

The assistance of our many contributors in the preparation of earlier volumes has been invaluable, and I ask that it be continued. Those who send in material suitable for use in the work will have their names placed on the mailing-list to receive future volumes.—ARTHUR CLEVELAND BENT, Taunton, Massachusetts.

A letter from William J. Lyon to Ira N. Gabrielson, Chief U. S. Bureau of Biological Survey, Proposing a Change in the Inscription on Bird Bands

Ira N. Gabrielson, Chief,
U. S. Biological Survey,
Dept. of Agriculture,
Washington, D. C.
Dear Sir:

It is my conviction that a much increased number of reported returns and recoveries would result from a change in the marking of the bands used by bird-banders under Federal permit.

Some years ago Dr. A. R. Shearer, of Mont Belvieu, Texas, wrote about the trouble he had had in securing the bands from birds killed for food by colored people and Mexicans. Even when he knew that a bird with a band had been taken, he found that the hunter's fear of prosecution for illegal killing prevented the delivering-up of the bands. He could get bands at last only by visiting these people frequently and obtaining their confidence.

Apparently "U. S. Biological Survey" means nothing to many hunters, and to the illegal killer, it suggests Federal prosecution. Hence I propose that, in the interest of securing the largest number of returns from the birds that are killed, the bands be stamped "Notify Box Z, Washington, D. C.," or in some similar manner.

Yours very truly,
WILLIAM I. LYON,
Inland Bird-Banding Association.

November 30, 1935.

RECENT LITERATURE

(Reviews by Margaret Morse Nice)

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 books or articles or literal translations of such titles. Other headings refer to general subjects or are abbreviated from titles in foreign languages. References to periodicals are given in italics.

BANDING AND MIGRATION STUDIES

Banding in Switzerland.¹ A. Schifferli, Jr., reports 20,681 birds banded in 1933, of which 7 species of Titmice totaled 7202, Starlings 3719, and Swallows (*Hirundo rustica*) 1140. The arrangement of data is excellent, for one can see at a glance the age of the bird when banded and recovered and the distance and direction of the place of recovery from that of banding. Many examples are given of young returning to their birthplaces. A few distant recoveries are reported for Blue Titmice (*Parus cæruleus*), 860 kilometers southwest, and Coal Titmice (*Parus ater*), 195 kilometers south. A Swallow reached the age of seven years, as did a Common Buzzard (*Buteo buteo*). Two Alpine Swifts (*Micropus m. melba*) banded as nestlings were found nesting in their birthplace eight years later.

Dutch Banding.—In the 22d report of banding results from the National Museum of National History at Leiden² we read that some of the Starlings (*Sturnus v. vulgaris*) that breed in Holland are permanent residents, while others winter in England. Fall visitors come from Sweden and Germany; some pass the winter in Holland, others going to England. Three birds of five years are reported and one of nine and a half. European Cormorants (*Phalacrocorax carbo sinensis*) probably do not breed until three or four years old, the sexually immature birds apparently spending the summers in their winter quarters. Ten birds reached ages of four to nearly seven years.

The Banding Station at Wassenaar³ states that 8058 birds were banded from May, 1933, to May, 1934; 4916 of these were Starlings and 1087 Chaffinches (*Fringilla caelebs*).

Ringed Birds Recovered in Bulgaria⁴—From 1931 to 1933, 61 ringed birds from other countries were taken in Bulgaria, among them 5 Hawks, 23 White Storks, 22 Ducks, 5 Black-headed Gulls (*Larus ridibundus*), and a Gray Heron (*Ardea cinerea*) nearly seven years old that had been banded in Rumania.

"Proportionate Numbers in Relation to Age and Sex in Fall and Spring Migrants."⁵—A tabulation of the records of Common Red-starts (*Phoenicurus phoenicurus*), Blackbirds (*Turdus merula*), and Chaffinches (*Fringilla caelebs*) taken at Helgoland showed a marked preponderance of females, especially in spring. Dr. Drost says that with the two latter species some males do not migrate, but this does not explain their even greater scarcity in spring. In the Chaffinch the proportion of adults to young in the fall was 100 to 256. In the Blackbirds the fall proportion was 100 to 174, and the spring proportion 100 to 105. The author suggests that this may point to a 50 per cent winter loss of adults and 70 per cent loss of young birds.

Return to Winter Quarters.⁶—The Governor of Sinai describes how a Gray Wagtail with a broken leg wintered in his garden for five years, a Black Redstart with a scalped head for four years, and a very tame Woodcock for seven years.

