

RECENT LITERATURE

BANDING

1. Bird-banding by the Museum of Natural History of Göteborg in 1948. (Göteborgs Naturhistoriska Museums Ringmärkningar av flyttfåglar under 1948.) Viking Fontaine. 1950. *Göteborgs Naturhistoriska Årstryck*, 1949 and 1950: 28-55. During 1948 160 cooperators banded 16,821 birds in 157 species. The total banded since the inception of the system is 204,079 in 219 species. From 1 April 1948 to 1 April 1949 there were 351 recoveries and returns. Species banded most frequently during 1948 were the Starling, *Sturnus vulgaris* Linnaeus 1254; Great Tit, *Parus major* Linnaeus 1526; Pied Flycatcher, *Muscicapa hypoleuca* (Pallas) 2390; and Black-headed Gull, *Larus ridibundus* Linnaeus 1362. Among the recoveries and returns is an interesting series of 18 records for the Eider, *Somateria mollissima* (Linnaeus); three were recovered at the banding locality in Gotland about a year after banding. There are nine winter recoveries from Denmark and Holstein.—D. S. Farner.

2. British Recoveries of Birds Ringed Abroad. E. P. Leach. 1950. *British Birds*, 18(9): 284-291. "The recoveries of Starling (*Sturnus vulgaris*), Black-headed Gull (*Larus ridibundus*), Common Gull (*Larus canus*), and Teal (*Anas crecca*) from Dutch decoys, are too numerous to be included." Many of the birds recovered were banded in Scandinavia and Greenland. The oldest bird was a Blackbird, *Turdus merula* Linnaeus, banded as a nestling at Melle, Hanover, Germany, 29 July 1939 and taken at Felixstowe, Suffolk, 3 March 1948.—M. M. Nice.

3. Results of Banding Birds by the Ornithologic Institute at Zagreb in 1948. 6th report. (Rezultati prstenovanja ptica Ornitološkog zavoda u Zagrebu u 1948. godini (VI. izvještaj).) Konstantin Igalffy. 1949. *Larus*, 3: 5-15. During 1948, 2643 individuals in 81 species were banded by 36 cooperators; 34 recoveries and returns were reported. Species banded in greatest numbers were the Greenfinch, *Chloris chloris* (Linnaeus) 360; Goldfinch, *Carduelis carduelis* (Linnaeus) 638; Great Tit, *Parus major* Linnaeus 235; and the Swallow, *Hirundo rustica* Linnaeus 256. There are two interesting recoveries of Goldfinches: the first was banded at Split on 26 October 1939 and was recovered 330 kilometers to the north in Hungary on 10 January 1948; a second was also banded at Split on 13 October 1948 and was recovered 660 kilometers southwest in Sicily on 25 December 1948. A Purple Heron, *Ardea purpurea* Linnaeus, was banded at Bačko Gradište 16 June 1939 and shot in Sicily 8 April 1948.—D. S. Farner.

4. The Activities of the French Bird-banding Stations during 1946-1947. (Bulletin des Stations Françaises de Bagueage, Numéro 5, 1946-1947.) M. E. Bourdelle and M. J. Giban. 1950. Published as an appendix to *L'Oiseau et la Revue Française d'Ornithologie*, 20(1). 30 pp. During 1946, 2063 birds were banded under the auspices of the Paris station; during 1947, 2432. Recoveries and returns for the two years total 48. Species banded most frequently were the White Stork, *Ciconia ciconia* (Linnaeus) 585; Common Heron, *Ardea cinerea* Linnaeus 235; Purple Heron, *Ardea purpurea* Linnaeus 266; Swallow, *Hirundo rustica* (Linnaeus) 442; and Redstart, *Phoenicurus phoenicurus* (Linnaeus) 280. Banding under the auspices of the Versailles Station resulted in the banding of 110 birds, 93 of which were Rooks, *Corvus frugilegus* (Linnaeus).—D. S. Farner.

5. Trapping Methods for Bird Ringers. P. A. D. Hollom. 1950. Field Guide Number One of the British Trust for Ornithology, Oxford. 40 pp., many figures. The manuscript for this pamphlet had been completed in 1939 but could not be published during the war; it was revised shortly before going to press. Included are descriptions and illustrations of more than 20 automatic and non-automatic traps, of which such types as the Potter and Chardonneret are familiar

to American banders. None of the designs are radical; those least familiar to American banders are the several house trap designs, all with collecting boxes so that hand nets are unnecessary in removing the birds. There is less use of automatic traps with complex moving parts than in many banding stations in this country (for example, the 8-cell Brenckle warbler trap, or certain recent automatic woodpecker traps). The pamphlet shows an interesting array of moveable nets, many being traditional designs used by bird-catchers in times past. Interest of American banders in this field guide has been enhanced by the fact that the somewhat similar discussion of trapping methods in the Manual for Bird-Banders of the Fish and Wildlife Service was published in 1929, with but minor amendments in the 1947 reprint. Too many banders are using second-rate traps, or spending long hours working out improvements which are essentially duplications, merely because it is so difficult to keep up with the best traps and trapping methods in use at other stations. The number of old government sparrow traps in use is a good index to this difficulty. It is hoped that a full or partial revision of the trapping material in the Manual may be feasible before long. North American readers who would like copies of the field guide may obtain them by sending 40¢ (stamps acceptable) per copy to the undersigned.—E. A. Bergstrom.

MIGRATION

(See also Numbers 2, 3, and 15.)

