire in one year nearly 2,500 pairs reared more than 1,800 fledglings. "There is no predation on Bonaire of the eggs, pullets, juvenile or adult flamingos." From 20-25% of the eggs and 5% of the young are lost. It is suggested that the flamingo "population probably remains constant in size if successful breeding occurs 3 times in 6 to 7 years."

The monograph contains 7 maps, 21 graphs, 20 excellent sketches by the author of flamingo behavior and nearly 40 very good photographs of the habitat and the birds. The author urges stricter protective measures for the colony, especially abolition of low-flying aircraft. An impressive study.—Margaret M. Nice.

BEHAVIOR

(See also 8, 13, 30, 38)

15. The Effect of a Constant Magnetic Field on the Motor Activity of Birds. (Vliyanie postoyannogo polya na dvigatelnyio aktivnost ptits). A. L. Eldarov and Yu. A. Kholodov. 1964. *Zhurnal Obshchei Biologii*, **25:** (3): 224-229. The motor activity of passerine birds was recorded under two hour and nine hour periods of exposure to a constant magnetic field of 0.6-1.7 ergs. In 87% of all cases the bird's motor activity was increased by 2-4 times during and after exposure. The magnetic field influenced not only the amplitude but also the character of the motor activity. The strongest effect of the magnetic field was observed in weak light of constant intensity. (English summary).—Leon Kelso.

16. Observations on the Behavior of Bird Flocks. (Beobachtungen über das Verhalten von Vogelschwärmen. E. Gensdorf. 1966. *Z. Tierpsychol.*, **23**(1): 37-44. (English Summary.) Flocks of Starlings (*Sturnus vulgaris*) may actively pursue avian predators; sometimes the enemy is driven into the open water and drowns.—Margaret M. Nice.

17. Some Play Movements of the Raven. (Ueber einige Bewegungsspiele des Kolkraben (*Corvus corax* L.).) Eberhard Gwinner. 1966. *Z. Tierpsychol.*, **23**(1): 28-36. (English summary.) Eighteen hand-raised Ravens, kept in open-air aviaries and often allowed to fly free, developed a number of distinct play patterns. These proved to be a much more complex repertoire than has been found in any other bird species. "The play sequences are composed of single (probably innate) motor elements, at least in part having the appearance of phylogenetically relict behaviour patterns. . . . Some learned motor sequences

acquired in play are secondarily employed in other categories of behaviour." Four sketches and two photographs show Ravens hanging upside down, sometimes holding on to the support by two feet, sometimes by one. The author points out that hanging upside down is practised in courtship by some of the Birds of Paradise, a family related to the Corvids.—Margaret M. Nice.

ECOLOGY

(See also 8, 40)

18. The Zoological Significance of Ecological and Geographical Borderlands. F. J. Turcek. 1966. *Acta Zoologica Academiae Scientiarum Hungaricae*, **12** (1-2): 193-201. The theme of the national meeting of the American Association for the Advancement of Science, coming to Washington 26-31 December, 1966: "How man has changed his planet," is well served by this paper, in English, by the outstanding ecologist of the Forest Research Institute, Banská Stiavnica, Czechoslovakia. The importance of borderlands and the border effect, in elements variously named as ecotones, transition zones, tension zones, marginal zones, zones of intermingling, etc., has long been recognized, but here we have emphasized that Man's exploitation greatly increases the area of such zones for whatever results may be effected. One result is the breaking down of the natural resistance (homeostasis) of older communities to invasion from other communities. A succeeding result is the bringing of domestic animals into contact with endemic nidi of viruses, e. g. encephalitis, from which they previously had been protected; they in turn carry pathogenic viruses to humanity. "In spite of the fact that many animal populations are eliminated . . . by the cultural area, the number of species in these territories will still constantly increase, largely proportionately to the richness, the splitting and subdividing of the culture area." Reading between the lines one may see the reasons for acceptance of the fact and inevitability of Man's influences in countries of the "East" as manifested in their suffrance of, and even desire for, introduction and acclimatization of many "foreign" species, policies which encounter much resistance in the "West," particularly in the USA. Here we try to maintain or restore the "original state"; there the attitude is one of more resignation to change.

This is a well thought out and concentrated summary paper and only complete reproduction could do it justice.—Leon Kelso.

19. Fundamentals of Forest Biogeocenology. (Osnovy lesnoi biogeotsenologii). V. N. Sukachev and N. V. Dylis, editors. 1964. "Nauka" Publishing House, Moscow. 575 pp. 85 figures, 145 tables. 3 rubles, 79 kopecks (about $6.60 U. S.). The biogeocenose is defined (p. 23) as "an aggregation over a certain expanse of the terrestrial surface of homogeneous natural phenomena (atmosphere, montane rock, vegetation, the animal world and the world of microorganisms, soils and hydrological conditions), having individual specific interactions among the components constituting it and their definite types of exchange of substance and energy between themselves and with other natural phenomena, and manifesting its own internal counteractions of dialectic unity; these being in a state of continual action and development."

Claiming that over one-third of the world's forested area is within their territory, the leading school of Russian ecology elaborates on it from every conceivable angle, on the basis of the above concept in this their most monumental production of the century. It is reviewed at greater length in the winter, 1966 issue of "Ecology." Of considerable interest to avian ecologists is the section "Vertebrate animals in forest biogeocenoses", pp. 277-299, which deals with the birds' role in seed dispersal (p. 291).—Leon Kelso.

