

1942, the day it left the nest. The point of recovery is approximately 20 air miles from the place of banding. Thus another age record of nine years is added to the two previous records of nine and ten years, and a little more light is thrown on the question of how far the young birds travel after leaving the area in which they are hatched.—Sally F. Hoyt, "Aviana," Etna, N. Y.

Two Tree Swallow Exchanges between Nesting Colonies.—On May 27, 1951, Tree Swallow 42-95835, which had been banded by me as an adult female on June 17, 1947, and trapped subsequently by me in 1948, 1949, and 1950, was trapped by Prof. Lawrence B. Chapman in his colony at Princeton, Mass. On June 19, 1951, I captured Tree Swallow 46-8727, which had been banded by Prof. Chapman in Princeton on May 27, 1951, as an adult female. Apparently its nesting effort at Princeton was a failure, as Professor Chapman reports he found "the nest deserted with one dead nestling, one broken egg, and three unhatched eggs" on June 16. Why this nesting failure should have driven the bird to seek a new site at a distance of about twenty miles is hard to understand.—William P. Wharton, Groton, Massachusetts.

RECENT LITERATURE BANDING

(See also Numbers 6, 58, 63, and 75.)

1. Notes on Banding Records and Plumages of the Black-headed Grosbeak. Josephine R. Michener and Harold Michener. 1951. *The Condor*, 53(2): 93-96. From 1921 to 1945 the authors made notes on the plumages and molts of 700 Black-headed Grosbeaks, *Pheucticus melanocephalus* (Swainson), banded in Pasadena, California, during the warmer months of the year. Of 675 banded during the first 14 years, there were 208 adult males, 206 adult females, and 261 juvenals. It was found that trapping data for individual years did not reflect the true sex and age composition of the summer-resident population for that locality, for the individual years. Of 39 recoveries after at least one migration from the last capture, 29 were males and ten were females. There was a far greater tendency for grosbeaks banded as adults to return than those banded as juvenals. As indicated by banding data, the oldest grosbeak was a male banded as an adult which returned last five years after banding. In the post-juvinal molt, the remiges and rectrices are not all lost and frequently none are lost. This fact usually makes it possible to distinguish one-year birds from grosbeaks more than one-year-old. Several descriptions of variations in this post-juvinal molt are presented.—L. R. Mewaldt.

2. Survival in Birds Banded at the Hastings Reservation. Jean M. Linsdale. 1949. *The Condor*, 51(2): 88-96. During the winter months of the years from 1937 to 1948 a total of 5,726 birds of 36 species were banded on the Hastings Reservation in the northern part of the Santa Lucia Mountains in Monterey County, California. The most commonly handled species were the White-crowned Sparrow, *Zonotrichia leucophrys* (Forster), with a total of 1,258 banded, and the Golden-crowned Sparrow, *Zonotrichia coronata* (Pallas) with 2,749 banded. These two species were handled more than 20,000 times including recaptures. Several tables are presented to show survival patterns and population composition. It is unfortunate that numerous inconsistencies between tables, and between tables and the text appear. For example, if data for White-crowned Sparrows from Table 4 (p. 94) are used instead of those from Table 2 (p. 91), one finds in part that 299 rather than 763 birds "survived" one year; that 143 rather than 179 "survived" two years; 65 rather than 82, three years; and 35 rather than 37, four years. On page 93 one reads that two Wren-tits *Chamaea fasciata* (Gambel) "survived" five years, but Table 2 indicates that five Wren-tits survived five years. A comparison of "returns" of White-crowned Sparrows by capture years in Table 3 (pp. 92-93) and Table 4 reveal no agreement except for the 1947-48 season. Table 5 (p. 95) shows 345 Golden-crowned Sparrows banded in 1941-42, whereas Table 3

indicates 330 were banded that winter. In addition to these and other inconsistencies, some additional comment seems desirable. The expression "minimum survival" or "birds known to survive" might better be employed when treating banding return data, rather than the word "survival" (pp. 91, 94, and 95). By averaging percentages for individual seasons at the bottom of page 95, the impression is gained that a larger percentage of juvenal White-crowned Sparrows (27.1 percent) returned to traps the first season after banding than adults (21.9 percent). Actually, if data apparently used to obtain these percentages are employed, one finds that only 24.0 percent of the juvenals returned and 29.7 percent of the adults returned to traps the first season after banding. This reviewer does *not* recommend that data or conclusions found in this paper be employed except as they may be subsequently clarified by the author.—L. R. Mewaldt.

3. Results of the Pacific Gull Color-Banding Project. Angus M. Woodbury and Howard Knight. 1951. *The Condor*, 53(2): 57-77. Under the sponsorship of the Western Bird-Banding Association, participants in the Pacific Gull Color-banding Project banded 14,091 gulls in the years 1937 to 1942. Banding activities extended from Coronado Island, Mexico, northward to Mittenatch Island, Gulf of Georgia, British Columbia, Canada, and inland as far as the Great Salt Lake Basin in Utah. Gulls were banded as juvenals, and included: 2,135 Glaucous-winged Gulls, *Larus glaucescens* Naumann; 2,301 Western Gulls, *Larus occidentalis occidentalis* Audubon; 1,097 Wyman's Gulls, *Larus occidentalis wymani* Dickey and van Rossem; and 8,558 California Gulls, *Larus californicus* Lawrence. Although results and observations were somewhat curtailed by exigencies of war from 1941 to 1946, a total of 639 recoveries and 364 sight records are considered. The greatest geographic movement was shown by 320 recoveries and sight records of California Gulls all of which were banded adjacent to inland waters, and most of which reappeared on the Pacific coast with recoveries as far north as Vancouver Island, British Columbia, and as far south as southern Lower California, Mexico (1,500 miles from the banding location). Wyman's Gull recoveries and sight records numbering 208 were at distances of less than 150 miles except for four which were less than 400 miles from the banding locality. Western Gull recoveries and sight records totaling 289 were well scattered along the Pacific coast from northern Washington to central California with a few from southern California. The 186 recoveries and sight records of Glaucous-winged Gulls were for the most part restricted to the Puget Sound, Washington, and Vancouver Island, British Columbia, areas, with only a few recoveries from more distant points. As indicated by recoveries, most of the gulls banded as juvenals died during the first 12 months after banding. The paper contains short discussions of migratory patterns, fluctuations in breeding populations, and possible isolating mechanisms.—L. R. Mewaldt.

4. A Historical Review of Bird Marking. W. Rydzewski. 1951. *Dansk Ornithologisk Forenings Tidsskrift*, 45(2): 61-95. The author has arranged chronologically a large number of records of marking birds by one method or another. The earliest listed is the record of Quintus Fabius Pictor who used a swallow bearing a thread with knots as a means of transmitting a message during the Second Punic War (218-201 B.C.). Almost without exception the various records are primarily of historical interest.—D. S. Farner.

5. The Use of Extruded Plastic for Colour Marking. R. H. Poulding. 1951. *British Birds*, 44(4): 126-127. A cheap and easy method of marking large numbers of juvenile gulls was devised by using plastic tubing of polyvinyl chloride extruded plastic, cutting tubing (internal diameter 12.5 mm., wall 0.5 mm.), into 20 mm. lengths and slipping the ring over the closed foot. Red and yellow were used and held the color very well.—M. M. Nice.

MIGRATION

(See also Numbers 3, 10, 12, 41, 42, 55, 58, 63, and 75.)

6. The Early Release in Western Germany of Young Storks from East Prussia through Vogelwarte Rossitten, 1933-1936. (Die Frühauffassung ostpreussischer Jungstörche in West-Deutschland durch die Vogelwarte Rossitten

1933-1936.) Ernst Schüz. 1950. *Bonner Zoologische Beiträge*, 1950(2/4): 239-253. This is a complement to the author's earlier paper (*Die Vogelwarte*, 2: 63-78, 1949. See *Bird-Banding*, 21: 119, 1950.) in which the results of experiments involving similar releases after the departure of local storks were described. In such releases these displaced young storks demonstrated a marked tendency towards the SE movement characteristic of the East Prussian population of *Ciconia ciconia* (Linnaeus). When, as described in the present paper, the young East Prussian storks were leased while the local storks were still present, they showed a pronounced tendency towards directional pattern of the local population. The ratio of experimental birds moving into the southwest sector to those moving into the southeast sector was 50:8. For the Netherlands population the ratio is 51:35. There appears to be little doubt that there is some sort of inherited sense of direction in the species as indicated by the results described in the earlier paper. Likewise there appears to be little doubt that this can be suppressed in favor of a still stronger tendency to associate with and to follow other individuals, *i. e.*, experienced local birds, with a stronger sense of direction.—D. S. Farner.

7. The Bird Navigation Controversy. Howard T. Odum. 1948. *The Auk*, 65(4): 584-597. This valuable paper must be read in detail and cannot well be reviewed briefly. After considering various theories, the author concludes (p. 596): "The wandering and visual orientation theory is certainly part of the correct explanation. The magnetic theory is lacking in theory and upheld by experiments which for various detailed reasons need to be repeated. Even if valid magnetic effects exist, that they are anything but grossly inefficient has yet to be shown. The burden of proof still seems to lie with the proponents of the magnetic theory." The literature cited contains many items that most bird students would not otherwise encounter.—Ralph S. Palmer.

8. Complexities of Migration: A Review. Allan R. Phillips. 1951. *The Wilson Bulletin*, 63(2): 129-136. This interesting review scans our present knowledge of bird migration and questions some generally accepted concepts regarding migration patterns. The author introduces in general terms some original data which indicate that Yellow Warblers, *Dendroica aestiva* (Gmelin), arriving in Arizona in March and early April, are of the bright colored southwestern race which establishes territories there long before it is ready to breed. Not until late April do more northern races reach Arizona, and the dull far northern race does not ordinarily enter the United States until May. These findings indicate that Yellow Warbler migrants, especially the northern races, do not gradually follow the advance of isotherms on their spring migration, but rather start their migration late and complete the movement in a relatively short period of time. The author suggests that most birds concerned in "alleged up-mountain movements" in late summer are either "southbound transients or breeding birds present before the arrival of human observers." (p. 131.) The need for further investigation is emphasized, especially in areas of study where already formulated general hypotheses tend to inhibit further original approaches to problems of bird migration.—L. R. Mewaldt.

9. The Seasonal Occurrence of Shorebirds on Bay Farm Island, Alameda County, California. Robert W. Storer. 1951. *The Condor*, 53(4): 186-193. A total of 39 counts were made of the shorebirds on mud flats, sand bars, and a salt marsh on Bay Farm Island in San Francisco Bay, California, from July 1948 through June 1949. Twenty-three species of shorebirds were observed with a high of about 41,900 individuals of 16 species on 23 April (peak of the spring migration), and a low of one to two hundred birds of six or seven species in late May and early June. The Western Sandpiper, *Ereunetes mauri* Cabanis, was the most abundantly observed species with a winter low of about 2,300 on 12 February, and a migration peak of about 26,500 on 23 April. Wintering Red-backed Sandpipers, *Erolia alpina* (Linnaeus), were observed at a high of about 6,000 on 10 November. Although Avocets, *Recurvirostra americana* Gmelin, were present all year, they were seen in greatest numbers during the winter with a total of about 10,000 observed on 9 February. An annotated list of all species of shorebirds observed is presented.—L. R. Mewaldt.

FOOD HABITS

(See Numbers 33, 34, 45, 58, and 68.)

PHYSIOLOGY

(See also Numbers 7, 57, and 58.)

10. The Sensory Basis of Bird Navigation. G. V. T. Matthews. 1951. *The Journal of the Institute of Navigation*, 4(3): 260-275. The author has critically reviewed recent theories concerning bird navigation. Orientation with respect to the sun is regarded as plausible in the one-direction navigation exhibited by homing pigeons and migrating wild birds. Actually the argument for the plausibility of this type of navigation is enhanced to a considerable extent by the inadequacies of other theories such as those involving differences in gravitational force, differences in Coriolis force, differences in strength of the earth's magnetic field, etc. However there is some suggestive experimental evidence. The greatest difficulty arises in proposing explanations for the return of homing pigeons released in unfamiliar surroundings and the remarkable precision of some of the more spectacular migrants.—D. S. Farner.

