

identified by Dr. Gross as a Hepburn's Rosy Finch. This race is found in nesting time above timber-line on the mountains of the Alaskan peninsula, east and south to central Oregon, wintering on the Pacific Coast from Kodiak Island to Vancouver Island, southeast to the mountains of Oregon, Nevada, Montana, Wyoming, Utah and Colorado.

Dr. Gross has happily refrained from "collecting" the bird, and up to March 20, 1937, he states the bird "is still alive to be enjoyed and studied by numerous ornithologists and bird lovers who continue to journey to Gorham to see this finch."—CHARLES L. WHITTLE.

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## RECENT LITERATURE

(Reviews by Margaret M. Nice and Thomas T. McCabe)

The articles have been selected and arranged under subjects of importance to students of the living bird, and also for the purpose of suggesting problems, or aspects of problems, to those banders who wish to make the most of their unique opportunities.

Headings in quotation-marks are the exact titles of articles or literal translations of such titles. Except in the case of books, which are always reviewed under their titles, headings not in quotation marks refer to general subjects, or are abbreviated from titles in foreign languages. References to periodicals are given in italics. Reviews by Mr. McCabe are signed with his initials.

## BANDING AND MIGRATION

"On Changes in Numbers of *Regulus r. regulus* (L.)".—<sup>1</sup>"Linear counts"—all birds noted within a strip forty meters wide—showed an abundance of Golden-crested Wrens in November and December, 1934, but only one tenth as many in February. In April and May the number was doubled or tripled through the return of migrating birds, but by October, 1935, only a few were left. The fall of 1934 was mild and the birds failed to migrate; that of 1935 was cold and they were stimulated to leave. "The Golden-crested Wren is a typical representative of those birds in which the migratory instinct functions in only a part of the population. . . . At the period when migration may take place, low temperature stimulates the migratory impulse and sets the greater part of the population in motion. If cold comes after the waning of the migratory impulse, migration is no longer possible. Those birds that have remained have little prospect of surviving the winter." (See No. 20.)

"The Average Direction; Terminology and Theory in Regard to Bird Migration."<sup>2</sup>—After discussing Baron von Geyr's ideas as to the "normal direction" of migration, particularly in respect to the White Stork (*Ciconia c. ciconia*) with its eastern and western routes, Dr. Rüppell concludes that the migration route of this bird is conditioned by two factors: "inborn normal direction" and "guiding ecological factors." The young follow the experienced adults.

"The Dependence of the Start of Migration-Restlessness on Latitude in Birds Removed from their Homes."<sup>3</sup>—In the spring of 1936 a number of male White-throats (*Sylvia communis*) were captured on Helgoland; ten of these were taken to Australia and back. The "migration-restlessness" of the controls that remained in Helgoland (as shown by recording cages) started on August 6th with two birds, August 16th with another, and September 3d and 8th with two others. No restlessness was shown by the experimental birds until September 21st, when the ship reached latitude 20° N., the latitude of the winter home of this species; all six began simultaneously. With the control birds the migratory impulse appeared after the molt was fairly well completed; no data are given as to the molt of the experimentals.

"Migrations of the American Brant (*Branta bernicla hrota*)."—Harrison F. Lewis. 1936. *Auk*, 54:73-95. Lewis has made a good job of distilling from a variegated mass of material, including a good deal of his own field work, what is known of the migration of the eastern Brant, and tracing its linear but complex routes of migration. To the uninitiated, three facts stand out in boldest relief. First, that the routes, though linear, are multiple and independent, perhaps even used by genetically distinct populations or morphologic races. Second, that certain of these routes lie overland for distances of almost six hundred miles. Third, that the great flocks (though evidently less great, as known to our generations, than those of *nigricans*) are thinning with appalling speed, probably along with the strange disappearance of the eel-grass. That no Brant should follow the Labrador coast, considering the physical nature of it and the easting required to turn Belle Isle, is not surprising in itself; that components of the flight should follow the Connecticut Valley short-cut to the St. Lawrence or even strike thence to the foot of Hudson Bay merely sends the mind groping into the geologic past for thinkable explanations; but that the largest flight should strike fair through the heart of Labrador from the St. Lawrence to Ungava Bay is one of those magnificent facts we must accept with little comment. To be sure, it is not essentially more strange than the overland flights of other geese, except that for the Brant, freshwater records being of the rarest, there is nothing on the way. It is like an oceanic flight by a Golden Plover or a man in an airplane, and it is useless to wonder how it came to be. There is some evidence that it takes about twenty-four hours.—T. T. McC.

"Chimney Swift Migration at Memphis."—1936. Ben B. Coffey, Jr. *The Migrant*, 7:79-83, 96-98. Great numbers of migrating *Chaetura pelagica* have been captured in September and October in high chimneys in Memphis, Tennessee; of 5907 birds banded between 1932 and 1935 there have been 86 returns and 20 recoveries from other localities—a percentage of retakes of only 1.8, although 9465 Swifts were examined. "Each night the flock present is a new one with less than five or six repeats." "Swifts apparently will remain within the chimney when the weather becomes cold or rainy."

"Ten Years' Returns from Banded Bank Swallows."—1937. Dayton Stoner, N. Y. State Mus. Circ. 18:1-21. A total of 1881 adult and 3044 young *Riparia r. riparia* were banded in Iowa and New York State. Of these, 3519 were available as returns in 1935; 5.2 per cent of the adults returned, and 1.4 per cent of the young. Six of the 31 young and 51 of the 68 adults that returned "were recovered in the same colony as originally banded," the others from one hundred yards to nine miles. There was no case of remating for a second year; indeed, some birds "changed mates before a first brood was reared; still other individuals have had different mates for the first and second nestings of a season." No bird was found that was known to be more than four years old.

"Recoveries of Marked Swallows within the British Isles."—A. W. Boyd and A. Landsborough Thomson. *British Birds*, 30:278-287. The total number of *Hirundo r. rustica* "marked up to the end of 1935 was 34,243," the great majority of which were nestlings. There have been 24 recoveries from France, Spain, and South Africa, while 103 of those marked as young and 59 of those marked as adults have been taken in the British Isles a year or more after banding. There are also 15 records of the young in their first autumn in all directions from the nesting-place as far as twenty miles east and twenty-four north. Ninety birds marked as nestlings were found at or near their birthplaces and thirteen elsewhere. Eighteen returned to the place of marking, 38 within one and three fourths miles, 26 within two to six miles, 7 from seven to ten miles, and one at thirteen miles. Of particular interest are those nestlings recovered away from the place of banding; six of these were taken in May south of their birthplaces and might still have been on migration. Of the others four were found north

of their birthplaces (75, 75, 90, and 160 miles respectively); two south (82 and 125 miles); and one east (155 miles). "Adult Swallows that have nested almost invariably return to the same place in subsequent summers, and often to the same nest." There are five cases of a pair remating a second year. As to age, there are a few records of four and five-year-old birds and one nine years old—killed by a cat. A brief review of foreign data is given, and a bibliography of seventeen titles closes this valuable contribution from the British Trust for Ornithology.

