so it was banded and released. I was able to follow its wanderings and action for a few hours which led me to make an interesting observation. The fledgling constantly called while it was in the area which excited two pair of adult Robins which had nests containing young in the neighborhood. The adults scolded constantly when I was in view. One of the adults, a female, was carrying some food which she fed to the fledgling. The other pair of adults retired to their territory while the other pair remained in constant attendance to the fledgling, the female was observed to feed it several more times though this was not observed in the male. The fledgling readily consumed the food but did not make an effort to solicit such from the birds but instead showed very little interest in the adults, but constantly called and snapped its bill in the manner of the adults when they are disturbed. In the morning the fledgling moved on never to be observed again. —James Hodges, 324 West 31st Street, Davenport, Iowa.

"Marrying" Junco Returns Again.—General Notes in *Bird-Banding*, 19(1): 22, and 20(1): 50, reported an example of miscegenation in which the female *Junco hyemalis hyemalis* (Linn.) 44-53154 played the star role. On July 10, 1939, she was trapped for the fourth consecutive summer at exactly the same spot in Millbridge, Maine. Upon this occasion she was accompanied by a new mate, an unbanded male, which we trapped later and marked with band No. 46-2162. As if her history were not already sufficiently complex, 44-53154 was now found to be infected, apparently, with *epithelioma contagiosum*. Tumor-like enlargements on the toes of both of her feet suggested this condition. These growths were not observed on this bird's feet prior to her capture this summer.—C. Hapgood Parks, 99 Warrenton Avenue, Hartford, Connecticut.

RECENT LITERATURE

Reviews by Donald S. Farner and others

Reprints of this section may be purchased from the Business Manager at 75 cents each.

BANDING

(See also Numbers 9, 10, 12, 19, 20, and 21.)

1. Report of the Bird Ringing Committee; Progress for 1948. A. L. Thomson. 1949. *British Birds*, 42(6): 175-180. A total of 39,324 birds were ringed in 1948 in Great Britain, 20,911 of which were nestlings. A Red-backed Shrike, *Lanius collurio* Linnaeus, ringed as a nestling was found 100 miles to the east a little more than a month later. A Blackbird, *Turdus merula* Linnaeus, "ringed in Ross-shire in March was recovered in Norway (lat. 62°N.) in a subsequent January, suggesting that it had migrated to this country in one winter but not in the later one. Few of our Blackbirds are recovered abroad, but a nestling from Wimbledon was recovered in Brittany in January three and a half years later."—M. M. Nice.

2. Results of Bird-Banding Activities under the Auspices of the Rijksmuseum van Natuurlijke Historie te Leiden XXXIV. (Resultaten van het ringonderzoek betreffende de vogeltrek, ingesteld door het Rijksmuseum van Natuurlijke Historie te Leiden, XXXIV (1947).) G. A. Brouwer and N. Croin Michielsen. 1949. *Limosa*, 22(3): 295-317. Species banded in greatest numbers in 1947 were the Teal, *Anas crecca* Linnaeus 1853; Garganey, *Anas querquedula* Linnaeus 485; Great Tit, *Parus major* Linnaeus 857; Starling, *Sturnus vulgaris* Linnaeus 2058; Linnet, *Carduelis cannabina* (Linnaeus) 371. Among the recoveries are those of 150 Teal; the recovery localities were mostly in the British Isles, Spain, France, the Netherlands, and Belgium. Two of the recovered Teal were six years old. A Stork, *Ciconia ciconia* (Linnaeus), banded 2 July 1934 at Zuidlaren was recovered in Saxony 28 August 1947. There are 32 records of recoveries of Lapwings, *Vanellus vanellus* (Linnaeus), mostly from Spain, France, Portugal, and the British Isles. There were four recoveries in the USSR of Lap-

wings banded in the Netherlands in winter. A Herring Gull, *Larus argentatus* Pontoppidan, banded as a juvenal 19 July 1931 at Texel was recovered 16 May 1947 between Urk and Lemmer with a lame wing; another banded at Haamstede on 30 June 1929 was found dead 16 September 1947. There are 60 records of recoveries of Starlings.—D.S.F.

3. Recovery in Netherlands of Birds Banded in Foreign Countries. (Terugvondsten van in het buitenland geringde vogels, 22.) C. G. B. ten Kate. 1949. *Limosa*, 22(3): 323-328. Details on 70 records of recoveries for 27 species. Most numerous (17) were recoveries of Black-headed Gulls, *Larus ridibundus* Linnaeus, from Finland, Norway, Sweden, Denmark, Lithuania, England, Switzerland, and Czechoslovakia. A European Golden Plover, *Pluvialis apricaria altifrons* (Brehm), was banded as a juvenal in Iceland 27 June 1948 and captured 1 November 1948 in the Netherlands.—D.S.F.

4. The Activities of the Ottenby (Sweden) Ornithological Station in 1948. (Verksamheten vid Ottenby fågelstation 1948.) Gunnar Svärdson. 1949. *Vår Fågelvärld*, 8(3): 97-120. This very interesting report includes a summary of the observations of migrating birds as well as a compilation of banding records for 1948. The station was manned during the period of 1 June - 30 October. Migration during 1948 was much more intense than in 1947, particularly in the case of certain passerine species. Gull, terns, and shorebirds apparently migrated in similar numbers. In 1948, 3058 Redpolls, *Carduelis flammea* (Linnaeus), were observed whereas only 58 were observed in 1947; this corresponds with the irruption of 1948. In 1947 and again in 1948 a single Short-eared Owl, *Asio flammeus* (Pontoppidan), was seen to fly out across the Baltic in June. Species observed in greatest numbers in flight out over the sea from the station included: Starling, *Sturnus vulgaris* Linnaeus 33,700; Linnet, *Carduelis cannabina* (Linnaeus) 22,400; White Wagtail, *Motacilla alba* Linnaeus 22,200; Swift, *Apus apus* Linnaeus 97,900; Chaffinch, *Fringilla coelebs* Linnaeus 18,600; Brambling, *Fringilla montifringilla* Linnaeus 12,650. During 1948, 9,271 birds were banded. Species banded most frequently included: White Wagtail 328; Robin, *Erithacus rubecula* (Linnaeus) 1137; Swift 1276; Dunlin, *Calidris alpina* (Linnaeus) 2141. Eighty recoveries and returns are reported. A Ruff, *Philomachus pugnax* (Linnaeus), banded 27 August 1948 as a juvenal, was shot in Milan, Italy, 31 August 1948. A Pied Flycatcher, *Muscicapa hypoleuca* (Pallas), banded 4 September 1948 at Ottenby, was recovered 200 kilometers south in Poland on 5 September 1948. There is a record of a southeasterly migratory direction of a Robin and a similar record for a White Wagtail; the normal migratory direction for these is southwesterly.—D.S.F.

5. Third Preliminary List of Recoveries of Birds Banded in Greenland. (Tredie foreløbige liste over genfundne grønlandske ringfugle.) Finn Salomonsen. 1949. *Dansk Ornithologisk Forenings Tidsskrift*, 43 (3): 251-255. A briefly annotated list of 38 recoveries. Thirty-four of these are of the White-fronted Goose, *Anser albifrons* (Scopoli); recoveries are mostly from Ireland, two from Iceland, and one from Scotland. A Fulmar, *Fulmarus glacialis glacialis* (Linnaeus), banded as a juvenal in Umanak District, 29 August 1948, was recovered at St. Anthony, Newfoundland 27 October 1948. A Brünnich's Murre, *Uria lomvia lomvia* (Linnaeus) banded 16 July 1948 Jakobshavn District was recovered 16 April 1949 at Conception Bay, Newfoundland.—D.S.F.

6. Bulletin Number 4 (1943, 1944, 1945) of the French Bird-Banding Stations. (Bulletin des Stations Françaises de Baguage. Station Ornithologique de Paris. Station Ornithologique de Versailles. Numero 4.) E. Bourdelle (Paris) and J. Giban (Versailles). 1949. Appendix to *L'Oiseau et la Revue Française d'Ornithologie*, 19(1). 27 pp. During 1943, 1944, and 1945, 3567 birds were banded with bands issued by the Paris Station. Most frequently banded were the White Stork, *Ciconia ciconia ciconia* (Linnaeus) 202; Swallow, *Hirundo rustica rustica* Linnaeus 701; Redstart, *Phoenicurus phoenicurus phoenicurus* (Linnaeus) 235; and Great Tit, *Parus major major* Linnaeus 240. There have been 76 returns and recoveries of birds banded in 1943, 1944, and 1945. In addition, 97

birds of several species were banded at the Camargue; 200 White Storks were banded in North Africa in 1945.—D.S.F.

7. Interesting Bird-ring Recoveries. J. Vincent. 1949. *The Ostrich,* 20(1): 39. Arctic Tern, *Sterna macrura* Naumann, banded Machias Seal Island, New Brunswick, Canada, 5 July 1947, recovered Pretoria, South Africa, 10 November 1948.—D.S.F. (See *Bird-Banding,* 20, 1949: 185-186.)

MIGRATION
(See also Numbers 1, 2, 3, 4, 5, 7, 40, 61, and 77.)

8. Airplane Observations of Homing Birds. Donald R. Griffin and Raymond J. Hock. 1949. *Ecology,* 30(2): 176-198. This paper presents in greater detail experiments with displaced breeding Gannets, *Morus bassanus* (Linnaeus), previously described briefly in *Science* (107: 347-349. 1948.) Of 22 birds from Bonaventure Island released at distances up to 213 miles, 13 returned to their nests. Seventeen, of which ten returned, were released in what certainly must have been unfamiliar territory (Caribou, Maine, 213 miles WSW of "home"). Airplane observations indicate that the birds in unfamiliar territory performed more or less random movements until familiar area (coast line) was encountered after which more rapid and direct progress "homeward" was made.—D.S.F.

9. Results of Displacement Experiments with Hooded Crows during Migration. (Ergebnis der Verfrachtung von Nebelkrähen *(Corvus corone cornix)* während des Wegzuges.) W. Rüppell and E. Schüz. 1949. *Die Vogelwarte,* 1: 30-36. This is an analysis of the recovery of Hooded Crows captured at Rossitten in fall migration and transported to Berlin (600 kilometers in the direction of normal fall migration) where they were released. (Berlin lies within the total winter area for Hooded Crows which migrate through Rossitten, but beyond the principal winter area for these birds.) There were 44 recoveries. Most of the winter recoveries indicated that the released birds continued to migrate from Berlin in the normal direction of migration. The spring and summer recoveries in Sweden and Finland are explained in terms of a retention of normal migratory direction with parallel westward displacement, a phenomenon previously demonstrated by Rüppell *(Journal für Ornithologie,* 92(1/2): 106-132. 1944.) With displacement experiments in which birds were transported to Flensburg, Essen, and Frankfurt-am-Main. The differences in behavior between adult and juvenal displaced crows is similar to that reported by Rüppell in his earlier paper. In general the results of these investigations support Rüppell's earlier conclusion that displacement of migrating Hooded Crows results in a subsequent parallel migratory route and correspondingly displaced breeding area although this may be modified in some instances by "experienced" adults.—D.S.F.