¹ 10. Bericht des Schweizerischen Vogelwarte Sempach. 1935. *Ornith. Beobachter*, 32, 10:155-174.

² Junge, G. C. A. 1935. Resultaten van het Ringonderzoek betreffende den Vogeltek, ingesteld door het Rijksmuseum van Natuurlijke Historie te Leiden. *Ardea*, 24:166-199.

³ Bouma, J. B., J. C. Koch en M. J. Tekke. 1935. Jaarsverlag 1933-1934 van het Ringstation Wassenaar. *Ardea*, 24:97-111.

⁴ Pateff, P. 1935. Die im Ausland beringten und in Bulgarien erbeuteten Zugvögel. II. Mitteilung. *Bull. Inst. Roy. d'Hist. Nat. a Sophia, Bulgarie*. 8:172-177.

⁵ Drost, R. 1935. Ueber das Zahlenverhältnis von Alter und Geschlecht auf dem Herbst- und Frühjahrzüge. *Der Voegelzug*, 6:177-182.

⁶ Jarvis, C. S. 1935. When Migrating Birds Get South. *The Countryman*. Oct:97-99.

HOMING EXPERIMENTS

Three sets of experiments with winter birds have recently been published. The most ambitious ones involved the capture of 1027 birds at their roosts at Magdeburg, Germany, from January 5th to March 30th, and shipping them the same night by express to five places from 210 to 470 kilometers distant in several directions. Only one bird—a Blackbird (*Turdus merula*) (released 420 kilometers south, retaken February 2d) returned before the end of March, but 33 were reported in Magdeburg by the end of July. Quite a number of the birds stayed for varying lengths of time in the place of release, some even nesting there. These distances—126 to 282 miles—are much longer than any which other experimenters have used with birds in winter. The longest distance of a winter return of which I know was a Gambel Sparrow (*Zonotrichia leucophrys gambeli*) released 34 miles from home, the only one of 16 birds of four species that accomplished this feat (E. L. Sumner, Jr., and J. L. Cobb. 1928. Further Experiments in Removing Birds from Places of Banding. *Condor*, 30:317-319.)

Of 30 House Sparrows (*Passer domesticus*) released in Potsdam, 6 kilometers from the place of capture, two returned; Titmice, a Nuthatch (*Sitta europea*

homeyeri), and a Spotted Woodpecker (*Dryobates m. medius*) returned from 4 kilometers, but none from 12 kilometers.⁸

A female Chaffinch (*Fringilla caelebs*) showed great persistence in homing: taken from 20 to 30 kilometers from her home in Nice in February, she returned promptly, once making the distance of 30 kilometers (24 miles) in one day. But when released again at this same place on March 1st during a violent mistral, she was not seen again until March 17th.⁹

⁷ Hilprecht, A. 1935. Heimfindeversuche mit Wintervögeln. *Der Vogelzug*, 6:188-196.

⁸ Wenkel, F. 1935. Verfrachtungen an Sperlingen, Meisen und Mittelspecht. *Der Vogelzug*, 6:200-201.

⁹ Mennig, S. 1935. Faculté d'Orientation chez les Oiseaux. *Le Gerfaut*, 25:138-140.

LONGEVITY

Records of longevity will be found in Numbers 1, 2, 4, and 6.

WEIGHT

Weights of birds coming to trapping stations are given by Marples¹⁰ and Mountfort¹¹. In the former paper maximum, minimum, and average figures are given on more than four hundred weighings of twenty-two species, but no differentiation is made as to sex and age. In the latter the birds are divided as to sex and age wherever possible. A Chiffchaff (*Phylloscopus c. collybita*) kept in captivity for three hours in the light lost 22.5 per cent of its weight, while another kept in the dark lost 5.29 per cent. A third paper gives the weights in pounds of 356 Geese of the *Branta canadensis* group.¹²

Other data on weight will be found in Numbers 21 and 38.

¹⁰ Marples, Geo. 1935. Some Results of Trapping and Ringing. *British Birds*, 29:22-25.

¹¹ Mountfort, G. R. 1935. Variations in the Weights of Birds. *British Birds*, 29:145-148.

¹² Swenk, M. H. and P. A. Dumont. 1935. The Weights of 356 Nebraska Specimens of Geese of the *Branta canadensis* Group, formerly contained on the D. H. Talbot Collection. *Nebraska Bird Review*, 3:135-139.