**Destruction of Swallows by Cold in October, 1936.**<sup>4,5</sup>—As in 1931, Swallows in southern Germany were caught by a sudden fall in temperature in early October and died in large numbers. Lambert<sup>5</sup> gives the strange report that some Swallows reversed their migration from September 25 to October 10, although Larks and Finches continued to migrate in the normal direction. Some five thousand Swallows were gathered up and carried to Venice by airplane and there released.

**A List of Banding Stations**<sup>6</sup> is being published in *L'Oiseau* with information on the history of each station, its personnel, equipment, publications, inscriptions on the bands, etc. The first installment covers seven European countries.

<sup>1</sup>Palmgren, P. 1936. Über den Massenwechsel bei *Regulus r. regulus* (L.). *Ornis Fennica* 13:159-164.

<sup>2</sup>Rüppell, W. 1937. Die Mittelrichtung. Terminologisches und Theoretisches zum Vogelzuge. *Der Vogelzug*, 8:1-10.

<sup>3</sup>Wagner, H. O. and H. Schildmacher. 1937. Ueber die Abhängigkeit des Einsetzens der nächtlichen Zugunruhe verfrachteter Vögel von der geographischen Breite. *Der Vogelzug*, 8:18-19.

<sup>4</sup>Bohman, L. 1937. Schwalbenzug-Katastrophe im Oktober 1936. *Der Vogelzug*, 8:25-26.

<sup>5</sup>Lambert, H. 1937. Unnormaler Zug der Schwalben (*Hirundinidae*). *Der Vogelzug*, 8:26.

<sup>6</sup>Chappelier, A. 1936. Répertoire des Stations Ornithologiques (Stations de baguage) *L'Oiseau et la Rev. franç. d'Ornithologie*, 6:622-678.

## HOMING

**"The Homing of Birds."**—Ernst Mayr. 1937. *Bird-Lore*, 39: 5-13. An excellent summary of this intriguing subject. Dr. Mayr defines homing as "the ability to return to a known goal over an at least partially unknown flight-route." He tells of the pioneer experiments of Watson and Lashley and relates in some detail the work of Rüppell through 1935. The paper closes with a clear presentation of theoretical aspects of the problem.

**"Homing Experiments with Starlings, Swallows, Wrynecks, Red-backed Shrikes and Goshawks (1936)."**—Dr. W. Rüppell is achieving even more brilliant results in the series of experiments which he is carrying out in Germany in co-operation with Dr. Stresemann. In 1936 birds of four species were sent from Berlin by airplane to localities many miles (over 1100) distant. With Starlings the most significant recovery was that of a bird found dead almost in a direct line from the place of release—Venice. One Starling returned from Rome (1200 kilometers) and another from Madrid (1850 kilometers). A rapid return was that of a Starling from Munich in five days (500 kilometers). Swallows (*Hirundo r. rustica*) were sent to London (900 kilometers), Athens (1800 kilometers) and Madrid, returning from all three places, and from the last two in seven days. Wrynecks (*Jynx torquilla*) returned from Munich, Venice (800 kilometers), and Saloniki (1500 kilometers). Of a dozen Shrikes (*Lanius collurio*) sent to various localities, only one was proved to have returned, a male from Marseilles (1200 kilometers) in eleven to thirteen days; in the meantime this bird's mate cared for her eggs alone and her much-travelled spouse helped to feed his offspring.

In contrast to these extraordinary results with migratory species, experiments with a resident species, *Accipiter gentilis*, gave negative results; none of the nineteen birds sent by express train to a distance of 620 kilometers were known to have returned, while three had been killed within 22 to 50 kilometers of the place of release.

<sup>7</sup>Heinfünderversuche mit Staren, Rauchschnäbeln, Wendehälsen, Rotrückwürgen und Habicht (1936). 1937. *Journal für Ornithologie*, 85:120-135.

### LONGEVITY

"Long Life of a Partially Albinistic Blackbird."<sup>8</sup>—Although albinistic birds are often supposed to be of weak constitution, an almost completely white *Turdus merula* lived to be at least eight years old when she died after a heavy rain-storm in May, 1936, weighing seventy-five grams at the time, which is only three-fourths the normal weight for the species. In 1935 she raised four normally colored young, and in 1936 again laid four eggs. A male Blackbird lived eighteen years in captivity.<sup>9</sup>

"Cardinal Pathology."—1937. Margaret S. Mercur. *Cardinal*, 4: 122-123. A female *Richmondena c. cardinalis* lived in the author's garden in Pittsburg, Pennsylvania, from the winter of 1927 to August, 1936, when she was found dead at the age of at least ten years. She had more red feathers in her wings than any other female Cardinal and was a fine singer. She usually had three broods, in 1933 raising eight young. In 1935 her mate deserted her after the first egg had hatched, whereupon she abandoned the nest and was never again seen with a mate. The male mated with a younger female, and the two drove the old bird away whenever they met her at the window-sill. At her death she "was disfigured by two bare bulbous growths, each more than half an inch through, that sprang from the base of the beak on either side and encroached upon the nostrils and upon the eyes." These "must have interfered with her sight, for from being tame and friendly, she became very nervous and shy."

Other notes on longevity are given in the papers on Bank Swallows and "Recovery of Marked Swallows" and in the book "Falconry."

<sup>8</sup>Gerber, R. 1936. Hohes Alter einer partiell albinotischen Amsel. *Ornithologische Monatsberichte*, 44:177-178.

<sup>9</sup>Wünn, H. 1935. *Gefiederte Welt*, p. 179.