10. The Return of Pied Flycatchers to their Birthplace or Breeding Locality. (Svartvita flugsnapparens, *Muscicapa hypoleuca* (Pall.), hemortstrohet.) Lars von Haartman. 1949. *Vår Fågelvärld,* 8(4): 74-81. This is a summary of returns of Pied Flycatchers banded in southwestern Finland. Thirty-seven percent of the banded adult males (159) returned indicating that almost all surviving males must return to the previous breeding locality. Data on females (11 percent of 177, and 14 percent of 154) indicate a lower tendency than in males. Only ten of 1161 banded as nestlings returned to the birthplace. About forty percent of the females which had already returned once to the banding locality, returned the following year; this is probably most or all of those surviving. The author feels that there are "ortstreue" females which breed every year in the same territory, and nomadic females which change their breeding place from year to year.—D.S.F.

11. Reorientation of Female Pied Flycatchers to the Breeding Site. (De svartvita flugsnapperhonornas återorientering till häckplatsen.) Anders Enemar. 1949. *Vår Fågelvärld,* 8(2): 81-84. The author reaffirms his earlier hypothesis contradicted by von Haartman's (see review above) hypothesis of two

groups of females "ortstreue" and "nomadic." The author conceives of a "critical area" with which the female becomes familiar after the young have left the nest. If a returning female encounters the "critical area" she may be oriented to the breeding site of the preceding year. Once the female uses a site a second year, the "critical area" is intensified by repetition and increased in size and direction. There is less chance of "missing" the enlarged "critical area."—D.S.F.

12. Migration of Some North American Waterfowl. A Progress Report on an Analysis of Banding Records. John W. Aldrich and others. 1949. *Special Scientific Report (Wildlife) No. 1.* Fish and Wildlife Service. U. S. Department of the Interior, Washington, D. C. 48 pp. and 31 maps. The eighteen reports which comprise this publication are based in part on previously published material but largely on partial analyses of banding records. These reports provide more exact information on the migratory routes of waterfowl than heretofore available and moreover reveal inadequacies in the available information thereby allowing a more intelligent planning of banding operations. Individual reports have been prepared as follows: Mallard, *Anas platyrhynchos* Linnaeus, by Arthur S. Hawkins; Black Duck, *Anas rubripes* Brewster, by C. E. Addy; Gadwall, *Anas streperus* Linnaeus, by G. Hortin Jensen; Baldpate, *Mareca americana* (Gmelin), by Allen G. Smith; Pintail, *Anas acuta tzitzihoa* Vieillot, by Seth H. Low; Green-winged Teal, *Anas carolinensis* Gmelin, by Seth H. Low; Blue-winged Teal, *Anas discors* Linnaeus, by Jerome H. Stoudt; Cinnamon Teal, *Anas cyanoptera* Vieillot, by G. Hortin Jensen and Allen G. Smith; Shoveller, *Spatula clypeata* (Linnaeus), by Jerome H. Stoudt; Red Head, *Aythya americana* (Eyton), by Chandler S. Robbins; Ring-necked Duck, *Aythya collaris* (Donovan), by Allen J. Duvall; Canvas-back, *Aythya valisneria* (Wilson), by Robert E. Stewart; Greater Scaup Duck, *Aythya marila* Stejneger, by John W. Aldrich; Lesser Scaup Duck, *Aythya affinis* (Eyton), by John W. Aldrich; Ruddy Duck, *Oxyura jamaicensis rubida* (Wilson), by Allen G. Smith; Canada Goose, *Branta canadensis* (Linnaeus), by G. Hortin Jensen. The principal usefulness generally in these reports is in the carefully prepared maps. Throughout the reports the "administrative flyways" are used. Whereas from the standpoint of administration and regulations these are useful concepts, analysis of recoveries and returns in terms of these flyways does not always allow the best understanding of the data. It is a genuine pleasure to see this extensive utilization of banding. It is to be hoped that similar analyses can, in some way, be applied to other groups of birds.—D.S.F.

13. The Temperature Factor in Bird Distribution. W. Wedgwood Bowen. 1946. *The Proceedings of the New Hampshire Academy of Science for 1946,* 1(6): 11-25. The author, using Linsdale's *(Condor,* 30: 180-184. 1928) method for indicating relative frequency of birds, has studied relative distribution and movements of a number of migratory species in New Hampshire. He feels that his data indicate that spring movements are associated with the relation of the existing temperatures to the temperature toleration of the species. When atmospheric temperatures are above or below the range of temperature toleration the birds are stimulated to move. The range of temperature toleration, which is presumed to be relatively great in winter, becomes smaller during the migratory period. In late migrants the upper limit of toleration drops more rapidly than in earlier migrants. The author feels that temperature changes do not initiate migration but that temperature, to a certain degree, is a regulatory factor once migration has begun.—D.S.F.

14. The Theory of Direction of Migration. (Zur Theorie der Zugrichtung.) H. Frhr. Geyr von Schweppenburg. 1949. *Ardea,* 36(4): 219-257. This interesting paper presents an attempt to analyze the factors involved in establishing the direction of migration and provide the factors involved and the results of these factors with appropriately connotative terms as best they can be designed from the fragmentary information available. In some instances, there are somewhat debatable and hypothetical concepts and in other instances there appear to be plausible alternative suggestions. Nevertheless, this paper does contain

important fundamental concepts which are very useful in understanding the basis of migratory direction. The *primary direction* (Primärrichtung) is the direction established by an inherited instinctive drive. Fundamentally this inherited instinctive drive is not affected by environmental influences. The *primary direction* is the migratory direction which would prevail in the absence of external influences. Migration rarely occurs in the primary direction. External stimuli may cause a temporary or total abandonment of the primary direction. The direction resulting from these external stimuli is designated as the *secondary direction* (Sekundärichtung). The *secondary direction* may be a *tactile-stimulus-direction* (Berührungstaktische Richtung) involving wind, for example; a direction established by previous familiarization with land marks in following adults in migration (Traditionsrichtung); or a direction established by fixed reaction to unknown (from previous experience) features of the earth's surface (collectively referred to as *Leitlinie* and *Leitpunkte*, i.e. guiding lines and guiding points, respectively) which may be accidentally encountered (Leitrichtung). The *tertiary direction* (Tertiärrichtung) is the direction established under the influence of the ability to return to a definite place. This is not established by inheritance nor is it guided by external factors. The *quaternary direction* (Quartärrichtung or Vorseztrichtung) is the direction resulting from mechanical disturbance such as the direct mechanical displacement by wind. The author is fully aware of the inadequacies of the system. "And consequently our incomplete system is in reality an interim arrangement of our faulty knowledge of processes which are at present very poorly understood." (p. 254.)—D.S.F.

15. New Theories Concerning Orientation in Migration. (Nye teorier om traekfuglenes orientering.) Finn Salomonsen. 1949. *Dansk Ornithologisk Forenings Tidsskrift*, 43(3): 242-250. The author reviews the recent contributions of Ising, Griffin and Hock, Wojtusiak, and Yeagley. He concludes that the sense of sight is more important in orientation than previously assumed; nevertheless the phenomenal orientation-ability of long-distance migrants is still a mystery.—D.S.F.

16. Notes on Migratory Birds from Karlskrona Archipelago in the Autumn of 1948. (Sträckfågelnotiser från Karlskrona skärgård hösten 1948.) Lennart Lundholm. 1949. *Fauna och Flora*, 1949(2/3): 85-88. Notes made at Äspo in Karlskrona Archipelago 1 August - 30 September 1948.—D.S.F.

17. The European Rough-legged Hawk as an Invasion Species. (Der europäische Rauhfussbussard, *Buteo l. lagopus* (Brünn.), als Invasionsvogel.) Ernst Schüz. 1945. *Jahresheften des Vereins für Vaterländsche Naturkunde im Würtemberg*, 97-101: 125-150. This paper summarizes the observations of the author and others on the 1935 invasion with reference also to the 1931 invasion. The invasion reached its maximum on the east Prussian coast in early November. The record observation was 508 on 3 November at Kahlberg. The invasion was apparently a consequence of an increased population in the breeding area and a reduced food supply because of a rapid decrease in rodent population. Records show that the lemming population was high in 1934 and low in 1935. It is possible that a special type of expansion may also have been involved. An examination of banding returns indicates that birds banded in Lapland migrate due southward with some tendency to bear eastward whereas those which migrate along the coast of East Prussia have a greater tendency towards the west. The 1935 invasion did not penetrate western and southern Europe to the extent of the 1931 invasion. Possible influences of meteorologic factors in the invasion movements are discussed.—D.S.F.

18. The Invasion of Jays in France in the Autumn of 1947. (L'invasion des Geais de l'automne 1947 en France.) Noël Mayaud. 1948. *Alauda*, 16: 213-216. Notes and records relative to an invasion of *Garrulus glandarius* (Linnaeus) in the fall of 1947; northeasterly return movements were noted in April and May, 1948.—D.S.F.

LONGEVITY AND MORTALITY

19. Clutch Size and the Egg and Chick Mortality of Kent Island Herring Gulls. Raymond A. Paynter, Jr. 1949. *Ecology*, 30(2): 146-166. Although several analyses of banding data have produced important information on age structure, mortality rate, longevity, and life expectancy for a number of species, it has always been necessary to base such calculations on dates substantially removed from the birthdate, *e.g.* first August 1, first January 1, etc. Consequently there is very little information concerning vital statistics for the period immediately following hatching. Hence this study on *Larus argentatus smithsonianus* Coues is of real importance. The mean clutch size for the Kent Island Colony (1947) was 2.47 ± .03; for the group of nests studied 2.7 ± .06. There were no significant differences in clutch sizes between early and late nests. Seventy-one percent of the eggs hatched. The percentage of hatching was 80.4 for 3-egg clutches, 56.4 for 2-egg clutches, and 28.6 for 1-egg clutches. The greatest mortality after hatching occurs during the first seven days when nearly 20 percent die. About 51 percent of the birds hatched survive to the 43rd day. There is no relation between size of brood and age at flight. There is no significant relation between brood size and survival. Using the mortality data obtained in this study and 362 returns from gulls banded in 1936 at Kent Island the author has synthesized a life table to attempt to eliminate certain discrepancies in his previous study of banding records (*Bird-Banding*, 18: 156-170. 1947.) and that of Marshall (*Auk*, 64: 188-198. 1947.). This synthetic table indicates that of each 1000 eggs laid, 79.9 birds reach breeding age and at breeding age have a life expectancy of 3.03 years. This would mean that only 300 eggs would be produced, a deficiency of 700. It is suggested that this may mean that the calculated mortality rates are generally too high, or that there was abnormal mortality in the 1936 and 1947 age classes, or that the recovery of older age groups is lowered by band losses. The survival curve from hatching illustrates a positively skewed rectangular pattern which, when mortality for the immediate post-hatching period is included, should probably hold for most species of birds. This is a very significant paper.—D.S.F.