20. The Ecology of the Lesser Rock Nuthatch in Armenia. (Ekologiya malogo skalnogo popolznya v Armenii). M. S. Adamyan. 1965. *Ornitologiya*, **7**: 157-165. This is a condensation of a fairly complete life history study of *Sitta neumayer rupicola* Blanford, with five tables on measurements of nests, growing young, and food. This species and the Large Rock Nuthatch (*S. tephronota*) cling to and ascend vertical rock surfaces as ably as the arboreal species move over tree trunks. Contrary to previous accounts, whereas *S. europaea* employs mud to

reduce or shape up entrances of its tree cavities, this species (and *S. tephronota*) builds the nest entirely of mud mixed with saliva, making a gourd-like or Cliff-Swallow-type of structure attached to rock walls; and whereas *Sitta canadensis* smears the wood around its tree cavity entrance with conifer gum or pitch, *S. neumayer* smears the entire exterior of the mud nest with juices of mashed caterpillar bodies. And the nest exterior is also decorated or masked over with attached feathers, tufts of rodent fur and insect fragments, giving it the color of the nearby rock surface. As if this were not enough, the nest interior is lined with rodent fur and bones obtained from pellets of raptorial birds and excrement of carnivorous mammals. Most of this work is performed by the male, the female only occasionally bringing lining material. A nest may be annually renovated and used for several years. The eggs, 6-13 in number, are incubated by the female, hatching in 15-18 days. Nearly 30 days are required for growth of the young. The food of adults and young, mostly insects, is gathered mainly from the ground and low herbaceous growth. There is one complete molt each year.—Leon Kelso.

21. Some Aspects of the Ecology of Migrant Shorebirds. Harry F. Recher. 1966. *Ecology,* **47**(3): 393-407. Here is a paper that should be read by all coastal bird-watchers and those interested in problems relating to population ecology. Despite large multispecific aggregations of migrating shorebirds, ". . . the totality of species differences and the transient character of migratory assemblages apparently minimizes interspecific interactions that might result in competitive exclusion." Thus the competitive exclusion principle, discussed by Hardin (*Science,* **131**: 1292-1297, 1960), is avoided by migrant shorebirds because of spatial and temporal segregation in feeding areas.—David W. Johnston.

PARASITES AND DISEASES

(See 27, 28)

CONSERVATION

(See also 24)

22. Israel Tackles Conservation. K. R. Ashby. 1966. *Oryx,* **8**(4): 256-261. "Indiscriminate use of persistent pesticides, particularly thallium sulphate, used against the vole *Microtus* . . . have had devastating effects on birds of prey" —the formerly abundant vultures, hawks, and eagles. "The population explosion of the Bedouin Arabs, who in Israel at present number 60,000 is a result of the introduction of modern medicine into a society where high fecundity is a major status symbol." Their immense flocks of goats are responsible for intense overgrazing. One bright spot in the picture is the Society for the Protection of Nature in Israel with its 10,000 members in a population of 2.5 million; this society emphasizes education in conservation and aims to make five per cent of the country into nature reserves.—Margaret M. Nice.

23. Wildlife Conservation in the Antarctic. Brian Roberts. 1966. *Oryx,* **8**(4): 237-243. It is heartening to read *good* news about conservation for a change. The 12 nations that cooperated in the International Geophysical Year in 1957-58, in 1961 signed the Antarctic Treaty and three years later adopted "Agreed measures for the conservation of Antarctic fauna and flora." After emphasizing the extreme vulnerability of wildlife in the Antarctic, Mr. Roberts concludes:

"Let us do our best to preserve for our successors some of the most interesting and exciting biological spectacles to be found anywhere on earth: the great seal and penguin colonies; the soaring of the wandering albatross; the fantastic evening flight of uncountable millions of prions returning to their nesting islands, when the whole surface of the sea appears to be moving against the wind in a solid sheet of gliding petrels as far as the eye can see; a sperm whale leaping clear of the water; a small pink *Colobanthus* flowering in isolated desolation—those who have been fortunate enough to witness these things will never forget the joy they evoked."—Margaret M. Nice.

WILDLIFE MANAGEMENT

(See also 23)

24. Waterfowl Resources in the USSR and their Management. (Resursy vodoplavayushchei dichi v SSSR i ikh vosproizvodstvo.) Yu. A. Isakov, editor. 1965. Information abstracts No. 5, Bureau of Technical Information. Headquarters of Game Management and Reserves in the Council of Ministers RSFSR. Moscow. 62 pp. Price 40 kopecks (about $1.00 U. S.). Despite extensive areas formerly available as breeding grounds for waterfowl, especially in arctic Siberia, the decline of waterfowl numbers in the USSR in recent years has occasioned widespread alarm. On this account an emergency conference was convened 7-9 April, 1965 in the offices of the Ministers' Council, under the auspices of their National Geographic Society and the Moscow Naturalists' Society. This was attended by about 100 persons, including biologists, conservationists, and game managers, representing interested scientific academies, university departments, and regional game agencies. Over 120 reports were presented. This is a summary of the conference, with an outline of the program proposed for waterfowl restoration and management, contributed by V. F. Gavrin, T. P. Shevareva, S. M. Uspenskii, G. T. Leinish, V. A. Klimpinish, Kh. A. Mikhelson, and P. N. Blum. The result of the conference was a resolution for a thorough restudy and survey of their waterfowl situation. But the situation is complicated by the fact that special migrations to special localities for molting are a prominent feature in the life cycle of Eurasian waterfowl. Therefore a vast continent-wide banding program was projected under the following three proposals: (1) a preliminary districting plan for the proposed study in which the USSR is divided into 27 areas, (2) a list of centers (47) at which it was deemed desirable to organize work of the banding program, and (3) a preliminary list of scientific agencies (in each of the 27 areas) to be employed in effecting the above program. Three chapters included instructions for the program: instructions for banding waterfowl, instructions on traps and trapping waterfowl, and instructions for banding recently hatched young of ducks and coots. Fifteen titles of Russian literature on waterfowl trapping and banding conclude the book. If carried out, this will be a very timely and productive project.—Leon Kelso.