### LIFE HISTORY

"On the Breeding Habits of Leach's Fork-tailed Petrel."—J. A. Ainslee and R. Atkinson. *British Birds*, 30:234-248; 276-277. This fine paper is the result of twenty-seven consecutive days and nights of intensive study on North Rona, a three hundred-acre island forty miles north of Cape Wrath, Scotland; it has been uninhabited since 1844, and the deserted ruins of "semi-underground crofts" form the chief breeding ground of *Oceanodroma l. leucorrhoa*. "Both parents brood for one to four days at a time. . . . The sitting bird was visited by its mate at night, and so, presumably, fed." (The parents were distinguished by bands.) "The chicks were visited irregularly during the night, sometimes by both adults, sometimes by a single parent . . . and sometimes not at all." This irregularity appeared to be correlated with the success of the parents in procuring food, as well as with wind conditions, for during easterly gales "the colony was practically deserted the whole night." "On light nights birds came in from the sea later than on dark nights." A vivid description is given of the behavior of the birds at night: "The frantic energy of the flying birds, their extraordinary calls, the whole midnight ritual above the dim ruins on a deserted island in an empty sea, make a never to be forgotten impression."

"Notes on the Breeding of the Short-tailed Shearwater, *Puffinus tenuirostris*, in 1936."—Frederic Wood Jones. 1936. *South Australian Ornithologist*, 13:223-228. A description of trips to several South Australian breeding islands of what the A.O.U. calls the Slender-billed Shearwater by an observer of great experience of such colonies, but who tells us the very irreducible minimum, or so at least it seems to readers whose preliminary knowledge is nil. It seems evident that the greater part of the island colonies are in rapid process of destruction by men, cats, goats, and humanly-induced erosion (antipodal causes whose results reach our own west coast).—T. T. McC.

"The Breeding Behavior of the Ringed Plover (*Charadrius hiaticula* L.)."<sup>10</sup>  
—By means of careful observations on banded birds in East Prussia the authors

found that pairs remained together throughout the season, that one bird laid four sets of eggs, and that two broods are sometimes raised. Both parents incubate about equally in periods ranging from nine minutes to six and one-half hours. Incubation lasts twenty-four days, and the fledging period the same. The first egg of the second brood is sometimes laid six days before the first brood become independent. Experiments were tried with adding eggs to a set; the birds refused plain-colored eggs, but accepted spotted ones. One bird upon finding artificial eggs on the rim of its nest went through "leading-away" manoeuvres for fifteen minutes. Much is given on details of behavior.

**The Night Heron in Java.**<sup>11</sup>—The same race (*Nycticorax n. nycticorax*) breeds in Java as in Europe; in the former it lays two or three eggs, in the latter from three to five. Adults do not know their young individually, even when the latter are fairly well grown.

**"Further Increase of the Stork in Schleswig-Holstein."**<sup>12</sup>—*Ciconia c. ciconia* has steadily increased from 1181 pairs in 1930 to 2128 in 1936; the average number of young raised per pair has dropped from 2.4 to 1.9. The percentage of pairs raising no young has increased from 14 to 24 in the seven years, while the number of eggs and young thrown out of the nest has risen from 146 to 711. Bergenhasen is the town richest in Storks, for it boasts 59 occupied nests, although in 21 nests no offspring were raised.

**"Stork Statistics in the Winsener Elbmarsch."**<sup>13</sup>—Much the same picture is shown here also: the number of pairs increased from 25 in 1929 to 30 in 1932 and 44 in 1936, but the total number of young raised since 1932 has been practically the same, the average per pair dropping from 2.9 in 1932 to 2.0 in 1936. Young pairs have raised an average of 1.5 young, old pairs 2.6. In 1936 there were many fights among the nesting birds, started by an extra female. Pairs A B, and C were peacefully incubating, when this stranger arrived and she and male A drove off female A (a banded bird); female A went to nest B and drove off that female, which promptly went to nest C and drove out female C, and so the disturbance spread on and on. In each case the eggs were thrown out and a new set laid. A nestling banded in 1932 returned to its home region to nest in 1935.

**"Observations on a Nesting of the Red-breasted Flycatcher in East Prussia."**<sup>14</sup>—A nest of *Muscicapa p. parva* with five young was watched for a whole day of seventeen hours; there were 176 feedings (one insect brought per trip), and excreta was removed 62 times, the male bringing 123 meals and taking off excreta 42 times.

**"Further Notes on the Nesting of the Barn Swallow."**—W. P. Smith. 1936. *Auk*, 54:65-69. Observations on a pair of *Hirundo erythrogaster* showed that incubation took 14 days and fledging 18 to 19 days. The young returned to the nest for three successive nights after leaving it; the family remained together 11 days after the young were fledged. An interesting description is given of the procedure (on July 8th and 9th) by which the parents stimulated the young to leave the nest. On July 12th another family of Barn Swallows joined the banded birds. While "apparently merged in one flock, each family group kept its identity, for when certain parents approached with food, the banded young remained quiet while those unbanded opened bills and fluttered wings and vice versa."

**"Further Notes on the Constancy of Catbirds to Mates and to Territory."**—Geoffrey Gill. 1936. *Wilson Bulletin*, 48:303-305. Further evidence that female Catbirds (*Dumetella carolinensis*) take their reproductive functions in the spirit of the journeyman laborer, who completes one job and moves on. With a single exception, there is little or no evidence even of accidental remating, and the contrast between sexes as to territorial attachment is very striking.—T. T. McC.

**"Biological and Other Notes on Some East African Birds."**—R. E. Moreau. 1936. *Ibis*, 1 (14th Ser.):152-174 (to be continued). One is permitted to imagine that, perhaps as a result of long exposure to the *Ibis*, Mr. Moreau made an effort to produce a systematic and distributional "bird-list," but broke down after a few pages and began to do thumb-nail sketches of habitat and behavior. These are often of the greatest importance, as those of the nesting of *Anas sparsa leucostigma*, of the "shading" of the egg by a pair of Two-banded Coursers (*Rhinoptilus africanus gracilis*), of the notes of the Long-tailed Cuckoo (*Cercococcyx m. montanus*), of the prey brought to the young of one Hornbill (*Bucorvus cafer*), of nest-plastering by another (*Bycanistes cristatus*), of the notes and postures of a third (*Lophoceros deckeni*), of the distributional ecology of the Broad-billed Roller (*Eurystomus glaucurus suahelicus*), of the song and dance of the Barbet, (*Trachyphonus d'arnaudii bohmi*), and of communal roosting and feeding of the young by the White-eared Barbets (*Buccanodon leucotis kilimensis*) This, in the history of types of ornithological literature, is a remarkable departure, and shows what a bird-list can be.—T. T. McC.