6. The White Stork in its Winter Area. (La Cigogne blanche dans son quartier d'hiver.) R. Verheyen. 1950. *Le Gerfaut*, 40(1/2): 1-17. This paper is based largely on a critical review of the literature concerning the migration and winter range of *Ciconia ciconia* (Linnaeus) but also, in part, on the author's own observations. The eastern European population of White Storks migrates around the east end of the Mediterranean Sea and winters in eastern Africa from north-eastern Belgian Congo and Uganda southward. The western European and north-western African population migrates principally around the western end of the Mediterranean Sea and spends the winter in western tropical Africa south to the great equatorial forest. The two populations can intermingle to a certain extent in the region north of the great equatorial forest. Although a few white storks establish more or less permanent winter-territories, the vast majority display vagabond movements which may be interpreted in terms of the abundance and movement of important food species, particularly certain grasshoppers or locusts. Young storks, sexually immature, may spend the summer in Africa. This paper contains a revision of Rüppel's (*Der Vogelzug*, 1942) map of the routes of migration of this species.—D. S. Farner.

7. Ten Years' Observations of Waxwing Invasions in Hungary and the Carpathian Basin. (Zehnjährige Erfahrung über Seidenschwanz-Invasionen in Ungarn und im Karpaten-Becken, 1938-39—1947-48.) András Keve. 1949. *Larus*, 3: 55-62. During this period Bohemian Waxwings, *Bombycilla garrulus* (L.), usually appeared at least in small numbers during each winter. There was a fairly substantial invasion during the winter of 1943-1944; however, the largest occurred during the winter of 1947-1948. The movement began in December and lasted into April. The birds arrived from the northeast. A consideration of the available information from Hungary and elsewhere leads the author to agree with Siivonen (*Ann. Soc. Zool.-Bot. Fenn.*, 8(6), 1941) that these invasions have a basic periodicity rather than being caused by "immediate" ecologic factors.—D. S. Farner.

8. Daily and Seasonal Movements of Wisconsin Prairie Chickens. F. N. Hamerstrom, Jr., and Frances Hamerstrom. 1949. *The Auk*, 66(4): 313-337. Although a few flocks of Prairie Chickens, *Tympanuchus cupido pinnatus* (Brewster), "still persist in widely scattered spots in southern counties, most of the present range is in the peatlands of the central and northern counties—a kind of 'substitute prairie'—provided by drained marshes and by swamps which have been converted to grass and sedge through lumbering, burning, and dredging." (p. 313.) Although the birds are able to and do have marked local movements

or even migrations, most of them are remarkably sedentary. Movements probably were caused by changes in food supply and by population pressure; now, with greatly decreased numbers and part of their range destroyed, the birds often are very local in occurrence the year round. Interesting examples are given both of movements and of sedentary habits.—Ralph S. Palmer.

9. Recent Observations on the White Pelican on Gunnison Island, Great Salt Lake, Utah. Jessop B. Low, Lee Kay, and D. I. Rasmussen. 1950. *The Auk*, 67(3): 345-356. Interesting historical data are given on the occurrence of the White Pelican, *Pelecanus erythrorhynchus* Gmelin, on Gunnison Island from 1850 to 1948. Probably about 3,000 to 6,600 adult birds and 2,600 to 3,300 nests have been present annually through the years, with as many as 20 separate colonies on the island. A banding return of 4.3 percent was recorded, 60 percent of these being for the first year following banding. Fifty-four percent of band recoveries were from Mexico, with other returns from Utah, Idaho, and California. The juveniles evidently fly north before the regular southward migration. Food is mainly non-game fish and taken largely from waterfowl refuges around the shore of Great Salt Lake. The birds need special protection at nesting time, from disturbance by man.—Ralph S. Palmer.

10. North American Bird Migrants in Chile. D. S. Bullock. 1949. *The Auk*, 66(4): 351-354. Thirty-four (and probably more) North American nesting species are migrants to Chile, the majority being shorebirds. It is pointed out that numbers of some of these species remain in Chile during the season when they would be expected to breed. It is suggested that study might reveal that some of them actually may breed on what is usually considered their non-breeding winter range.—Ralph S. Palmer.

11. Weather and Spring Migration. George G. Williams. 1950. *The Auk*, 67(1): 53-65. Students of bird migration will gain little enlightenment from reading this paper, other than to learn that the subject of weather vs. migration "needs to be re-studied." As a typical example of wording, one reads that "the beliefs that forces dependent on day-lengths, gonadal development, and inherited migratory habit drive migrants forward undeviatingly toward a goal is not sound . . ." (p. 64.) The author criticizes accepted lines of reasoning, and even seems to imply that the migratory urge is unmodifiable (ignoring a vast literature from Rowan's work to date), and offers no acceptable alternatives of his own.—Ralph S. Palmer.

FOOD HABITS

(See also Number 20.)

12. A Contribution to the Knowledge of the Food Habits of the Goshawk in Norway. (Et bidrag til kjennskapen om hønschaukens (*Accipiter gentilis*) naering i Norge.) Hjalmar Munthe-Kaas Lund. 1950. Reprinted from *Skogdirektørens Årsmelding 1943-1947*. 27 pp. This paper is based on examination of the stomach contents of 29 specimens, 14 complete pellets, and 116 partial pellets. Included are data on the food of young. Twenty-nine prey species were noted; nine mammalian and 20 avian. Twenty-two percent of the items fed to young were mammals, the remainder birds. In the stomachs of adult and juvenal birds the items were 45 percent mammalian and 55 percent avian. Among the birds taken were grouse, thrushes, and most important, woodcock. However, it appears that birds are somewhat less important as a source of food for Goshawks in Norway than in areas to the south. This is an important and interesting paper. It is unfortunate that it contains no foreign-language summary.—D. S. Farner.

PHYSIOLOGY

(See also Numbers 16, 21, 30, and 31.)