LIFE HISTORY

Study of a Nesting Colony of Starlings.¹³ A valuable and important paper. About 80 per cent of the breeding adult *Sturnus v. vulgaris* at a colony at Wageningen, Holland, were banded (by being trapped in the boxes) from 1932 to 1934, and all of the young from 1931 on; 124 of the 250 adults returned (49.6 per cent) and 81 (8.3 per cent) of the young. The best method of distinguishing sex is by the color of the iris, which is dark brown in the male, but in the female consists of two concentric rings, the inner brown, the outer yellowish. The nest boxes are visited by the males every month in the year and by the females every month but December, January, and July. Of the banded nestlings, 13 females bred at one year, 6 at two years; 4 males bred at one year and 15 at two years. Males may take longer to reach maturity, or their non-breeding may be due to the shortage of females. Each year there are quite a number of unmated males, some of which bred the previous year; some of these males get mates for the second brood. If a second brood is raised, the pair may stay together or they may separate; the birds do not mate permanently, and a remating a second year has occurred only once. Young females start to lay slightly later than older ones and usually lay fewer eggs; records are given for seven banded birds for two years and for four birds for three years. Young females never laid seven eggs, but there were seven cases of seven eggs among sixty sets of older females and one set of eight by a five-year-old bird that had laid seven eggs during each of the two previous years. The average size of brood raised per pair ranged between 4.2 and 4.8 birds except in two years when rats and a Carrion Crow (*Corvus corone*) preyed on the young.

The author has no explanation for the excess of males; the survival of breeding females is as good as that of males. The nestlings that returned to breed were equally divided as to sex. As to the return of the young, Dr. Kluijver believes that slightly less than half the young that survive come back to the home colony, the

others nesting elsewhere. One of his young birds was found in the breeding season forty kilometers distant. He calculates the average age of a Starling that survives to breed as three years. It is a pity that a paper of such wide interest as this should not be published in English or German.

"The Natural History of the Double-crested Cormorant (*Phalacrocorax auritus auritus* (Lesson))."¹⁴ An excellent study of the biology of this colonial bird. The male selects a nest-site, and "sings" to attract a female. Birds steal material from one another's nests, and sometimes eggs are broken in the process. The monograph contains a wealth of material on many phases of the bird's life-history and economic relations and interesting observations on behavior of young in captivity.

A Nesting Study of Leach's Petrel.¹⁵ Both sexes in this species incubate, one bird often remaining four days at a stretch. Young birds attain adult weight (40-45 grams) at about 20 days, reach 69 grams by 34 days and decline after 40 days. The incubation period of Procellariiformes is extraordinarily long in relation to the size of the eggs (see Heinroth¹⁶), but it is not clear why—on a basis of one record of at least 42 days—the author supposes that "in all probability incubation endures for at least 50 days," adding that "This long period has been affirmed by natives who live on the islands where the birds breed." He suggests that the "long incubation period may be correlated with the low temperature and great humidity of the burrow, and to the low body temperature of the adults (106° F.)." But Baldwin and Kendeigh¹⁷ found that 106.3° F. was the average body temperature of female birds (of eight passeriform species) during the breeding season (p. 157). With the Storm Petrel (*Hydrobates pelagica*) R. M. Lockley¹⁸ found the incubation period lasted 38 to 40 days and the fledging period 54-68 days, averaging 61 days.

"Mockingbird Life History Studies."¹⁹ A continuation of the excellent observations published in *The Migrant*, 1933, 4:29-35, and reviewed in *Bird Banding* for January, 1934, and a splendid example of life-history studies with the aid of colored bands. Some of the males of *Mimus p. polyglottos* and a few females are permanent residents. "Mockingbirds choose specific areas, usually, in Tennessee, during late autumn or early spring, which they defend vigorously from their own and other species, particularly Robins, Brown Thrashers, and Cardinals." Females also hold territory in winter. A "territory establishment" ceremony is described: "The birds face each other, step backward, forward, sideways, usually ending with a sudden turn, each flying in the opposite direction on his own side." (See the Micheners' paper, *Condor*, 37, 97-140, reviewed in *Bird-Banding*, July, 1935). Both males studied—"B" and "Y"—had the same mates two seasons in succession. "Y" was zealous in feeding his young and in guarding his nest, attacking Mrs. Laskey when she appeared in the garden, while "B" showed little concern over enemies and took no share in feeding the young. "The egg laying periods were marked by some zealous singing from high perches with an occasional flight or tossing in song. 'Y' almost ceased singing when the young hatched, but 'B' sang most excitedly at that time for a few days," also singing at night.

The nest is built by both birds, but incubation is performed by the female alone. Incubation takes 12 days, fledging 10 days. Five broods were attempted by one pair during one season. Courtship and singing were greatly influenced by temperature.