20. Fluctuations in the Population of Barn Owls in Switzerland. (Schwankungen des Schleiereulenbestandes *Tyto alba* (Scopoli).) A. Schifferli. 1949. *Der Ornithologische Beobachter*, 46(3): 61-75. Although this paper is based on limited data, it is nevertheless of real fundamental importance in giving an insight into the dynamics of an owl population, the first substantial attempt in this direction. In clutches of four or less, all eggs usually hatch whereas in clutches with five or more eggs there are frequently one or two unhatched. In larger broods (five, six or seven) there is a tendency towards loss of small birds by starvation or cannibalism. From 1937 to 1947 clutch size apparently varied inappreciably from 5.4; increases in brood size during this period may be explained in terms of decreased mortality of nestlings. However, there is some indication that there may have been an increase in clutch size in 1947 in correlation with more favorable food conditions. Although the data are not strictly comparable it appears irrefutable, on the basis of clutches found and banded, that 1937 and 1947 were years of elevated productivity, the young produced being more than double that of the two preceding years in each case. This increase was due primarily to an increase in the *number* of clutches although to a lesser degree increased size of clutches and increased size of broods may have been contributory. Apparently 1948 was again a year of very low productivity as had been the case in 1938. There was an increase in the number of nests in the spring of 1949. Of 41 first-year (up to 1st June 30) recoveries of Barn Owls banded as nestlings during 1935-1946 (1937, a year of high productivity, excluded) 63 percent were found within 50 kilometers of the birthplace and 37 percent more than 50 kilometers (up to 340 kilometers) from the birthplace. Among young produced in years of high productivity there appears to have been a greater degree of wandering. For 1937 (21 records) 43 percent less than 50 kilometers and 57 percent farther than 50 kilometers (up to 260 kilometers); for 1947

32 percent less than 50 kilometers and 68 percent farther than 50 kilometers (up to 1080 kilometers). In direction these wanderings appear to have been random. Mean longevity for Barn Owls banded as nestlings and subsequently recovered dead was 11 months; for those that reached the age of one year, 2.25 years. Mortality rate was calculated as 71 percent for the first year of life and 57.5 percent per annum thereafter. In interpreting these values, it must be borne in mind that the number of records is small, and that there may be factors involved which bias the data somewhat. However, these data would suggest that 100 adults (50 pairs) at 4.6 young per brood would produce 230 young. Loss of 57 percent of the adults (57) and 76 percent of the young (175) would leave 98 at the beginning of the next season. This would indicate that there is a fair order of validity among the data and the calculations. However, there are complications, such as failure of some birds to breed during years of poor food conditions. The author suggests that increased rodent populations are accompanied by increased Barn Owl production and that the characteristic decline in rodent populations after having reached a maximum results in decimation of the Owl populations. There is evidence to suggest that infectious disease (coccidiosis), in conjunction with malnutrition, may be basic to the decimation. This is a very interesting paper.—D.S.F.

21. Vital Statistics from Ringed Swallows. David Lack. 1949. *British Birds,* 42(5): 147-150. The age of *Hirundo rustica* Linnaeus was determined from ringing recoveries. "The average annual mortality of the Swallow is 63%, and the expectation of life on the first January 1st of life is another 1.1 years." The average size of "June [first] broods . . . in different years varied between 3.91 and 4.38 young." "Average brood-size declines from 4.06 in June to 3.50 in September."—M. M. Nice.

PHYSIOLOGY
(See Numbers 39, 41, 42, and 86.)

FOOD HABITS
(See Numbers 44, and 73.)

LIFE HISTORY
(See also Numbers 43, 46, 47, 55, 59, and 79.)

22. The Red Crossbill at Pimisi Bay, Ontario. Louise de Kiriline Lawrence. 1949. *The Canadian Field-Naturalist,* 63(4): 147-160. Appearances of the Red Crossbill, *Loxia curvirostra* Linnaeus, at Pimisi Bay, Ontario, in the past decade have occurred in periods of evergreen cone abundance. Measurements, composition, and situations are given of four nests located at Pimisi Bay between April 3 and 9, 1948. Of these one was abandoned when discovered, two were later abandoned, and one produced three young. Courtship, including courtship feeding, is described. Two songs of the male were noted, a perching song and a flight song, both of which ceased at the beginning of incubation. Several interesting aspects of incubation, which is by the female only, are described from observations made at two nests. Attentive periods were found to be usually long, the sitting female being fed regurgitated "food balls" by the male every two or three hours. From 3 to 30 of these were offered at a feeding. Duration of incubation was not learned exactly but was certainly "at least twelve days, probably 14 to 18 days." (p. 160.) Data on young birds were derived from one nest. Young were brooded until five days old by the female, the latter fed by the male. When brooding ceased the parents foraged together and shared equally the feeding, by regurgitation, of the young. Nesting territory appeared to be confined to the nesting tree. Small avian invaders (other Red Crossbills and Red-breasted Nuthatches, *Sitta canadensis* Linnaeus) were "hopped" out of the nesting tree, beyond which no pursuit was observed. The young remained in the nest 17 days and were fed

by the parents until at least two weeks after leaving the nest. Interesting observations and comments are made also on food habits (including salt and gravel eating, food preferences, and drinking by placing the bill sideways to the water surface and lapping with the tongue), defence behaviour, and call-notes.—W. Earl Godfrey.

23. Notes on the Reproduction of the Ortolan Bunting in Sweden. (Notes sur la reproduction du Bruant Ortolan en Suède.) S. Durango. 1948. *Alauda*, 16: 1-10. This paper is based on the author's observations of *Emberiza hortulana* Linnaeus near Stockholm during 1942-44 together with information from other sources. Ortolan Buntings arrive in southern Sweden in the latter part of April or early May, in central Sweden during the first half of May, and usually in northern Sweden during the latter half of May. In Sweden the Ortolan Bunting is a species of open and cultivated areas; in the area studied by the author it is common in the marginal zone between field and forest, on bush-covered hills with isolated trees, around arable land or pastures, along roads lined by trees in agricultural areas, and in fields crossed by telegraph and telephone lines; farther north it occurs in clearings in the coniferous forests. The nest is almost always on the ground (100 out of 102 recorded for Sweden). The nest is constructed by the female, the work being done mostly in the morning. The mean clutch is 4.5, five being the most frequent (41 of 89). Most clutches are completed during the first third of June. Apparently the male does not incubate; he sings or searches for food while the female incubates. The male may feed as much as 500 meters from the nest. Incubation period is probably about 11-12 days. Mean number of young per nest for 57 nests in Scandinavia is 4.1. Both parents feed the young. The nesting period is apparently 10-13 days. The Ortolan Bunting is not very territorial or perhaps it is better described as having a very limited territory which is not well guarded against other males.—D.S.F.

24. Further Contributions Concerning the Ortolan Bunting. (Weitere Mitteilungen über den Ortolan (*Emberiza hortulana* L.).) Max Garling. 1949. *Die Vogelwelt*, 70(4): 101-104. This paper is based on the observation of more than thirty nests near Berlin. The female is largely responsible for nest-site selection. The female likewise builds the nest being accompanied by the male in procuring nesting material. Nests were found on edges of fields, in "not too luxuriantly developed grassy areas," in dry ditches, and further in clover and rape fields. The first clutch in Brandenburg is completed in the latter part of May; five is the most frequent number of eggs. The second clutch is completed in the latter part of June; four is the most frequent number. The male sings during incubation and the first few days of the nestling period and thereafter ceases when he begins to share in the caring for the young. Song is resumed when the young leave the nest. The author has not seen the male feed or relieve the incubating female. The incubation period is about 12 days; the nestling period, 14-15 days.—D.S.F.

25. The Grasshopper Warbler in Pays Drouais, Département d'Eure-et-Loir, France. (La Locustelle tachetée Locustella naevia naevia Boddaert 1783 en pays Drouais.) André Labitte. 1949. *L'Oiseau et la Revue Française d'Ornithologie*, 19(1): 31-40. First singing dates, 1932 through 1944, were between 6 and 24 April. Establishment of territory occurred about 15-20 April, once as late as 5 May. Other species inhabiting the same biotope include the Tree Pipit, *Anthus trivialis* Linnaeus; Stonechat, *Saxicola torquata* (Linnaeus); Yellowhammer, *Emberiza citrinella* Linnaeus; and Whitethroat, *Sylvia communis* (Latham). The territories of *Locustella naevia* in this area occur primarily on dry slopes of waste or unfallowed land covered with any vegetation levelled by the wind and with a scattering of Black Thorn and low Wild Cherry. Territories are much less frequent in the valley. Nest construction normally occurs in the first part of May. Eggs have been found as early as 30 April and as late as 5 July. The normal clutch contains five or six eggs. Mean nestling period was found to be about 12 days. If the first clutch is lost before incubation it is generally replaced in 16-20 days.—D.S.F.

26. The Blue-headed Wagtail Nesting in the Alsace near Basel. (Die Schafstelze als Brutvogel im Elsass bei Basel.) M. Schwarz. 1949. *Der Ornithologische Beobachter,* 46(2): 29-39. The author records observations of the nesting of the Mediterranean race of *Motacilla flava cinereocapilla* Savi in Alsace near Basel. The nest was well concealed in the grass near a dry stream bed, and contained five young and an infertile egg when discovered on the 13th of June, 1948. Three days later the nest was found destroyed with a neighboring pair of Magpies suspected of the robbery. There are observations on territorial defense: The Reed Warbler, *Acrocephalus scirpaceus* (Hermann), was the only bird chased from the territory by the male probably because of similarity in habits and markings. Nest, eggs, and young are described. Incubation was principally conducted by the female although the male assisted in feeding the young. The behavior of the adults is described in detail and the author also discussed the differences among the races of *Motacilla flava* (*flava* Linnaeus, *thunbergi* Billberg, and *cinereocapilla* Savi).—R. O. Bender.

27. Territory and Nesting in the Rufous Whistler. N. Jack. 1949. *The Emu,* 49(1): 26-34. This paper is based primarily on observations of *Pachycephala rufiventris* (Latham) near Brisbane. The male apparently may retain, in certain circumstances, the same territory for a number of years and "the female will remain in the territory, though not necessarily in close association with him." (p. 34.) "The nesting season extends from August to November. Both sexes apparently share in the selection of a nesting site." (p. 30.) The female builds the nest but the male shares in incubation. The male's territory song is most intense during the incubation period and may be uttered while the male is actually on the nest. The female occasionally sings. The normal clutch is apparently two; incubation period is 19 days. Both parents feed the young. This species does not flock; however, in the non-breeding season it may occur in "family parties" or in association with other species.—D.S.F.

28. Contributions to the Biology of the Blue Rock Thrush in Switzerland. (Beiträge zur Biologie der Blaumerle *Monticola solitarius* (L.).) Ulrich A. Corti, R. Melcher, and Th. Tinner. 1949. *Archives suisses d'Ornithologie,* 2(5): 185-212. This paper summarizes observations made by the authors on this rare species in Canton Tessin 1946-1948. During the summer it is associated with quarries at 240-450 meters above sea level in areas with 140 to 170 centimeters of rainfall with annual temperature mean about 11° C. Other species which occur in the same quarries include the White Wagtail, *Motacilla alba* Linnaeus; House Sparrow, *Passer domesticus italiae* (Vieillot); Black Redstart, *Phoenicurus ochruros* (Gmelin); House Martin, *Delichon urbica* (Linnaeus); and Crag Martin, *Riparia rupestris* (Scopoli). The Blue Rock Thrush breeds in east-west oriented quarries, one pair per quarry; there is apparently one brood per year. There are miscellaneous notes on many aspects of biology and behavior.—D.S.F.

29. Long Fledging Period of Tree-Creeper. E. M. Williams. 1949. *British Birds,* 42(7): 244. A pair of *Certhia familiaris* Linnaeus fed their young in the nest 19 to 20 days.—M. M. Nice.