13. On the Concept of "Incubation Period." P. O. Swanberg. 1950. *Vår Fågelvärld*, 9(2): 63-80. There is confusion in the literature as to whether

"incubation period" means (1) the period of time in which the bird is sitting on the nest with eggs under it or (2) the time which elapses, with regular uninterrupted incubation of a newly laid egg, until the young has left the egg. The first definition centers around the behavior of the adult bird and includes time spent on the eggs before the set is completed and until the last egg hatches but does not include brooding of the young, although this is similar behavior. A difficulty with this concept is that in most species all eggs hatch in a period that is much shorter than required to lay the complete set. Two principal reasons have been cited for this: (a) the first eggs laid require a longer time for development than the last eggs of a set, (b) the last eggs of a set are farther advanced in development at the time of laying than are the first eggs. Swanberg points out that no evidence has ever been presented that different eggs in a set when placed under identical conditions require different times to hatch. On the other hand, he records original observations on *Nucifraga caryocatactes* (Linnaeus), *Phalaropus lobatus* (Linnaeus), *Luscinia svecica* (Linnaeus), and *Calcarius lapponicus* (Linnaeus) where the early eggs of the set felt cold to touch even though the bird had been sitting on them as if incubating. This, together with evidence that he cites from the literature, suggests that the full incubation temperature does not occur until the set nears completion. The first eggs laid receive some heat but obviously do not develop as rapidly as they do later. The reviewer has used thermocouples in nests of *Troglodytes aëdon* (Vieillot) and can verify that the full incubation temperature in this species does not develop until the set nears completion even though the adult bird appears to be incubating them. Swanberg points out that this development of heat is not entirely due to the gradual development of the brood-patch as the eggs are laid, as the phenomenon also occurs in second sets during the same season after the brood-patch has once formed. However, it needs to be stated that the brood-patch involves more than the loss of feathers; it requires increased vascularization and shunting of blood-flow to the skin. This process is probably under hormone control and may need to develop gradually during each egg-laying period. Because of the difficulties in defining incubation from the behavior of the adult, Swanberg concludes, and rightly so, that incubation should be defined according to Heinroth's rule as stated under (2) above, and further that in nature it is generally possible to ascertain the incubation period with satisfactory exactitude from the time of laying of the last egg to the hatching of the last young.—S. Charles Kendeigh.

14. Effect of Temperature and Season on Energy Resources of the English Sparrow. S. C. Kendeigh. 1949. *The Auk*, 66(2): 113-127. This experimental study of *Passer domesticus* (Linnaeus) was done at the University of Illinois. Conclusions (pp. 126-127), in brief, are as follows. Gross energy intake and metabolizable energy intake, on a voluntary diet just sufficient to give continual maintenance of weight in a photoperiod of ten hours of light per day, increase as straight lines between +34° and -31° C. Increase in rate of metabolizable energy intake with decreasing temperature does not keep pace with the increase in gross energy intake, due in part to increasing percentage of energy loss in excrement from the large intestine and kidneys. Preliminary calculations indicate that birds at liberty under natural conditions in midwinter have a potential, metabolizable energy intake of 35.89 cal./bird/day, of which 21.80 calories are equivalent to minimum existence requirement under most favorable summer conditions, 5.79 calories represent increased energy cost of resistance to winter cold, and 8.30 calories is productive energy which is divided between the cost of maintaining a free existence and other miscellaneous activities. "During spring and summer, under free, natural conditions there may be small decrease in the potential energy intake and a larger decrease in energy required for existence. As a consequence, productive energy may rise to 12.52 cal./bird/day, an increase of 4.22 calories over midwinter. This additional energy makes possible such other activities as migration, reproduction, molt, and fat deposition. . . The initiation of migration, reproduction, molt, and other activities requiring considerable expenditures of energy may be conditioned by the availability of productive energy over and above that required for existence."—Ralph S. Palmer.

15. Differences Between Migrant and Non-migrant Birds in Food and Water Intake at Various Temperatures and Photoperiods. Henri C. Seibert. 1949. *The Auk*, 66(2): 128-153. This experimental study, done at the University of Illinois, concerns temperature versus food consumption, gross energy consumed per day, energy lost in feces, metabolizable energy absorbed, and water consumption. Species studied were English Sparrow, *Passer domesticus* (Linnaeus); Slate-colored Junco, *Junco hyemalis* (Linnaeus); White-throated Sparrow, *Zonotrichia albicollis* (Gmelin); Blue Jay, *Cyanocitta cristata* (Linnaeus); and Field Sparrow, *Spizella pusilla* (Wilson). From the author's summary (p. 152): "These experimental results, when interpreted in terms of winter conditions in the breeding ranges of the junco and white-throat, indicate that migration south in the fall may be induced because decreasing photoperiods and colder temperatures combine to prevent the birds from absorbing sufficient food to maintain an energy balance over the 24-hour day. . . The English sparrow and the blue jay are not forced to migrate south in the autumn because short photoperiods at low temperatures induce a rate of energy absorption sufficiently great to minimize the effect of shortened day-length. High temperatures at long photoperiods do not reduce the energy absorption in the English sparrow to the same extent as in migrant species. . . The field sparrow may be limited in its northward migration and distribution by its innately high food requirements. . . Northward migration in the spring in the white-throat may be influenced by a delicate water balance that is easily upset by high temperatures."—Ralph S. Palmer.

LIFE HISTORY

(See also Numbers 9, 17, and 19.)