"Some Nesting Habits of the Brown Thrasher."²⁰ Many facts are given on the nesting of *Toxostoma rufum* in Nashville, Tenn., but unfortunately no banding appears to have been done, either of adults or young. Both birds incubate, the female 64 per cent of the time during one day's observation, the male 27 per cent, but details are not given as to the length of the periods on and off the nest. The male builds almost as much as his mate on the first nest, but she builds the second nest while he cares for the young. Five to seven days are spent on first nests, and three to four days on later ones, these not being as well built as the

early nests. Incubation averaged twelve and one half days, fledging nine to thirteen days.

"Studies of the Short-billed Marsh Wren (*Cistothorus stellaris*) in Michigan." L. H. Walkinshaw. 1935. *Auk*, 52:362-370. Incubation lasted 14 days, fledging 12 to 14 days. The female did most of the feeding of the young, while the male "sang as many as twenty-two hours in one day."

"Temperature and Growth Studies on the Barn Swallow."²¹—Records on 34 nestlings of *Hirundo erythrogaster*. Increase of weight was most rapid between the 4th and 10th days, the maximum (about 21 grams) being reached on the 12th day, after which weight gradually decreased until, at the time of leaving the nest at 20 days, it averaged 17.5 grams. The weight of three female parents averaged 19.6 grams. Temperature-control became established at about the 9th or 10th day. Body and feather growth in a brood subjected to excessive heat beneath a tin roof appeared to be affected adversely.

"Notes on Population Problems and Territorial Habits of Chiffchaffs and Willow-Warblers."²²—Censuses of *Phylloscopus c. collybita* and *P. t. trochilus* over eight years gave the following results: In two tracts of two hundred and three hundred acres the number of Chiffchaffs were 63 and 42, the numbers of unmated cocks 25 and 14 (40 and 30 per cent), while the percentage of success of 20 and 14 nests were 60 and 70 respectively. On the same tracts the numbers of Willow-Warblers were 90 and 53, the number of unmated cocks 18 and 23 (20 and 43 per cent), and the success of 36 and 15 nests was 86 per cent for both tracts. These percentages of unmated males are surprisingly high, but the author's methods of diagnosis carry conviction. The earlier nesting dates of the Chiffchaffs before the foliage is out renders their nests more open to predation than later nests. "Not all territories are rigid. Those of the unmated birds show every grade of fluidity, though some are very definite for given periods. The feeding territories of mated birds do not necessarily coincide with the nesting sites."

Polygamy is reported with a Red-breasted Merganser (*Mergus serrator*) on the Bird Island Schlei-münde²³ and in the case of a Chaffinch (*Fringilla c. c. c.*) in Belgium.²⁴ Two instances of extra females feeding young are given for the Violet-green Swallow (*Tachycineta thalassina lepida*) in Colorado.²⁵

Papers on Hawks.—In three studies of Hawks in Holland and Germany the male was observed to do all the hunting for his mate and young. The species were Hobby (*Falco subbuteo*),²⁶ Sparrow Hawk (*Accipiter n. nisus*)²⁷ and Kite (*Milvus m. milvus*).²⁸ The island Signilskär is a stopping-place for many transients, but it has little cover on it; the majority of birds killed there by *Accipiter nisus* have red in their plumage—Chaffinches, Bullfinches, Redstarts, and Redbreasts. The Vogelwarte believes this is due to the conspicuousness of these birds in this particular environment.²⁹

In an excellent paper on the ecology and nest life of Marsh Hawks (*Circus hudsonius*) in Minnesota³⁰ we learn that pairs may nest as near as two hundred yards to each other, that incubation lasts 30 to 32 days, and is performed by the female; that the male caught 80 per cent of the food for the young and transferred it to his mate in the air; and that if in her absence he brought it to the nest, he appeared not to notice the young. The number of feedings per day increased from four at the age of 8 days to 24 at 23 days, but dropped to 18 at 30 days and to 8 at 34 days. The young began to fly at about 5 to 6 weeks of age and could catch food in the air dropped by the parents when 7 to 8 weeks old.

A young male prairie Falcon (*Falco mexicanus*) taken from the nest and raised by hand became an affectionate and interesting pet.³¹

Papers on Storks.—The problem of sexual maturity in the White Stork is discussed by Steinbacher³² and Schüz,³³ the latter reviewing the literature on the subject of the age at which this bird begins to breed, finding that it usually does so

when three or four years old, but that there have been two cases of breeding at two years of age, one bird being a female, the sex of the other being undetermined.