25. Duck Nesting and Production on Wisconsin Farmlands. John M. Gates. 1965. *J. Wildl. Mgt.*, **29:** 515-523. Observations on Mallard and Blue-winged Teal on 7 square miles, largely intensively cultivated, in east-central Wisconsin, from 1959-63. Little permanent water was present, and Mallard nesting was principally in temporary wetlands (19% of the study area), whereas Teal nested in both wetlands and hayfields. About 23 Mallard and 30 Teal pairs nested, or about 7.6 total pairs per square mile. Hatching success was estimated as 27% for Mallards and 37% for Teal, comparable to that of other studies. However, brood survival was low, probably because of lack of brood habitat. Average production was about 2 Mallard, and 2 Teal broods per square mile, but was notably higher in 1960, when water conditions were unusually good.—Robert S. Hoffmann.

26. The Effect of Mammals on Prairie Chickens on Booming Grounds. Frances Hamerstrom, Daniel D. Berger, and F. N. Hamerstrom, Jr. 1965. *J. Wildl. Mgt.*, **29:** 536-542. A previous paper (Berger, *et al.*, *J. Wildl. Mgt.*, **27,** 1963) discussed the low degree of vulnerability of Wisconsin populations of *Tympanuchus cupido* to predatory raptors when on booming grounds. The present paper reinforces the previous conclusion that the exposed position of displaying Prairie Chickens is actually an advantage in eluding predators. Of 179 observed contacts between mammals and Prairie Chickens on booming grounds from 1939-63, in only one instance did the predator, a domestic dog, kill a bird. Prairie Chickens usually reacted weakly to the presence of native mammals (red fox, skunk, white-tailed deer), more strongly to domestic mammals (dog, cattle, horse), and most strongly to man.—Robert S. Hoffmann.

27. Adverse Effects on Birds of Phosphamidon Applied to a Montana Forest. Robert B. Finley, Jr., 1965. *J. Wildl. Mgt.*, **29:** 580-591. Phosphamidon (2-chloro-2-diethylcarbamoyl-1 methylvinyl dimethyl phosphate) is a short-lived insecticide which it was hoped might be an effective replacement for DDT in spruce budworm control. However, a field trial application of 1 lb/acre in the summer of 1963, on a 5,000 acre test area 25 miles NE of Missoula, Montana, indicated high mortality to birds on the sprayed area. Bird activity was determined by transect counts, and special effort was made to locate Blue Grouse. A significant decline, from 29.5 ± 12.4 to 6.8 ± 3.3 birds seen per 2 hr count, occurred on the test area, whereas on an unsprayed control area, 46.8 ± 2.6 birds were seen prior to spray operations, and 59.2 ± 11.6 in early postspray counts. A month later, bird numbers on the test area recovered to 52.0 ± 46.8, and the control area had 91.2 ± 25.6. Ironically, the insecticide did not control spruce budworm, nor did it noticeably reduce other insect populations. Bird mortality apparently resulted from consumption of phosphamidon-containing plants, and budworms and other insects rather than from starvation. Casualty searches produced sick and dead birds that suffered phosphamidon poisoning; sick Blue Grouse had significantly lower cholinesterase activity.—Robert S. Hoffmann.

28. Effects of Field Applications of Heptachlor on Bobwhite Quail and other Wild Animals. Walter Rosene, Jr. 1965. *J. Wildl. Mgt.*, **29:** 554-580. One of the crucial biological problems of our time, biocides, demands high-quality research. This study clearly and unequivocally demonstrates the deleterious effects on birds of aerial broadcasting of heptachlor by the U. S. Department of Agriculture for the purpose of fire ant control in Georgia and Alabama. The study areas included blocks receiving 1/2 lb. to 2 lbs. of pesticide per acre, as well as untreated blocks. A third control area received no pesticide at all. Bobwhite Quail, the principal species studied, were censused by means of summer whistling-cock transect counts, and a winter covey count. On the untreated control area, both whistling cocks and coveys densities were stable at about 25/1000 acres during the four years of study, 1958-61. Prior to treatment, densities on the study areas were similar to that of the control area, but dropped to 3-4 cocks and coveys on one, and 11-12 on the other, the year following a 2 lb/acre heptachlor treatment of 93% and 53% of the study areas, respectively. Detailed transect-by-transect analysis confirmed that heptachlor treatment significantly reduced Bobwhite populations. Moreover, analysis of counts on untreated blocks within one study area showed a significant decrease in Bobwhite here too, probably a result of birds moving from untreated to treated blocks where resident Bobwhites had been wiped out by the heptachlor.

Spring songbird populations were also recorded on the two study areas by noting species and individuals seen and heard during the course of Quail transect counts. On one area prior to heptachlor treatment, 643 individuals belonging to 23 species of permanent residents were noted. Following 53% treatment, 405 individuals of 25 species were found, and after 93% treatment on the other area, only 185 individuals of 15 permanent resident species were present. Summer resident birds were less affected, since heptachlor was applied before their arrival. A 4.07 acre plot was searched one week after heptachlor application; many dead and ill birds and mammals were found, as well as abundant evidence of predators and scavengers. On a second visit 47 days after application, *"no live birds were seen or heard on the area."* Hence, more severe songbird mortality, followed by replacement from adjoining areas, probably occurred after treatment than was indicated by the spring censuses. The final irony is found in the concluding paragraphs; no permanent control of fire ants was effected by heptachlor treatment,and in any case the fire ants have no importance as enemies of birds and other wildlife. —Robert S. Hoffmann.