11. Inhibition with Prolactin of Light-induced Gonad Increase in White-crowned Sparrows. Robert E. Bailey. 1950. *The Condor*, 52(6): 247-251. Eighteen wintering White-crowned Sparrows, *Zonotrichia leucophrys pugetensis* Grinnell, trapped at Berkeley, California, were illuminated continuously with incandescent light from 23 December 1949 to 15 January 1950, and a second group of 27 from 3 February to 20 February 1950. On 16 January 1950, the average testis volume of two uninjected males was 12 times greater than the average for testes of five males, each of which had received 15 International Units of prolactin daily (as 0.075 milliliter of an aqueous solution). On 20 February four injected controls, which had received 0.075 milliliter of a two percent aqueous solution of albumin daily, had enlarged testes not significantly different from five uninjected control males. The average testis size of these nine controls was about four times greater than the average of six prolactin injected males. It was noted that during the last few days of both experiments that controls sang loudly, but that the prolactin-injected birds did not. In the ovaries of all control females in both groups follicles measuring 0.5 to 1.3 millimeters could be seen with the naked eye, whereas the ovaries of the prolactin-injected birds had to be sectioned to reveal the small follicles. The oviducts of female controls increased considerably in size over the prolactin-injected females. The author points out that although these experiments suggest that prolactin is probably physiologically capable of being a hormone responsible for refractoriness in birds, the prolactin content of the pituitary over the entire year must be correlated with the annual reproductive cycle, including the refractory period.—L. R. Mewaldt.

12. The Metabolism of Hummingbirds. Oliver P. Pearson. 1950. *The Condor*, 52(4): 145-152. Metabolic rates of five captive Anna Hummingbirds, *Calypte anna* (Lesson), and two captive Allen Hummingbirds, *Selasphorus sasin sasin* (Lesson), from California were obtained while the birds were in different states of activity or inactivity. During the day while at rest (true basal metabolism not obtained), oxygen consumption ranged from 10.7 to 16.0 cubic centimeters per gram per hour for individuals weighing from 3.75 to 4.32 grams. This is thought to be higher than for any other organism that has been studied. During the night when adults of both species became torpid, body temperatures probably dropped to near the environmental temperature of 24 degrees Centigrade, and oxygen consumption dropped below three cubic centimeters per gram per hour. The throat temperature of a torpid male Allen Hummingbird was found to be 18.7 degrees when the room temperature was 16 degrees. This nocturnal torpidity did not occur in two young Anna Hummingbirds when 17 and 25 days old. During periods of flight, measurements averaged 85 cubic centimeters per gram per hour for adult Allen Hummingbirds (22 determinations acceptable to the author), and 68 cubic centimeters of oxygen per gram per hour for adult Anna Hummingbirds (10 determinations). Applying these data to the Ruby-throated

Hummingbird, *Archilochus colubris* (Linnaeus), and making several assumptions, the author calculated that this species must have a flight range of about 385 miles. He suggests that this flight range would not be sufficient to carry the Ruby-throated Hummingbird across the Gulf of Mexico from South or Central America to the Gulf Coast of the United States. The importance of the physiological approach to problems of bird migration cannot be overemphasized.—L. R. Mewaldt.

13. Critical Periods and Causes of Death in Avian Embryonic Development. A. L. Romanoff. 1949. *The Auk*, 66(3): 264-270. In the Domestic Fowl, *Gallus gallus* (Linnaeus), embryonic mortality has risen markedly with refinement in poultry management methods. It appears to be a generality in birds that three peaks of embryo mortality occur. In the fowl they occur at these days: third to fifth, twelfth to fourteenth, and eighteenth to twentieth. Many deaths are caused by structural abnormalities and by malpositions of chicks in the shell. Various ideas that have been advanced as to why death occurs at these critical periods are summarized. "The appearance of three peaks in the embryonic mortality curve is, so far as is known, specific to birds. The causes of death at each critical period are more or less distinctive, and many of them are specific for Aves." (p. 268.) Forty references are cited.—Ralph S. Palmer.

14. Pattern and Rate of Cranial "Ossification" in the House Sparrow. Robert W. Nero. 1951. *The Wilson Bulletin*, 63(2): 84-88. The extent of cranial ossification has been used as an aid to the aging of birds for many years, but little is actually known concerning the pattern and rate of pneumatization which causes the cranial hardening. The author banded 346 nestling House Sparrows, *Passer domesticus* Linnaeus, from May to August of 1949, at Madison, Wisconsin, and subsequently recovered 51 varying in age from 15 to 240 days, for laboratory examination. The crania of these specimens of known age showed that pneumatization begins in the posterior parietal and exoccipital regions at about 23 days after hatching; appears along the median suture between the frontals shortly thereafter; is confined largely to lateral extension from this median suture in the area posterior to the frontoparietal suture up to about 80 days; and then proceeds generally from posterior to anterior until pneumatization is complete as early as 181 days and as late as after 221 days. Twelve birds reared in captivity showed more variability and a less symmetrical pattern of development than wild birds.—L. R. Mewaldt.

15. Notes on Determination of Sex and Age in the Woodcock and Mourning Dove. George A. Petrides. 1950. *The Auk*, 67(3): 357-360. In the Woodcock, *Philohela minor* (Gmelin), the bursa of Fabricius is of value as an age indicator, it being large in young of the year. In the Mourning Dove, *Zenaidura macroura* (Linnaeus), adult birds can be sexed by plumage characters (the male has a pinkish breast and bluish-gray crown; the female has a plain brown breast and brown crown), but in juvenile birds sexing by plumage characters proved unreliable. The bursa evidently persists in this species until about early winter. Size and development of gonads are convenient age indicators that can be checked rapidly in the field.—Ralph S. Palmer.

LIFE HISTORY

(See also Number 38.)

16. Life History and Ecology of the Scissor-tailed Flycatcher, *Muscivora forficata*. Frank W. Fitch, Jr. 1950. *The Auk*, 67(2): 145-168. Field work for this study of *Muscivora forficata* (Gmelin) was done mainly in Brazos County, Texas. Among matters discussed are the following: geographical distribution, individuality of behavior, territoriality, nest-building (the male escorts the female who carries material), nest site (usually in a single tree or group of isolated trees), nest materials, clutch (three to five, rarely six, eggs laid at a rate of one per day), incubation (14 days, by the female), growth of young (the female brings most of the food), and fledging (14 to 15 days). The species is single-brooded, at least in Texas. Vocalization includes a flight song, also calls accompanied by display when mates meet. The favored summer food is grass-

hoppers. On the breeding range, males, unmated and unsuccessful females, and birds of the year are gregarious, having a common roost. "As many as 250 individuals have been counted as they entered one tree just prior to dark." (p. 167.) The species is gregarious in the non-breeding season.—Ralph S. Palmer.

17. The Sandhill Crane in the Bernard W. Baker Sanctuary, Michigan. L. H. Walkinshaw. 1950. *The Auk*, 67(1): 38-51. The Greater Sandhill Crane, *Grus canadensis tabida* (Peters), was studied on a 571-acre area from 1930 through 1948. There is shallow, slightly alkaline, water over much of the area always. "The area consists of several irregular marshy arms extending between wooded ridges, tamarack peninsulas and ash-maple bottomland." The cranes nested, roosted, and occasionally fed in the open marshy area and also fed on nearby fields. Both feeding and nesting territories were maintained. The birds usually arrived about mid-March and departed in late November, both arrival and departure being "definitely influenced by temperature." Nineteen clutches contained two eggs each. Incubation apparently lasted 29 or 30 days; at the nest there is a changing over ceremony at daybreak. Young remain at the nest for about 48 hours, then are led to higher ground by their parents. They are fledged in 70 to 80 days and the family continues as a unit until the following spring when the parents drive the past season's young away. In fall, family groups join in flocks about the time that ice begins to form and remain on the water; then they disappear on migration.—Ralph S. Palmer.

18. The California Quail in Hawaii. Charles W. and Elizabeth R. Schwartz. 1950. *The Auk*, 67(1): 1-38. Two races of *Lophortyx californica* (Shaw and Nodder) have been introduced to the Hawaiian Islands, where both now occur separately and there also are intergrades in some localities. Plantings were made from prior to 1855 down to 1940. Geographical distribution and population density per square mile in different vegetation types are shown on maps. The birds occur from sea level up to 11,000 feet elevation, in areas with mean annual temperatures of 75° F. to 40° F., and with rainfall varying from 20 to 60 inches (perhaps 100 in some areas) annually. About 78,000 birds were present in 1946-1947, in densities varying from less than 15 to 600 birds per square mile and these correlating fairly well with different vegetation zones. Food plants are listed; seeds and browse are the major types eaten. Parasitism and predation are not decisive population influences. The breeding season begins in January, nests are built towards the end of March, and laying occurs the first three weeks in April. The main hatching period is from late May to late June. There is good adult survival, but poor replacement by young. Rainfall is believed to be one of the most important factors influencing reproductive success. This is an important contribution to the literature on introduction of exotics.—Ralph S. Palmer.

19. Nesting Habits of the Clapper Rail in New Jersey. E. L. Koziacky and F. V. Schmidt. 1949. *The Auk*, 66(4): 355-364. The nesting of the Northern Clapper Rail, *Rallus longirostris crepitans* Gmelin, was studied in 1948 in Cape May County, New Jersey. Most of the 56 nests with eggs were in tall salt-marsh grass (*Spartina alterniflora*) type of vegetation and usually within 12 feet of a tidal ditch. One egg per day is laid, with a mean number of 9.97 eggs per clutch. Incubation requires 20 (extremes 18 and 22) days. Both parents probably were together during the incubation period. Clutches usually hatched in 24 to 48 hours. Fifty (89.3 percent) of 56 nests hatched successfully. The egg shells were removed in a manner not discovered. The authors suggest that an annual nest count has possibilities as an index to population trends.—Ralph S. Palmer.

20. The Eggs and Young of the Bristle-thighed Curlew. Arthur A. Allen and Henry Kyllingstad. 1949. *The Auk*, 66(4): 343-350. *Numenius tahitiensis* (Gmelin) nests on flat, dry, exposed ridges to the east of the low mountain range that follows the coastline of Western Alaska from 50 to 100 miles inland. Two nests, the first known to science, were discovered in 1948. Eggs and newly hatched young are described in detail and illustrated by photographs. A diagram shows the difference in color pattern between downy young *Numenius phaeopus*

hudsonicus Latham and *Numenius tahitiensis*. Reference is made to the colored photographs of eggs, downy young, and adult of the latter that were published in *National Geographic Magazine*, 94(6): 762-764, December, 1948.—Ralph S. Palmer.

21. Success of Marsh Hawk Nests in North Dakota. M. C. Hammond and C. J. Henry. 1949. *The Auk*, 66(3): 271-274. Observations on 60 nests of *Circus cyaneus* (Linnaeus) were made at the Lower Souris National Wildlife Refuge in the period 1937-1939. Five eggs was the commonest clutch size and the mean number hatched, for all nests, was 4.07. The laying and hatching periods sometimes are considerably protracted. Sixty-eight percent of nests observed held one or more young to fledging age.—Ralph S. Palmer.

22. Nesting of the Spotted Sandpiper at Detroit, Michigan. J. Robert and Jean T. Miller. 1948. *The Auk*, 65(4): 558-567. The nesting of *Actitis macularia* (Linnaeus) was studied in 1947 on the island of Belle Isle in the Detroit River. Thirty-nine nests and three family groups were found. Forty-three pairs foraged on the 17.6-acre study area, a density of 2.44 breeding pairs per acre. Data are given on "nuptial performance," nest location (usually in tall growing grass), egg laying (average of 3.95 eggs in 37 nests, usually laid at one-day intervals), incubation (20-22 days, often beginning before the clutch was completed), calling from the nest, distraction displays, and nesting success (average of 2.3 young left 32 nests). This good study would have included much more data on courtship if the birds had been watched at daybreak during the few days prior to egg laying.—Ralph S. Palmer.