The recent increase in the numbers of breeding Storks is discussed in three papers. In Saxony there has been a rapid rise since 1928; the average number of young raised per year per pair has ranged from 2.6 to 3.58, during 1933 and 1934 being 3.01.³⁴ In Schleswig-Holstein there was a rapid decrease from 1907 to 1930, and a rapid increase since then. The average number of young raised per pair was 2.6 in 1925 and 2.4 in 1930 and 1934. In 1925 twelve per cent of the pairs raised no young, but during 1930 and 1934 the percentage was fourteen.³⁵ In Bavaria the number raised per pair in the very wet, cool season of 1933 was 2.7, and in the extraordinarily dry season of 1934, 2.84. In the former year 10.6 per cent of the pairs raised no young, in the latter 15 per cent, but this loss was offset by the fact that 44 of the 119 pairs raised 4 young apiece (33 raising 3 young), whereas in 1933 three young were raised by 36 of the 113 pairs and four young by 32 pairs. One pair in 1934 raised 6 young!³⁶

³³ Kluivjer, H. N. 1935. Waarnemingen over de Levenswijze van den Spreeuw (*Sturnus v. vulgaris* L.) met Behulp van Geringde Individuen. *Ardea*, 24:133-166.

³⁴ Lewis, H. F. 1929. Ottawa, Ru-Mi-Lu Books. 94 p. 75c.

³⁵ Gross, William A. O. 1935. The Life History Cycle of Leach's Petrel (*Oceanodroma leucorhoa leucorhoa*) on the Outer Sea Islands of the Bay of Fundy. *Auk*, 62:382-400.

³⁶ Heinroth, O. 1922. Die Beziehungen zwischen Vogelgewicht, Eigewicht, Gelegegewicht und Brutdauer. *Journal für Ornithologie*, 70:172-285.

¹⁷ Physiology of the Temperature of Birds. 1932. Scientific Pub. Cleveland Mus. Nat. Hist. III. 196 p.

¹⁸ On the Breeding Habits of the Storm-Petrel, with Special Reference to its Incubation and Fledging-Periods. 1932. *British Birds*, 25:206-211.

¹⁹ Laskey, A. R. 1935. *Auk*, 62:370-382.

²⁰ Erwin, W. G. 1935. *Jour. Tennessee Acad. Science*, 10:179-204.

²¹ Stoner, D. 1935. *Auk*, 62:400-408.

²² Price, M. P. 1935. *British Birds*, 29:158-166.

²³ Ringleben, H. 1935. Polyandrie und Polygynie bei *Mergus serrator*. *Ornithologische Monatsberichte*, 43:148.

²⁴ Van Benedin, A. 1935. Elevage des Jeunes Oiseaux par des Nourriciers étrangers. *Le Gerfaul*, 25:40-41.

²⁵ Shirling, A. E. 1935. Observations on the Violet-green Swallow. *Wilson Bulletin*, 42:192-194.

²⁶ Tinbergen, N. 1935. Een Boomvalknest. *De Levende Natuur*, 40:143-150.

²⁷ Tinbergen, L. 1935. Waarnemingen bij een Nest van de Sperwer (*Accipiter n. nisus* (L.)). *Ardea*, 24:67-86.

²⁸ Thiede G. u. A. Zänkert. 1935. Aus dem Brutleben des Roten Milans. *Beiträge Fortpflanzungsbiologie der Vögel*, 11:121-129, 169-173.

²⁹ Nordberg, S. 1935. Zur Ernährungsbiologie, des Sperbers, *Accipiter n. nisus* (L.), während der Zugzeit. *Ornis Fennica*, 12:65-71.

³⁰ Breckenbridge, W. J. 1935. An Ecological Study of Some Minnesota Marsh Hawks. *Condor*, 37:268-276.

³¹ Pierce, W. M. 1935. Experiences with Prairie Falcons. *Condor*, 37:225-230.

³² Steinbacher, J. 1935. Ricerche sulle Gonadi della Cicogna Bianca. *Rassegna Faunistica*, 2:3-15.

³³ Schütz, E. 1935. Riconoscimento dell'Eta delle Cicogne che Covano. *Rassegna Faunistica*, 2:16-23.

³⁴ Zimmermann R. u. W. Scholze. 1934. Das Vorkommen des Weissen Storches, *Ciconia c. ciconia* L., in Sachsen und die Wiedernahme seines Bestandes seit 1928. *Mitt. Vereins sächsischer Ornithologen*, 4:147-174.