16. The Life of the Swift, *Micropus apus* (L.), in Relation to the Weather. Jukka Koskimies. 1950. *Annales Academiae Scientiarum Fennicae*; Series A, IV. *Biologica* (12): 1-151. A very fine report, dealing competently with the large literature on the subject and giving results of new observations and experiments. Swifts are entirely dependent on "aeroplankton"; in cold and rainy weather and particularly as cyclones (areas of low atmospheric pressure) approach, aeroplankton becomes so scarce that there is no food for these birds. Swifts are able to withstand long periods of starvation, adults about 4.5 days, nestlings 10 days. "While fasting, the young swifts are able to utilize at least half (on an average 52.8%, even about 60%) of the total body weight. In adults the average weight loss was about 38%." (p. 105.) "After a fast period of some days swifts lose their capacity for temperature regulation during the diurnal rest period, and are fairly typically poikilothermic during the night . . . they sink into a condition of torpidity closely reminiscent of the hibernation torpidity of some mammals." (p. 137.) Two papers from North America are cited which are important in relation to the food of our swifts and swallows. P. A. Glick (1939. The distribution of insects, spiders and mites in the air. *Technical Bulletin, U. S. Department of Agriculture*, 673: 1-150) studied the aeroplankton by sampling the air at different heights and under different weather conditions by means of airplanes. Aeroplankton was most abundant at 60 meters when the surface temperature was between 21° and 27° C. (70° and 80° F.). A rise or fall of 10° C. (16° F.) "causes a decrease of insects to half the amount observed in optimal conditions." During rain the insects disappear. Other studies on the distribution of insects in the atmosphere were conducted by W. G. Wellington (1945. Conditions governing the distribution of insects in the free atmosphere. *Canadian Entomologist*, 77: 7-15, 21-28, 44-49, 69-74.) "Bad weather and lack of nourishment often result in characteristic weather flight movements performed principally by the young non-breeding birds hatched the year before. The birds then move more or less southwards, often combining into very great flocks, and avoid the center of the approaching cyclone as a rule by passing through the side of its warm sector," p. 136. "Swifts start their weather flight movement already long before any signs of bad weather are perceptible to human senses." (p. 94.) Swifts are estimated to be well able to fly from 540 to 600 miles a day in the course of their ordinary lives. (p. 95.) The breeding of the swift is closely dependent on the weather. Contrary to the general rule of larger sets in the North, the average number of eggs laid in Finland and Scandinavia is two, but in central

Europe three. In "climatically more favourable regions the swift has a larger clutch than in the less favourable regions." (p. 59.) Fewer eggs are laid in unfavorable than in good weather. In Switzerland it was found that if weather was fine at the onset of incubation, all eggs were incubated normally. But if it turns "cold and rainy the parents remove 1-3 eggs—the worse the weather the more eggs—from the nest bowl and soon afterwards they drop them to the ground." (p. 62.) Fledging takes 35 to 56 days according to the weather. On the 20th to 32nd day the young reach their maximum weight—55 to 66 grams, in contrast to adult weight of 40 to 45 grams. The young leave the nest "quite independently of the parents" and probably immediately start their migration. A very important paper containing a great deal of valuable information.—M. M. Nice.

BEHAVIOR

(See also Numbers 16 and 28.)

17. The Pre-egg Stage in the Albatross Family. L. E. Richdale. 1950. *Biological Monographs*, No. 4. Dunedin, New Zealand. 92 pp. 12 shillings and sixpence. Another important study by Mr. Richdale based on prolonged and detailed observation of color-banded birds over many years as well as a careful survey of the literature. A colony of Royal Albatross, *Diomedea epomophora sanfordi* (Murphy) was watched for 13 years, while Buller's Mollymawk, *Diomedea bulleri* Rothschild was studied for one season during the pre-egg stage on the Snares Islands. For breeding birds the pre-egg stage lasts about a month, extending from their arrival from the sea on their breeding grounds to the laying of the eggs. "For unemployed birds, the pre-egg stage extends into the post-egg stage for breeding birds and really covers the whole time unemployed Albatrosses are on the breeding grounds in any one season." The most interesting type of Albatross behavior is the ecstatic ritual or "dance." "The ecstatic ritual gradually increases in intensity from the sober and relatively unspectacular behaviour of the Sooty Albatross to the most impressive ceremonies of all, which are performed by the 2 large species of Albatross." With breeding birds the male usually arrives first and may wait a long time before the first appearance of the female. "Until approximately 2 days before the egg is laid, the female is ashore only for short periods for coition; after that she returns to lay and usually works feverishly at nest-building." The male also may build. "Albatrosses appear rarely to be called upon to defend territory. They will, however, defend a sex-partner or potential sex-partner whether that partner is at the nest or some distance away." The most conspicuous members of an Albatross community are the unemployed birds, mostly males. The ecstatic ritual is performed mostly by these birds and has pair-formation value. Mr. Richdale has never observed it given between members of a mated pair of Royal Albatrosses either before or after the laying of the egg. During incubation, the members of the pair see very little of each other, as each is absent a long time at sea, sometimes as long as 24 days. "Pair-formation in Albatrosses is probably initiated with behaviour known as aerial activity, visiting, and parties, which allow the birds to meet. The subsequent use of the lesser love-habits, and then the ecstatic ritual, permit the acquaintance to deepen. Coition, at this stage, probably has the same function. Next, 2 birds attempt to segregate themselves and the male soon finds he has to warn off potential rivals. At the beginning of the succeeding breeding season, if all goes well, these 2 birds may be observed mated, but the exact moment of pair-formation has not been ascertained." (p. 85.) Very interesting detailed accounts are given of the behavior of individual Royal Albatrosses. These birds apparently mate for life. One female twice lost her mate and each time spent a season as a non-breeding bird taking part in pair-formation activities. It may well be that pair formation is completed at sea. Mates apparently meet at sea and one can communicate to the other "the futility of the second bird's returning to the nest after a chick has flown or died." (p. 54.) Of 15 fledglings that have left the area, three have so far returned, one six years old, the others eight.