23. The Cuckoo in the Hungarian Plain. Béla Molnár. 1950. *Aquila*, 51-54: 100-112. A summary of 277 observations on *Cuculus canorus* Linnaeus, parasitizing the Great Reed Warbler, *Acrocephalus arundinaceus* (Linnaeus). Evidence of polyandry in the Cuckoo is cited. At times the Reed Warblers bitterly attack the Cuckoo attempting to lay in their nests; the author found three female Cuckoos in the water, one drowned, the others nearly so. These last he took home and both laid eggs in the night. Dramatic recitals are given of the process of eviction of eggs and young of the host and of the struggle to the death between two young Cuckoos. This instinctive movement shows itself when the nestling is about 8 to 10 hours old. The struggles of a Cuckoo are described with a nestful of Reed Warblers, three of which were a day old, two a few hours old. These grasped each other in a ball and despite the labors of the Cuckoo for three days were not to be evicted; at five days the Cuckoo was dead.—M. M. Nice.

24. Additional Data on Victims of Parasitic Cowbirds. Herbert Friedmann. 1949. *The Auk*, 66(2): 154-163. The Shiny Cowbird, *Molothrus bonariensis* (Gmelin), which has four subspecies, has 163 species and subspecies as known hosts; the three subspecies of the North American Cowbird, *Molothrus ater* (Boddaert) have as a total list of known hosts 276 species and subspecies; the Red-eyed Cowbird, *Tangavius aeneus* (Wagler) has 36 species and subspecies now recorded as hosts. New and previously not tabulated hosts are listed for each subspecies of Cowbird species; detailed information on many hosts is given.—Ralph S. Palmer.

25. Some Observations on the Nesting Activities of the Redwing Starling, *Onychognathus morio morio*, and Especially the Feeding of the Young. G. J. Broekhuysen. 1951. *The Ostrich*, 22(1): 6-16. A report of observations covering two successive breeding seasons at a single nest of the Redwing Starling, *Onychognathus morio morio* (Linnaeus), on a building near Capetown. Incubation period during one nesting was determined as 25 days. Feeding frequency and food analysis are accorded detailed treatment; the food was about half animal and half vegetal matter. Fifteen call notes of the adults are discussed, and behavior patterns which the author terms "cackling" and "begging" ceremonies are described and interpreted.—Hustace H. Poor.

26. Bird Records from Surinam, Dutch Guiana. Fr. Haverschmidt. 1950. *The Auk*, 67(2): 217-221. For the most part, these notes consist of range exten-

sions for 16 species; some breeding data are given on several of these and four nests are figured.—Ralph S. Palmer.

BEHAVIOR

(See also Numbers 22, 23, 24, 39, 58, and 62.)

27. Observations on Social Behavior in Turkey Vultures. Howard H. Vogel, Jr. 1950. *The Auk*, 67(2): 210-216. Observations were made on a family of Turkey Vultures, *Cathartes aura* (Linnaeus), in 1947 near Crawfordsville, Indiana. The development of the young is treated briefly; most of the paper consists of discussion of so-called "death-feigning." It would appear to this reviewer that the Turkey Vulture is one of those species in which the paralyzing effect of fright is marked and has developed selectively because it has some survival value in situations where escape is difficult. The author notes that "death feigning seems to depend, at least in part, upon the type of nesting environment." (p. 214.) Suggested terminology for social behavior (p. 215), from J. P. Scott's work on sheep, probably will not be adopted widely by students of bird behavior.—Ralph S. Palmer.

28. Additional Observations and Comments on "Anting" by Birds. Horace Groskin. 1950. *The Auk*, 67(2): 201-209. This summarizing paper presents information that has come to light since the previous summary by McAtee in 1938. A table lists some birds and the ants they are known to have used, showing that several species of ants are used by the same avian subspecies. Theories as to the reasons for "anting" are listed. "It is evident that we do not have enough information about ants and their excretions to solve the problem of why birds 'ant.' It is suggested that observers of 'anting' collect some specimens of the ants immediately after the bird finishes 'anting' and have these ants identified and also, if possible, secure from a chemist an analysis of the chemical composition of the excretion of the ant and have this recorded, which no doubt would contribute greatly in solving the 'anting' problem."—Ralph S. Palmer.

29. Social Life and the Individual among Vertebrate Animals. N. E. Collias. 1950. *Annals of the New York Academy of Sciences*, 51: 1074-1092. An informative summary citing 99 references. Dominance hierarchies are discussed as examples of competition. Under "cooperation," benefits to the individual from the group, and leadership and contagious behavior are treated. The author concludes: "Biological phenomena are organized into a general competitive-cooperative pattern, but the biosphere viewed as a whole can be regarded as a basically cooperative venture in the transformation and control of other energy sources." (p. 1088.)—M. M. Nice.

30. Some Aspects of the Behaviour of the Jay, *Garrulus glandarius* L. Derek Goodwin. 1951. *Ibis*, 93(3): 414-442. An intensive study based on a number of captive birds as well as observations of wild birds in different parts of England and the Lebanon. Display and posturing are described and two sketches given. Jays are great mimics and use their mimicry "... particularly in moments of intense excitement. That birds with a wide range of innate notes should utter copied ones when courting or threatening others of their own species appears inexplicable." The same is true of the Blackcap, *Sylvia atricapilla* (Linnaeus). This use of copied sounds does not seem to bring about "misunderstanding among Jays, the birds doubtless taking their cue from the tone and intensity with which the notes are uttered and from the caller's actions if he is visible." (p. 424.) The author believes that the primary function of the noisy spring gatherings of three to thirty or more birds "is to facilitate the meeting of unpaired birds that are ready to pair." (p. 426.) "Courtship feeding in the Jay seems to serve both as a bond-forming act of considerable importance and also as a food-supply for the female when she has other things to do than seek food." (p. 431.)

One pair nested three years in succession, both birds building, but the male doing more work especially in the nest-lining stage. Only the female incubated. This is a family characteristic of the Corvidae. In 1949 two young were raised

by a captive pair, the author helping feed them while in the nest. They left at 22 days and became very wild. They did not feed themselves until 38 days of age; at 42 days the mother stopped feeding them, and the father began to grow weary, 12 days later refusing to give them any more food, but for some time they robbed their parents of food. This has also been noted with wild Jays and ". . . in Britain with the Carrion Crow *Corvus corone* and Jackdaw *Corvus monedula*, and it is regular with the Hooded Crow *Corvus cornix* and Black Kite *Milvus migrans* in Egypt." (p. 440.)—M. M. Nice.

31. The Behavior of the Bearded Tit. (Das Aktionssystem der Bartmeise (*Panurus biarmicus* L.). I. Otto Koenig. 1951. *Oesterreichische Zoologische Zeitschrift*, 3(1/2): 1-82. Exceedingly interesting study based on 12 years' observation in the wild, the capture of 100 adults and raising of 60 young by hand. The systematic position of *Panurus* is not clear; some authorities classify it with the Asiatic *Paradoxornis*. The Bearded Tit is a highly socialized bird with an unusual life history. Nests are placed in phragmites always in sheltered positions; this seems to be correlated with the fact that this species does not possess the ability to take the typical sun-bathing position. "When a Bearded Tit wishes to sun-bathe it lays itself on the flat ground like a hen and lies there until it becomes too hot. It does the same when protecting the young." (p. 31.) Both members of the pair build the nest; both incubate, the female staying on the eggs at night. A young pair may build a nest without lining, the female lay two or three eggs, then desert, the other eggs being laid in a neighbor's properly constructed nest. Second attempts result in a complete nest and full set, but now a new difficulty may arise: in the evening the male calls his mate to roost beside him; she may vacillate between the eggs and mate, finally staying with him. The eggs may be incubated in the daytime, but this nesting, too, is soon given up. By the third attempt the instinctive behavior has matured and all goes well. The young leave at 12 to 13 days and sleep side by side. At this time the male's bill is orange, the female's black. When independent of their parents at about 26 days of age they join other families of young. Soon the males begin to fight each other and pursue the females; before the juvenile molt which comes at two months the pair is formed and remains together throughout life. As with geese, brothers and sisters in the wild do not mate, the preference being for an individual ". . . not too well known." (p. 73.) There is a strong personal bond between the pair. An adult male called for three days for his mate, trapped by the author. Due to this system of "child-marriage," it is difficult for birds that have lost their mates to get new ones. A widowed male will sing tirelessly, whereas otherwise song is little heard. It is not an announcement of territory for there is no territory except that the immediate vicinity of the nest is defended. But a pair that has lost its brood will be permitted to help feed at another nest. The value of this fine study would have been increased had the author given more definite figures as to ages at which different events take place.—M. M. Nice.

32. An Experimental Study of Territorial Behavior in Breeding Red-winged Blackbirds. Robert W. Nero and John T. Emlen, Jr. 1951. *The Condor*, 53(3): 105-116. This paper presents observations upon territorial behavior as affected by the experimental moving of nests of Red-winged Blackbirds, *Agelaius phoeniceus* (Linnaeus), on a two and one half acre marsh in the University of Wisconsin Arboretum at Madison, Wisconsin. The Red-winged Blackbird is a semi-colonial polygynous species, the males of which have highly developed territorial behavior. Thirteen color banded adults on five adjacent territories, and their color banded young, were studied from early April until mid-August of 1949. The nest-moving experiments were accomplished during the height of breeding activity from mid-May until mid-July. Nests were moved with their supporting clump of cat-tails (*Typha*), generally in the presence of the female, and not more than ten feet at a time, to avoid nest desertion. Males vigorously defended sharp and stable territorial boundaries against the intrusion of alien males and noisy fledglings, but tolerated the introduction of alien nests and eventually alien females which persistently invaded their territories to reach transported nests. Males did not extend their aggressiveness beyond their territorial boundaries even in the defense of their mates or nests in neighboring territories. Although females took no part in the defense of male territories, and

tolerated harem mates at close quarters, they repulsed actual visits to their nests by harem mates. These well-designed experiments serve to demonstrate and clarify various characteristics of territorial behavior not previously well understood.—L. R. Mewaldt.

33. Hirundines Following Tractor and Taking Moths. Denby A. Wilkinson. 1951. *British Birds*, 44(6): 204. Like Franklin Gulls on our western plains, Barn Swallows, *Hirundo rustica* Linnaeus, House Martins, *Delichon urbica* (Linnaeus), and Bank Swallows, *Riparia riparia* (Linnaeus), were seen in Sussex following a tractor, cutting a field of red clover, Sept. 23, 1950. The birds were catching Silver Y moths, *Plusia gamma* (Linnaeus), (migrants in England), but ignored Small White butterflies, *Pieris rapae* (Linnaeus).—M. M. Nice.

34. Distraction-Display in the Kentish Plover. K. E. L. Simmons. 1951. *British Birds*, 44(6): 181-187. Observations on six pairs of *Leucopoliis alexandrinus* (Linnaeus) in Egypt. Sketches are given of the "mobile lure-display" with wings beating ground and with "peculiar alternate wing action," and of "static lure-display" with "wings in a shallow 'Y.'" The mobile lure-display is shown as long as the observer follows the bird, but as soon as he "stops or moves away in the direction of the chicks, the static figure appears."—M. M. Nice.

35. The Learning Abilities of Birds. Part 2. W. H. Thorpe. 1951. *Ibis*, 93(2): 252-296. The second part of Dr. Thorpe's very valuable paper discusses chiefly imitation, imprinting, memory, and the ability to recognize individuals. Social facilitation is very important in the life of birds, but ". . . the evidence for true imitation is at present very slender." (p. 281.) "Imprinting is discussed as an innate disposition to learn in a particular direction and in a particular restricted period. Once accomplished, this type of learning is particularly difficult to eradicate." An interesting section concerns "Song acquisition as imprinting and its relation to vocal imitation." Much more work on learning versus inheritance of song has been done in Europe than in this country. Dr. Thorpe pleads for more detailed information in accounts of experiments on this subject. Apparently herons do not recognize their mates outside the territory, but with many species mates are recognized at a distance both by appearance and voice. "There is no evidence of an inherited recognition of man as an enemy, but there is evidence that the general tendency to wariness—especially wariness of groundliving predators where these are prevalent—becomes readily attached to man as a result of experience and the training of parents. Such wariness may be overcome by habituation, association, social facilitation, and possibly by true imitation." (p. 276.) This very important paper concludes with a ten-page bibliography.—M. M. Nice.