30. Nesting of the Mourning Dove at Nashville. Harry C. Monk. 1949. *The Migrant,* 20(1): 1-9. Records of nests from 1917 to 1948 in Tennessee. *Zenaidura macroura carolinensis* (Linnaeus) nests from late March through September. "A total of 122 of the 235 nestings were successful, or almost 52 percent." One pair built "five successive nests, all but the last being at least partially successful."—M. M. Nice.

31. Rearing Young Bee-Eaters. (Aufzucht nestjunger Bienenfresser.) Lilli Koenig. 1949. *Umwelt, Zeitschrift der Biologischer Station Wilhelminenberg,* Wien, 2(2): 9-12. Instinctive behavior of five nestling *Merops apiaster* Linnaeus was watched. A touch on the bill was sufficient to release begging reactions, but as soon as the eyes were well open the birds gaped at the sight of the forceps.

At this time they often attacked each other fiercely. At 18 days the first feathers broke through, but preening movements had been carried out by the blind and naked nestlings, directed to empty places where the spread wings and tail would eventually be! About two hours after a feeding, pellets containing chitin remains of insects were ejected.—M. M. Nice.

32. The Pre-egg Stage in Buller's Mollymawk. L. E. Richdale. 1949. *Biological Monographs*, No. 2. Otago Daily News, Dunedin, N. Z. 50 pp. 10 shillings. Very fine work on *Diomedea bulleri* Rothschild on the Snares Islands from 9 January to 26 February 1948. The birds (161 banded) at 112 nests that were observed daily ". . . could be distinguished as individuals and the sex of each was known." Males arrive before the females and wait at the nests. "The male is ready for coition all the time, but the female has definite periods of receptivity." "Two drives influence the behaviour of the male. (1) A coitional urge impels him to wait, often for long periods, for the arrival of the female; (2) when the egg is about to be laid he tends to absent himself preparatory to taking his first turn on the egg. The behaviour of the female is noted for the fewness of the times she attends the nest (16.3% of inspections). At first, she attends only for coition, which for 67 females averaged every six days. Later, she returns to lay; this return averaged 1.65 days before laying." "Coition occurs (1) between members of mated pairs, (2) between intruder males and females not their mates, (3) between members of non-breeding pairs at nests, and (4) anywhere on the cliffs and headlands, between birds apparently with no bond between them." The mated pairs appear to have been formed before arrival on the breeding grounds. The nests are not placed closely together, but there is a certain amount of grouping. Individuals seem to recognize each other's sex on sight, as seems to be the case with the Royal Albatross and Yellow-eyed Penguin. Detailed descriptions are given of types of behavior between mates, illustrated with excellent photographs. The Mollymawk's behavior closely resembles that of the Royal Albatross.—M. M. Nice.

33. Notes on the Cape Hen *Procellaria aequinoctialis*. C. A. Gibson-Hill. 1949. *The Ibis*, 91(3): 422-426. A miscellany of notes from off the South African coast and South Georgia.—D.S.F.

34. Notes on Observations of Birds on Madagascar. (Notes d'observation à Madagascar: II. Visites à Nosy-Maintra et à Nosy-Mborno.—III. Sur le Paille-en-queue à queue rouge observé à l'île Europa.) Ph. Milon. 1948. *Alauda*, 16: 55-74. A miscellany of notes on oceanic birds observed and collected.—D.S.F.

35. Notes on Crakes of the Genus Porzana around Melbourne, Victoria. C. E. Bryant and Bruce Amos. 1949. *The Emu*, 48(4): 249-267. This paper records a miscellany of observations by the authors together with a summary of some pertinent literature, on the Marsh Crake, *Porzana pusilla* (Pallas); the Spotless Crake, *Porzana plumbea* (Gray); and the Spotted Crake, *Porzana fluminea* Gould. The material on the Spotless Crake is most extensive. Territories are small and the birds appear to have confined themselves to the territory during the period of observation. Breeding season is from mid-September to mid-January; apparently there are normally two broods per season. The second nest is usually near the first. "The male appears to take little interest, if any, in incubation." (p. 265.) Extra nests, four to ten, are built close to the nest with eggs and are used for "cradling" the young.—D.S.F.

BEHAVIOR

(See also Numbers 8, 9, 11, 14, 22, 23, 24, 25, 26, 31, and 32.)

36. Animal Behavior: Animal Psychology. (X Verhalten der Tiere, Tierpsychologie.) Otto Koehler. 1949. *Naturforschung und Medizin in Deutschland* 1939-1946: *für Deutschland bestimmte Ausgabe der FIAT Review of German*

Science, 52, *Biologie,* Teil 1: 189-213. W. Klemm, Wiesbaden. This is a remarkable review of European contributions to animal psychology during the War, 161 papers being cited. The following subjects are discussed: methods; taxes; orientation in space; orientation in time; instinctive movements; the inborn pattern; learning; experiments on counting; experiments on effects of domestication. Birds play a prominent part in all these researches except those on orientation in time. Experiments with five species of birds show ability to distinguish between numbers of food objects up to five and six. A most valuable and critical synthesis and summary.—M. M. Nice.

37. The Biological Significance of Bird Song in Australia. Angus Robinson. 1949. *The Emu,* 49(4): 291-315. Because so little has been published concerning the behavior of Australian birds, this interesting paper is particularly significant. *Territorial song* is usually the most highly developed song of a species and is always specific. The author describes vocal duels at a distance between the Rufous Whistler, *Pachycephala rufiventris* (Latham), and the White-winged Triller, *Lalage tricolor* (Swainson), whose songs are somewhat similar. The duels are discontinued at close range presumably because of mutual identification by plumage differences. Intraspecific variations in song, such as in the Magpie-Larks, *Galerida cyanoleuca* (Latham), are regarded as "an immense advantage in recognizing neighbors and each other." (p. 293.) "With the Musk Duck *(Biziura lobata)* we see territorial song at its greatest biological advantage. This duck is a very poor flyer and only travels at night. . . . The male arrives on a small swamp and starts to sing its extraordinary song. . . . The females, when they arrive, have no difficulty in locating the singing males, whilst other males realize that the swamp is already in possession of one of their own species. . . ." (p. 293.) *Mating songs* ". . . are, as a rule, low monotonous songs with no rising and falling inflections and may easily be overlooked; these songs must not be confused with *whisper songs.* Mating songs, though apparently of rare occurrence in Europe, are prevalent in Australia and of vital importance to resident territory holders." (p. 293.) They are suggested to be one of the stimuli by which the sexual rhythms of the members of a pair are adjusted. Examples cited included the White-faced Heron, *Notophoyx novae-hollandiae* (Latham); Kookaburra, *Dacelo gigas* [= *Dacelo novaeguinae* (Hermann)]; and the Magpie Lark. The behavior of the Swamp Harrier, *Circus approximans* Peale, is considered analogous. *Moonlight and dawn song* is noted in a number of species including the Willie Wagtail, *Rhipidura leucophrys* (Latham); Magpie, *Gymnorhina dorsalis* Campbell; Wedgebill, *Sphenostoma cristatum* Gould; Brush-larks, *Mirafra javanica* Horsfield; and others. The author suggests that these songs appear to be caused by "a superabundance of male sex hormone . . . over and above that needed to insure the species the capacity to complete its breeding cycle successfully." (p. 295.) This certainly is highly speculatory. In Australia many species sing throughout the year. The author suggests that this may be explained by (1) climatic conditions, (2) the relatively small numbers of migratory birds, (3) large numbers of birds which "mate for life" and hold permanent territories throughout the year, (4) relatively larger size of territories of Australian birds [which, however, on the whole probably results in a lower volume of song], (5) prolonged breeding season of some species. *Mimicry* is practiced by a number (49 according to Chrisholm, *Nature's Linguists,* Melbourne, 1946) of Australian species. *Whisper songs* are barely audible songs and "often include mimicry. . . ." (p. 303.) *Whisper songs* are generally sung by "unemployed" birds. Emphasis is placed on the role of climate and meteorologic conditions in affecting volume of song; rain is regarded as most important.—D.S.F.

38. The Seasons of Bird Song—The Cessation of Song After the Nesting Season. Aretas A. Saunders. 1948. *The Auk,* 65(1): 19-30. Data are given on 64 species, mostly passerines, studied in New York and Connecticut. Beginning of cessation, general cessation, and last individual song are tabulated for periods ranging from three to 15 (seldom less than five) years. The direct cause of cessation is approach or onset of the postnuptial molt, with weather evidently an influence also. There is a revival of song in some species after the molt.

A graph showing "general cessation" of four passerine species for 14 years shows yearly correlation, the dates being earlier for all in some years and later in others, but the causative factors are not known. Five Wood Thrushes, *Hylocichla mustelina* (Gmelin), individually identified by peculiarities in song and occupying adjoining territories, began and ceased to sing in pairs. A valuable paper.—Ralph S. Palmer.

39. The Orientation Problem in Birds. (Over het orientatieprobleem bij vogels.) S. Dijkgraff. 1946. *Koniklijke Nederlandsche Akademie van Wetenschappen, Proceedings*, 49(6): 1-11. Preliminary experiments with a Greening, *Chloris chloris* (Linnaeus); a Starling, *Sturnus vulgaris* Linnaeus; and a Siskin, *Spinus spinus* (Linnaeus), in a symmetrical 12-sided chamber in which food was placed out of sight behind a rail, produced no evidence for a sense of direction although learning involving optic and auditory cues succeeded well using the same apparatus. (See *Bird-Banding*, 20(1): 55-56. 1949.)—D.S.F.

40. The Biology of the Mourning Chat in Winter Quarters. P. H. T. Hartley. 1949. *The Ibis*, 91(3): 393-413. These are observations made in lower Egypt where *Oenanthe lugens* (Lichtenstein) performs "regular but short migrations from breeding stations . . . between the Nile and the Red Sea to winter quarters on the fringes of the desert." In winter, each bird occupies and defends a separate territory. "Winter song" in the territory is most energetic in July-October; it is less frequent in November-February. There appears to be some interspecific territorial competition among Mourning Chats; Hooded Chats, *Oenanthe monacha* (Temminck); and White-tailed Chats, *Oenanthe leucopyga* (Brehm). This is a very important study.—D.S.F.

41. Yearly and Daily Rhythm of Some Birds in North Finland. (Jahres- und Tagesrhythmus einiger Vögel in Nordfinnland.) Jost Franz. *Zeitschrift für Tierpsychologie*, 6(3): 309-329. A most interesting and careful study. There is a diagram giving the number of minutes before sunrise of civil twilight for the whole earth (slightly more than the calculations of Americans and English who count this as occurring when the sun is 6° below the horizon in contrast to 6.5° of the present study.) Charts are shown of twilight and night throughout the year at Munich (48°N) and Alakurtti (67°N), also records at these localities of awakening and roosting in relation to civil twilight of the Yellowhammer, *Emberiza citrinella* Linnaeus; House Sparrow, *Passer domesticus* Linnaeus; and three titmice. In lower latitudes the birds' activities closely follow the sun's course, but in the far north only the spring curve of awakening is connected with the sun's position. In summer the chief sleeping time is shortly before midnight. A male Yellowhammer on June 1 slept from 8:32 to 11:42 P.M., his mate from 8:12 to 12:04 P.M.; five days later he slept from 7:37 to 11:12 P.M. The Spotted Flycatcher, *Muscicapa striata* (Pallas), does not roost until after midnight, an adaptation to the late evening activity of its prey.—M. M. Nice.