MORPHOLOGY AND ANATOMY

29. Fluctuations in the Weight of Bullfinches. I. Newton. 1966., *British Birds*, **59**(3): 89-99. Based on over 800 weights of *Pyrrhula pyrrhula* from near Oxford, England, this study extended from September 1962 to March 1964. These Bullfinches, a non-migratory species, were heaviest in winter, especially during

cold spells. Most of the year weights of males and females did not differ significantly, but during the breeding seasons females were heavier than males. Both sexes lost weight when feeding young. All the Bullfinches gained weight during the molt.—Margaret M. Nice.

PHYSIOLOGY

30. A Possible Endocrine Basis for Migratory Behaviour in the White-crowned Sparrow, Zonotrichia leucophrys gambelii. 1965. Albert H. Meier, Donald S. Farner, and James R. King. *Animal Behaviour*, **13:** 453-465. Ever since the pioneer photostimulatory experiments by Rowan in the 1920's, physiologically oriented ornithologists have implicated various endocrine glands and hormones in the complex mechanisms underlying migratory behavior. It was Wolfson who induced fattening in birds by using relatively crude mammalian pituitary extracts, and in a later refinement Meier and Farner found that prolactin caused fat deposition. Still other investigators have proposed that thyroxin is involved in migratory behavior.

A series of experiments, reported in the present paper, was designed to test the roles of various hormones in the induction of migratory behavior in White-crowns. By and large the most significant conclusion stemming from these experiments was that prolactin not only increased *zugunruhe* in caged birds prior to spring migration but also that these effects were augmented by adrenocortical hormones. Thus, prolactin has been demonstrated to play a dual role in premigratory White-crowns—"promoting fattening and nocturnal locomotor activity." Bioassays of pituitary prolactin appeared to confirm these roles, for prolactin levels were highest at times of migration.

Histochemical evidence, especially that amassed by Tixier-Vidal *et al.* (*Arch. Biol.*, **73:** 317-368, 1962), lends some support to the present experimental report. In the Peking Duck, certain erythrosinophiles (the eta cells) in the cephalic lobe of the anterior pituitary are believed to secrete prolactin. These cells become more abundant in March and April, suggesting some relationship between prolactin and the breeding season in the duck. It would, of course, be of extreme value if one could demonstrate in wild birds, such as the White-crowned Sparrow, similar relationships between pituitary cell types and events in the bird's annual cycle.—David W. Johnston.

PLUMAGES AND MOLTS

31. Development and Maturation of Primary Feathers of Redhead Ducklings. Glen Smart. 1965. *J. Wildl. Mgt.*, **29:** 533-536. Two groups of *Aythya americana* ducklings were hatched from incubators on 15-25 June and on 17-20 July, 1961. Early-hatched ducklings began to show visible primary growth at 36-38 days of age, while primaries of late-hatched birds emerged at 29-31 days of age. The 7-10 day differential thus established was maintained throughout primary maturation, and the late-hatched ducklings could fly when younger by 7-10 days than the early-hatched Redheads. Mature primaries of early-hatched birds were significantly greater in length than those of late-hatched ducklings.—Robert S. Hoffmann.

32. Age Determination and Notes on the Breeding Age of Black Brant. Stanley W. Harris and Peter E. K. Shepherd. 1965. *J. Wildl. Mgt.*, **29:** 643-645. Flightless *Branta bernicla orientalis* trapped in summer can be aged; yearlings have white-tipped secondary coverts which are molted during the second summer of life, but not until after the flight feathers have been lost. Brant two years old and older have black secondary coverts. Six out of 19 known-age two-year-old females are thought to have nested as two-year olds, but the majority probably do not breed until they are three years old—Robert S. Hoffmann.

ZOOGEOGRAPHY

(See also 7, 39, 44)

33. Avifaunal Relationships between the Neotropical and Ethiopian Regions. J. M. Winterbottom. 1965. *El Hornero*, **10**(3): 209-213. In this short paper the author points out both similarites and differences between these continental avifaunas. Only 14 species of land and fresh water birds (excluding holarctic migrants) are common to both regions, all of these being non-passerines and all but four, species that have invaded these regions from the north. Some explanations are proposed for the distribution of certain ducks and other species. Interesting parallelisms are discussed for larids, penguins, gannets, cormorants, and pelicans.—David W. Johnston.

34. On Tubinares and Alcids of the Bering Sea. (O trybkonocykh i chistikovykh ptitsakh Beringova morya). V. P. Shuntov 1965. *Ornitologiya*, No. **7**: 276-286. 3 distribution maps. A post-nesting distributional survey on the movements of 8 species of tubinares, and 13 species of alcids in the above area. For the more numerous species, *Puffinus tenuirostris*, *Fulmarus glacialis*, and *Oceanodroma furcata*, maps showing variation of density on various parts of the Bering Sea are given.—Leon Kelso.

FOOD

(See also 6, 8, 19, 20, 21)

35. Fish-eating Birds and their Significance in Fisheries. (Ryboyadnye ptitsy i ikh znachenie v rybnom khozyaistve). N. A. Gladkov, editor. 1965. Publ. by Academy of Sciences USSR for the Ministry of Fisheries, Ichthyological Commission, and Moscow Naturalists' Society. "Nauka" Publishing House, Moscow. 264 pp. Price 1 ruble, 58 kopecks ($3.25 U. S.). This collage of articles was printed by resolution of a special session of the Bureau of Ichthyology Fish-eating Birds Commission. Its stated purpose is to examine the relation of piscivorous birds to other aquatic animals, and to show their role in the biological balance of natural and cultivated waters. The papers deal with the food habits of piscivorous birds, their fluctuations in numbers by year and season, their relationship to commercial and predatory fishes, amphibia, and aquatic invertebrates. The role of birds in the distribution of fish parasites, in sanitation, and the effect of offal from bird bazaars on the biochemical content of coastal waters are considered. The book is intended for ornithologists, ichthyologists, parasitologists, and for workers in fisheries and reserves.