³⁵ Emeis, W. 1935. Bestandsschwankungen und heutige Verbreitung des Weissen Storches in Schleswig-Holstein. *Journal für Ornithologie*, 83:588-601.

³⁶ Dietz, J. 1935. Der Weisse Storch als Brutvogel im Rechtsrheinischen Bayern in den Jahren 1933 und 1934. *Verh. Ornithologischen Gesellschaft in Bayern*, 20:538-562.

TERRITORY

Territorial Behavior in the Wood Warbler (*Phylloscopus sibilatrix*).³⁷ After the arrival of a mate the male restricts his activities to a smaller territory than before but defends it more vigorously, driving out *all* other birds—Warbler, Titmouse, or Woodpecker. "Il ne permet à aucun autre oiseau, Pouillot, Mésange ou Pic, de traverser ces nouvelles frontieres." Before he gets a mate he sings at intervals of 25 seconds to 2 minutes, but afterwards at intervals of 4 to 10 minutes. His first song advertises his want of a mate, his second announces that the territory is occupied.

The Meadow Pipit (*Anthus pratensis*) often nests in little colonies in Brittany and has no territory. In late February and early March two or three males follow

a female as she feeds and later fight each other in the air. "The possession of the female is the sole motive and these disputes never take on the character of the defense of a chosen territory." The earliest sets contain 4 eggs, later ones 5 eggs. The weight of 20 nests ranged from 4 to 13.5 grams.

"**Bush-Tits 'Shadow-Boxing'.**" J. M. Robertson, 1935. *Condor*, 37 : 257-258. Both male and female *Psaltriparus m. minimus* fought their reflections in a window one hundred feet from their nest. "The instinct to defend the selected territory during the nesting period must predominate over the instinct to flock together that is so conspicuous a part of the behavior of these birds during the rest of the year."

Further data on territory will be found in Numbers 13, 14, 19, 22, 30, 39, 40, and 41.

³⁷ Mountfort, G. R. 1935. Manifestations Visibles du Développement Sexuel des Oiseaux *L'Oiseau et La Revue française d'Ornithologie*, 5:494-505.

³⁸ Lebourier, E. et Rapine, J. 1935. Ornithologie de la Basse-Bretagne. *Anthus pratensis* L. 58. Le Pivit des Prés. *L'Oiseau et La Revue française d'Ornithologie*, 5:462-480.

BIRD BEHAVIOR

"**The Courtship of Gould's Manakin (*Manacus vitellinus vitellinus*) on Barro Colorado Island, Canal Zone.**"³⁹ Dr. Chapman gives a vivid picture of strange courtship patterns in an important paper that should be read in full by all students of bird behavior. "The manakins (family Pipridæ) are small, passerine birds inhabiting the American tropics and subtropics." As a group "they possess notable courtship behavior which in the physically better equipped species becomes complex, coöperative, and well organized." The breeding season of Gould's Manakin lasts for eight months; it is inaugurated by the gathering of the males at their "courts," five to seven of which, situated about thirty to forty feet from each other, "constitute a group or *lek*." The court is a "small space on the forest floor, from which the male removes all loose material. This at once becomes the focal point of his life; to induce the female to visit him in court for the purpose of mating now becomes the chief object of his existence." "The vocal powers of the males are limited and, to announce the location of their courts to the females, they produce with their wing-feathers loud snapping and whirring sounds which can be heard at surprising distances. With rare, and generally explicable, exceptions territorial rights are rigidly observed." Every two or three hours the male leaves his court for a few minutes to get his food which consists of berries. The males "appear to be on peaceful terms with each other. During periods of inactivity, owners of adjoining courts may perch side by side." Very interesting "submissive-dominant" relations were observed between neighboring males. Upon the arrival of a female all the males enter their courts. "Simultaneously they whirr, snap while jumping around and across court, and perform a variety of acrobatic feats, all designed to attract the attention of the female." Experiments with stuffed birds showed that the male courted the female and sometimes attempted coition, while a stuffed male placed in or near a court was attacked with fury.

The Courtship of the Capercaillie.⁴⁰ Much on the same order as that of the gay little Manakin, but with far less time devoted to it, is the courtship of the great *Tetrao urogallus*, as carefully observed by two French ornithologists in the Alps, their paper being illustrated with striking sketches. The males gather at *leks*, crow, and leap in the air, beating their wings, all the cocks leaping simultaneously. Each defends his "mating territory," primarily by intimidating postures, the authors never observing any fights. The female watches from a tree, from which she descends to join one of the males.