42. New Studies on the Daily Rhythm of the Swift. (Neue Studien über den Tagesrhythmus des Mauerseglers, *Apus apus* (L.).) Lars von Haartman. *Ornis Fennica*, 25(1): 16-24. Swifts do not have a mid-day rest period and in the far North there may be no period of sleep at midnight during mid-summer. The time elapsed between sundown and going to sleep is greatest at the summer solstice; it likewise increases with latitude, for example, 76 minutes at 65.8° N, 48 minutes at 60.5° N, and 22 minutes at 52.5° N, on comparable dates. The swifts went to rest earlier on cloudy days than on clear days.—D.S.F.

43. Notes on Two New Guinea Bower-birds. Norman Chaffer. 1949. *The Emu*, 49(1): 19-25. A series of very interesting notes on the biology of Lauterbach's Bower-birds, *Chlamydera lauterbachi* Reichenow, and the Orange-crested Gardener Bower-bird, *Amblyornis macgregoriae* DeVis. The bower of the former was decorated with large blue berries, a few bluish stones, and ". . . two or three small red berries." The bower of the latter was decorated with moss and ". . . small bundles of the borings of wood-boring insects fastened together with spider

web or similar material." (p. 24.) There are detailed descriptions of the plan and structure of the bower of both species.—D.S.F.

44. Observations on Courtship Feeding and Coition of the Marsh-Tit. Averil Morley. 1949. *British Birds*, 42(8): 233-239. Detailed notes on these subjects made on 25 color banded individuals of *Parus palustris* Linnaeus.—M. M. Nice.

45. Mixed Associations of Small Birds in the South-West of Western Australia. Eric H. Sedgwick. 1949. *The Emu*, 49(1): 9-13. This is an interesting tabulation of 42 mixed flocks composed of two to ten species. In general the species are small insectivorous passerines.—D.S.F.

46. Notes on the Australian Pipit and its Territory. Allan McEvey. 1949. *The Emu*, 49(1): 35-43. These are notes on a single pair of *Anthus australis* (Vieillot) at Nareen in southwestern Victoria. The "territory" occupied was approximately 22 1/3 acres; however, since the tabulated chases (combat or courtship) occurred exclusively in the eastern half of this area, the true territory probably consisted of about 11 acres.—D.S.F.

47. Observations on a Magpie Sleeping Place. (Beobachtungen am Elsternschlafplatz.) Gerhardt Zink. 1949. *Der Ornithologische Beobachter*, 46(4): 101-106. This paper is based on observations of a roost of *Pica pica* (Linnaeus) in a row of trees on the edge of Munich. The number of birds using the roost varied between 15 and at least 37. Arrival at the sleeping place occurred while it was still completely light; intensive feeding took place in the vicinity of the sleeping place. Flight to the roost followed congregation in the top of a nearby tree. The dispersal for the day's activity occurs rather late (about 7:00 A.M. in February). The roost was used until 7 or 8 March.—D.S.F.

48. European Blackbird Fledglings Fed by a Male Chaffinch. (Buchfinchenmännchen füttert nestjunge Amseln.) R. Hauri. 1949. *Der Ornithologische Beobachter*, 46(3): 89. A male *Fringilla coelebs* Linnaeus fed three young *Turdus merula* Linnaeus from the first days after hatching until they left the nest. He also waited in vain for fecal sacs after each feeding.—D.S.F.

49. Mistle-Thrush Swimming. Georges Olivier. 1949. *British Birds*, 42(6): 183. A *Turdus viscivorus* Linnaeus bathed in a forest pool and then swam about in it, using its wings a little to assist it, but using them slowly. The depth of the water was 10 to 14 inches.—M. M. Nice.

CENSUSES AND POPULATIONS

(See Number 17.)

ECOLOGY

(See also Numbers 13, 17, 20, 25, 26, 27, 34, 38, 40, 41, 42, 53, 54, 55, 72, 73, and 75.)

50. Bird Populations and Biotic Communities in Northern Lower Michigan. S. Charles Kendeigh. 1948. *Ecology*, 29(1): 101-114. These studies, conducted in the vicinity of Douglas Lake, Michigan, are of particular importance since the area lies in the ecotone between the coniferous forest biome and the deciduous forest biome. The data are presented primarily in terms of breeding pairs per species per 100 acres for the various plant communities. The total breeding pairs per 100 acres are recorded as follows: Grassland, 56; Aspen-red maple, 59; Pine-aspen, 112; Cedar-aspen, 139; Cedar-balsam, 146; Beech-maple-pine, 155. The data are also considered in terms of *biociations* (climax biotic communities which may include several associations as well as late seral associes, ". . . provided the same bird community is characteristic of all and the plant dominants, regardless of species, belong to the same type of vegetation.") and

biocies (". . . seral units, each composed of a distinct community of birds and all associes whose plant dominants belong to the type of vegetation occupied by the bird community."). This enables greater emphasis in the *type of vegetation* which is more important in "niche requirements" than the species of plants involved. The following are recognized: *Sterna-Actitis* lake biocies, *Telmatodytes-Podilymbus* marsh biocies, *Sturnella-Ammodramus* grassland biocies, *Spizella-Tyrannus* forest-edge biocies, *Vireo-Seiurus* broad-leaved biociation, *Zonotrichia-Oporornis* forest-edge biocies, and *Dendroica-Regulus* needle-leaved forest biociation. This is an important paper.—D.S.F.

51. The Black-shouldered Kite in Masira (Oman). Charles Green. 1949. *The Ibis*, 91(3): 459-464. A small population of *Elanus caeruleus* (Desfontaines) has adapted itself to the desert environment of Masira Island. Adaptations include the substitution of fish for rodents as the predominate source of food, nesting in caves instead of trees, and smaller brood-size.—D.S.F.

WILDLIFE MANAGEMENT AND METHODS
(See Number 84.)

CONSERVATION
(See Numbers 53 and 85.)

AVIFAUNAL DYNAMICS
(See also Number 13.)

52. Southward Invasion in Georgia. Eugene P. Odum and Thomas D. Burleigh. 1946. *The Auk*, 63(3): 388-401. A detailed and valuable discussion is given of the spread southward, in the past 35 or 40 years, of the Robin, *Turdus migratorius* Linnaeus; Song Sparrow, *Melospiza melodia* (Wilson); and Chestnut-sided Warbler, *Dendroica pensylvanica* (Linnaeus). The Robin has occupied cities, but not rural areas where suitable habitat is lacking on the coastal plain; one Song Sparrow population has followed mountain valleys, another a strip of natural vegetation of shrubby life form on the coast; the Chestnut-sided Warbler invasion seems to be clearly correlated with chestnut blight which has rendered much high ridge country into a sort of 'chestnut sprout disclimax.' All three species nest in early seral or developmental stages of vegetation (or artificial equivalents) of types that had increased, mainly through man's agency, prior to invasion; all three have wide climatic tolerance. Incidental mention is made of other species and three showing invasion tendencies are discussed.—Ralph S Palmer.

53. The Wild Turkey in Ontario. C. H. D. Clarke. 1948. *Sylva*, 4(6): 5-12; 24. A well documented and very readable article on the Eastern Turkey, *Meleagris gallopavo silvestris* Vieillot, in southern Ontario, its decline and extirpation there. Its former range included parts of 15 southern countries. Evidence of its decrease as early as 1822 and in 1866 is cited. By 1884 land clearing had left it little adequate habitat. Game warden reports cited indicate that it was present in Essex County at least until 1902. A bibliography completes this interesting article.—W. Earl Godfrey.

54. Some Recent Changes in Bird Ranges in the State of Iowa. Charles A. Stewart. 1949. *Iowa Bird Life*, 19(2): 26-28. This is a summary of a discussion conducted at the joint meeting of the Iowa and Nebraska Ornithologists' Unions at Sioux City, Iowa, 1948. Changes were noted in the ranges of 14 species. —D.S.F.

55. The Marsh Warbler in Sweden. (Kärrsångaren, *Acrocephalus palustris* (Bechst.), i Sverige.) Karl Georg Wingstrand. 1949. *Vår Fågelvärld*, 8(2): 49-74. Approximate arrival dates in Sweden for males are 23-27 May, for females 27 May - 2 June. Hence males frequently sing in territories for a week before the

arrival of the females. Singing decreases after arrival of females. Only the female was observed to build the nest. Both parents feed the young. Breeding in Sweden is in luxurious herbaceous vegetation often with scattered brush. Males, whose territories are not visited by females, disappear after a week or more. "Furthermore . . . such males appear at biotopes, previously unoccupied, during the whole of the breeding season, and remain there for some days or longer. The author believes such unmated males to be capable of considerable migration northwards, because the migration instinct has not been compensated by the normal breeding instincts . . ." (p. 73.) From 1900 to 1930 there were only four fairly reliable records of the Marsh Warbler in Skåne; records for Sweden prior to 1900 cannot be regarded as definite. Since 1930 it has become a fairly regular breeder, particularly in 1930 in western Skåne strengthening the idea that the species invaded Sweden from Denmark. The author suggests that increased spring temperatures have prolonged migration. On the other hand, it is thought that increased breeding-season temperatures have not been factors in the expansion since June temperature in much of southern Sweden before 1930 was the same as in Denmark where the species has bred for a long time.—D.S.F.

56. The English Sparrow in the Faeroe Islands. (Gråspurven *(Passer d. domesticus* (L.).) på Faerøerne.) Samuel Petersen. 1949. *Dansk Ornithologisk Forenings Tidsskrift,* 43(2):166-167. The English Sparrow first appeared on Svinoy about 1944; it now appears to be successfully establishing itself.—D.S.F.

57. A Breeding Serin in Denmark. (Gulirisken *(Serinus canarius serinus* (L.) ynglende ved Naestved.) N. J. Nortzen. 1949. *Dansk Ornithologisk Forenings Tidsskrift,* 43(2): 172-175. A nest with young found 27 May 1948 is stated to be the first breeding record for Denmark.—D.S.F.

58. Has the Raven Become More Abundant in the Swiss Alps? (Ist der Kolkrabe in den Schweizeralpen häufiger geworden?) R. Melcher. 1949. *Der Ornithologische Beobachter,* 46(2): 39-45. After carefully reviewing the information at hand, the author concludes that any increase in numbers of *Corvus corax* Linnaeus is insignificant. An apparent increase may be due to changing habits of the bird under the influence of tourist and other traffic in the Alps.—R. O. Bender.

59. Breeding Bee-eaters in the Island of Bornholm, Denmark. (Ynglende Biaeder *(Merops apiaster* L.) i Danmark.) Arne Larsen. 1949. *Dansk Ornithologisk Forenings Tidsskrift,* 43(2): 129-149. This is apparently the first breeding record for this species in Scandinavia although there are 13 previous records of its occurrence. Nests were dug in a gravel pit already occupied by a colony of Sand Martins, *Riparia riparia* (Linnaeus); incubation began about 22 July and lasted about 19 days. The two broods were of two and three young respectively. Analysis of pellets revealed various Hymenoptera to be the principal food items. It will be of interest to see if the species remains established in Denmark indicating whether or not it belongs to the group of European species which is extending its northern limits.—D.S.F.