It is comprised of the following articles, largley described by their titles: Nikolskii, G. V. On some problems in biotic reclamation through regulating the effects of predators on schools of commercial fishes; Gladkov, N. A. Fish-eating birds and their potential piscicultural significance; Bykhovskaya-Pavlovskaya, I. E. and Dubinina, M. N. The significance of fish-eating birds in the dispersal of helminthoses among fishes; Borodulina, T. L. The piscicultural importance of gulls and terns in the Azov-Chernomorsk and Caspian basins; Skokova, N. N. On the nature of the effect of the Great Cormorant (*Phalacrocorax carbo*) and wading (ardeid) birds on the aquatic fauna of the Volga delta, and their economic importance; Markuze, V. K. Fish-eating birds in the spawn hatcheries of the Volga delta and their significance; Skokova, N. N. The feeding of the Gray, Greater, and Little White Herons (*Ardea cinerea*, *Egretta alba*, and *E. garzetta*) in the Volga delta in relation to their piscicultural importance: Markuze, V. K. The effect of human activity on the abundance of fish-eating birds in the spawn hatcheries of the Volga delta; Zaletaev, V. S. The distribution and abundance of fish-eating birds on the eastern shore of the Caspian Sea; Vinokurov, A. A. Wading birds in the floodlands of Kubani and their importance to fisheries of the northwest Ciscaucasus; Markov, V. I. Notes on pelicans and cormorants of the Aral Sea; Shigin, A. A. Epizootological importance of fish-eating birds in the Rybinsk reservoir and modes of reducing their detrimental effects; Gerasimova, T. D. The food habits of Murmansk coast gulls (extensive data on *Rissa tridactyla*, *Larus marinus*, *L. argentatus*, *L. canus*, and *Sterna paradisea*); Golovkin, A. N. and Poz-

dnyakova, L. E. The effect of colonial marine birds on the regime of biogenic salts in the coastal waters of Murmansk (an unusually original and significant paper); Kokshaiskii, N. V. The role of behavior in the genesis of peculiarities in herons' food habits; Belova, Z. V. Nutritional interrelationships of young fish and the Lacustrine Frog (*Rana ridibunda*) larvae in the Volga delta; Chronicle: Efrom, K. Significance of fish-eating birds to the national economy; Resolutions: On the economic value of fish-eating birds; table of contents. On the whole the articles find much in favor of piscivorous birds on many counts.—Leon Kelso.

36. The Avian Response to a Population Outbreak of the Tent Caterpillar, Malacosoma constrictum (Stretch). Richard B. Root. 1966. *Pan-Pacific Entomologist*, **42:** 48-53. With the exception of Yellow-billed and Black-billed cuckoos, most birds are believed to avoid caterpillars with numerous, long hairs. In the present paper the author reports his observations of birds in an area of California where a population outbreak of Tent Caterpillars was in effect. Attention was devoted to feeding habits and stomach contents of *Vireo gilvus*, *V. huttoni*, *Vermivora celata*, *Polioptila caerulea*, and *Parus inornatus*. Although Tent Caterpillars were abundant and the birds passed within two feet of them, none of the birds was ever seen to take one of these caterpillars. Furthermore, a series of these birds' stomachs contained numbers of other lepidopterous larvae, but no Tent Caterpillars.

An additional feature of the study indicated that "the widespread defoliation [by Tent Caterpillars] probably reduced the populations of the foliage arthropods which constitute a major proportion of these birds' diet. Such a failure in the food supply could result in a cessation of avian breeding activity."—David W. Johnston.

37. Stomach Analyses of Korean Birds. Chester M. Fennell. 1965. *Misc. Rep. Yamashina's Inst. Ornith. Zool.*, **4:** 172-183. Stomach contents of 1407 birds from South Korea comprise the subject of this paper. Some 244 forms (species and subspecies) are included in a lengthy table presenting stomach contents of each species.—David W. Johnston.

BOOKS AND MONOGRAPHS

38. Complex Forms of Behavior. (Slozhnye formy povedeniya). A. D. Slonim, editor. 1965. Published for the Joint Scientific Council on the "Physiology of Man and Animals," by "Nauka" Publishing House. Moscow-Leningrad. 234 pp. Paperback. Price 1 ruble, 51 kopecks (about $2.75 U. S.). It would be difficult for any book to fulfill the implied possibilities of the above title, and how adequate this one is must be judged by workers in other fields of vertebrate zoology since most of the collected articles are non-avian. The 34 articles contributed to the book by various authors, too many to cite here, are arranged under sections as follows: (I) Theoretic and practical aspects of research on complex forms of behavior (5 articles); (II) Morpho-physiological fundamentals and ontogeny of complex forms of behavior (9 articles); (III) Species and population relationships and behavior (7 articles, including a significant paper by G. A. Novikoc on "Variability of the specific nesting stereotype in birds," also, "On vocal imitation in birds", by A. S. Malchevskii; "Our results in experimental studies of complex forms of bird behavior in natural conditions", by E. K. Wilks; and "The role of microclimates in the formation of the specific behavior stereotype in the incubation period of some sylvan passerine birds", by N. A. Shilov and E. M. Dobkin); (IV) Research on the behavior of farm animals (6 articles); (V) Behavior and regulation of physiological functions in extreme environmental conditions (7 articles).

In the introduction to the volume (p. 3) A. D. Slonim writes: "Some of the methodic devices in research and treatment of data (here) would lead readers into the field designated as ethology in the West and in other peoples' democracies, in recent years. While ethology arose as an offshoot of zoology, it at present enfolds almost all fields of natural history into the study of animal behavior and the evolution of this behavior.