There are thirteen excellent photographs showing the behavior of Royal Albatrosses, both adults and young. Mr. Richdale, through his tireless study of marked birds, is unravelling many problems in the previously confused picture of the behavior of Albatrosses.—M. M. Nice.

18. Mixed Bird Parties in the Tropics, with Special Reference to Northern Rhodesia. J. M. Winterbottom. 1949. *The Auk*, 66(3): 258-263. The author discusses studies made by D. E. Davis, J. K. Stanford and himself, then divides bird parties into four categories: (1) "nucleus" species, (2) other "regular" species, (3) "regular accidental" species, and (4) "accidental" species. A possible fifth category, "accidental nucleus" species, is mentioned. The author analyzed 169 bird parties seen in Rhodesia, finding a total of 64 species in these and an average of 7.8 species per party.—Ralph S. Palmer.

19. Home Range and Duration of Family Ties in the Tufted Titmouse. J. Van Tyne. *Wilson Bulletin*, 60(2): 121. Observations and trapping records on twenty-nine banded Tufted Titmice, *Parus bicolor* (Linnaeus), at Ann Arbor, Michigan, suggest that a certain segment of the population, probably the adults, are non-migratory and remain within a limited area through the year, while another group, primarily yearlings, are wanderers. Young birds often accompanied their parents on foraging excursions for several weeks, in one case until mid-winter.—John T. Emlen, Jr.

ECOLOGY

(See Numbers 16, 20, 24, 25, and 28.)

AVIFAUNAL DYNAMICS

(See also Numbers 22, and 25.)

20. The Status of the Eagle Owl in Sweden and some Details Concerning its Biology. (Berguvsens, *Bubo bubo* (L.), förekomst i Sverige jämte något om dess biologi.) K. Curry-Lindahl. 1950. *Vår Fågelvärld*, 9(3): 113-165. This important paper is the result of a five-year (1943-1948) study of the Eagle Owl in Sweden and a careful review of its history in Sweden and its status elsewhere as indicated by published information and private communications. During the 17th, 18th, and early 19th centuries this species was apparently common in Sweden. Since then it has become increasingly rare and disappeared from several of the provinces of central Sweden. In 1948 there were at least 291 breeding pairs in the entire country, 197 of which were in northern Sweden. In Norway and Finland this species is widely distributed but no longer common. The last breeding record for Denmark was in 1891. It bred in Belgium as late as 1937. In 1938 the population in Germany was 100-110 pairs. There are currently about 10 breeding pairs in Switzerland and 50 pairs in Austria. There are also breeding birds in Italy and Sicily. The status in Eastern Europe is more favorable. There are probably 50-60 pairs in Esthonia and 400-420 in Latvia; it has been reported to be increasing in numbers in eastern Poland whereas it is virtually extinct in western Poland. Apparently it is quite common in the Balkans although precise data are unavailable. The decrease of this species in Sweden is attributed by the author primarily to persecution by hunters and collectors. Also of importance has been the gradual destruction of suitable biotope. In Sweden the Eagle Owl is a bird of the wooded mountains, "rocky woods," and the cliffs in the archipelagoes. A breeding pair apparently changes among two to four places in its territory. The principal food items in Sweden are small rodents. Among the birds taken, the Hooded Crow, *Corvus corone cornix* L., is the most frequent, about nine percent of all items. There is some specialization in food habits. The author concludes the food habits to be generally "beneficial." This is a very important paper.—D. S. Farner.

PLUMAGE AND MOLT

21. The Molt and Plumages of the European Jay. (La mue et les plumages du Geai *Garrulus glandarius*.) Noël Mayaud. 1948. *Alauda*, 16: 168-179. Using a series of 55 skins collected in western France the author describes a method for distinguishing jays up to about one year of age from adults.

Of the 55 specimens, 15 were classed as undoubted adults by the presence of some trace of molt among the remiges, and six were classed as undoubted juvenals due to the presence of at least a few juvenal feathers, or because they were in juvenal plumage. The remaining specimens were classified as to age (19 adults and 15 juvenals) according to the shape of their remiges and rectrices. The partial juvenal molt extends to all the short feathers, to the three posterior secondaries of the wing, to the six posterior greater secondary coverts, and in about 25 percent of individuals to two or three of the alular feathers. The remainder of the remiges and their greater coverts, as well as the rectrices, are retained. The annual (post nuptial) molt is complete. Molts in the case of both age classes take place in western France between early July and the end of September. The author contrasts the appearance of adult and juvenal rectrices and remiges as follows: whereas the juvenal rectrices tend to have narrowly pointed and weakly pigmented tips, those of the adults tend to have more nearly square and more heavily pigmented tips; the tips of the outer alular feathers are more pointed in the juvenal; in microstructure, the barbules of the outer barbs at about the midpoint of the outer alular feathers are elongate and the barb shaft forms a rostrum like projection in the case of the juvenal only; the black bars on the leading edge of the outer alular feathers of the juvenals are broader, less well defined, and fewer in number than in the adults; the black bars of the sixth greater upper primary coverts are fewer in the case of juvenals than in the case of adults; and the blue of the juvenal plumage is in general less bright than that of the renewed feathers. There is a discussion, without experimental evidence, of the possible causes for the morphologic differences in barring of the blue feathers in respect to age. He feels that the morphologic detail of feather development is conditioned by daily changes in metabolic rate in both the juvenal and the adult, and that the differences found in the case of the juvenal may be attributed to a relatively high level of thyroid activity in the growing juvenal bird.—L. R. Mewaldt.