**"Nests and Broods in 1936 in Whipsnade Bird Sanctuary, Bedfordshire."**—Julian S. Huxley. 1936. *British Birds*, 30:224-225. A total number of 173 nests belonging to 23 different species was found on the 5.9 acres of the Whipsnade Sanctuary, over 29 pairs to the acre. Record was kept of the success of nesting of the 38 nests in boxes—15 of Blue Tits (*Parus caeruleus*), 10 Great Tits (*Parus major*) and 9 Starlings (*Sturnus v. vulgaris*): 265 eggs were laid, 210 were hatched (79.3 per cent), and 196 fledged (74 per cent).

**"Ménage à Trois in the Mute Swan."**—J. C. S. Ellis. 1936. *British Birds*, 30:232. A case of a male (*Cygnus olor*), fathering two broods that hatched simultaneously (1934). There are now (1936) about twenty-six Swans on fifty-five acres of water and "all attempts at breeding have proved fruitless" as "the Swans spend most of their time in the earlier part of the nesting season in making vain attempts to secure territory."

**"Some Cases of Polyandry and Polygamy in Birds."**<sup>15</sup>—Three cases are cited from the literature: a female White Stork with two mates, and a male with two mates, and two female Mute Swans mated to a Black Swan (*Chenopsis atrata*); in this family the male sat on one nest and his wives on the other, but the eggs hatched only in the latter. Two cases have come under the author's personal observation: another instance of a male Mute Swan with two mates, each with her own nest; and a male Red-breasted Merganser (*Mergus serrator*) with two mates that laid in the same nest—the second year that this has happened.

<sup>10</sup>Köchler, O. and A. Zagarus. 1937. Beiträge zum Brutverhalten des Halsbandregenpfeifers (*Charadrius hiaticula* L.). *Bei. Fortpfl. der Vögel*, 13:1-9.

<sup>11</sup>Höogerwerf, A. 1936. Een stukje levensgeschiedenis van den Nachtreiger (*Nycticorax nycticorax*). *De Tropische Natuur*, 25:167-173.

<sup>12</sup>Emeis, W. 1936. Weitere Zunahme der Störche in Schleswig-Holstein. *Ornithologische Monatsberichte*, 44:183-184.

<sup>13</sup>Schein, W. 1936. Storchstatistik in der Winsener Elbmarsch. *Ornithologische Monatsberichte*, 44:171-173.

<sup>14</sup>Steinfatt, O. 1937. Beobachtungen über das Brutleben des Zwergfliegenschnäppers in der Rominter Heide. *Ornithologische Monatsberichte*, 45:1-7.

<sup>15</sup>Ringleben, H. 1936. Ueber einige Fälle von Polyandrie und Polygamie bei Vögeln. *Ornithologische Monatsberichte*, 44:178-179.

#### TERRITORY

**"New Results of Research on Territory."**<sup>16</sup>—An excellent summary of this vital subject, the author discussing the question from many angles and incorporating the results of recent studies. His bibliography includes 66 titles.

**"Territorial Behavior of Normal and Castrated Females of *Anolis carolinensis*."**—L. T. Evans. 1936. *Jour. Genetic Psychology*, 49:49-60. "Comparativeness and the urge to defend territory are shown to be stronger in castrates than in normals," since with female chameleons a normal resident attacked an

intruder in 5 to 6 minutes, while a castrate attacked in 1 to 1.25 minutes. The author concludes that "relative dissimilarity in territorial behavior of normal and castrated females is due to the presence or relative absence of the hormone or hormones secreted by the ovaries."

"**Fall and Winter Behavior of Mockingbirds.**"—Amelia R. Laskey. 1936. *Wilson Bulletin*, 48:241-255. This account of a period of peculiar interest (just now, perhaps, of more interest than the breeding period) in the Mockingbird cycle is, like most dramas of many acts, large casts, and complex plots, not easy to follow, but is so faithful and so sympathetic that it seems to leave us just in the somewhat bewildered state which witnessing the actual events might have produced,—perhaps the most desirable of results. The reviewer has often said that analyses of behavior have ultimate scientific value just in so far as they become parts of comparative behavior studies. It is obvious that studies of two races of *Mimus polyglottos*, by the Micheners and by Mrs. Laskey, provide the first complete sets of material ever to be published for the examination of psychological divergence on continuous geographic areas. The most desirable culmination would be a close coöperative effort between the workers to create a more purposeful comparison than is conveyed by a mere reading of the parallel accounts. The result would be the analysis of an evolutionary point of departure quite certain to have antedated morphological divergence.

The paper begins by showing the loosening of the bonds of the territorial vested interests in late August and September, the dramatic invasion by young or vagrant populations, the emergence in late September or early October of aspirants to exclusive possession, with territorial attack and pursuit and autumn song, all on ground conveniently emptied of its previous occupants. One of the subsections was taken by a lone female, which showed less territorial vigor and took less ground than the males. The culmination was a "systematic campaign in which each of the eight or ten resident Mockingbirds in the neighborhood had a definite part and which diverted arrivals before they could alight." Definite calls, such as an "alert" call, were a part of this mechanism of coöperative defense. Many accidents caused the ground to be occupied and reoccupied before the next breeding season. Late winter occupants seem to have been rather of the nature of visitors, spreading in from other territories to which they showed a tendency to return with the coming of spring. On near-by areas, contrary to the previous general rule of autumn separation, in which Mockingbirds tend to resemble their Catbird relatives, two pairs remained together through the winter.—T. T. McC.

<sup>16</sup>Meise, W. 1936. Neue Ergebnisse der Revierforschung. *Mitt. Vereins sächs. Ornithologen*, 5:1-23.

#### BIRD BEHAVIOR

"**The Sexual Display in the Little Grebe.**"—P. H. T. Hartley. 1937. *British Birds*, 30:266-375. "The selection of a mate, and the acquisition of a territory seem to take place simultaneously." "The mated Little Grebe is a passionately territorial bird." In this important study and analysis of courtship in *Podiceps r. ruficollis* the author concludes: "The Little Grebe is a species which has evolved a vocal expression of its emotions—an inter-sexual display of sound rather than of action. Its slight antic displays are probably very like those of the ancestors of its genus; but in the Dabchick's small gestures may be seen the beginnings from which the elaborate and beautiful displays of the Great Crested Grebe have grown."