"The ethological trend in the West, while being basically objective and scientific, is in opposition to the materialistic doctrine of I. P. Pavlov and his followers. Thus some ethologists proclaim the unity of behavior and attempt to distinguish special "ethological" modes of research which cannot be subjected to physiological, morphological or psychological analysis. This extreme stand, however, has not received general support among ethologists, many of whom (e.g. Tembrock) hold to materialistic grounds in their research."—Leon Kelso.

39. The Birds of the Republic of Panama. Part 1. -- Tinamidae (Tinamous) to Rynchopidae (Skimmers). Alexander Wetmore. 1965. *Smithsonian Misc. Coll.*, Vol. **150:** 1-483. "The long, narrow Isthmus of Panama which unites North America on the one hand and South America on the other, is a geographic area outstanding in its interest to biologists in the systematic field as the land connection between these two regions of the Northern and Southern Hemispheres." Thus reads the introductory sentence to this important ornithological contribution. For more than 20 years Dr. Wetmore has been making periodic trips to Panama studying birdlife in the field and collected specimens in the laboratory. The present volume represents the first installment summarizing known facts about the birdlife of the Republic.

Members of 10 orders and 35 families are reported here. Families are introduced by brief statements indicating distinctive characteristics and distribution, and in many cases with dichotomous keys to the species. Such keys assist one in specimen identification, but would be of limited value in the field. Each species account contains information on its description, measurements, habitat choices, nesting, food, voice, and the like. As a matter of fact, the species accounts are really condensed life history accounts of the bird in Panama with added information on synonomy, taxonomy, and measurements of specimens. No doubt, these data, assembled by the author from his many years of experience and including pertinent references from the literature, summarize many biological facts about tropical birds hitherto unavailable. Walter A. Weber's skilful illustrations—all too few of them—add much to this first volume.

If the succeeding volumes are as well written and comprehensive as the present one, we can expect to have eventually one of the finest ornithological treatises covering a major area of tropical America. I, for one, hope that succeeding volumes will contain more concrete ecological information on habitat preferences, competition, and population.—David W. Johnston.

40. Ecology and Field Biology. Robert Leo Smith. 1966. Harper & Row, New York. 686 pp. 7" x 10". $12.75. This is a large and impressive book, designed primarily as a college text for sophomores or juniors who have already had a full year in general biology. In the preface the author, who is a professor at West Virginia University at Morgantown, suggests a number of sequences in which the book might be used in such a course. He hopes that it will also serve "as a reference book for applied ecologists in forestry, wildlife, fisheries, and sanitary engineering, as well as those interested in natural history as an avocation." The emphasis of the book is on research in the field.

The main text consists of 27 chapters in 6 parts, namely: "Introduction," "The ecosystem and the community," "Aquatic and terrestrial habitats," "Population ecology," "Natural selection and speciation," "The behavior of animals." Each chapter concludes with an excellent summary. Next, on p. 545, comes the general "Bibliography," 28 pages long. This is followed by four other bibliographies, all annotated: "Suggested readings for chapters 1-27," "Aids to identification," "Journals of interest to field biologists," and "General bibliographies", 8 of which are cited, such as Biological Abstracts and Zoological Record.

There are five appendices: "An annotated bibliography of statistical methods," "Environmental measurements" (of the chemical and physical features); "Study of the plant community," "Studying animal populations," and "Methods for studying animal behavior." These offer much technical information and each has its own bibliography. Finally we reach the "Index"; a helpful device here is that "Page numbers in italics indicate that the word or concept is initially defined or more fully explained at that place." One marvels that it took Dr. Smith *only* five years to write such an assemblage of knowledge, supported by so many references!

While reading the book I found the location of the main bibliography confusing, coming as it does 100 pages before the end of the volume; this difficulty was solved by the insertion at p. 545 of a large book mark.

In clear and easy style, with a minimum of ecological and ethological jargon, Dr. Smith gives striking descriptions of the complex and fascinating interplay of geography, plants, and animals in all major habitats except for the depths of the ocean. He emphasizes man's gross misuse of the earth through air and water pollution, overgrazing, pesticides, radiation, and reckless over-population.

On reading the book I came upon only one point to criticize: in the section on the arctic tundra, I was sorry to see on p. 327 that the author accepts Karplus' (1949) unverified example of a brood of Robins (*Turdus migratorius*) in Alaska leaving the nest at the age of 9 instead of 13 days, the average age of fledging of 85 broods in northern North America. In January 1953 I reviewed (*Bird-Banding,* **24:** 21-22) a later version (1952) written by Karplus in which he stated: "The observation of a shortened nestling period in one pair of birds indicates that a factor from which migrations derive their survival value is the more rapid growth of young possible in the north." I pointed out that this author had given no details as to the fate of the 9-day Robins, and I cited well-documented studies on three other species nesting in the far North whose young left the nest at ages similar to their relatives in temperate zones.

This volume is authoritative and up-to-date, with a remarkably wide coverage. It is illustrated with photographs and with striking and delightful sketches by the artist Ned Smith. In short, it presents a wealth of ecological and biological information and deserves the highest success.—Margaret M. Nice.

41. Birds of the Atlantic Islands. Volume Two. A History of the Birds of Madeira, the Desertas, and the Porto Santo Islands. David A. Bannerman and W. Mary Bannerman. 1965. Oliver and Boyd, Ltd., Edinburgh and London. *xlviii* + 205 pp. 84s. As stated in my review (*Bird-Banding,* **35:** 289, Oct. 1964) two volumes were originally planned for this series, but this plan has been scrapped as being impractical. Furthermore, sufficient pressure was exerted by local officials and residents of the several islands involved to induce the author to prepare separate volumes. We can expect, then, a third volume on birdlife of the Azores and "a fourth volume on the Cape Verde Islands would be a logical conclusion."