36. A Case of Herring-Gulls Learning by Experience to Feed after the Explosion of Mines. V. A. Vleugel. 1951. *British Birds*, 44(5): 180. Off the island of Walcheren in August 1947 the Dutch Navy was exploding mines, whereupon large numbers of *Larus argentatus* Pontoppidan appeared to feed upon the dead fish. Two similar cases are mentioned from the literature.—M. M. Nice.

37. Feeding of Juvenile Goldfinch by Another Juvenile. Edwin Cohen. 1951. *British Birds*, 44(5): 174. On Aug. 4, 1950 a juvenile *Carduelis carduelis* (Linnaeus) was watched feeding a still younger juvenile, both perched on Scotch thistles. Two adults were present. The observer believed it was a case of young of the first brood feeding young of the second. An unusual record for wild passerines.—M. M. Nice.

38. The Flights of the Red-backed Shrike. J. H. Owen. 1951. *British Birds*, 44(5): 166-170. Careful description of hunting, defence, and mate-searching flights in *Lanius collurio* Linnaeus, when a male may fly 120 yards or more at one time, shouting "chah." Sometimes two cocks will go mate-searching in company. The cocks visit each other on their territories. "When one cock visits

another he seems very welcome and they bawl 'chah' at one another frequently and vigorously. The visitor may perch *on top* of any bush, even quite close to the nest . . ." but ". . . he must keep in sight and must not hunt there, much less *enter* a bush." When the cocks catch insects 60-70 feet up, the descents may be spectacular, either a vertical plunge or "a 'falling leaf' descent." Unfortunately these interesting birds have completely disappeared from the Shropshire Border and many other of their old haunts.—M. M. Nice.

ECOLOGY

(See also Numbers 9, 16, 17, 18, 19, 23, 26, 46, 47, 48, 56, 58, 60, 61, and 65.)

39. Competition and Habitat Selection in Birds. Gunnar Svårdson. 1949. *Oikos*, 1(2): 157-174. This very interesting review initially gives attention to the matters of distribution and competition between closely related (congeneric) species and those of geographic and ecologic replacement. Replacements of this kind are noted in Sweden with respect to species of *Picus*, *Dryocopus*, *Strix*, *Muscicapa*, and *Parus* and are typical of these phenomena as noted elsewhere. Both intraspecific and interspecific competition may modify habitat selection. The author accepts Tinbergen's thesis of "heterogenous summation of stimuli" and, on this basis, constructs a very interesting, and quite plausible, model to explain habitat selection by four species of *Anthus*. An argument is presented to suggest that the genetic evolution of the mechanisms of habitat selection may lag behind modifications resulting from environmental selection. Also an interesting argument is developed for a hypothesis that a shift in the balance of interspecific and intraspecific competition may cause great populations within a given species. This is a very thought-provoking paper.—D. S. Farner.

40. Passerine Bird Populations of the Savannah River Refuge, South Carolina. Arnold B. Erickson. 1948. *The Auk*, 65(4): 576-584. The study was done in the period March 26 - August 8, 1946. "The islands, dykes, and marsh of the Refuge form three ecological units: live oak forest on the islands; raspberry, silverling, tallow tree shrubs on the dykes; and cut grass, pickerel weed *jussiaea* marsh." (p. 583.) On islands, 35 acres had 215 breeding pairs (30 species); on dyke and marsh, 47.48 acres had 188 breeding pairs (20 species). The population, mostly passerines, is listed by species in a table. (p. 579.) Birds in the study area and elsewhere in the region "did not seem to sing with the same zest and abandon" as observed in basswood-maple forests of Minnesota. "It is certain that the amount and intensity of song differ in different geographical and ecological communities." (p. 584.) Various factors are suggested that might cause these differences.—Ralph S. Palmer.

41. The Distribution and Abundance of Shorebirds on the North and Central New Jersey Coast, 1928-1938. Charles A. Urner and Robert W. Storer. 1949. *The Auk*, 66(2): 177-194. Although many variables in the data are admitted, much important information is derived on migration characteristics such as times of principal migration, peaks, extreme dates of occurrence, and "average rating" (relative numbers) of 41 species and subspecies (31 seen northbound and 41 southbound). "None of the common species with the possible exception of the ruddy turnstone [*Arenaria interpres morinella* (Linnaeus)], could be said to have decreased in numbers. On the other hand, the most conspicuous increase was that shown by the red-backed sandpiper [*Erolia alpina pacifica* (Coues)] which increased ten- to twenty-fold in numbers between 1928 and 1938. The short-billed dowitcher [*Limnodromus griseus griseus* (Gmelin)] and *Limnodromus griseus hendersoni* Rowan, sanderling [*Crocethia alba* (Pallas)], knot [*Calidris canutus rufus* (Wilson)], and western sandpiper [*Ereunetes mauri* Cabanis] showed large increases, although in the last species the apparent increase might be due, at least in part, to observers becoming more familiar with the species through the study period. The black-bellied plover [*Squatarola squatarola* (Linnaeus)], Hudsonian curlew [*Numenius phaeopus hudsonicus* Latham], greater yellow-legs [*Totanus melanoleucus* (Gmelin)], and

piping plover [*Charadrius melodus melodus* Ord] increased substantially, and there appeared to have been an increase in the flights of willets [*Catoptrophorus semipalmatus* (Gmelin)] and upland plovers [*Bartramia longicauda* (Bechstein)]. The numbers of the remaining species either remained relatively constant throughout the period or fluctuated so greatly that a trend could not be determined." (pp. 190-191.)—Ralph S. Palmer.

42. Observations on Populations of North Pacific Pelagic Birds. Lee W. Arnold. 1948. *The Auk*, 65(4): 553-558. Data are recorded for 18 census periods, from shipboard, June 8-September 16, 1944. Localities were in an area including some 2,000 lineal miles, beginning 30 miles west of Cape Spencer, Alaska, and extending to the island of Attu. Of about 17 species observed, only the following "could be classed as truly universal pelagic birds in the area concerned:" Tufted Puffin, *Lunda cirrhata* (Pallas), 2,259 counted; Shearwater (Slender-billed ?), *Puffinus* sp., 167,809 counted; and Black-footed Albatross, *Diomedea nigripes* Audubon, 182 counted. On the afternoon of June 9, 38,000 Fulmars, *Fulmarus glacialis* (Linnaeus), were seen in Unimak Pass. Large birds occasionally could be tracked by means of surface radar. No reaction of birds to radar was noted at any time.—Ralph S. Palmer.

43. Nesting Birds of the Willow-Cottonwood Community in California. Lloyd G. Ingles. 1950. *The Auk*, 67(3): 325-332. In 1949, in a willow-cottonwood community in the eastern San Joaquin Valley, a survey of the nesting population was made on a 33-acre tract over a period of five months. "The bird community is essentially an 'edge' or ecotone type and supports a nesting density of 394 birds (197 pairs) per 100 acres (40 hectares) or 50 birds per kilometer of edge. Twenty species nested on the area but 71 were recorded there during the study. Each nesting species showed differences in feeding and nesting behavior. Fremont Cottonwoods were preferred by hole-nesters and Valley Oaks were preferred by foliage-nesters." (p. 331.)—Ralph S. Palmer.

44. Birds of Moku Manu and Manana Islands off Oahu, Hawaii. Frank Richardson and Harvey I. Fisher. 1950. *The Auk*, 67(3): 285-306. Manana is about 65 acres in extent; Moku Manu is less than a third as large. The former is made up of two volcanic cones, the latter of a much eroded single cone. A few species of plants occur on the islands. Six bird species breed on Manana and ten on Moku Manu, with added migrants and visitant species occurring. Of particular interest is the Sooty Tern, *Sterna fuscata oahuensis* Bloxham, which "shows a striking divergence in its breeding cycle on the two islands, its laying and incubating period being about November to March on Moku Manu and April to July on Manana." (p. 293.) It is suggested that the former colony may have developed its annual cycle during long local isolation, while the latter may be a recent colonization from Midway or the Leeward Islands. The Noddy Tern, *Anous stolidus pileatus* (Scopoli), showed significant but less variation in breeding pattern on the two islands. The Hawaiian Tern, *Anous minutus melanogenys* G. R. Gray, nests on Moku Manu and variations in its annual cycle are associated with colonies, not seasons. As to breeding species in general, ". . . all the species that were present throughout the year have protracted breeding seasons." (p. 304.) "It would appear that the resident breeding birds have lost or tended to lose a northern hemisphere cycle, but that the species which are migratory (hence, away from the islands part of the year) have retained such cycles." (p. 305.)—Ralph S. Palmer.

45. Waxwings in the Winter of 1949-50. John and Christina Gibb. 1951. *British Birds*, 44(5): 158-163. The distribution of some 2,000 *Bombycilla garrulus* (Linnaeus) in the British Isles in the winter of 1949-50 is shown on a map. Observations were made on the immense numbers of berries eaten by one bird, a volume much greater than that of the bird itself—an estimated 600-1,000 *Cotoneaster horizontalis* berries in one day. Another observer estimated that one Bohemian Waxwing ate 6 oz. of *Cotoneaster* berries in one day, whereas a Waxwing weighs about 2 oz.—M. M. Nice.

AVIFAUNAL DYNAMICS

46. Some Remarks on the Short-term Fluctuations in the Numbers of Northern Birds and Mammals. Pontus Palmgren. 1949. *Oikos*, 1(1): 114-121. This is a discussion of the data on cycles in mammalian and avian species assembled recently by Siivonen (*Papers on Game Research*, 1, 1948. See *Bird-Banding*, 22(2): 95-96, 1951). Although some attention is given to criticism of certain of Siivonen's methods and conclusions, primary emphasis is directed towards a possible explanation of these phenomena. Initially the author points out that the conclusion of a basic 3 1/3-year cycle actually obscures the true picture. His recalculation of Siivonen's data for avian populations, for example, show mean periods between maxima to range from 3.24 to 4.00 years. The author then constructs a most interesting model in which the population for a hypothetical species for each year in a series is determined by two multipliers. The first is a random factor, actually for purposes of the model drawn from a series of 20 cards, representing random changes in climate. The second is an arbitrary density factor which expresses the effect of the size of the population of a given year on the size for succeeding years. It is very interesting to note that "cycles" resembling those of Siivonen's data very closely may thus be developed. Although the argument is not conclusive, we must accept the very distinct possibility that the physical fluctuations which almost certainly must be basic to population "cycles" may well be random rather than truly cyclic.—D. S. Farner.

47. The Expansion of *Phylloscopus trochiloides viridanus* Blyth in Northwestern Europe, Especially in Finland, and its Cause. (Die Expansion von *Phylloscopus trochiloides viridanus* Blyth im nordwesteuropäischen Raum, insbesondere nach Finnland, und ihre Ursachen.) Nordmar Välikangas. 1951. *Ornis Fennica*, 28(2): 25-39. Beginning during the summer of 1937 a marked northward expansion of the Willow-wren developed into southeastern, southern, and central Finland successively. The author presents evidence and arguments indicating that this was the result of more favorable temperatures in May, June, and July during the period of expansion.—D. S. Farner.

48. The Distribution and Breeding Biology of the Water Rail in Finland. (Piiirteitä luhtakanan, *Rallus a. aquaticus* L., levinneisyydestä ja elintavoista Suomessa.) Kalevi Raitasuo. 1951. *Ornis Fennica*, 28(2): 40-53. The first definite record for the species in Finland was for the Åland Islands in 1922. Since that time with the general amelioration of the climate it has expanded into the southern part of the country. The first nests were recorded during 1950.—D. S. Farner.

PLUMAGE AND MOLT

(See also Numbers 1, 58, and 61.)