The Courtship of the Red-necked Phalarope.⁴¹ Careful, detailed studies of the territorial, mating, and egg-laying behavior of a particular *Phalaropus lobatus*.* The female arrives before the male, and takes up a territory, which she defends—although not very vigorously—from other females of the species. She

advertises her presence by a ceremonial flight and special call or song, indulging in it "every five minutes for several hours," until she attaches a mate, whereupon she becomes silent. Both birds made "scrapes," sometimes alone but more often together. When ready to lay, the female gave her ceremonial flight and song once more and was closely followed by the male. The males took complete charge of incubation and care of the young. Excellent discussions follow on the function of color in plumage, "supposed polyandry," "discrimination of the other sex," and other phases of bird-behavior. A valuable paper that deserves to be widely read.

"Parental Instincts in Black Phoebes." E. C. Kinsey. 1935. *Condor*, 277-278. A pair of *Sayornis nigricans* accepted newly hatched young in place of fresh eggs; another accepted young ready to leave the nest in place of newly hatched birds, while a third pair accepted partly grown young in place of slightly incubated eggs. In all these cases the cycle was advanced. A fourth pair accepted young several days old in place of young ready to leave, but when eggs were given to the birds that had young several days old, the nest was deserted.

The book on "Sea Terns or Sea Swallows" reviewed below contains much material on bird-behavior; see also Numbers 14, 19, and 31.

* This species is the Northern Phalarope (*Lobipes lobatus*) of the A. O. U. Check-List.

³⁵ Chapman, F. M. 1935. Bull. American Museum Natural History, 78:471-525.

⁴⁶ Hainard, R. et O. Meylan. 1935. Notes sur le Grand Tétrás. *Alauda*, III, 7:282-327.

⁴¹ Tinbergen, N. 1935. Field Observations of East Greenland Birds. I. The Behaviour of the Red-necked Phalarope (*Phalaropus lobatus* L.) in Spring. *Ardea*, 24:1-42.

POPULATION THEORIES

"On the Dynamics of Populations of Vertebrates."⁴² Severtzoff believes that populations are always striving to increase to a maximum, whereupon they are decimated by a "plague," which may be abiotic—cold, floods, drought, etc., or which may be epidemic disease. He contends that "the coefficients of the periodic reproduction and of the dying off of the population must be specific for each species and must correspond to the potential fertility and to the mortality rate of that species between two plagues." "This shows the utter impossibility of admitting a simple periodicity in the mass reproduction of different species, connecting it with the periodicity of climatic fluctuations, resulting from the eleven-year cycle of sunspots."

In this and another paper⁴³ the author gives figures on fluctuations in various game populations, and he concludes that mammals lose 50 per cent of the total young born, while only 10 per cent of birds hatched reach maturity. Although these last generalizations are too sweeping, his point of view is suggestive and the papers are well worth reading.

"Wildlife Cycles in Relation to the Sun."⁴⁴ Cycles in populations and in migration are illustrated by means of smoothed curves. The paper is not convincing to the reviewer.

"Solar Radiation and Weather Studies." C. G. Abbot, 1935. Smithsonian Mis. Collection, Washington, D. C. 94 (10). 89 p. Basic data on periodicity in solar phenomena.

"Over-populations and Predation. A Research Field of Singular Promise." P. L. Errington, 1935. *Condor*, 37: 230-232. This brief, suggestive paper points out many vital questions in the matter of predation in relation to populations and over-populations, showing how little we really know in this field.

⁴² Severtzoff, S. A. 1934. *Quarterly Review of Biology*, 9:409-437.

⁴³ 1934. Vom Massenwechsel bei den Wildtieren. *Biol. Zeil.* 54, 7/8, 337-364.

⁴⁴ L. W. Wing. 1935. *Trans. 21st American Game Conference*: 345-363.

BOOKS

"Fauna of the National Parks of the United States."—George M. Wright, J. S. Dixon, and B. H. Thompson. 1933. Wild Life Survey, Fauna Series No. 1. 157 p. 20 cents. An excellent little book treating the faunal problems of each park, and concluding with twenty admirable suggestions for National Park Policies, three of the most interesting being:

"That the rare predators shall be considered special charges of the national parks in proportion that they are persecuted everywhere else. That no native predator shall be destroyed on account of its normal utilization of any other park animal, excepting if that animal is in immediate danger of extermination, and then only if the predator is not itself a vanishing form. That species predatory upon fish shall be allowed to continue in normal numbers and to share normally in the benefits of fish culture."