"**The Experimental Measurement of a Social Hierarchy in *Gallus domesticus*.**"<sup>17</sup>—In five articles Carl Murchison reports his investigations into the foundations of social behavior, concentrating on three "social reflexes" and two "social discriminations." An ingenious "Social Reflex Runway" was devised in which the chicks were released at opposite ends and the distance measured which each ran to meet the other. The dominant rooster was *not* the largest of the group. When two cocks were confined in wire cages six feet apart, a free

cock went towards the cock lower in the social hierarchy. However, it is well known that a subordinate male bird upon finding his master at a disadvantage often seizes the opportunity to attack him. On the basis of observations on eleven individuals, three of which were abnormal since they never showed primary sexual behavior, the author raises a mighty edifice of graphs and tables and couches his conclusions in such technical terms that they are meaningless to any but the trained statistician.

<sup>1</sup>1935. *Jour. Gen. Psych.*, 12:3-39. *Jour. Social Psych.*, 6:3-30. *Jour. Genet. Psych.*, 46:76-102. *Jour. Gen. Psych.*, 12:296-312. *Jour. Social Psych.*, 6:172-181.

#### ECOLOGY

**"The Composition and Dynamics of a Beech-Maple Climax Community."**—Arthur B. Williams. 1936. *Ecol. Mon.* 6:1-92. An admirable ecological study of sixty-five acres in northeastern Ohio in the North Chagrin Reservation, based upon weekly all-day visits over a period of four years; the treatment of climate, vegetation, and mammals is especially praiseworthy. A tremendous drop in the rodent population followed the failure of the beeches and sugar maples to fruit in 1932; the drought of the next summer destroyed amphibia and insects, thus affecting the shrews; rabbits increased, followed by foxes that cleaned them out; skunks disappeared in the wake of the mice. Ample beech crops in 1933 and 1934 and maple crops in 1934 were soon followed by a come-back of rodents and later of shrews. The disturbance in the "balance of nature" was "partly the normal rest in the bearing rhythm of the forest dominants, and partly the abnormal break in the climatic factor of precipitation of moisture. . . . Competition between individuals and between species seems to have been largely the keen-edged instrument whereby numbers were cut down after the failure of basic food supplies." (Page 57.)

The section on birds, although containing much of value, is not preëminent as is the rest of the study; the author does not cite the most pertinent literature, nor does he discuss fluctuations in the numbers of his breeding birds. These numbered 136 pairs in 1932, 174 in 1933, 176 in 1934, and 134 in 1937—an average of 2.0 to 2.7 pairs per acre. The number of nesting species ranged from 23 to 26, 10 of which were residents; about two thirds of the individuals were summer residents. In this tract of forest not a single Hawk nests and but one pair of Owls. Table 18 showing the "estimated average bird population by months" is excellent; a line showing the number of species as well as individuals would have added to its value.

This monograph is a model in its masterly treatment of what actually happened in a vertebrate population during the space of four years.

**"Breeding Seasons of Birds in East African Evergreen Forest."**—R. E. Moreau. 1936. *Proc. Zool. Soc. London* 631-653. The author finds a "single breeding season of surprisingly short duration" (October through March) in the birds of the evergreen forests in East Africa; he considers as possible stimuli light, temperature, precipitation, and food-supply, deciding against any "single-factor hypothesis," but concluding that the breeding rhythm appears to be timed when conditions are at the optimum for the young birds.

**"Avian Habitats in the Thorn-Bush Areas of Natal."**—Raymond B. Cowles. 1936. *Auk*, 54:55-61. Students of African forest birds, much more than those of European and North American regions, are impelled to analyze populations into habitat groups somewhat on the order of horizontal layers, starting with the treetops. Chapin does something of the kind in his great study of the Belgian Congo, and the present study uses such division as a basis of approach to the problem of specialization. That the concept is relatively unfamiliar to us is explained by the relative poverty in "stories" of our temperate forests and the vast areas of inhospitable conifers in the zones in which most work has been done. The author's general thesis appears to be that the birds of the lower layers are progressively more and more rigidly restricted in habitat, and so



more "specialized." The treetop birds are least restricted to any definite type of "bush"; the ground cover inhabitants are the most narrowly restricted of all. The word "specialized" is used to mean restricted in requirements, not as necessarily presenting gross or obvious specializations, as of adaptive structure. If we include both the "sedentary" and the "itinerant" birds, the numbers of forms decrease regularly from the least to the most restricted or specialized, but not so if we deal only with the residents. In discussing the best criterion for determining the essential habitat the author proposes the surroundings into which the bird retreats from alarm or danger, but even this leaves much to be desired.—T. T. McC.

**"Marine Food of Birds in an Inland Fjord Region in West Spitzbergen."**  
—F. C. Stott. Part I, 356-369. C. H. Hartley and James Fisher. Part II, 370-389. 1936. *Journal of Animal Ecology*, 5:2. The first part of this fine study deals with the determinative physical and food factors, the second with the resultant behavior of the very definitely observable populations of the local marine avifauna. For most of the forms, including all the divers and scavengers, the results are so limited and variable as to amount to little more than food-records, which for the most part do not agree with those already published by Montague. For *Rissa tridactyla* and *Fulmarus g. glacialis*, however, population-presence and behavior is worked out in a most concrete and interesting manner. For these, and to a certain degree for the rest, the presence of breeding colonies is probably determined by a freak circumstance of limited scope. A subglacial stream enters the sea through an ice cave and creates a small area where, perhaps owing to low surface-temperature and salinity, perhaps to turbidity and reduced light, an ordinarily deep-living Euphausiid crustacean, *Thysanoessa*, is abundant at the surface. The amount of melt-water, the size of this "brown" area, and the concentration of birds correlate with changes in temperature. Kittiwakes and Fulmars crowd to or into the ice cave, where they are often killed by ice-falls and "calving"; other forms hang on the margins. Skuas, not entering the crowd at the cave or daring to attack the colonies, parasitize the Kittiwakes on the way back and forth. It is our natural thought to begin with *Thysanoessa* or at least with its food, such as diatoms, and build the whole picture on this foundation, but it seems likely that what really exists is a closed food-chain, in which the removal of any element, including the birds, would destroy the whole. In addition to the other physical and invertebrate factors already mentioned the water-area is extremely high in phosphates owing to the great quantities of excrement being poured into it. This furnishes a reason for high diatom concentration, which, the other physical conditions being feasible, attracts *Thysanoessa*, and so forth. *Thysanoessa*, well known at greater depths as cod food and in other connections, has never before been taken at the surface in non-spawning condition.—T. T. McC.