49. Notes on White Spotting and Other Plumage Variations in Geese. Harold C. Hanson. 1949. *The Auk*, 66(2): 164-171. Published records of white spotting and other mutations in various species of *Branta* and *Anser* are summarized. To these the author adds records and photographs of spotting (also a record of melanism) in the Greater Canada Goose, *Branta canadensis interior* Todd, as observed in Alexander County, Illinois. "The relatively frequent occurrence of white spotting in geese as compared with many other kinds of birds may be related to a number of factors." (p. 170.) Those mentioned are: semi-colonial nesting habits, returning to the same breeding grounds year after year, monogamy, and long life.—Ralph S. Palmer.

SYSTEMATICS

(See also Numbers 8, 56, and 61.)

50. Some Concepts of Hybridization and Integration in Wild Populations of Birds. Alden H. Miller. 1949. *The Auk*, 66(4): 338-342. The author cites some specific cases and concludes as follows: "In brief, a group of hybrids

linking two forms can neither be assumed to indicate species status because of 'hybrid appearance' nor can they safely be supposed, regardless of their number, to indicate full or even partial breakdown of reproductive isolation and hence racial status. The situation must be completely explored to determine the manner and degree of reproductive isolation, and we should not always expect therefrom a simple positive or negative answer." (p. 342.)—Ralph S. Palmer.

51. The Amount of Overlap Allowable for Subspecies. A. L. Rand and Melvin A. Traylor. 1950. *The Auk*, 67(2): 169-173. Authors' summary: "Subspecies are subjective, though based on natural phenomena, and treatment varies as to the fineness of distinctions used in recognizing subspecies. Some workers claim any constant difference is enough; at the other extreme are those who ask that 75 percent of individuals of one subspecies be separable from all of another. Size of sample must be allowed for in making comparisons. With subspecies, overlap may be partial, or it may be complete but of rare occurrence. Current conventions are discussed. As subspecies are often based on average differences, rather than on non-occurrence of characters, a 'percentage from a percentage' rather than a 'percentage from all' convention is advisable. A conservative value is suggested—80 to 90 percent of one subspecies separable from 80 to 90 percent of another before they are recognized. In any case, the degree of separation should be given in discussing races." The discussion of current conventions is particularly useful.—Ralph S. Palmer.

52. *Luscinia megarhynchos* Brehm in the Western Palaearctic Region, and a New Race from the British Isles. P. A. Clancey and A. Von Jordans. 1950. *The Auk*, 67(3): 361-363. Four races of the Old World Nightingale are listed, the one here described being *Luscinia megarhynchos caligiformis*, type from Martlesham, Woodbridge, East Suffolk, southeastern England.—Ralph S. Palmer.

53. Geographical Variation in the Gray Kingbird, *Tyrannus dominicensis*. Pierce Brodkorb. 1950. *The Auk*, 67(3): 333-344. From a study of 1,104 specimens, the author proposes to recognize five subspecies of this flycatcher which ranges from Florida through the West Indies to northern Colombia. Of these, two here are proposed as new: *Tyrannus dominicensis sequax*, type from Nueva Gerona, Isle of Pines, and *Tyrannus dominicensis tenax*, type from Margarita Island, Venezuela.—Ralph S. Palmer.

53a. The Races of Collared Scops Owl, *Otus bakkamoena* Pennant. H. G. Deignan. 1950. *The Auk*, 67(2): 189-201. From a study of almost 150 specimens, the author recognizes 22 subspecies of this owl of the Indo-Chinese Subregion. Two of these are described here as new: *Otus bakkamoena cnephaeus*, type from Rumpin River, southern Pahang State, Malaya, and *Otus bakkamoena hypnodes*, type from Pulau Padang, an island off the mouth of the Siak River, eastern Sumatra.—Ralph S. Palmer.

54. Birds Collected During Capt. James Cook's Last Expedition (1776-1780). Erwin Stresemann. 1950. *The Auk*, 67(1): 66-88. About 120 species were collected in the Pacific south of the Tropic of Cancer on Cook's last voyage, many being represented by a single specimen. No less than 85 species were named from this collection; 70 names have proved valid, 11 not valid, and four have not been identified. The birds are listed by locality and date, with taxonomic and other bibliographic references given under each scientific name. As a result of his study, the author gives a "list of threatened changes of long established names" and urges that the doctrine of *nomina conservanda* be applied to avian taxonomy. [In discussing "Stability in Zoological Nomenclature," *The Auk*, 67(3): 370-374, Frances Heming pointed out that "precisely the kind of international machinery" that Stresemann has in mind already exists.]—Ralph S. Palmer.

BOOKS AND MONOGRAPHS

55. A Quantitative Study of the Nocturnal Migration of Birds. George H. Lowery, Jr. 1951. *University of Kansas Publications Museum of Natural History*, 3(2): 361-472. This important monograph initially (pp. 370-408) devel-

ops the basic theory, techniques, and procedures involved in lunar observations of migrating birds and the concept of flight density. The remainder is used to present data and conclusions obtained by this method. These data represent a truly prodigious effort on the part of the author and his collaborators. The conclusions derived from the careful analyses of these data are of noteworthy significance. Night migrants apparently travel singly more often than in flocks, a situation quite different from the flocked distributions observed during the day. Nocturnal migration is apparently preceded by a resting or feeding pause during which time there are few migrants in the air. Thereafter the migratory activity increases until about one hour before midnight after which it declines sharply. This is in good agreement with the pattern of *Zugunruhe* observed in caged migrants in Europe during the migratory season. The data fail to support a theory that nocturnal migrants follow narrow, topographically-determined flight lanes. Heavy flight densities from the northern coast of Yucatán indicate that trans-Gulf migration must be extensive although this does not deny necessarily the importance of migration along the west shore of the Gulf. The data also suggest that the Florida route is quantitatively less important than the trans-Gulf and west-shore routes. Of particular interest is the observation that "The amount of migration is apparently seldom sufficient to produce heavy densities of transient species on the ground without the operation of concentrative factors such as ecological patterns and meteorological forces." (p. 470.) Data on flight directions and air currents are interpreted that a system of pressure-flying may be involved in nocturnal migration. Although there is no intention on the part of the reviewer to belittle the importance of lunar observations as a research tool in the study of migration, it is necessary to note that it has certain important limitations. It is restricted in time to periods of full moon and near full moon and to clear weather. Further there is the problem of accurate evaluation of flight direction. It is possible that adequate statistical procedures can be developed to indicate the probability of correctness of the calculated flight directions. Perhaps the principal difficulty lies in the fact that, at present at least, the data and conclusions cannot be assigned definitely according to species. Hence a certain amount of caution must be employed in the interpretation of results. Perhaps one of the greatest difficulties in the development of our knowledge of bird migration has been the tendency to over-generalize too much in the realm of *migration of birds* and to pay too little attention to the dynamics of migration for individual species. Again it is to be emphasized that these remarks are in no way to be interpreted as an attempt to minimize the importance of this monograph. The author is to be commended both for the accomplishment of a remarkable piece of research and for an excellent presentation of the results and conclusions from the research.—D. S. Farner.

56. An Analysis of the Distribution of the Birds of California. Alden H. Miller. 1951. *University of California Publications in Zoology*, 50(6): 531-644. \$1.50. In this interesting and important monograph the author has analyzed the extensive information on the rich avifauna of California from the aspects of zonal distributions, ecologic formations, and faunal groups. These analyses not only contribute to a better understanding of the distribution of California birds but also much to a better understanding of the basic precepts, philosophies, and relative usefulness of the three types of faunal analyses. Analysis with respect to life zones indicates the following distribution: Lower Sonoran 143, Upper Sonoran 174, Transition 177, Canadian 86, Hudsonian 35, Alpine-Arctic 3. Analysis of the zonal range (number of zones occupied by a species) of breeding species indicates the following: one zone, 54 species; two, 89 species; three, 88 species; four, 23 species; five, 5 species; six, 1 species. Twenty-four ecologic formations, assigned to seven groups, are recognized. Seventy-seven percent of the breeding species are restricted to a range of three formations or less. The greater precision of the formation is gained primarily by the greater number of categories although its consideration of climatic factors in general rather than differences in temperature alone is also contributory. The faunal groups recognized are the Boreal, Great Basin, Sonoran, and Californian avifaunae. The first three are intrusive. Within each of these faunae, geographic subdivisions have been compared and tested for significance in terms of differences from adjoining subdivisions. Thus *provinces, districts, and areas* were erected as units of decreasing importance. The provinces of the boreal division are the Coastal, Sierran, and Great Basin

mountains; the provinces of the austral division are the Interior, Californian, and Channel Islands. The final discussion includes thoughtful considerations of historic factors, and the role of climate and isolation in microevolution. The statements therein constitute a succinct elucidation and integration of many recent trends in thought with respect to zoogeography, evolution, ecology, and systematics.—D. S. Farner.

57. The Effect of Light Intensity and Day Length on Reproduction in the English Sparrow. George A. Bartholomew, Jr. 1949. *Bulletin of the Museum of Comparative Zoology at Harvard College*, 101 (3): 433-477, 10 plates. Using fluorescent lighting with approximately the same wave-length composition as sunlight, the author has subjected male and female *Passer domesticus* Linnaeus to treatments of various light intensities and day lengths. In general the response of the females was more variable and never complete with respect to the development of the gonads. This conforms with experience in other species. That there is a more basic "internal" cycle involved in testicular development is indicated by the fact that in winter 16-hour days of 10 foot-candles are as effective as the same day length with much higher intensities, whereas in fall 16-hour days with intensities of 10 foot-candles are much less effective than 16-hour days with higher intensities. Up to day lengths of about 14 hours the rate of testicular development could be increased with increases in day length; in winter, however, it was possible to bring males into breeding condition in 43 days with day lengths of 10 hours. In females also the rate of gonadal development could be increased by increasing day length; however, in 30-day exposures the greatest development occurred between day lengths of 16 and 24 hours. It is suggested that the difference in response between males and females is a difference in responsiveness of testes and ovaries to gonadotropic hormones rather than a sex difference in the response of pituitaries to light stimulation. A logical additional suggestion is made to the effect that the role of light in the normal reproductive cycle of the species is that of reinforcement of the "internal rhythm" which may be another way of saying that the development of the gonads begins when the "refractory period" of the anterior pituitary is waning and the amount of stimulation (day length) is increasing. Presumably then, as the author suggests, the ensuing reproductive period is in some way responsible for the initiation of the next refractory period. It would be of great interest if these interesting and important experiments could be pursued further in terms of observations of food uptake, quantity and pattern of daily activity, weight, fat deposition, and metabolic rate.—D. S. Farner.

58. Contributions to the Breeding Biology of *Larus argentatus* and *Larus fuscus*. Knud Paludan. 1951. Ejnar Munksgaard, 6, Nørregade, Copenhagen, Denmark. 142 pp. 20 Danish kroner. This excellent monograph is the result of the author's studies on Christiansø from November 1942 to April 1947 and his analysis of the data on Herring Gulls banded in Denmark and subsequently recovered. The vast wealth and variety of information on many aspects of life history and population dynamics are so extensive that only a relatively small sample can be discussed in a brief review. At the time of occupation of the breeding area in spring, courtship behavior in the Herring Gull is incomplete and the gonads are relatively small. Development of the gonads is initially slow; however, there is a marked acceleration during the 8-10 days before egg laying when copulation occurs frequently and when nest-building activity is at its maximum. Occupation of the breeding area may be delayed substantially by unfavorable weather. The pre-egg stage normally involves 6-7 weeks; in 1947 when there was a late occupation, it was reduced to 16 days ". . . which seems to be the minimum time in which the synchronization of the parters and the final growth of the gonads can take place." (p. 124.) The date of the beginning of egg laying was extremely constant being delayed only 4-7 days in 1947 when there was a late occupation and a short pre-egg period. The first normal egg-laying period, for the population as a whole, extends over more than a month. Normal clutch size is three; a few nests contain four eggs. The interval between the destruction of a clutch and the laying of the first egg in a new clutch is 11-12 days for both species. The author reports interesting results from a series of experiments on

removal of eggs from clutches. If eggs were removed from the nest at the beginning of egg laying, a fourth egg was laid. If eggs were removed later than 24 hours after the laying of the second egg, no fourth egg was laid; rather another clutch was begun after the normal interval. After about nine days before laying foreign eggs are accepted in the nest; this coincides with the "final phase of growth of the follicles." Although the Herring Gull is a determinate egg layer, four follicles enter the final phase of growth. The fourth attains a considerable development before it degenerates presumably as a result, in some manner, of the bird's contact with the first egg. Cessation of copulation and the development of broodiness are a consequence of the bird's contact with the first egg. Incubation may be prolonged artificially up to three times the normal period, terminating when the eggs disappear or when begging by the chicks prevents further incubation. The author's analysis of banding data indicates an annual adult mortality rate of about 15 percent which is about half the rate indicated by the studies of Marshall (recalculated by the author) and Paynter. There seems to be no reason to believe that the differences are the result of band loss or differences in methodology. The 15 percent annual adult mortality rate can be adequately balanced by the productivity in the Christiansø gallery. It is suggested that the higher adult mortality in the American populations is compensated by lower juvenile mortality rates than prevail in the Danish population. Apparently changes in clutch size are not important in balancing changes in mortality.—D. S. Farner.