60. The Roller in Sweden. (Blåkråkan *(Coracius g. garrulus* L.) i Sverige.) S. Durango. 1949. *Faunistisk Revy,* 1/49: 14-21. This paper summarizes records in addition to those of the author's previous paper *(Vår Fågelvärld,* 5(4): 145-189. 1946. See *Bird-Banding,* 19(4): 179-180. 1948.). Included are additional early records indicating the occurrence of the Roller in Uppland as early as 1674. There are also additional recent records.—D.S.F.

61. The Pine Grosbeak in Scania and Reflections Concerning its Movements. (Reflexioner kring tallbitens, *Pinicola enucleator* (L.), upptradände i Skåne.) Torsten Malmberg. 1949. *Vår Fågelvärld,* 8(3): 121-131. Since 1940 there have been four records of the species in Scania; the species has become rare in Scania whereas during the 19th century it was a frequent invader in south-

ern Sweden. A similar decrease has occurred in Denmark. Data on invasions suggest that cold weather may be a motivating factor.—D.S.F.

GEOGRAPHIC DISTRIBUTION AND ZOOGEOGRAPHY
(See Numbers 66, 67, 68, and 80.)

SYSTEMATICS
(See also Number 80.)

62. The Bearing of the New Systematics on Genetical Problems. The Nature of Species. Ernst Mayr. 1948. pp. 205-237 in *Advances in Genetics*, Volume II. Academic Press Inc., 125 East 23rd Street, New York 10, N. Y. This is a thorough and penetrating analysis of the concept of the species. Definitions of species fall into two categories: (1) "morphological" species definitions based on the degree of morphologic difference, and (2) "biological" species definitions based on the amount of gene interchange *i.e.* the degree of reproductive isolation. There has been a gradual shift toward the latter concept. The "morphological" species of the taxonomist is merely an inference from the species in nature. Recognizing the necessity of a "biological" definition and the fact that most species consist of several or many populations the author has earlier defined the species as ". . . groups of actually or potentially interbreeding natural populations, which are reproductively isolated from other such groups." In cases where the situation is complicated by hybridization it is suggested that a definition of the sense of that proposed by Maitland be accepted: "A species is an actually or potentially interbreeding array of forms whose net mutation rate is greater than the actual or potential gene interchange with other arrays of forms." (p. 209.) Distinction must be made between such species characters as described as quantitative or qualitative (taxonomic), morphologic, physiologic, ecologic, etc., and the species characters which help to maintain the isolating gap between species. Characters which promote the geographic coexistence of species may be divided into two groups: (1) those which result in reduced competition between the species, and (2) those which promote isolation. "Well-defined species are thus characterized (1) by morphological and physiological differences, (2) by reproductive isolation, and (3) by ecological differences." (p. 224.) Some of the difficulties of the species concept are discussed. "Giving due weight to the importance of reproductive isolation, the difficult situations can be decided by the taxonomists as follows: (1) Morphologically distinct, sympatric, but not reproductively isolated individuals are members of a single interbreeding population (either polymorphic variants or ecophenotypes). (2) Morphologically identical, either sympatric or allopatric, reproductively isolated individuals are members of different populations (sibling species). (3) Morphologically distinct, allopatric populations of which the degree of reproductive isolation is unknown may either be subspecies or allopatric species." (p. 225.) Consideration is given to allopatric species as compared to subspecies. In doubtful cases it regarded as advisable to treat the populations as subspecies. In any instance where there is doubt concerning the systematic rank of a natural population, morphologic data should be supplemented by data on ecologic differences and completeness of reproductive isolation. This paper should be read by every zoologist. In addition to its thoughtful inventory of current concepts of the species, it shows modern systematics in its true position as an apical philosophy which springs from a broad spectrum of biological sciences rather than solely from the classical taxonomy.—D.S.F.

63. Speciation and Systematics. Ernst Mayr. 1949. pp. 281-298, in *Genetics, Paleontology,* and *Evolution,* edited by Glenn L. Jepsen, George Gaylord Simpson, and Ernst Mayr. Princeton University Press. No brief review can adequately indicate the importance and contents of this succinct and logical dissertation. It can only be hoped that a cursory commentary on some of the important aspects will stimulate the reader to study the original paper. "It is now recognized that evolutionary change is possible without multiplication of species, and reciprocally that multiplication of species is sometimes accompanied by rather

slight evolutionary changes." (p. 281.) The latter, involving geographic isolation with possibly eventual cross colonizations is that which is termed as *speciation.* Each species consist of populations with similar gene combinations ". . . optimally adapted for a given environment." (p. 151.) As a result of speciation new gene complexes find previously insufficiently occupied or unoccupied ecologic niches. This leads to an increasing diversity of organic nature since each new species aids in the increasing of the numbers of niches. "Species are recognized not on the basis of the degree of difference but rather on the completeness of the separation. Species are groups of actually or potentially interbreeding natural populations that are reproductively isolated from other such groups. *Sympatric species are always separated from each other by a distinct gap.*" (p. 284.) It must be borne constantly in mind that the evolution of sexual animals is a phenomenon of populations rather than individuals. "Not individuals but populations are the units of evolution and such populations can drift apart decisively through an accumulation of small, often minute, genetic differences. Such *gradual* speciation is the norm while *instaneous* speciation is the exception." (p. 285.) The latter is of little, if any, significance in the evolution of animals. The normal process of speciation is that of *geographic speciation* which involves geographic isolation. The author feels that no basic difference exists between geographic and ecologic isolation. Isolation or *complete* absence of gene flow, between two populations probably never exists. On the other hand, even in the complete absence of barriers, panmyxia does not occur because of "isolation by distance." The efficiency of barriers in isolation of populations is, in part, a function of intrinsic factors of the species including degree of instinctive adherence to its habitat, genetically controlled physiologic factors affecting interbreeding, dispersal abilities, etc. Although, it is still uncertain as to whether or not spatially segregated populations can develop into full species if they are in complete contact with each other. Recent evidence indicating a previously unsuspected importance of natural selection in the reduction of gene flow may make necessary a revised definition of the species: "Species are groups of actually or potentially interbreeding natural populations that are either completely reproductively isolated from other groups or whose genetic differentiation (owing to mutation, selection, etc.) outweighs an actual or potential gene interchange with other such groups." (p. 290.) "The speciation process in its simplest form occurs in a population completely isolated geographically from its parental population: *A.* Genetic changes owing to mutation, recombination, and random fixation, strongly owing to and directed by selection pressure. *B.* As a consequence of *A.* (1) The development of reproductive isolating mechanisms. (2) Ecological divergence. (3) Sufficient genetic change to make hybrids between parental and incipient species inferior in competition with either parental population." (p. 292.) An analysis of sympatric speciation leads to the conclusion that there is no process of sympatric speciation which differs in principle from spacial speciation.—D.S.F.

64. Variation in the Spruce Grouse in Canada. A. L. Rand. 1948. *The Auk,* 65(1): 33-40. In *Canachites canadensis* males and downy young have no characters sufficiently marked to diagnose races in Canada; this study was based on 134 females, which have diagnostic coloration features. These subspecies are recognized: *canace* (Linnaeus), ranging from Nova Scotia and New Brunswick to southern Quebec (including Gaspé), east on north shore of Gulf of St. Lawrence to Bonne Esperance, north to Lake St. John, and southern Ontario north to Temagami and Georgian Bay; *canadensis* (Linnaeus), from Labrador and eastern Quebec, north to Chimo, and south to Lance au Loup through northern and western Ontario to Alberta and southern Mackenzie; and *osgoodi* Bishop, from central Mackenzie west through Yukon and south into northern British Columbia and to the St. Elias Range, at least in Alaska. This treatment differs markedly from the earlier ones by Uttal and Friedmann.—Ralph S. Palmer.

65. The Relationships of Hypocolius. Jean Delacour and Dean Amadon. 1949. *The Ibis,* 91(3): 427-429. It is concluded that *Hypocolius* should be placed in the Bombycillidae.—D.S.F.

66. Notes on Some Asiatic Finches. Charles Vaurie. 1949. *American Museum Novitates*, 1424. 63 pp. This is a report on the Carduelinae collected by Dr. Walter Koelz in Persia, Afghanistan and northern India; 71 named forms are included.—D.S.F.

67. Notes on the Bird Genus Oenanthe in Persia, Afghanistan, and India. Charles Vaurie. 1949. *American Museum Novitates*, 1425. 47 pp. The species concerned include *xanthroprymna* Hemprich and Ehrenberg, *oenanthe* Linnaeus, *pleschanka* Lepechin, *hispanica* Linnaeus, *picata* Blyth, *lugens* Lichtenstein, *finschii* Heuglin, *deserti* Temminck, *isabellina* Temminck, *monacha* Temminck, *alboniger* Hume, and *leucopyga* Brehm, and/or their races as they occur in the region. The principal source of material is the extensive collection of Dr. Walter Koelz.—D.S.F.

68. Notes on Some Ploceidae from Western Asia. Charles Vaurie. 1949. *American Museum Novitates*, 1406. 41 pp. This is based largely on the collections of Dr. Walter Koelz in various parts of India, Afghanistan, and Persia. The genera concerned are *Petronia, Passer, Montifringilla, Ploceus, Lonchura,* and *Estrilda.* Among others, this paper makes an important contribution to the systematics of the Asiatic races of *Passer domesticus* Linnaeus, 13 being recognized. —D.S.F.

69. Intermediate Forms between the Bean Goose and the Pink-Footed Goose. (Overgangsformer mellem Saedgås *(Anser arvensis rossicus* But.) og Kortnaebbet Gås *(Anser arvensis brachyrhynchus* Bail.).) Hans Johansen. 1949. *Dansk Ornithologisk Forenings Tidsskrift,* 43(2): 105-108. Two specimens collected in Denmark. The author reports that he has seen similar intermediates from Novaya Zemlya in the Zoological Museum of Leningrad. Since the two races do not have adjacent breeding areas at present, he believes that the intermediate populations arose when both forms ". . . bred further north e.g. in the northern part of Novaya Zemlya . . ." during the warm post glacial period.—D.S.F.

70. The Long-toed Stint and its Eggs. (Langtået Dvaergryle *(Calidris subminuta* Midd.) og dens Aeg.) Hans Johansen. 1949. *Dansk Ornithologisk Forenings Tidsskrift,* 43(2): 101-104. Description of nest and eggs found 20 June 1930, on Bering Island. It is suggested that *subminuta* may be conspecific with the Least Sandpiper, *Erolia minutilla* (Vieillot).—D.S.F.

71. Albinism in Herons. (L'albinisme du plumage chez les Ardéidés.) J. Berlioz. 1949. *L'Oiseau et la Revue Française d'Ornithologie,* 19(1): 11-30. The author discusses the occurrence of white plumages among eleven species of Ardeidae. A generic revision of these species is proposed.—D.S.F.

EVOLUTION

(See also Numbers 51, 62, 63, and 80.)