**"The Rookeries of South Manchester and District."**—S. Cramp and J. H. Ward. 1906. *Journal of Animal Ecology*, 5:351-355. The Nicholsons (*Journal of Ecology*, 18:51-66) and Wynne (*Journal of Animal Ecology*, 1:168-174), with a tendency to abstraction, determined the distribution of rookeries near Oxford and on the Isle of Wight to correlate with low altitude, the proximity of rivers, certain geological formations, perhaps the neighborhood of buildings, and perhaps freedom from certain other bird neighbors. The present investigation boils these factors, or most of them, down to "water-meadows."—T. T. McC.

**Feeding Methods of Podargus.**—D. L. Serventy. 1936. *Emu.*, 36:74-90. An instance of immensely developed specialization wasted, perhaps as a result of its own senseless overreaching, upon a presumably aberrant form which has abandoned the corresponding habits, is found in those grotesque *Caprimulgi*, the Australian Frogmouths (*Podargus*) of which *P. strigoides* is considered in particular. The fact that these birds, for all their equipment for hawking in the matters of flight and mouth-parts, feed tamely on the ground on beetles, grasshoppers, and the like, was known to Gould, but has since been obliterated under the oft-repeated

presumption of more characteristic goatsucker behavior. Something similar was shown to be true of the Salvadorean Pucuyo, *Nyctidromus albicollis*, by Van Rossem (*Condor* 27, 1927). *Batrachostomus javensis hodgsoni* of southern Asia and Malaya seems to be intermediate between hawking and ground-feeding habits, though the evidence is somewhat scant. Therefore a deeply interesting comparative study of *Podargus* and *Batrachostomus* as to flight and flight equipment is carried out, with computations of wing-loading and "aspect-ratio" after Graham (*British Birds* 24, 1, 2 and 3, 1930; *Ann. Rep. Smiths. Inst.* 1932, et al.) with the conclusion that *Podargus* is actually capable of faster flight than *Batrachostomus*. This negative result turns the author's attention to tail-area, which is considerably larger in *Batrachostomus* and which probably correlates with power of rapid manoeuvre and so of aerial pursuit. Many of the possible causative or contributing factors are considered. Among them are regional or seasonal reductions of small-winged life, the development of the "post-sitting" habit as opposed to aerial search, the unsuitableness of the blunt, almost round bill of *Batrachostomus* for ground-feeding, and last, the not-unfamiliar phenomenon of over-specialization leading to inefficiency. Barely to color such problems with the palest cast of scientific thought is all that can be asked of this excellent introduction to the subject, but the discussion is full of suggestion and inspiration to more intensive work.—T. T. McC.

**Effect of Temperature on Migration and Nesting.**<sup>18</sup>—A very warm March, followed by a cold April in southwestern France brought early migrants early, while later migrants were much delayed. Nesting of some birds—Chaffinches (*Fringilla caelebs*), Goldfinches (*Carduelis carduelis*), and Serins (*Serinus canarius serinus*)—started exceptionally early, but April weather greatly delayed nesting.

<sup>18</sup>Delamain, J., and H. Jouard. 1936. Notes sur la Migration et la Nidification du Printemps 1936. *Alauda*, Ser. III 8:472-476.

#### POPULATION STUDIES AND CENSUSES

**"Factors Affecting Yearly Abundance of Passerine Birds."**—S. C. Kendeigh and S. P. Baldwin. *Ecol. Mon.* 7:91-124. After such a comprehensive title it is something of a shock to turn to the bibliography and find six references, half of which, moreover, are concerned not with birds, but with statistical methods. What the paper is really concerned with is "A Statistical Treatment of the Fluctuations in a Population of House Wrens." Yet even such a specialized subject cannot be properly dealt with without reference to the experience of other workers.

Interesting items in this paper concern ten cases of polygamy out of 193 nestings, age-findings—6 birds reached 5 years, and 2 birds 6 years—and returns of banded birds—631 of 1831 nesting adults and 152 of 7375 young. According to my arithmetic, these percentages would be 34.4 and 2.06 respectively, but they are given as 2.5 for the young and 29.0 for the adults (omitting 1933 and 1934). Curiously enough, 33 of the returned nestlings were not taken until they were 2 or in a few cases 3 years old; 38 adults also skipped a year, so far as the records show. This apparent non-breeding was more common in cold than in mild springs, although definite figures and temperatures are not given. The use of colored bands would have been helpful in the recognition of individuals early in the season.

Various questions occur to the reviewer. Because the number of males fluctuated more than that of females, the authors consider the former sex more sensitive to climatic factors; but would not the earlier arrival of males in the spring point to the opposite conclusion? We are told that age makes no difference in the number of broods attempted by a bird (apparently never more than two at the most). Is there any difference in the number of eggs laid by young, middle-aged, and old birds? On page 114, line 22, the reference should be to page 392 instead of page 302. Each year 70 per cent or more of the breeding birds are new (page 115); all these are assumed to be young, but is it not probable that some of them are adults from other regions that have been unable to return

to their former nesting sites, because these have been either destroyed or pre-empted by other individuals? This would be especially true in the case of females. The reviewer is glad to see that Dr. Kendeigh apparently no longer holds to that much-quoted statement in his paper of 1934 that "the number of broods per female tends to vary inversely with the population."

Table 2 gives "numbers of young raised" each year, but, instead of being the actual numbers fledged, these figures were "determined" by multiplying the average number of eggs laid in 67 first sets (6.5) by the number of first sets that year, and the average number of eggs laid in 50 second sets (5.2) by the number of second sets that year, adding these two numbers and multiplying them by 0.684, which is the percentage of 133 nests which "were successful in having at least one young leave the nest." The authors admit that this "is obviously approximate," since there is a definite loss of eggs and young even in "successful" nests. Nevertheless they use this hypothetical figure in calculating the "percentage increase in total number" and in the columns of "yearly loss." It is true that, "because of the frequent use of the eggs and young for other experimental purposes," the numbers actually fledged on the fifteen acres would be lower than if the nests had been undisturbed, but what we need to know (for the sake of the other calculations) is how many young actually were raised on the area, not a theoretical figure that is too high in any case.

Dr. Kendeigh has spent a great deal of labor in applying statistical methods to the population of *Troglodytes aëdon* nesting for fourteen years on the fifteen acres at Gates Mills, Ohio—a population ranging between 10 and 26 individuals. I cannot see that this treatment has added anything to our knowledge, and this is not to be wondered at, since these techniques are of value only when applied to large numbers.