59. The Birds of Newfoundland. Harold S. Peters and Thomas D. Burleigh, with illustrations by Roger Tory Peterson. 1951. Newfoundland Department of Natural Resources, St. John's, Newfoundland. i-xix + 1-431 pp., 32 plates, 40 figs. \$6.00. The authors of this handsome volume have had extensive field experience in Newfoundland over a number of years at all seasons. They have covered much of the land (except remote parts of the interior), traveled by boat along the entire coast, visited most of the coastal islands. The bulk of the text (pp. 46-399) is devoted to an annotated list of 227 birds known to occur, or to have occurred, on that island. The species accounts are well organized and include sections on local names, description, field marks, voice, nest and eggs, range, status in Newfoundland, and habits. There are useful counts and estimates of numbers for some of the colonial nesting birds. Banding data are often used to indicate post-breeding dispersal of some of the breeding species or the origin of some of the visitants that breed elsewhere. Of two fulmars recovered in Newfoundland, one was banded in Greenland, one as a "juvenile" on St. Kilda Island, indicating the occurrence of the Old World race *Fulmarus glacialis glacialis* (Linnaeus). Of 23 nests of *Turdus migratorius nigriceps* Aldrich and Nutt examined, all contained no more than three eggs! Local distributional data, of which many are the results of the authors' own investigations, are carefully compiled and well-documented. Students of distribution will find the occurrence of many species in Newfoundland, including a number of Old World forms, hardly more interesting than the apparent absence of others. Contributions of the authors to the taxonomy of Newfoundland birds have been published elsewhere and are not repeated in this book.

Introductory chapters contain a brief description of Newfoundland island, a good account of previous work done there, and mention the authors' sources of information. There are elementary general notes on plumage development ("juvenile" is not distinguished from "juvinal"!), song, courtship, territory, nests, eggs, incubation, feeding of young, food, legs and feet, wings, aids to identification, geographical distribution, banding, attracting birds, and systematic classification. Also there is a chapter on conservation and protection of birds with particular reference to Newfoundland.

A more adequate treatment of bird habitats would seem desirable. In a list of 13 habitat types (p. 3) there is no mention of such important habitats as beaches, marshes, cliffs, or the great expanse of open water entirely surrounding the island. These, collectively, attract to Newfoundland a very considerable and most interesting part of its avifauna. From the list of forest components white spruce, *Picea glauca*, and aspen, *Populus tremuloides*, are deleted. *Anas albeola* Linnaeus is missing from a list (p. 4) of 24 birds described from Newfoundland.

For *Icterus galbula* (Linnaeus), *Picoides arcticus* (Swainson), *Sphyrapicus varius varius* (Linnaeus), *Chordeiles minor minor* (Forster), *Zonotrichia albicollis* (Gmelin), *Quiscalus quiscula versicolor* Vieillot, and *Pheucticus ludovicianus* (Linnaeus) the westernmost part of the range is given, oddly enough, as Manitoba. It is common knowledge that all of these breed regularly and commonly far west of Manitoba, in one case west to Alaska. The choice of "Northeastern" as the subspecific vernacular name of the Olive-backed Thrush *Hylocichla ustulata clarescens* Burleigh and Peters may perhaps be misleading, as it now appears that the Newfoundland population is racially the same as that breeding in the Maritimes and extreme northeastern United States which are in the southeastern part of the bird's range. The 32 full-page colored plates and 40 text figures, by Roger Tory Peterson, beautifully and, with one exception (*Picoides arcticus* is shown with four instead of three toes), accurately supplement and decorate the text. These few shortcomings, however, but little alter the fact that the authors and artist have produced an excellent book on a fascinating insular avifauna. It is indispensable to beginner, advanced amateur, or professional interested in Newfoundland birds. The student of insular distribution will find it especially useful.—W. Earl Godfrey.

60. The Present Status of the Wild Turkey in Louisiana. F. D. Hollis. 1951. Louisiana Department of Wild Life and Fisheries, New Orleans, La. viii + 78 pp. Like many of the other southern states, Louisiana has been concerned about the dwindling numbers of wild turkeys. A survey conducted in 1941-42 and reported by George H. Bick (*Journal of Wildlife Management*, 11(2): 126-139, 1947) indicated a population of about 158 flocks, occupying 1,320 square miles or five percent of the original range. Re-survey of the turkey population in 1946-47 by Hollis, reported in the present bulletin, shows a decrease to 133 flocks on 1,201 square miles. The factors limiting turkeys in Louisiana are said to be uncontrolled hunting, and range deterioration resulting from agricultural development, timber cutting, and open-range grazing. This is essentially the pattern throughout the southeastern turkey range. The present bulletin in large part is a recapitulation of Bick's earlier paper. Many figures, tables, maps, and even part of the text are reproduced with little alteration or added information. However, distribution data have been considerably refined, and full-page maps of 13 parishes are presented with individual turkey flocks plotted.—A. Starker Leopold.

61. Speciation and Ecologic Distribution in American Jays of the Genus *Aphelocoma*. Frank A. Pitelka. 1951. *University of California Publications in Zoology*, 50(3): 195-464. This monograph is a noteworthy contribution not only to our knowledge of the particular genus concerned but likewise to the broader field of the processes of evolution at specific and infraspecific levels. It is another manifestation of a growing realization of the important functions of ecologic factors in evolution. Following a description of the methodology of the analytical procedures, there is an extensive and detailed analysis of the subspecific variation in the species of *Aphelocoma*, in the currently accepted concept of the genus. The recognized numbers of subspecies, according to the currently accepted species, are *Aphelocoma coerulescens* 18, *Aphelocoma ultramarina* 8 (including a tentative unnamed race from interior central Jalisco), *Aphelocoma unicolor* 5. For each subspecies there are usually sections dealing with racial characters: individual, sex, and age variations; geographic distribution; comparisons with other races; variation and intergradations; and ecologic distribution whenever appropriate and available. Six previously unknown races are described; two receive previously unpublished names.

A number of interesting ecologic relationships are presented with respect to the morphology, development, and distribution of various races. The races of *Aphelocoma coerulescens* and *Aphelocoma ultramarina* show increased pigmentation in areas with greater humidity and rainfall thus conforming with Gloger's rule. The available data, however, provide no confirmation of Allen's rule and only a partial confirmation of Bergmann's rule. Considering both the historic factors and the highly irregular ecologic nature of the areas inhabited by these species, the possibility of a clear demonstration of such functions among so many

other variables and their functions would appear to be remote. This is doubtless recognized by the author in noting that the fragmentary support offered by his data does not minimize the importance of these rules. Wherever possible the author has attempted to rationalize subspecific differences and variations on ecologic and other basis.

With respect to phylogeny, *Aphelocoma unicolor* is regarded as closest to the progenitor of the genus. Speculation on the phylogeny is difficult because of a paucity of comparative studies with respect to morphology and because the only available fossils of American jays are Pleistocene remains of three modern species. The history of the genus is thought to extend from the Miocene when Tertiary forests extended south into Central America. *Aphelocoma unicolor* inhabits the present remnants of these forests. The expansion of *Aphelocoma coerulescens* into North America is thought to be related to the early Pleistocene spread of the Mexican sclerophyll woodland and chaparral "assemblages" into southwestern North America and the Gulf and South Atlantic coastal regions. Subsequent subspeciation occurred when these assemblages became subdivided.

Perhaps of greatest general interest is the discussion (pp. 374-380) of interspecific limits primarily on the basis of information concerning *Aphelocoma*. The arguments present a species concept with considerably greater emphasis on ecologic rather than genetic criteria. This is well illustrated by the discussions with respect to the relation between the Floridan and other forms of *Aphelocoma coerulescens*. Initially a conspecific relationship is accepted because of "equivalence" and because of the lack of evidence that the two groups would behave as species were they in geographic contact. The reviewer interprets this as the current thinking of a considerable body of systematists. However, later the author indicates that even evidence of inability to successfully interbreed would not indicate a specific difference since there would still be the question of whether or not the Floridan form could survive should it be in contact with one of the other forms. The core of the general philosophy appears best expressed in the following: "A point usually overlooked or briefly mentioned in discussion of the broader species concept . . . is its ecological implication. By this I refer to the fact that notwithstanding the intraspecific variability of such a species as *A. coerulescens* and the possible existence of undeterminable interracial reproductive barriers, the niche occupied by that species is approximately the same one throughout. The interracial differences, with or without concomitant evolution of intersterility, illustrate various kinds of adaptive modifications which a genetic system, fundamentally similar among all the races, permits in a niche which is fundamentally similar throughout their collective range. The races are ecotypes comparable in broad terms to those described in plant species. . . . The critical turn of events in the evolution of the species comes when two closely similar forms, which are ecotypes of a widely ranging species, are brought together in a given environment. Assuming that reproductive isolation is complete and under circumstances of ecological competition, if one species is not eliminated by the other, some adaptive readjustment occurs which leads to occupation of narrower niches by the respective species or to occupation of a new niche by one of them. This is the usual turn of events that leads to the evolution of new genetic systems. Whichever species concept one applies in the genus *Aphelocoma*, the fact remains that there are fundamentally three adaptive types which meet in southeastern Mexico and occur (or did occur) in adjacent habitats. To recognize as many as thirteen species or even no more than seven or eight seems to me to be an exaggeration of the accomplishments of evolution." (p. 378.) In discussions of this type it is difficult sometimes to avoid arguments which simply represent the semantic difficulties in attempting to fit a complex natural system into a simpler artificial system; this is especially true with respect to definitions and "concepts" of the species. When natural populations are recognized as aggregates of genetically differing individuals whose compositions vary both in time and space and attention is given to the history and causality of these variations, it is possible with reasonable care to avoid such semantic difficulties. In this respect the author has been quite successful and for this reason his monograph constitutes an important contribution to modern thinking in biology.—D. S. Farner.

62. Cooperation among Animals with human implications. W. C. Allee. 1951. Henry Schuman, Inc., 20 East 70th St., New York 21, New York. 233 pp. \$3.50. This is a "revised and amplified edition" of the author's "Social Life of Animals," reviewed at some length in *Bird-Banding*, 8: 217-218, 1938. There seems to be little added except Chapter XI on "The Peck Order and International Relations," the Summary, and thirteen new references. It is a fine thing to stress cooperation among animals as the other side of the picture has been over-emphasized. This delightfully written book is packed with interesting information on the social life of invertebrates, fish, mice and hens. The author traces the history of the recognition of the principle of cooperation in animal life and describes various studies on the subject, mostly made by himself and his students. Instances are given for wild mammals and birds on the lowest numbers of a given species that can maintain themselves. Darling's studies on gulls are reported, as well as the failure of the Heath Hen to recuperate from a greatly repleted population. As to Laughing Gulls on Muskeget Island, the author states that under protection "... a few breeding pairs ... were able to regenerate the local population in less than fifty years." (p. 78.) But there is no proof that the "thousands in 1938 were all descended from the twelve pairs of 1880"; there might well have been immigration from other points. It was disappointing in the first edition and again in the second that the discussion of peck order in birds is confined almost entirely to domesticated species. The criticism made in 1938 is still valid: "No mention is made of Goethe's and Kirkman's studies on Gulls, nor of Lorenz' on the Jackdaw, and the *Kumpun*, nor of Friedmann's review of the subject in his chapter on "Bird Societies." It is even more disappointing to find that the discussion has not been brought up to date in regard to the most fundamental problem facing the world today, the greatest danger to lasting peace—overcrowding of the human species with resulting destruction of natural resources. What we need is all the cooperation and collective wisdom we can muster to plan for control of human reproduction and conservation of natural resources.—M. M. Nice.