BOOKS

22. The Birds of Greenland. Part I. Finn Salomonsen with plates (water color) by Gitz-Johansen. 1950. Einar Munksgaard, Copenhagen, Denmark. 158 pp. \$9. This attractive volume is the first of a series of three which will adequately fulfill the long-standing need of a comprehensive treatise on the birds of Greenland. The material presented in these volumes will be of very substantial interest to American ornithologists since much of it concerns American species. In the introduction the author presents a brief résumé of the climatology, physiography, and zoogeography of Greenland. The avifauna is confined to the coast and to the inland belt, a strip between the coast and the ice-cap varying in breadth from a few to 200 kilometers. The climate of the coast is maritime whereas that of the inland belt is continental. The area north of Melville Bay on the west coast and north of Blossville Coast on the east side is designated as high-arctic whereas that to the south is designated as low-arctic. This division has considerable significance in the distribution of the avifauna. There is a restricted amount of coniferous forest. Volume I treats the loons, fulmars, shearwaters, petrels, cormorants, ducks, and geese. Many items of interest are to be noted. The author points out that there is no reliable evidence for the breeding of Leach's Petrel, *Oceanodroma leucorhoa leucorhoa* (Vieillot), despite statements to this effect in many treatises. There is an interesting discussion of the evidence indicating a high probability that the Whooper Swan, *Cygnus cygnus cygnus* (Linnaeus), once bred in Greenland during periods of milder climate. Evidence is presented indicating that Hutchins's Goose, *Branta canadensis hutchinsii* Richardson, is a breeding species. The Pintail, *Anas acuta* Linnaeus, has begun to breed in recent years as the climate has ameliorated. Greenland Pintails are intermediate between the American and European populations and the author favors discontinuance of the use of trinomials in this species. Twenty species are included in Part I. For each there is information on status, abundance, habits, in addition to notes on history and systematic status. The text is in Danish and English in parallel columns. The format is attractive; there are relatively few typographical errors. The translation into English is accurate. The attractiveness of the volume is much enhanced by 16 colored-plates (water color) by Gitz-

Johansen. As a source of important information on several interesting arctic elements of the American avifauna this treatise is heartily recommended to American ornithologists.—D. S. Farner.

23. The Birds of North and Middle America. Part XI. Herbert Friedmann. 1950. *United States National Museum Bulletin* 50, xiii + 793 pp. U. S. Government Printing Office, Washington 25, D. C. \$4. Part XI of this important series includes the Cathartidae, Accipitridae, Pandionidae, and Falconidae. Seventy-six species are admitted to the list with the usual descriptions, keys, and illustrations of important diagnostic characters. The total named forms admitted is 114. In general the differences in nomenclature from that of the Fourth Edition of the A. O. U. Check-list (and supplements) are slight. *Falco sparverius gadalupensis* Bond, accepted in the 20th Supplement, is synonymized with *sparverius* Linnaeus. It is a pleasure to note the continued progress toward the completion of this important tool in ornithology.—D. S. Farner.

24. The Breeding Birds of the Netherlands. A. L. J. Van Ijzendoorn. 1950. E. J. Brill, Leiden. 73 pp. 6.25 guilders. An excellent little book designed primarily for foreigners visiting Holland. A brief description is given of the geology and geography of the Netherlands with mention of the best places to see birds, most of them carefully preserved by nature protection societies and the State Forest Service. The systematic list consists of short accounts of the past and present status of 184 species and four subspecies; of these 150 regularly breed in Holland. Since the beginning of the century 25 species have been added to the Dutch list, while five have disappeared. Twenty-four species have increased in this century. "In some species the increase is undoubtedly due to human protection (Spoonbill, Eider, Cormorant, Avocet, Sandwich Tern, gulls). These colony-nesting birds responded to protective measures with an—in some cases astonishing—growth of population. Other species show an increase not due to human interference, and also in other countries: Song and Mistle-Thrush, Black-bird, Stock-Dove, Black-necked Grebe, Little Ringed Plover. Changes in ecological preferences seem often to be coinciding with greater abundance: Oyster-Catcher, Stock-Dove."

Twelve show a distinct decrease. "Decrease often results from habitat-destruction by humans: Great Grey and Woodchat Shrike, Purple Heron, Common Snipe, Stone-Curlew. Persecution by hunters and catchers may have been partly responsible for the numerical decrease in Hoopoes, Kingfishers, White Storks, Night-Herons. Modern hay-winning methods presumably affect numbers of Corn-Crake and—locally—waders such as Lapwings, Ruff, Black-tailed Godwits, and so on."

Drainage of swamps, cultivation of heaths, increase of human population constitute the greatest dangers to the birds, but these are partly offset by the ever-growing interest in ornithology, establishment of many sanctuaries, planting of woods.

There is a useful one-page bibliography of recent publications on birds in the Netherlands and seven neighboring countries. Indices list scientific, English and Dutch names of the species treated. There are 13 photographs of birds and nests and a map of the country showing the sanctuaries. This admirable book can be unreservedly recommended to the traveler in northern Europe, as well as to all bird students and other biologists interested in problems of ecology.—M. M. Nice.