Prefatory subjects in this volume consume nearly 50 pages embracing such subjects as a bibliography dating back to 1507 and including German, French, Portuguese, American, and British titles, history of ornithological explorations, and natural features. The latter topic contains a wealth of data assembled by G. E. Maul (Curator of the Museu Municipal do Funchal) on the natural history, climate, vegetation, and geology of the Madeira Archipelago. More than 100 pages are devoted to breeding birds, 41 species of these, and in the species accounts one finds information on systematics, preferred habitat, nesting, food, and behavior. A section is then devoted to 182 species of migratory birds, that is, birds of passage or wintering birds (nonbreeders on these islands). In Appendix A are found "Unconfirmed records," ". . . the evidence for their inclusion in the main text being either insufficient or requiring corroboration." Appendix B contains the names of 16 species that Bannerman rejects from the list of birds occurring on the islands. In Appendix B are also the names of seven birds, banded at various European sites, and recovered in these islands. And Appendix C is an addenda to Volume I; herein are presented data from new expeditions and observations in the Canary and Salvage Islands.

The present volume is handsomely adorned with the color plates of D. M. Reid-Henry. Black-and-white line drawings throughout the text are also well done; some of these are by Reid-Henry but others are unsigned or contain only initials of the artist. All the artists should have been given recognition.

Despite the verbosity in the accounts of both breeding and migrant birds occurring on these islands, this book contains a wealth of natural history data. Because there are a number of endemic Madeiran birds, their life history accounts are all the more valuable. Certainly Dr. Bannerman and his wife have done a thorough job in reviewing the literature and in presenting a readable and scholarly description of the avifauna.—David W. Johnston.

42. Birds Around the World. A geographical look at evolution and birds. Dean Amadon. 1966. The Natural History Press, Garden City, New York. 175 pp. $3.95. The felicitous cooperation of staffs of the American Museum of Natural History and Doubleday and Co., Inc., is termed the Natural History Press. This latest in a series of inexpensive volumes holds to the high standards previously established. It should be of interest not only to professional biologists, particularly non-zoogeographers who want a broad review of the field, but to anyone with a serious interest in birds. Why were dodos restricted to the Mascarene islands? Why are there no hummingbirds in Africa? In clear, plain language the author sets about answering such questions, and relating them to the most basic of biological questions, the origin of species. Thus, ecological and evolutionary, as well as geographic, zoogeography are integrated.

"The effects of physical barriers" (Ch. 2) discusses the nature of different sorts of global surfaces, and how these may have different influences on different sorts of birds—water as a barrier to land birds, and land as a barrier to water birds, to cite only the grossest example. Chance long-distance dispersal is also carefully considered, especially for island populations, and correlated with the dispersal tendencies inherent in young birds and crowded populations.

A brief review of the ecological requirements of birds—food and water, territory, shelter, nest sites—and of migration, lead to a discussion of ecological niches. The author is clearly familiar with the recent ecological literature, and neatly summarizes a wealth of information. With this prerequisite topic developed, problems of geographic isolation, speciation, habitat and niche selection and segregation, competitive interactions, and dominant and declining species are discussed in the chapter "Species Dynamics and Distribution." Unfortunately, coherence is broken by an interpolated chapter on effects of climate, predators and parasites, and man. While it is possible to point to particular instances of deleterious effects of climate or of predators and disease on certain bird populations, no satisfactory general theory is yet available in this area to provide a thread of continuity, and the author's attempts at generalization are sometimes too sweeping. While no one would deny the importance of predator-free islands to the evolution of certain unique insular avifaunas, or to breeding colonies of marine birds, the general statement that "predation has a very important influence upon distribution" badly needs qualification.

The book concludes with a series of summary catalogs; the distribution of higher systematic categories (mainly at the ordinal level, with a distributional analysis of the Corvidae as an example at the familial level); biogeographical regions; and the systems of ecological classification; life zones, biotic provinces, and biomes. This book presents a great deal of complex, interrelated material in a simple, highly readable style. I may disagree with some aspects of its organization, and I can find factual details to quarrel with or omissions to deplore, but I must envy the author's skill in producing such an excellent work.—Robert S. Hoffmann.

43. A Field Guide to the Birds of Britain and Europe. 1966. Roger T. Peterson, Guy Mountfort, and P. A. D. Hollom. Second edition, revised and enlarged. Houghton Mifflin Co., Boston, Mass. 344 pp. $6.00. Twelve years after the appearance of the first edition of this book, the authors and publisher have deemed it desirable to bring out this revised edition. Although the general format (identification, voice, habitat, map) for each species is the same, the number of pages has been increased from 318 to 344, this increase being due mostly to the addition of 21 species ". . . previously treated only as rare vagrants from North America, Africa or Asia. . . ." Two more color plates are found, these including miscellaneous rarities, and two more pages of line illustrations are included. Both the species' maps and the Selected Bibliography have been thoroughly revised and brought up-to-date.

Other notable changes are of a taxonomic nature. The family Hydrobatidae is now recognized. Warblers, flycatchers, and thrushes reside in one family, the Muscicapidae. At least ten common names have been changed (Horned Grebe to Slavonian Grebe, Dowitcher is now Long-billed Dowitcher, etc.). Most striking is the arrangement of passerine families, the sequence now following the proposals of Mayr and Greenway. Thus, one now finds the order of the last passerine

families to be Emberizidae, Ploceidae, Sturnidae, Oriolidae, Corvidae. Some North American users of this field guide might find it difficult to adjust to this sequence, especially if they have been used to the time-honored Wetmore scheme of placing the corvids and their relatives early in the Passeriformes.