72. The Significance of Ecological Isolation. David Lack. 1949. pp. 299-308 in *Genetics, Paleontology,* and *Evolution,* edited by Glenn L. Jepsen, George Gaylord Simpson, and Ernst Mayr. Princeton University Press. Based on his studies of Galapagos Finches, British passerine birds, passerine species on remote islands, British cormorants, and European Falconiformes and Strigiformes as well as observations and conclusions of others, the author concludes that ". . . the normal ecologic isolation of birds is the result of and not the cause of speciation." Geographic isolation is believed to be basic to speciation. "Speciation is closely associated with adaptive radiation, the links being as follows: (a) geographical isolation of populations, (b) morphological differentiation, (c) partial intersterility and partial ecological divergence, (d) re-meeting, with persistence of each form as a new species when both genetic and ecological isolation are sufficient, (e) increased ecological restriction and differentiation and increased specialization of each form to its modified niche, and (f) further geographical spread

of each form, with a repetition of the whole process from (a) to (e)." (p. 308.) —D.S.F.

73. Ecological Isolation in a Rich Tropical Avifauna. R. E. Moreau. 1948. *The Journal of Animal Ecology,* 17(2): 113-126. The author has carefully analyzed the habits and distribution of 172 species of birds of Usambara, Tanganyika Territory, in order to ascertain the degree of ecologic isolation and overlap among them. Theoretically there are 173 possible cases of intrageneric interspecific ecologic overlap and 1474 cases of intergeneric interspecific overlap. Thirty-one habitat "subdivisions" are recognized and each species is assigned to the subdivision in which it forages. Excluding the Ploceidae, which ". . . present a different ecological picture . . ." only 16 percent of the theoretical intrageneric cases of possible habitat overlap actually exist and only one-third of these overlap in feeding habits and, in addition, some of those which do overlap in diet occur in numbers too small to create real competition; hence, 94 percent of the congeneric species are actually isolated ecologically from all other species; the corresponding figure for confamilial species is 98 percent. The Ploceinae which constitute an exception in that numerous species of this subfamily ". . . feed together in the temporarily superabundant graminaceous food produced in, for example floodplains." (p. 120.) "The inference from the foregoing is that the forces that minimize ecological overlap between related birds are highly effective." (p. 120.) A most interesting paper.—D.S.F.

74. Family Size in Certain Thrushes (Turdidae). David Lack. 1949. *Evolution,* 3(1): 57-65. The author has compiled and studied mean clutch sizes, mean brood sizes, survival in the nest, and survival after leaving the nest in *Turdus merula* Linnaeus, *Turdus ericetorum* Turton, *Erithacus rubecula* (Linnaeus), and *Phoenicurus phoenicurus* (Linnaeus). In all there seem to be seasonal variations in clutch size (highest in between April and end of May) which are probably adaptive *i.e.* resulting in larger broods when larger broods can be more effectively reared. Annual differences may actually be expressions of seasonal variability. Interpretation of data is made more difficult by the fact that the capacity to modify clutch-size in response to environmental factors means that a smaller clutch produced in response to poor conditions may not result in improved survival. "Moreover, the capacity to modify clutch-size adaptively is presumably itself a hereditary character subject to natural selection." (p. 65.) In all four species mortality *in the nest* is the same for all normal clutch sizes. After leaving the nest the young of *Turdus merula* from small broods appear to survive better than those from larger broods; with *Turdus ericetorum* there appears to be no relation between brood size and survival although the data are statistically insufficient. In general this study supports the author's hypothesis, originally erected on the basis of data on Starlings, *Sturnus vulgaris* Linnaeus, that ". . . clutch size is ultimately limited by the average maximum number of young which the parents can raise." (p. 57.) This is a very interesting paper.—D.S.F.

75. Do Tropical Birds Rear as Many Young as They Can Nourish? Alexander E. Skutch. 1949. *The Ibis,* 91(3): 430-455. The author examines Lack's hypothesis of natural selection of clutch size on the basis of feeding ability of the adults in light of observations and data on tropical birds. As contradictory evidence the author points out that (1) many birds can augment considerably their food-bringing activity, (2) in some instances clutch can be successfully increased by one, (3) in a number of species one adult rears as many young as are reared in closely related species by two adults, (4) clutches of nidifugous species are smaller in the tropics than in the North, (5) in tropical finches the time available for feeding young would theoretically allow larger clutches, (6) breeding season in many species is restricted even though conditions apparently would allow a larger season and more broods. For these, and other reasons, the author concludes that Lack's hypothesis cannot hold for tropical species. The author would retain the hypothesis that clutch size has been selected on the basis of the number required to maintain the population of a species. It is presumed then that lower mortality rates in the tropics have resulted in lower clutch sizes.—D.S.F.

76. Comments on Mr. Skutch's Paper on Clutch Size. David Lack. 1949. *The Ibis*, 91(3): 455-458. This is a rebuttal to Mr. Skutch's objections. The most important point is that there seems to be no conceivable mechanism by which clutch size can be selected on the basis of numbers "necessary" to maintain the population. The author still contends that birds produce all of the young that they can and that selection of clutch size is on the basis of the rearing-abilities of the parents.—D.S.F.

BOOKS AND MONOGRAPHS

77. Bird Migration. 3rd Edition. A. Landsborough Thomson. 1949. H. F. & G. Witherby Ltd., 5 Warwick Court, W.C. 1. 183 pp. 8/6. The "Third Edition" of this important little book is a reprint of the second edition with only a brief reference in an "authors note" to more recent developments such as the theories of Yeagley and Ising. Doctor Thomson's book continues to be the best brief general treatise of the biology of bird migration; it is a pleasure to note that it is again available.—D.S.F.

78. Maine Birds. Ralph S. Palmer. 1949. *Bulletin Museum of Comparative Zoölogy at Harvard College*, vol. 102, 656 pp. $5.00. For many years the late Arthur H. Norton, Curator of the Portland Society of Natural History, built up a card file of data on Maine birds mainly from his own observations, but also from the literature and from various correspondents. At his recommendation, this file passed at his death to the Library of the University of Maine under the care of Ralph Palmer of Vassar College. Mr. Norton's extensive file forms the basis for the present book on Maine birds and without doubt the completeness of the work is due in large part to the 60,000 entries, but the utilization of this mass of material fell to Palmer who has skillfully woven it into the species accounts together with his own observations.

The introduction is brief and contains no physiographic description of the varied surface of the state—rather it is divided into a series of short explanatory paragraphs which should be carefully studied by users of the book in order that they may better understand the author's methods. Under the species in the Annotated List are paragraphs showing seasonal status, time of migration, breeding data, remarks on status past and present and a section on ecology, the latter being a decided innovation in state lists and one to be highly commended. Palmer has been very particular to trace unusual or doubtful records to their source and where doubt remains the bird has been relegated to hypothetical status; he has been careful not to create new errors or to perpetuate old ones; in this connection it is interesting to note that Audubon is the basis for a number of erroneous statements such as mentioning the Willow Ptarmigan from Maine, the nesting of the Red-bellied Woodpecker from Maryland to Nova Scotia, the occurrence of the Tufted Titmouse in "all our Atlantic states as well as Nova Scotia." Worm-eating Warbler occurring in Maine and Cerulean Warbler "very rare in Maine."

The number of species and subspecies credited to Maine, including acceptable sight records, amounts to 361; in addition, ten species have been introduced, four extirpated, four extinct, one fossil, six erroneously recorded, hypothetical 15. In addition, five species are noted under separate headings but not included in the tabulation for various reasons. The total number of forms discussed amounts to 406. A most comprehensive list of literature cited is a very valuable feature. *Maine Birds* is an up-to-date authoritative list, carefully prepared in the most meticulous detail. It has everything to recommend it and little, if anything, to criticize.—J. L. Peters.

79. Life Histories of North American Thrushes, Kinglets and their Allies. Arthur Cleveland Bent. 1949. *U. S. National Museum Bulletin* 196. U. S. Government Printing Office, Washington 25, D. C. viii + 439 pp. $1.50. This volume of Bent's "Life Histories" which deals with 56 species and subspecies of the families Turdidae and Sylviidae adheres to the well-established pattern of previous volumes. One or more individual sections have been contributed by Bernard W. Tucker, Winsor M. Tyler, Alfred O. Gross, George J. Wallace, Flor-

ence G. Weaver, Francis M. Weston, and Robert S. Woods. Although there is a general tendency toward anecdotal accounts, sometimes perhaps somewhat noncritical, there can be no question that this volume, like its predecessors, presents an important inventory of the available information on the life histories of the species treated. One is constantly amazed at the sparsity of fundamental information concerning many rather common species—for example the Mountain Bluebird, *Sialia currucoides* (Bechstein), and Townsend's Solitaire, *Myadestes townsendi* (Audubon). For the latter there is no information on incubation period, nestling period, or number of broods per year. It is unfortunate that the publication of the manuscript has been so long delayed, having been closed except for "information of greatest importance" in 1943.—D.S.F.

80. A Revision of the Bird Family Dicruridae. Charles Vaurie. 1949. *Bulletin of the American Museum of Natural History*, Volume 93 (article 4): 199-342. $1.75. This important monograph constitutes the basis for the previously published study of the evolution of the Drongos (Mayr and Vaurie, *Evolution* 2(3): 238-265. 1948. See *Bird-Banding*, 20(4): 206-207. 1949.). It includes keys, description, notes on distribution, phylogeny and systematic relationship for each of the recognized forms.—D.S.F.

81. Know Your Ducks and Geese. Angus H. Shortt and B. W. Cartwright. 1948. Sports Afield Publishing Company, 401-405 Second Avenue South, Minneapolis 1, Minnesota. vi + 36 plates, each with transparent sheet of general and descriptive information. $10. In 1945, *Sports Afield Magazine* commissioned Angus H. Shortt to prepare a series of paintings of North American anseriform birds. These paintings, with accompanying texts by B. W. Cartwright, began to appear in January 1946 at the rate of one per month and continued thus for 36 months. This truly exquisite series has now been reproduced as a single volume by *Sports Afield*. The brief text for each species includes common and scientific names, descriptions, statements on distribution, migration, courtship, nesting, and weights. A very important adjunct to any program of management and conservation of waterfowl is the instillation of an appreciation of waterfowl among laymen and sportsmen. As a matter of fact, no such program can hope for success without this appreciation. *Sports Afield* has made a very important contribution in this direction by the preparation of this most attractively bound collection of beautiful waterfowl paintings. It can be recommended enthusiastically and without reservation as an appropriate and certain-to-be-appreciated gift for a sportsman or any other person interested in the out-of-doors.—D.S.F.

82. The Clearing. A Way of Life. Jens Jensen. 1949. R. F. Seymour. Chicago, Illinois. 85 pp. $3.25. This little book is "dedicated to the Soil." "The ages have proven that a feeling of the soil is fundamental to all clear thinking. . . ." (p. 17.) The theme of "The Clearing" is the interdependence of all life, "the brotherhood of all living things." Jens Jensen has been a power for conservation and has long preached friendship with our native landscape. He has faith that man will some day awake. "Nature must remain in its unspoiled virginity to welcome him when he approaches for only nature not soiled by man can lead him aright to where he sees for himself the immensity of Life's inheritance. . . ." (p. 69.) A beautiful book, full of idealism and inspiration.—M. M. Nice.