25. The Avifauna of Serbia. (Rasprostańenje i zivot ptitza u Srbiji.) S. D. Matvejev. 1950. *Srpska Akademija Nauka, Posebna Izdańa*, vol. 159, *Institut za Ekologiju i Biogeografiju*, vol. 3, xiv + 363 pp. Belgrade, Yugoslavia. This monograph is based on field observations by the author and his collaborators in the period 1936-1950; the notes of V., E., and K. Martino for 1931-1941; about 5,500 specimens in the museums at Belgrade, Zagreb, Sarajevo, and Skoplje; and about 20,000 records from the literature. In Part I (pp. 1-100) primary attention is given to a synecologic consideration of the birds of Serbia. There is an elaborate analysis of biotopic distribution and frequency, and considerable attention to species in corresponding niches in different faunal groups. According to the

author, four avifaunal types may be recognized in the mountains of Serbia: (1) the birds of the rocky terrain and pastures at higher elevations, (2) the birds of the forests of higher elevations, (3) the birds of the forests of the coast and lower slopes, (4) the birds of the open terrain in the valleys, low plains, and lower slopes. Part II (pp. 101-122) is a biogeographic analysis of the avifauna of Serbia. The species are classified as follows: (1) *Balkan*, none; (2) *Balkano-Anatolo-European*, 4; (3) *Mediterrano-European*, 25; (4) *Pan-Mediterranean*, 69; (5) *Eurasian*, 89. The classification for subspecies is: (1) *Balkan*, 31; (2) *Balkano-Anatolo-European*, 45; (3) *Mediterrano-European*, 89; (4) *Pan-Mediterranean*, 24; (5) *Eurasian*, 14. Part III (pp. 123-300) is the systematic list with annotations on ecology, distribution, abundance, history, and specimens. Only species are considered, 288 being admitted as definitely occurring in Serbia. Species of uncertain status are placed in proper systematic position in the list but are not numbered. This part of the monograph represents, in reality, a fifth volume of C. Reiser's "Materialien zu einer Ornithologie der Balkanica" (1894-1939). It contains Reiser's material for Serbia with extensive augmentation by the studies of the author and his collaborators. This section differs from the more general plan of regional ornithologies in that the systematic list does not consider subspecies. Actually the only material concerning subspecies is given in the section on biogeographic analysis where it is used to show the relation of the Serbian avifauna to the avifauna of adjacent areas. It seems to the reviewer that the systematic list would have been more useful had material on subspecies been included under the appropriate species. It is unfortunate that the quality of the paper is inferior so that the reproduction of the photographs is relatively unsatisfactory. There is a useful summary (309-319) in French; however, this is concerned primarily with the materials of parts I and II. The use of Part III requires a working knowledge of Serbian. This monograph is obviously an important contribution to regional ornithology.—D. S. Farner.

26. Menaboni's Birds. Paintings by Athos Menaboni and text by Sara Menaboni. 1950. Rinehart and Company, Inc., 232 Madison Ave., New York 16, New York. xvi + 132 pp. \$10. The many who have observed and admired Athos Menaboni's paintings in exhibitions will welcome the publication of this collection of 32 masterful color plates (8¾ by 12 inches), 23 full-page black and white plates, and 38 other black and white illustrations. The full-page plates depict species of eastern North America. These beautiful paintings display a consistently meticulous accuracy in color and morphologic detail, a realism in setting, and a distinctive perfection in technique. They are the product of great technical skill and a profoundly sympathetic familiarity with the subjects portrayed. One irresistibly compares these with the Audubon paintings of the same species. To this reviewer the comparison is strikingly favorable in many cases. Those of the Canada Goose, Turkey, and Ruby-throated Hummingbird are examples. Although the reputation of a bird artist is established only over a substantial period of time and by the reactions of many people, there can be little doubt that Menaboni will assume a position among the foremost painters of American birds. The text is a nicely written mixture of observations of birds in nature and in captivity, with a considerable sprinkling of anthropomorphisms, as well as anecdotes which collectively tell much of the interesting life, personality, and philosophy of Athos Menaboni. From the standpoint of the organization of the book, it is unfortunate that the name of the bird, and descriptive material, is on the *back* of the plate. Hence on the page opposite the plate of the Bald Eagle one finds the name and description of the Eastern Wild Turkey. On the other hand this arrangement is best if the plates are to be removed for framing. In general the book is most attractively prepared; the reproduction of the paintings is excellent. In consideration of its high quality, and the currently high costs in the manufacture of books, this volume is not excessively priced. It will doubtless enjoy an extensive distribution.—D. S. Farner.

27. Bird Portraits. J. C. Harrison. 1950. Charles Scribners Sons, 597 Fifth Avenue, New York 17. 119 pp. \$12.50. This extremely attractive book is primarily a collection of more than 400 sketches and 16 exquisite water-color (6¾x8½ inches) paintings of British birds. The accompanying text is a curious,

although certainly interesting, mixture of notes on ecology, distribution, and behavior, as well as explanations of the sketches and the circumstances under which they were made. It gives an insight into the author's field studies and his methods of recording his observations in sketches. The water-color paintings are portraits of birds in action with a remarkable degree of naturalness. "Grouse—straight for the butts," "Ptarmigan disturbed by a Golden Eagle on the snowy Corrie of Cairngorm," "Spoonbill alights," "The arrival of Brent Geese," and "Whooper Swans below Vatnajökull in Iceland" are examples. All have a distinctive motif of natural freedom around which has been woven an adequate degree of detail. This fine collection will doubtless enjoy favor among those who seek both artistic and accurate portrayals of birds in action.—D. S. Farner.