The authors have done fine work in the past. They could give us an invaluable picture of population problems with their House Wrens if they would present the detailed story from year to year; the number of adult males and females that returned and where they settled; the number of young that returned and their places in relation to the birthplace; the mean *daily* temperature of each nesting season, and the number of nests started each day; mortality of adults during the nesting season; the number of eggs laid and number of young *really* raised; the temperature of the winter on the wintering grounds; details as to the birds that missed breeding seasons, etc., etc. In short, what we need is not generalizations, nor elaborate statistics, but actual facts.

"The Population of Partridges (*Perdix perdix*) in Great Britain during 1935."—R. A. Middleton. 1936. *Journal of Animal Ecology*, 5:252-261. This continuation of the 1933-1934 Partridge counts, with their immense amount of data and great precision, reduces to quantitative certainty many factors which in larger and wilder countries remain in realms of vague speculation. Effects of "good" and "bad" years are countable as to almost every stage of the cycle. Percentages of nests hatching remain for two years as close as 77 per cent and 78 per cent. Considerable variation in size of clutch seems to correlate with greater numbers of *young* females in the high year. The percentages of eggs to hatch (in the "Successful" nests) was, for a number of years, 93 per cent. For 1935 it was 91 per cent. Failures are analyzed into several classes. Chick survival works out to an average of 8.6 per covey. The great drawback to the whole study as an interpretation of nature is the vast numbers of the birds which are shot.—T. T. McC.

"The Bird Population of an Area in Sussex."—Vera Maynard. 1936. *Journal of Animal Ecology*, 5:312-318. This contains the parallel results of two very thorough examinations of the breeding birds of some twenty acres of field, hedge, and garden in 1934 and 1935. The general population is analyzed by the "daily list" method, *i.e.*, number of counts including each bird are expressed as percentages of total monthly numbers of counts, which are high. The greatest, and least necessary, deficiency is the lack of dates and stages with the complete

list of nests. The picture as a whole is splendidly complete and very valuable—T. T. McC.

**"A Census of Gannets on Ailsa Craig, with a New Method of Estimating Breeding-Cliff Populations."**—H. G. Vevers and James Fisher, 1936. *Journal of Animal Ecology*, 5:246-251. This is a by-product of the world-wide survey of breeding Gannets (*Morus bassana*). (*British Birds*, 29:262.) Various ways of counting these immense and inaccessible colonies are discussed briefly: direct counts, counts of specimen areas, and photographic methods. Methods tried at Ailsa Craig were: (1) direct counts of natural subdivisions by two observers simultaneously but independently, usually more than once, (2) the photographic method, and (3) the new "alighting method" which consists in carefully counting the numbers of birds alighting in a unit of time on an already carefully counted small area, and then applying the proportion to the number alighting in like time and under similar conditions over the whole area, or larger units of it. The alighting method on the cliffs called "the Mare" gave 1577 nests; direct count (practicable in this case) 1559-1598 (mean 1578.5).—T. T. McC.

**"The Bird Population of the Island Nesterinsaari in the Summer of 1934 and 1935."**<sup>19</sup>—On an island in the River Pielisjoki in Finland the breeding birds on twenty-six hectares (sixty-four acres) of spruce, pine, and birch woods numbered 117 in 1934, but only 87 in 1935, the decrease being due to the cutting of trees and rooting-out of shrubbery. Two species accounted for more than half the population; the Chaffinch (*Fringilla caelebs*), totalling 35 pairs in 1934 and 28 in 1935, and the Willow Warbler (*Phylloscopus trochilus acredula*), 30 and 21 pairs respectively. The next most numerous species was the Tree Pipit (*Anthus t. trivialis*) with 7 pairs each year. No Hawk was present and only one pair of Owls.

**"Attempt at a Quantitative Study of Winter Bird Population."**<sup>20</sup>—Numbers of birds recorded on winter trips near Helsingfors are shown in a table, while another gives the results of "linear counts," i.e. birds noted within twenty meters on either side of the observer. From November to December the populations of Willow Titmice (*Parus (Penhestes) atricapillus borealis*) and Crested Titmice (*Parus cristatus*) decreased to one third their numbers, but that of the Golden-crested Wren (*Regulus r. regulus*) to one eighth. See No. 1 for further observations on this species in Finland.

<sup>19</sup>Tuovinen, A. 1936. Nesterinsaaren pohjoisosan linnusto kesinä 1934-1935. *Ornis Fennica*, 13:137-139.

<sup>20</sup>Klockars, B. 1936. Försök till kvantitativ undersökning av vinterfågelbeståndet. *Ornis Fennica*, 13:139-147.

#### CYCLES

**"A Cycle in Northern Shrike Emigrations."**—David E. Davis. 1937. *Auk*, 54:43-49. In point of fact, this paper deals briefly with the Shrike invasions and passes on to a general review of recent work on periodicity, such as the papers of the Matamek conference, of Elton, and of Riddle, with application of the principles of Severtzoff and of Du Rietz. As to the Shrikes, there is a tendency to use figures with a degree of absoluteness not quite consistent with the reliability and abundance of the facts and the usual elastic character of biological data. The periodicity, for instance, averages about 4.2 years, but with extremes of from four or less to five. Abbott's periodicities of solar radiation, all of which are "integral submultiples" of 23, are dismissed, as I understand it, by an argument which might be reconstructed as follows:—(1) Shrike periodicities accord with Snowy Owl and arctic fox periodicities; (2) fur-records previous to 1893 show an average of 3.3 years but since that date have changed to about 4 years; (3) the Owls and Shrikes have changed correspondingly; (4) 3.3 is (nearly) an "integral submultiple" of 23, but 4.2 (later given as 4.1) is not. Therefore there is no correlation. No—but 4.6, for instance, is an integral factor of 23. Furthermore, in the Shrike graph, the longest and richest collection of modern data,

periodicities vary by over a year. There is one pair of equal and adjacent highs (1935 and 1936), and one high not included in the computation, whose order of magnitude nearly reaches the properly periodic ones, yet is located fairly half-way between the 1900 and 1905 highs. These and other considerations make a correction of at least 4 or 5 tenths highly probable, should (in some golden age of vertebrate zoölogy!) a set of perfect figures become available. Furthermore it has always seemed to the reviewer that physical changes inducing periodicity, unless very violent, would hardly create an immediately, or even progressively, visible result, but rather would become evident when and where the shoe began to pinch in the matter of survival, as at breeding time or in winter, so that phenomena like invasions, starvations, and perhaps even epidemics, would reflect their causes with an inconstant error of time. The material is valuable—the general correlations of Shrikes, Owls, foxes, and mice are interesting. One wonders somewhat at the usual tendency in such speculations to abandon the food-chain or other causation and turn so easily to epidemism at the mouse (or rabbit) stage. It would perhaps be a desirable shift of emphasis to say, not that "the fundamental periodicity . . . is determined by the epizootic disease," but that the fundamental periodicity is determined by the complex of fertility coefficient and ulterior and external causes, perhaps including ultimate physical conditions, which affect the variable frequency of attainment of the epidemic threshold. It is in these intangible, ulterior conditions, not in the mere physiological fact of the threshold's existence, that the interest of the naturalist lies, for they would reveal the essential factors controlling animal life and distribution.—T. T. McC.