I, for one, wish that the color plates had been placed closer to the species' accounts because wide separations between text material and illustration do not provide for the fastest and most efficient correlation between these two features. This relatively minor criticism will undoubtedly be overridden by the many other favorable features of the field guide, for certainly this second edition will be of great value to ornithologists abroad in the years to come.—David W. Johnston.

44. Birds of North America. A Guide to Field Identification. Chandler S. Robbins, Bertel Brunn, and Herbert S. Zim. 1966. Golden Press, New York, N. Y. 340 pp. $2.95. Here is a new field guide that will likely become a serious competitor to extant guides on North American birds. Its advantages include: small size with flexible yet durable covers; excellent colored illustrations by the renowned Arthur Singer; embraces all of North America north of Mexico; contains small range maps for most species and brief though diagnostic features of all species including their habits and habitats. Particularly helpful are comparative silhouettes of birds perched or flying and the grouping of similar-appearing forms on a given color plate. Thus, one finds separate plates of white-tailed sparrows, orange orioles, ladder-backed woodpeckers, *Aimophila* sparrows, marsh sparrows, fall warblers with and without wingbars, and many more.

Two innovations in the book merit special comment. As an experiment, the authors utilize sonograms as a means of best describing a bird's song or typical call-note. For most of us, much time and patience will be required to master this technique, although it is likely that persons with musical training will master it faster. Just as with other methods tried through the years, only time will tell how effective sonograms will prove in the interpretation of bird songs for the usual bird-watcher.

The small range maps present at a glance breeding and winter ranges as well as migratory routes. Despite careful checking of bird distribution maps from the files of the U. S. Bureau of Sport Fisheries and Wildlife, numerous errors appear on the maps. The Blue Grosbeak does not occur in summer throughout peninsular Florida. Not all the Golden Plovers of western Alaska migrate across the northern Pacific Ocean, and, furthermore, the map for this species omits its occurrence along the California and south Atlantic coasts during migration. Likewise, Long-billed Curlews are known as infrequent migrants (also wintering) on the south Atlantic coast. For Alaska, maps of the Hudsonian Godwit, Harlequin Duck, Tufted Puffin, and Sanderling are inaccurate. Surely these relatively minor though significant distributional errors will be corrected in future editions.

Handsomely illustrated, well conceived and composed, *Birds of North America* should attain rapid success as a useful field guide.—David W. Johnston.

45. Migration in Birds. (Migracion en Aves.) Francisco Bernis [Madrazo]. 1966. Published by the Sociedad Española de Ornitologia, for the Department of Vertebrates of the University of Madrid. Madrid, Spain. [Paper cover]. 487 pp. 107 figures. While this is intended as a general compendium on bird migration like Dorst's (1956. "Les Migrations des Oiseaux") and written with the latter available, using some of the same illustrations and maps, it is nevertheless an original work, having grown out of what was intended as a chapter on migrations of Iberian birds. The fact that the bibliography of about 427 titles, according to my count (as compared to 968 titles in the Dorst Book), contains many additional and significant references indicates the individuality of the work. While it covers somewhat fewer topics and touches upon or cites the migrations of fewer species of birds as examples, the discussion on some of them is more exhaustive, and penetrating. Considering the "information explosion" now in progress neither these nor any other books could be absolutely complete in all respects.

The eleven chapters with their titles cover: migration in general, geographic patterns of migration, the typology and composition of migrations, banding—its nature and practice, the results of banding and their evaluation; visual migration —its observation and recording, en route migration, external influences, the

physiology of migrants, the problem of orientation, and additional aspects of practical application. As to the critical chapters on orientation, the one in this book is the more extensive, and being more recent by 10 years, it is the more up-to-date, including the "inertia hypothesis" of Barlow (1964. *J. Theoretical Biol.*, **6**: 76). The final chapter deals with two topics that are novelties for migration texts, but nevertheless quite serious and relevant to bird travels: birds as accumulators and spreaders of radioactive contamination, and birds as vectors of viruses and the arthropod hosts of such (with 47 references). The bibliography citations are at the close of the pertinent chapters. An additional feature is an appendix cataloguing 77 banding centers of Eurasia and Africa, with their addresses, and 17 centers on other continents. All in all this book may be regarded as an invaluable comprehensive text on bird migration for latin language countries, and moreover it presents some topics and aspects worthy of worldwide consideration.—Leon Kelso.

NOTES AND NEWS

A symposium on "Terrestrial Animal Ecology in Southern Africa" will be held by the Zoological Society of Southern Africa in Pretoria, South Africa, during 11-14 July, 1967. Details may be obtained from the Hon. Secretary, Zoological Society of Southern Africa, c/o Zoology Dept., Univ. of Cape Town, Rondebosch, South Africa.

NEBBA attempts to deliver mist net orders promptly, and generally does so. We guarantee replacement of any order which is lost in the mail. However, a guarantee of delivery by any particular date is impossible, in view of conditions beyond our control. For example, a recent shipment from Hartford to South America (Colombia) by surface parcel post took three months to arrive instead of two weeks, as it had been missent to Formosa. It finally arrived, properly addressed and in good condition, after travels of over 22,000 miles.

The 30mm. mesh in mist nets, as discussed by Heimerdinger and Leberman in this issue, involves 3 NEBBA net types at present, all with 4 shelves and 2.4 m wide: type H (12-meter), type J (6-meter) and type HT (like H except "tethered" at the top). For details of these and other NEBBA nets, write to Mr. E. A. Bergstrom, 37 Old Brook Road, West Hartford, Conn. 06117.

Erratum: in *Bird-Banding*, **37**: 123, April, 1966, the reference to migrating Black Vultures should be deleted ("Autumnal Hawk Migration Through Panama", Hicks, Rogers and Child).