63. The Migration of Birds. (La Migrazione degli Uccelli.) August Toschi. 1939. *Supplemento alle Ricerche di Zoologia Applicata alla Caccia*. 292 pp. Laboratorio di Zoologia Applicata alla Caccia, Università di Bologna. Via S. Giacomo N. 9, Bologna. Lit. 1,500. It is unfortunate that the distribution abroad of this interesting little book was long delayed by the war and the general difficulties of the times thereafter. Following a brief discussion of the history of the knowledge of bird migration, its importance, and methods of study, there is a general section (pp. 23-38) in which attention is given to the differences between non-migratory and migratory species and to the types of movements of populations of birds. Thereafter the author turns his attention to certain general aspects such as altitude, speed, effect of meteorologic conditions, routes, direction, geographic aspects, etc. In general the conclusions do not differ greatly from those of other general treatises on migration. However, the author is to be commended on his broad selection of illustrative material which contributes much to the general applicability of his conclusions. Perhaps the most useful part of the book is the discussion of the general picture of migration in Italy (pp. 95-106) since the Italian peninsula represents one of the trans-Mediterranean routes. Among the factors discussed are the effects of the positions of the Alps, the Apennines, and the Adriatic Sea; the situation is further complicated by the NW-SE position of the peninsula whereas the general direction of fall migration in Europe is NE-SW. Unfortunately the sections dealing with origin, cause, stimulation, and orientation now are of limited usefulness because of the extensive developments in these fields during the past decade. Very useful is the appendix which consists of a list of Italian species annotated with respect to their migratory status and habits.—D. S. Farner.

64. Fall of the Sparrow. Jay Williams. 1951. Oxford University Press, 114 Fifth Avenue, New York 11, New York. 158 pp. \$3.00. "Man, viewed objectively, is essentially the glutton and waster of the animal kingdom. He might almost be said to be, more than anything else, a maker of garbage dumps." (p. 61.) This book retells the shocking tale of man's—and woman's—wanton

destruction of the beasts and birds of the world. Most of it in the fairly recent past, some of it right now, for instance the slaughter of the big game animals in Africa ". . . in the belief they spread sleeping sickness. . . . It was a little like burning down a kitchen to get rid of houseflies." (p. 113.) The author is a journalist, not a naturalist, and there are various errors of fact, for example in the account of New Zealand birds. In another place he states that one pair of "sparrows" ". . . may raise as many as five or six broods a year." (p. 104.) In reality *Passer domesticus* raises two to three. Aspersions on the appearance and character of the Condor and Bald Eagle will not be helpful in arousing the enthusiasm of the laity for preserving these fine birds. One chapter is devoted to describing some of the conservation societies and international protection sponsored by Unesco. There is an index, but no bibliography, although a few authorities are cited in the text. What with the cartoons of Taylor and the "entertaining," at times flippant, style of the author, one wonders whether journalists and publishers believe that Americans will not buy books unless they promise to amuse and/or horrify. The author shows little grasp of the underlying factors in the situation and offers no militant program to halt the destruction of the wildlife of the earth.—M. M. Nice.

65. Ecological Animal Geography. Second Edition. W. C. Allee and Karl P. Schmidt. 1951. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, New York. The appearance of a second edition of this distinctive treatise will be of interest to biologists in many fields. In general the revisions are not extensive, being confined mostly to the addition of some more recent materials, some modifications of terminology, reorganization of a few sections, and the reorganization of the references at the ends of chapters with pertinent additions. In general, however, the basic outline and contents of the previous edition remain intact. A constant effort is made to explain distribution in terms of presently existing ecologic factors or systems with a minimum of emphasis on historical aspects. However, the approach in this respect is sensible with references to historic factors when they are prominent in the rationalization of distributions. This book can be heartily recommended to ornithologists as an interesting exposition of the almost countless ways in which ecologic factors may affect the distribution of animals. Since the coverage is broad and the field almost limitless, the attention to birds is not extensive, although, in general, the examples drawn from avian biology are quite well chosen. It is rather unfortunate that such rather unspecific names as "sparrow," "curlew," and "blackbird" are used without accompanying scientific names. A section (pp. 157-158) on territoriality, with much of the material drawn from ornithology, has been added. There are occasional references to bird migration. Although one can agree that the problem of migratory routes is in part a meteorologic problem, the inference that many important migratory routes, used by a large variety of species, are established because of the presence of ascending currents of air is not impressive. The inclusion, without adequate explanation, of diagrams of Lincoln's waterfowl flyways could be a source of misapprehension to non-ornithologists. These criticisms are minor and do not detract extensively from the great basic value of the book. As a basic exposition of a huge number and variety of factors which affect the distribution of animals and of the ways in which animals are adapted to these ecologic factors, the book continues to be eminently successful. It continues to be one of the truly important biological treatises.—D. S. Farners.

66. The Song Birds of Germany. Ninth Edition. (Die Singvögel der Heimat. Neunte Auflage.) Otto Kleinschmidt. 1951. Quelle und Meyer, Heidelberg, Germany. xii + 96 pp. 15.80 German marks. This ninth edition was in preparation in 1942, at which time the plates, tables, and type were destroyed by fire. As it now appears this ninth edition is a beautiful little book which should find its way to the library of many American ornithologists. The bulk of the book is concerned with 82 species, all passerine except the Swift, *Apus apus* (Linnaeus). The text for each species, usually one page in length, gives condensed information on nomenclature, distribution, identification, size, description, calls, song, eggs, nest, nesting habits, food, migration, and systematics. There are brief notes on 21 less common species and a list of passerine species which occur

rarely in Germany. There is a brief general discussion of eggs accompanied by a colored plate of "important egg types." The attractiveness and usefulness of the book are much enhanced by 82 beautiful colored plates prepared by the author. They will constitute a most desirable addition to any ornithological library.—D. S. Farner.

67. The Birds of Central Europe. Volume 1. Song Birds I. Third Edition. (Die Vögel Mitteleuropas. Erster Band. Singvögel I.) Otto Fehring. 1950. Carl Winter, Universitätsverlag, Lutherstrasse 59, Heidelberg, Germany. xvii + 111 pp. 7.80 German marks. The introductory section (x-xxvii) of this little volume discusses some of the general aspects of the biology of passerine birds: included are migration, molt, song, bird protection, food, rearing of young, sexual dimorphism, systematics, and seasonal activity. About 115 species are treated; for each there is usually elemental information on distribution, plumage, nest, eggs, young, voice, habits, and behavior. The material for each species, with few exceptions, is confined to one page or less. Ninety-six of the species are illustrated with water-color plates by Walter Heubach. Unfortunately the reproduction is by no means uniformly good. This little book and its companion volumes should prove useful to American ornithologists who wish a usable condensed source of information on common central European species. The second volume of this series (originally published in 1926 and apparently unrevised) includes the remainder of the passerine species, the near-passerine species, owls, hawks, pigeons, and galliform birds. The plates are by Walter Heubach and Erwin Aichele. The third and final volume (originally published in 1931 and apparently unrevised) is concerned with cranes, rails, coots, storks, herons, shore birds, ducks, geese, cormorants, pelicans, grebes, loons, gulls, and terns. The basic plan in the second and third volumes is the same as in the first. Both are available from the publisher at the same price as Volume One.—D. S. Farner.

68. American Wildlife and Plants. Alexander C. Martin, Herbert S. Zim, and Arnold L. Nelson. 1951. McGraw-Hill Book Co., 330 West 42nd Street, New York 18, New York. ix + 500 pp. \$7.50. As a *general* reference guide to the food habits of North American birds and mammals and to the value of higher plants as food for these animals, this book is indispensable. It fills an important and previously vacant niche in American literature. The basic data were derived from food-habits research of the U. S. Fish and Wildlife Service; in addition the literature representing studies by individuals and other agencies has been covered rather thoroughly. The text is divided into three parts, the first of which deals with a brief general introduction concerning the importance of various groups of plants to wildlife, parts of plants consumed, availability, preference and nutritional value, farm crops, collection and examination of materials, and a chapter on symbols and methods used in presentation of the data. The second part presents discussions and tabulations of the feeding habits and foods of birds and mammals at the species level, following a general phylogenetic sequence and covering waterbirds, marshbirds and shorebirds, upland gamebirds, songbirds, birds of prey, fur mammals, small mammals (including non-game as well as game species), and hoofed browsers. Part three is concerned with plants useful to wild animals, the discussions being presented at the generic level. The limitations of food-habits analyses are duly recognized and no attempt is made to attach specific ecologic or economic significance to the data beyond obvious and general conclusions. Rather than to imply high degrees of accuracy through use of percentages, relative importance of food items is expressed by a system of starring. General distribution maps are shown for many species of animals and plants, and pertinent remarks are made concerning past and present status and economic importance. It is perhaps inevitable that some important references have been neglected. The food habits of Blacktail Deer, *Odocoileus hemionus columbianus* (Richardson), for example, would have been more accurate with the inclusion of data from Ian McT. Cowan (1945, The Ecological Relationships of the Food of the Columbian Black-tailed Deer, *Odocoileus hemionus columbianus* (Richardson), in the Coast Forest Region of Southern Vancouver Island, British Columbia, *Ecological Monographs*, 15: 109-139). Pronghorn antelope, *Antilocapra americana* (Ord), utilize far less grass than implied in the discussion or the data actu-

ally presented (Buechner, H. K., 1947. Range Use of the Pronghorned Antelope in Western Texas, *Transactions of the North American Wildlife Conference*, 12: 185-192). For Bobwhite Quail, *Colinus virginiana* Linnaeus, in Oklahoma and Texas, the relative importance of ragweed, sunflower and lespedeza would be changed somewhat and acorns, buckthorn and wild bean would have been added as important items by inclusion of the data from 385 crops reported by Levon Lee (1948, The Fall and Winter Food of the Bobwhite in Oklahoma. *Oklahoma Game and Fish Department*, 23 pp.). Undoubtedly the conceptions of food habits for many animals, particularly those for which little information is now available, will change considerably as more data are accumulated through further research. The format and system of symbols are excellent for an easy and rapid comprehension of general food habits and the importance of plants to wildlife. Ornithologists, mammalogists, ecologists, wildlife managers, and many others will find this book a valuable addition to their libraries.—Helmut K. Buechner.

69. Biological Investigations in Mexico. Edward Alphonso Goldman. 1951. *Smithsonian Miscellaneous Collections*, 115. xiii + 476 pp. The bulk of this impressive volume is an annotated list of the localities in México and Guatemala visited by the author and Edward William Nelson during the course of their investigations sponsored by the Biological Survey. In many respects this is the most important portion of the treatise because of the usefulness it will inevitably have whenever the extensive collections of these investigators are used in scientific studies. The location of each locality is carefully given with indication of how material from the locality was labelled. Frequently there are biologic notes also. The relatively brief section (pp. 298-308) concerning the physiography of México is the least important part. The final portion of the book is concerned with biotic relations. Included is a discussion of the seven major life zones of México with a defense of the life-zone system and rationalization of it with the biome system of Clements and Shelford. A major portion of the section consists of a characterization of the life zones as they occur in México and the listing of zonal distributions of plants, birds, and mammals. Following this is a discussion of biotic provinces. The following provinces are recognized with respect to México: California, Guadalupe Island, Vizcaíno Desert, Southern Baja California, Revillagigedo, Sonora, Sierra Madre Occidental, Chihuahua-Zacatecas, Tamaulipas, Sinaloa, Nayarit-Guerrero, Sierra Madre Oriental, Transverse Volcanic, Tehuantepec, Chiapas Highlands, and the Yucatán Peninsula. Much credit for this important treatise goes to Dr. H. H. T. Jackson who first suggested its preparation in 1942 and to whom fell the difficult task of final preparation of the manuscript for publication after the death of the author in 1946. Extensive revisions of the material on biotic provinces were necessary. The discussions of mammals and the lists of mammals were prepared largely by Dr. Jackson.—D. S. Farner.