## PHOTOPERIODICITY

"Sexual Photoperiodicity."—T. H. Bissonnette. 1936. *Quarterly Review of Biology*, 11:371-386. A valuable review of this important subject, the author giving much more detail than in his shorter papers cited in the January number of *Bird-Banding*. Bibliography of 127 titles.

## BOOKS

**The Passenger Pigeon in Ontario.**—Margaret H. Mitchell. 1935. Contributions of the Royal Museum of Ontario, No. 7, 181 pages. Cloth, \$1.50; paper, \$1.00. It is always sad to read of the fate meted out to this superb bird by the greed and cruelty of man, but it is well for us to be reminded again of the shameful story, for the same thing is being repeated now with many, many birds and animals. The present volume is based on answers to a questionnaire sent out over the province of Ontario, but much material is taken from published sources. It is a pity that the author did not consult Bent's "Life Histories," Bull. 162 of the U. S. National Museum (1932); there she would have learned that *Ectopistes migratorius* laid but one egg, and that incubation lasted fourteen days. The ease with which a mistaken conclusion is adopted is illustrated by the statement: "It is becoming steadily more apparent that weather has little to do with spring migration of birds. The migratory species obeys an urge from within rather than responding to an impulse from without. . . . It might seem a logical conclusion that early arrivals should follow upon mild winters, but this is not the case." (Pages 90-91.) On the contrary, weather has a great deal to do with the spring migration of many early migrants, but it is not the temperature of the winter, nor even of the whole of any spring month that is the crucial factor, but the temperature of much shorter periods. The book contains a great deal of interesting and valuable information on the history of this vanished species.

**October Farm.**—William Brewster. 1936. Cambridge, Mass. Harvard University Press. 285p. \$2.50. This distinguished ornithologist was a keen and careful observer, possessed of a wide sympathy for nature, and, moreover, he was a master of English. The present selection from his diaries is full of interest, with notes on many birds, mammals, and other creatures, and descriptions of the beauty of the woods. Unfortunately the book was published without an index—an unpardonable omission in an anecdotal volume such as this. On

page 49 the length of time which the male Flicker spent in feeding each of his young is variously given as one and a half seconds and one and a quarter minutes; from a sentence on page 51 it would seem that the first statement was the correct one. Mr. F. H. Allen in a review in *Bird-Lore* explains that the mysterious "Kicker" was later identified as the Yellow Rail. Mr. Brewster's tales of muskrats are delightful, while his account of the large and distinguished repertoire of song of Lincoln's Sparrow comes as a surprise. The story of the devotion of the goose and guinea-hen is utterly charming.

**Artist and Naturalist in Ethiopia.**—Louis A. Fuyertes and W. H. Osgood. 1936. Doubleday, Doran. Garden City, N. Y. 149p. \$5.00. This handsome book, consisting of the diaries of the two authors on their collecting trip in 1926, is bound to make the stay-at-home appreciate the hard, hard work involved in such an undertaking. A diary means much to the writer, for it can bring back the whole scene to him, but to outsiders the effect is somewhat barren and disappointing. One would like to hear more impressions of the living birds, rather than so much about killing them. Sixteen of Fuyertes' magnificent paintings are beautifully reproduced in color.

**Canary. The History of a Family.**—Gustav Eckstein. 1936. Harpers, N. Y. 281p. \$2.50. To those who know the Canary only as a solitary prisoner with nothing much to do but eat, sleep, and sing, the tale unfolded in this book will come as a revelation. This community of Canaries living in freedom in a laboratory with all sorts of objects for experimentation showed themselves as highly socialized creatures and developed striking personalities. There is a charm about "Canary," despite the disconcerting proportion of incomplete sentences, for Professor Eckstein writes of his charges with an affection and sympathy that is quite disarming.

**New Zealand Birds and How to Identify Them.**—Pérrine Moncrieff. 1936. 2nd ed. Auckland, N. Z. Whitcomb & Tombs. 142p. 7/6. This is a popular handbook written by a former President of the Royal Australasian Ornithologists' Union and dedicated to the Children of New Zealand. Mrs. Moncrieff's earnest desire to arouse interest in the unique and vanishing avifauna of the country is shown by her chapter headings—"Importance of New Zealand Birds," "Hints on Bird Observation," "List of Birds according to their Usual Haunts"—and by her rather confusing arrangement of her birds in "order of size." The colored plates are attractive, but the photographs of "stuffed" birds are sad-looking and misleading as to relative sizes. To an outsider the number of birds that have been introduced—mostly from England—is amazing. The endemic avifauna offers a wonderful field for research in life-history problems, and one wishes Mrs. Moncrieff all success in her admirable efforts to save the remnants of native wild life from destruction.

**A Monographic Study of the Red Crossbill.** Ludlow Griscom. 1937. Proc. Boston Society Natural History, 41 (5):77-210. \$1.60. A very interesting treatment of a puzzling and erratic bird "that is rarely present in any one section of its breeding range more than three or four years in succession" and that "rarely breeds in the same month two consecutive years." *Loxia curvirostra* has been recorded as breeding in every month in the year. The author points out two factors that may account for some of the vagaries of this species: its dependence on a crop of cones (and these are produced very irregularly) and competition with the white-winged Crossbill (*Loxia leucoptera*), which is more northerly, but often invades the range of the Red Crossbill. One wishes the author had devoted more space to life-history matters and that he had discussed the important paper of the McCabes (*Condor*, 1933, :136-147) in which they suggest that Crossbills may breed the year they are hatched. There is no bibliography.

**Falconry.**—Gilbert Blaine. 1936. Philip Allen, London. This authoritative instruction for beginners in falconry is of only general interest to ornithologists. Irides in the Accipitrine Hawks change from yellow to fiery orange with age. The best average weight for a falcon flown at game is two pounds, for a tiercel twenty ounces. A Goshawk in France caught rabbits until it was almost thirty years of age.—(Reviewed by J. J. Hickey.)