83. Birds in Your Back Yard. Ted Pettit. 1949. Harper & Brothers, 49 East 33d Street, New York 16, New York. 210 pp. $3.00. A pleasant chatty little book, discussing attracting birds to the garden, feeding, housing and photographing them. There is also a list of recommended books, as well as an index. The five pages of photographs are fairly good, but the black and white drawings of birds fall way below present-day standards. As to the greatest problem with which bird attracters have to contend, the author cheerily states that he traps cats with fish, ties a tag with a warning on it "to its collar, or around its neck," and after the fourth capture sends the creature to the proper authorities for disposal. In six years he has had no trouble with his neighbors. Somehow it sounds

too simple; he doesn't explain the precautions needed in attaching that tag to a fighting, scratching cat. One wonders why, with the excellent books already covering the field, the publishers put out this volume. There is an over-abundance of bird books that add little to our knowledge, while at the same time manuscripts, beautifully written and significant contributions to ornithology, are rejected.—M. M. Nice.

84. Waterfowl Management of Small Areas. C. E. Addy and L. G. MacNamara. 1948. Wildlife Management Institute, Investment Building, Washington 5, D. C. 84 pp. This attractive booklet is directed primarily to the landowner, farmer, or group of sportsmen who may have a small area suitable for waterfowl production. Part I (pp. 9-58, by C. E. Addy) discusses ponds and marshes with respect to waterfowl. Attention is given to a sound, but simple, analysis of the physical and biological characteristics of a marsh or pond in terms of the ecologic requirements of various species of waterfowl. It is particularly wise that attention is thus directed in such a publication. Water levels, soil type, flora, loafing-areas, erosion, acidity of water, enemies, are among the factors considered. Suggested management practises are based on the consideration of these factors. The practises are within the means of the average landowner or small group of sportsmen. Part II (pp. 58-74, by L. G. MacNamara) is concerned with the construction of ponds and lakes and is in the same practical approach as Part I. Topography, preconstruction activities, water control structures, and dikes are among the aspects presented. Certainly the improvement of small privately owned areas is a most important, although difficult to effect, complement to the improvement of larger publicly owned areas by state and federal agencies. This little booklet, if extensive use of it can be stimulated, should go far in stimulating properly conceived projects in privately owned areas.—D.S.F.

85. Proceedings of the Inter-American Conference on Conservation of Renewable Natural Resources. Denver, Colorado, September 7-20, 1948. *U. S. Department of State Publication,* 3382. 1949. xi + 782 pp. Even a most cursory examination of the collection of more than 100 papers could not fail to impress any thinking person with the awesome magnitude of the continued depletion of the renewal resources of the Western Hemisphere. A more serious perusal affords some understanding of the complexity of the economic and sociologic factors which are always superimposed on the basic biologic and physical aspects of conservation. Many of the papers contribute to a growing understanding that the popular conception of a reservoir of "untouched natural resources" in Latin America is fundamentally false and that the relation between resources and populations, in many instances, is more precarious than in the United States and Canada. To select "outstanding" papers in this collection is foolhardy and can only be biased by interest and point of view. However, of particular interest are: "Population and Resources in the Americas" by Kingsley Davis (p. 88), "Population of El Salvador and Its Natural Resources" by Mario Pacheco and Alfredo Martinez (p. 125), "Disequilibrium Between Population and Resources; The Case of Puerto Rico" by Clarence Senior (p. 143), "National Parks . . ." by John E. Doerr (p. 172), "Technique of Natural Resource Utilization in the Light of the Crisis in the Systematics of Sociology" by Mario Lins (p. 261), "New Horizons in the Peruvian Guano Industry" by Enrique Avila (p. 311), "Soil Conservation" by Hugh H. Bennet (p. 349), "Soil and Forests: Two Natural Resources which, in Brazil, Must be Renewed" by Alpheu Dominques (p. 407), "The National Park Concept" by Newton B. Drury (p. 315), "The Forest Problem of Mexico" by Enrique Dupre Conceros (p. 418), "The Ecologic Approach to Conservation Programs" by E. I. Kotok (p. 471), "The Intangible Resources of Wild Country" by Olaus J. Murie (p. 496), "Action Must Be Taken" by Fairfield Osborne (p. 506), "Planning the Utilization of Renewable Natural Resources in Relation to the Industrialization of Mexico" by B. F. Osorio Tafall (p. 510), "Wildlife and Its Conservation in the United States" by Gustav A. Swanson (p. 577), and "Changes in the Climate of a Coffee Plantation in Chiapas from 1920 to 1942" by Helmuth O. Wagner (p. 589). Throughout these many significant papers

one can detect repeatedly the profound influence of the philosophy of William Vogt. One cannot avoid the impression that there is a genuinely growing awareness of the fundamental problems of conservation. This awareness must grow and must be accompanied by the more difficult step of implementation of proper procedures. —D.S.F.

86. The Natural History of Sex. (Storia naturale del sesso.) Emanuele Padoa. 1948. Giulio Einaudi, Turin, Italy. 1948. 561 pp. 2100 lire. This interesting book is an amazing collection of information on the biology of sex including meiosis, gametogenesis, fertilization, sex determination, sex chromosomes, secondary sex characteristics, sex hormones, and sexual inversion. All of these are treated from a comparative aspect. Of particular interest to ornithologists is the section (pp. 423-439) on secondary sex charactertistics and their determination and development in birds. In the opinion of the reviewer this field, once better understood, will make important contributions to our knowledge of avian sytematics and evolution. There is a table (pp. 436-437), compiled from several sources, which gives the bases for sexual dimorphism in plumage among several species of birds. Chapter X is an interesting discussion of sex in relation to evolution; it can be read profitably by any biologist. Each chapter has a bibliography of review papers as well as references to original contributions.—D.S.F.

87. The Birds of Concord. Ludlow Griscom. 1949. Harvard University Press. Cambridge, Massachusetts. 340 pp., 16 phot., 2 figs. (maps). $5. To this reviewer this book has three outstanding values: (1) there is a valuable discussion (100 pages) of population changes and their actual or presumed causes in many instances, appropriate for the book's subtitle, "A study in population trends," (2) these same pages would be a good reading assignment for students in ornithology at the college level; and (3) the record of nearly a century of field work in the Concord area lays the foundation for important studies in the future there. Any person who consults the writings of William Brewster, or anyone who wants to know what goes into the making of a first-rate ornithologist will read with profit pages 5-16, where Brewster's methods and accomplishments are discussed. One of the latter was to lay a good foundation for the present volume.

Some chapter and subheadings include: description of the area, summary of past work there, changing methods of study, geology, climate, vegetation, effects of recent human occupation ("civilization"), biological advantages and disadvantages that birds have in comparison with some other forms of life, fluctuations, adaptability, population densities, declines and increases, cycles and periodicity, principles of population trends, migration routes, various analyses of the avifauna, systematic list (287 forms listed), bibliography (43 titles), and a good index.

The experienced student soon will realize that the author presents many of his data in a rather dogmatic fashion, making the picture seem clearer, and often simpler, than actually it may turn out to be. Of many examples of this, his discussion (pp. 113-114) of the Nighthawk, *Chordeiles minor minor* (J. R. Forster), will be considered in detail here. Griscom presumes it was rare and local in "primeval forests of the whole northeast" in 1600. One could make just as strong a case for the opposite—that Nicholas Denys (not cited by Griscom) evidently knew the bird well at Miscou, New Brunswick, in the early 1630's, also that lightning fires created many suitable nesting areas then as they do today. One reads of the "intense excitement of ornithologists" when, in the period 1895-1920, "the bird abandons its ground-nesting habits from Philadelphia to Cape Breton Island, and nests exclusively on flat city and town roofs." This is considerable of a half truth, since only a small fraction of the breeding population nested on roofs in much of the area listed and in the period listed. The statement that no population change "is reported" 1920-1945 from northern New England to Cape Breton Island and that the species is "therefore" still fairly common in migration on the coast to Cape Rosier, Maine, and inland in the Connecticut River Valley, is misleading. The status of the bird was not entirely unrecorded, and the Nighthawk occurs in equal (probably greater) numbers in migration in much of Maine north and west, including coastwise, than from Cape Rosier eastward. In a general

discussion of population densities there are some curiously grouped figures (pp. 99-101). Included are total existing populations of Whooping Crane, *Grus americana* (Linnaeus); Trumpeter Swan, *Cygnus buccinator* Richardson; ducks and geese in North America, as well as per acre censuses (? all breeding censuses) of various small land birds, and so on. Numbers grow larger toward the end of the table, i. e., per acre figures of 5,000 Tricolored Redwing, *Agelaius tricolor* (Audubon), nests in a California marsh, 14,520 pairs of Sooty Terns, *Sterna fuscata* Linnaeus, on Dry Tortugas, and 22,000 pairs of Murres, *Uria aalge* Pontoppidan, at Three Arch Rocks off the Oregon coast. Such figures are not strictly comparable, for most of the small land birds defend a territory in which they both nest and feed, thus resulting in the food factor limiting per acre nesting density, while certainly the adults associated with 5,000 Redwing nests or the 20,000 Murres require for support more than the acre on which they breed. For analogy, one might census theater managers by visiting theaters, but the per acre density of the closely packed audiences would not give much of a clue as to the area the latter utilize daily in earning a living. No bibliographic citations are given for any of the population figures. The Maryland farm data included undoubtedly are McAtee's, for example. There are other parts of the book where the reader is left to guess, if he is uninformed or so inclined, whether the data are original there or previously published by some other author elsewhere. Under cycles and periodicity (pp. 123-130), where the author wisely devotes space to definitions, he appears unaware that short-time fluctuations have been noted in American tropical as well as temperate zone species, although seldom recorded for the former. The 16 photographs, from the National Audubon Society, are "window dressing" and may boost over-the-counter sales of the book; they may also have increased its cost. Probably none was taken in the Concord region, although species occurring there are depicted. For the sake of future generations, one wishes that some photographs of noted birding places in the area had been included. On page 169 it is stated that no sight records are published of birds very difficult to identify, yet on page 203 one finds a specimen of Bald Eagle listed under the subspecies *Haliaeëtus leucocephalus alascanus* C. H. Townsend, and all sight records given are under *H. l. leucocephalus* (Linnaeus). The discussion (p. 204) rather confuses the facts that (1) there is a north-south cline in eagle size, (2) young eagles (not only southern ones) disperse over a much wider area than where they were reared and evidently return to breed, and (3) some adults are more, others less, migratory depending on seasonal conditions and the part of the species' range that they occupy. Interestingly, two *fall* sight records of Willets (p. 225) are referred to the western race *Catoptrophorus semipalmatus inornatus* Brewster. Was this done by rule of thumb?

Particularly valuable discussions deal with several rails (pp. 210-213); Woodcock, *Philohela minor* (Gmelin) (218-219); Wilson's Snipe, *Capella delicata* (Ord) (220-222); the cuckoos, *Coccyzus* (64-65, 234-235); Northern Cliff Swallow, *Petrochelidon albifrons albifrons* Rafinesque (253-254); Brown Thrasher, *Toxostoma rufum* (Linnaeus) (265-266); thrushes, *Hylocichla* (267-271); and Vireos, *Vireo* (277-280). A familiarity with two preceding works authored or co-authored by Griscom (see *Bird-Banding*, 16: 154-156. 1945; 20: 122-123. 1949) does not prepare one to expect the wealth of useful data contained in the present volume. It should be stimulating to both amateur and advanced students of North American birds. It is issued in a good binding and will stand the usage it deserves. The price seems not far out of line, considering current printing and binding costs.—Ralph S. Palmer.