70. The Birds of South Africa. Austin Roberts. 1940. Ninth Impression, 1949. H. F. & G. Witherby, Ltd., 5 Warwick Court, London, W. C. 1, England. xxxvi + 463 pp. It is a pleasure to note the continued availability of this useful treatise on South African birds. For those unfamiliar with this volume, it should be noted that 875 species are admitted to the list. There are 1032 separate illustrations in color on 56 plates prepared by N. C. K. Lighton. Although the information provided for each species is limited, the most essential elements of description, distribution, and breeding habits are included.—D. S. Farner.

71. A Field Guide to the Butterflies. Alexander B. Klots. 1951. Houghton Mifflin Company, 2 Park Street, Boston, Massachusetts. xvi + 349 pp. \$3.75. Written in the tradition of the original "Field Guide to Birds" by Roger T. Peterson, as part of a "Field Guide Series" by the publishers, under the editorship of Peterson, this work represents the efforts of a naturalist who is a leading authority on the Lepidoptera. It is based on over thirty years of collecting as well as field studies by the author, who, in addition to being Assistant Professor of Biology at the City College of New York, is a Research Associate at the American Museum of Natural History. While designed primarily as a utilitarian handbook for the beginner or advanced student of this diverse and colorful group of insects, the book is especially commendable for its inclusion of habits, habitats and general

biology of the butterflies. To this end six chapters are devoted to such subjects as "How to Use This Book," life histories and development, "The Butterfly and Its Environment," a description of the external structures, and classification of adult butterflies. The excellent treatment of the ecology of the butterfly, as regards its distribution in relation to climatological conditions, life zones and geographic regions, as well as its relationship to plants, is a definite contribution to the naturalist interested in the broader aspects of interrelationships of animals and their environment. Such subjects as predators and parasites of butterflies, protective form and coloration, and behavior are also included. For the teacher of natural history or nature group leaders, the author presents suggested plans for group organization, including preparation, collecting and plans of study. This should prove especially valuable to such individuals interested in utilizing this handbook to its maximum as a guide for a broader program of nature study. For those who expect to become reasonably conversant with this group of animals, it should be emphasized that, like practically all field guides or handbooks, this guide requires preliminary preparation and study before it can be used in the field with any degree of facility. However, to this end excellent color illustrations of 247 different species of butterflies and good to mediocre black-and-white illustrations of 170 other species of butterflies can be utilized by the beginner with effectiveness. In this connection, for each native species is included a brief description of its chief characteristics, its habits and common habitat, a description of the mature larva, overwintering habits and date of spring appearance as well as geographic range. In the three sections of the appendix is included such useful information as principles of classification of animals; literature on collecting and preserving insects, on taxonomy and nomenclature; and a list of museums with butterfly collections. It is apparent that the author, as a biologist who is a naturalist, has not only produced a useful field guide in this book, but also an excellent brief treatment of the biology and natural history of a group of animals, whose interest to naturalists is perhaps second only to that of birds.—Morris Rockstein.

72. A Guide to Bird Finding East of the Mississippi. Olin Sewall Pettigill, Jr., with illustrations by George Miksch Sutton. 1951. Oxford University Press, 114 Fifth Avenue, New York 11, New York. xxi + 659 pp. \$5. This handbook is designed for use in the 26 states which lie entirely east of the Mississippi River and constitutes an interesting experiment in popular ornithology. The book is organized according to an alphabetic arrangement of the states. For each there is a discussion of its biotic characteristics as they relate to the distribution of birds. Also there are lists of species (common names only) characteristic of particular types of habitat. Consistent effort has been made to list and discuss at least the major ornithologic phenomena for each state. Considerable space is devoted to description of *specific localities*, their habitats, and avifauna. Although the number of possible localities which might be included is almost limitless, the author has apparently selected quite wisely if one considers such matters as availability, variety of habitats, inclusion of a maximum number of species, historical interest, and other factors. Reference is made also to important laboratories, libraries, zoos, sanctuaries, and colleges and universities which offer instruction in ornithology. In the opinion of the reviewer this handbook will become a constant travelling companion for many who have an interest in birds.—D. S. Farner.

73. John Burroughs' America. Selections from the Writings of the Hudson River Naturalist. Edited by Farida A. Wiley. Foreword by Julian Burroughs. Illustrated by Francis Lee Jaques. 1951. The Devin-Adair Company, 23 East 26th Street, New York 10, New York. xv + 304 pp. \$4. In this very attractive book the editor has organized selections from the writings of Burroughs into seventeen delightful chapters. Although most of the chapters are derived from several sources, the selections have been made in such a way as to provide invariably a pleasant continuity. Although agreement with respect to which is "best" among the bountiful writings of Burroughs would be difficult or

impossible to attain, it must be conceded that the editor has succeeded in presenting in sharp focus his spirit and wholesome natural philosophy. Such delightful chapters as "Maple Sugar Days," "Insect and Amphibian Ways," "Birds' Nests," and "The Ways of Mammals" should do much to revive an appreciation of John Burroughs in a new generation.—D. S. Farner.

74. The Birds of Rocky Mountain National Park. Fred Mallery Packard. 1950. Rocky Mountain Nature Association, Estes Park, Colorado. vi + 81 pp. This little manual, which is based primarily on the author's extensive experience in the area, is designed basically for the visitor in Rocky Mountain National Park. It should prove equally useful for both the experienced and inexperienced ornithologist although in the case of the latter, the simultaneous use of a more detailed handbook for field identification of birds would be advisable. For each of the 219 species and subspecies there are descriptions with emphasis on field identification and brief statements concerning distribution and status in the Park. Although it is admittedly a matter of individual philosophy, the reviewer is of the opinion that manuals of this type should be arranged only according to *species* with attention to subspecies reduced to a minimum and then placed within the treatment of the species concerned. Too frequently the separate listing of subspecies results in unwarranted subspecific designations with respect to sight records. Nevertheless this manual will certainly be important not only in stimulating increased interest and enjoyment of the birds of the Park by visitors but also as an indicator of studies yet to be accomplished in order to better understand the avifauna of this interesting mountainous area.—D. S. Farner.

75. Bird Folk on Far Journeys. The Wonder of Bird Migration. (Vogelvolk auf weiter Reise. Das Wunder des Vogelzuges.) Rolf Dircksen. 1951. Bertelsmann, Gütersloh, Germany. 191 pp. 9.80 German marks. A remarkable book, written with charm, enthusiasm and thorough knowledge of the subject. After each essay expressing the wonder and joy of bird watching, come facts based on banding, telling of migration routes and winter quarters with maps showing recoveries. It is most impressive what has been accomplished by well-directed, planned banding, thorough study of the results, and finally, publication in ornithological journals. A total of two and a half million birds have been marked with the rings of the Vogelwarte Helgoland and Rossitten (now Radolfzell); returns and recoveries have reached 75,000. (In America 5,700,000 birds have been banded.) A preliminary section is occupied with banding, its history and results, with five essays describing actual experiences in ringing at the Vogelwarte, terns on the seacoast, ospreys in their nest and nestlings in a garden. Most of the book is devoted to "Life and Migration Pictures of our Birds," covering most of the central European species. Bird migration in Asia and North America is touched upon. A number of general chapters treat of speed and height of migration, return to breeding and birth place, and age as found by banding. Greatest ages reached by banded birds in Europe are 24 years for Oystercatcher, 25 years for Black-headed Gull, 26 years for Herring Gull, and 27 years for Arctic Tern. Orientation ability in birds is interestingly treated with accounts of many experiments on homing after removal to considerable distances, and particularly the various recent experiments including those by Gustav Kramer that indicate that day migrants take their cue from the position of the sun. Of the 36 maps two are taken from English sources, four from Dutch, six from American and the rest from German. There are 93 very fine photographs of birds and also a seven-page bibliography. Dr. Dircksen is to be congratulated on this admirable book, delightful to read and to look at, and packed with valuable information.—M. M. Nice.

76. Evolution. Second Edition. A. Franklin Shull. 1951. McGraw-Hill Book Company, 330 West 42nd Street, New York 18, New York. ix + 322 pp. \$5.

Although the chief purpose of this book remains unchanged, its second edition has been extensively revised, largely by bringing the subject matter up to date and by including material on plant as well as on animal evolution. The book has as its main objective the presentation of a general treatment on evolution based on a broad genetic background; it is addressed to biologists chiefly con-

cerned with other phases of biology, to college students with a minimum of biological knowledge and to interested laymen. With this in mind, the out-of-the-laboratory illustrations of the genetic process, as it relates to evolution, are given from the naturalist's viewpoint as well as from the geneticist's. The book is introduced by a historical statement on the evolution concept over the centuries. This is followed by chapters on organic diversity, the distribution of diversity in time and space, and the evidential material supporting the evolution theory. The inclusion of evidential material is not so much to convince readers that evolution has occurred, "... for with rare exceptions they hold that view already. It is merely that they should know why they hold it. In this age too many people have opinions whose bases are not clear to them." The genetic information is dispersed throughout the book more than in the original edition, it being the author's aim to strengthen the relation between such information and the evolutionary phenomena to which it applies. With deference to students of the humanities and social sciences, the material on the origin of man has been expanded to form a separate chapter and the often confused relations between biological and societal evolution have been rather strongly contrasted. In the reviewer's opinion, retention of a general bibliography in the second edition would have been desirable. A few cytological errors involving the mechanism of crossing over and the relation of the centromeres to the strands of a meiotic tetrad (p. 126) do not detract materially from the main purpose and effectiveness of the book.—Ray Moree.

Letter to the Editor

In his interesting and informative article on "The Mourning Dove on Cape Cod" in the October 1951 issue of *Bird-Banding*, Dr. Oliver L. Austin, Jr., calculates the number of young that must be raised each year in order to keep up the population. "The production of 4.6 young per pair in three broods of two eggs each requires a nesting success of 77%" (p. 164), i.e. success of eggs, not nests. In three of the nesting studies on this species involving more than 50 nestings, success of the eggs reached 38% in 57 nestings (Kendeigh 1942), 35.9% in 141 nestings (Nice 1923), and 46.6% in 4,273 nestings (McClure 1946). The other studies give success of nests only—always higher than for eggs: 51.9% for 235 nestings (Monk 1949, *Migrant* 20: 1-9), an estimated 45-50% for 771 nestings (Quay 1951), and 52.2% of 592 nests (Pearson and Moore 1939, *Trans. N. A. Wildl. Conf.*, 4: 468-473). The success of nests in the first three studies was 54.4%, 43.2% and 47.9% respectively.

Dr. Austin explains the wide divergence between his theories and the findings of these students by suggesting that "their very actions in observing the nests could not help but contribute to the mortality," (p. 165) by causing desertion and increasing predation. Desertion was brought about by nest-hunting in Young's (1949) report on 10 nests, and perhaps also in Quay's work (1951: 35). In only 8 of the 141 Oklahoma nests were deserted eggs found; five of these desertions occurred in September after the hunting season had started (Nice 1923: 52). In populations in towns, as were McClure's and mine, these birds become very tolerant of human beings. Predators would hardly follow people by scent to nests in trees, but it seems possible in McClure's work that Blue Jays were sometimes attracted by disturbance incident to banding. However, his study of the birds resulted in much public interest that probably offset any loss from this cause. The low percentage of success found in Oklahoma was due primarily to severe storms.

If observations on nesting Mourning Doves decreased the success of the birds from 77 to 47 percent, what about all the studies of other altricial species with open nests that have been found to average some 43%? Moreover, does the Mourning Dove with its frail nest have higher success than altricial species nesting in holes that have been found to average 66%? If the Mourning Dove really has a nesting success of 77%, we will have to discard the results of all our studies on this subject because of the very high mortality we brought about by watching the birds.

Dr. Austin believes that three broods a season are indicated by his trapping results; 77% of 6 eggs gives 4.6 young. *But Mourning Doves attempt more than three broods.* In Iowa McClure (1943: 384) found that in 1938 303 pairs aver-