28. Wild Animals in Captivity, An Outline of the Biology of Zoological Gardens. H. Hediger. Translated by G. Sircom. Foreword by Edward Hindle. 1950. Butterworths Scientific Publications, London (Academic Press, Inc., 125 East 23rd Street, New York, New York). ix + 207 pp. \$6.00. This interesting book represents a most admirable attempt to present scientifically many of the aspects of the behavior and maintenance of wild animals in captivity. Although principal attention is given to mammals, there is extensive information on birds. Furthermore many of the general principles are applicable to birds. In addition to his extensive use of the literature on animal ecology and behavior the author draws constantly from his rich experiences at the Dählhölzli Park in Berne, at the Basle Zoological Gardens, and from his participation in expeditions to Morocco, Central Africa, New Guinea, and the Pacific islands. Considerable attention is given to the distribution of animals under natural conditions, particularly in terms of limitations in available space and habitat; this is related to conditions in captivity. Flight distance, a natural interspecific phenomenon, is an important factor in confinement; successful confinement requires provision of adequate space for flight distance or reduction of flight distance. Considering the effects of space restriction more generally, the following summary is presented: "We must therefore differentiate between: (1) Direct *i. e.* primary effects of space restriction—restriction of freedom of movement, or possibility of movement in the physiological sense (necessary muscular activity *etc*) (2) Indirect *i. e.* secondary effects of space restriction; as, for example, hypertrophy of values ('Valenz' in the sense of W. Fischel); lack of diversion and occupation; impoverishment of the subjective world; liberation of energies that were pent up in freedom (through avoidance of the enemy *etc*); impossibility of suitable differentiation of space; impossibility of free choice of food; impossibility of choice of optimum micro-climate; hypersexuality; anti-social behavior; impossibility of avoiding members of its own species at will, and increase in danger from infection and re-infection." (pp. 31-32.) Additional important factors affecting animals in confinement are the elimination of the necessity of defense against other individuals of the species as well as against predators and reduction in the time required to obtain food. Attention is drawn, in considerable detail, to the difficulty in producing a simulation of a natural habitat in a restricted space; at its very best it is an isolated section of nature and "is cut off from the main cycle of life." (p. 72.) The rich anecdotal material makes this an unusually interesting book despite the fact that the translation is, in many places, somewhat unpolished. Although there are certainly to be disagreements with some of the author's interpretations and generalizations, this book should be of considerable interest to students of animal behavior and zoologists in general. The extensive references to practical problems of keeping wild animals in captivity will make it invaluable to any investigator confronted with maintaining in captivity experimental animals of other than the common laboratory and domestic species.—D. S. Farner.

29. Handbook of Attracting Birds. Thomas P. McElroy, Jr., illustrated by Lambert Guenther. 1950. Alfred A. Knopf, 501 Madison Avenue, New York. xiv + 163 pp. \$2.75. This attractive little book contains a wealth of useful information for the layman who wishes to make his garden, lawn, farm, or estate more attractive and interesting by increasing its population of birds. Many experienced ornithologists will likewise find the book to be a source of useful information. In general it is prepared for the eastern United States but the

principles involved are generally applicable. Among the useful items included are plans and specifications for nesting boxes and feeding apparatus, information concerning kinds of food, suggestions about bird baths, lists of plants useful for protection and food, lists of nesting materials, devices for attracting upland game birds, and suggestions for attracting waterfowl. There is a brief useful chapter with suggestions for establishment of sanctuaries. A wide circulation of this book will contribute much to an enhanced interest in wildlife conservation.—D. S. Farner.

30. Comparative Physiology. Volume IV. (Vergleichende Physiologie. Band IV. Hormone.) W. von Buddenbrock. 1950. Verlag Birkhäuser, Elisabethenstrasse 15, Basel, Switzerland. 492 pp. \$12.60. It is a pleasure to note the resumption of publication of this important treatise after a prolonged war-time interruption. About 400 pages of this volume are devoted to the endocrinology of the Vertebrata. For each of the endocrine glands and its hormones there is a discussion of the available information for the various groups of vertebrates. The material on birds is extensive, well-selected, and well-integrated. Consequently this book can be highly recommended to anyone interested in the endocrinology of birds both for the actual material on birds and for the suggestions which may be derived from the examination of a concise treatment of the endocrinology of other classes of vertebrates.—D. S. Farner.

31. Comparative Animal Physiology. C. Ladd Prosser (Editor), David W. Bishop, Frank A. Brown, Theodore L. Jahn, and Verner J. Wulff. 1950. W. B. Saunders Company, West Washington Square, Philadelphia 5, Pennsylvania. ix + 888 pp. \$12.50. This scholarly book is the second comparative physiology to be published recently in this country. The basic approach is a comparison of method of performance of the various fundamental animal functions in the major groups of animals. Consequently in most chapters there is a brief consideration of, or reference to, physiology of the particular function in birds. Although it is obviously necessary to omit reference to much of the literature in avian physiology, the choice of material to be included is generally good. An example is the brief consideration of hormones in relation to bird migration. (p. 767.) In the opinion of the reviewer this book is among the very most outstanding published in the field of biology in this country during the past decade.—D. S. Farner.

The Eastern Bird-Banding Association has extended a cordial invitation to all banders to attend its Annual Meeting at the Pratt Library in Baltimore, Maryland, at 9 A.M. on Saturday, March 31, 1951, followed by a visit on Sunday to the Patuxent Research Refuge near Laurel. Requests for details may be addressed to the Secretary of the E.B.B.A., Mr. Bender. It is hoped that an unusually large number of banders from a distance will attend.

An early issue of *Bird-Banding* will include an article by Mr. Seth H. Low, biologist in charge of the bird-banding work of the Fish and Wildlife Service, giving the names and addresses of all cooperators who banded 100 or more birds during the banding year ending April 30, 1950, and reported them by June 30, 1950, together with the number banded by each. No separates of the article will be available from Mr. Low, nor will the Service publish the information in any other way. It appears that the Service will no longer find it possible to publish such information in *Bird-Banding Notes*, or to publish a list of the number of individuals banded annually of each species. It may be possible for *Bird-Banding* to publish a list of active cooperators as soon as possible after June 30 of each year, followed in a later issue by the list of birds by species. Whether it is desirable to devote that much space to the lists is not clear, although it may well be that they would be of marked interest to our present subscribers and to other active banders. We are always mindful of the mutual benefits to be derived from an expansion of *Bird-Banding's* circulation among such banders. The editor would greatly appreciate an expression of opinion by readers, for or against the inclusion of such lists, after Mr. Low's article has appeared.