"Michigan Waterfowl Management."—M. D. Pirnie. 1935. Department Conservation; Game Division, Lansing, Mich. 328 p. \$1.50. A most practical handbook, amply illustrated and with headings and summaries in heavy black type. The first part treats of waterfowl conditions and problems in Michigan, while the second deals with Wildlife Management and the Waterfowl Program with chapters on Laws and Regulations, Refuges, Duck Foods and Planting, Propagation and Restocking, Predator Control, a Management Calendar, and Restoration. The only suggestion for improvement occurring to the reviewer would have been a final chapter summarizing general principles.

"The Bird Book."—Neltje Blanchan. 1932. Doubleday, Doran & Co. Garden City, N. Y. 498 p. \$2.95. This is a reprint of the familiar "Bird Neighbors" and "Birds that Hunt and are Hunted" with the addition of colored plates by Nellie Fairpoint. The text has considerable charm and is well calculated to arouse interest in the beginner, although the arrangement of the biographies in the first part of the book according to the *color of the bird* is confusing, to say the least. As to the colored plates they are a decided detriment to the book, the pictures being unbelievably bad.

"Bird and Animal Paintings."—R. Bruce and Carra E. Horsfall. Nature Magazine, Washington, D. C. 58 p. \$1.50. These colored plates and brief biographies of some one hundred fifty birds and mammals chosen from all over the country are well adapted to interesting children in nature.

"Birds of the States."—R. Bruce and Carra Horsfall. Nature Magazine, Washington, D. C. 50 cents. Illustrations and brief biographies of the thirty species that have been chosen as "State Birds," with an account of the campaigns of election, such campaigns being considered as possessing definite educational value.

"Sea Terns or Sea Swallows; Their Habits, Language, Arrival and Departure."—George and Anne Marples. 1934. Country Life, London. 228 pages. 15s. This large and handsomely got up monograph, illustrated with beautiful photographs, is concerned partly with the status of different species of Terns on the British Isles, but mostly with observations on their life-history. Five species are considered: Sandwich (*Sterna s. sandvicensis*) and Little Tern (*S. a. albifrons*), and the Common (*S. h. hirundo*), Arctic (*S. macrura—paradisæa*), and Roseate (*S. d. dougalli*) Terns, these last three nesting on both sides of the Atlantic. Many experiments were carried out in exchanging eggs between different nests, in changing the surroundings of the nests, moving eggs, and painting them different colors. Although there were specific and individual differences, the birds on the whole were found remarkably tolerant of changes and fairly well able to cope with new situations. The value of these interesting experiments would have been greater if the authors had summarized their findings and also compared them with the work of other investigators. The book makes a distinct contribution to the subject of bird-behavior and will prove especially interesting to banders in America and other countries who have worked with Terns.

"The American Eagle. A Study in Natural and Civil History." Francis H. Herrick. 1934. Appleton-Century Company, New York. 267 pages. \$3.50. A notable book on the Bald Eagle (*Haliaeetus leucocephalus*) which has been the subject of the admirable studies of the author for many years. All phases of the bird's life-history are treated, chiefly from knowledge gained by long hours of watching from the observation tower, but also from experiments with hatching eggs and raising young in the laboratory, and finally from a wide acquaintance with the literature on eagles. The last part of the volume is concerned with the "Eagle as Emblem" from the times of earliest history to the present. The book is well written and well illustrated, and shows Dr. Herrick both as tireless and resourceful investigator in the field and as scholar. "The American Eagle" deserves the widest circulation; copies should be given by Audubon Societies and individuals to schools and libraries and camps, for they surely will enlist enthusiasm for this noble bird and his kin.

"Birds and the Sea."—Frances Pitt. 1935. Longmans, Green & Co., London, and New York. \$2.50. In this delightful book Miss Pitt tells of experiences at the wonderful Gannet colony of Grassholm; of long tramps in the rain to view a Heron colony nesting on cliffs in the Orkneys—the large stick-built nests "somehow or other safely lodged on the ledges;" the placid fearless Eider Ducks on the Farne Islands, where they are called "St. Cuthbert's Ducks;" the pet Raven now nearly twenty-four years of age; and fascinating accounts of adventures at Skokholm with Storm Petrels and Manx Shearwaters. "Fully fledged young shearwaters, replicas of their parents save for a few shreds of down, sat pathetically on their rabbit-hole doorsteps, waiting for parents that came no more but had left them to shoulder their own fate." A most attractive book, richly illustrated with admirable photographs taken by the author.

"Singing in the Wilderness. A Salute to John James Audubon."—Donald C. Peattie. 1935. G. P. Putnam's Sons, New York. 245 pages. \$2.50. A wholly fascinating book beautifully written by a naturalist and artist out of great sympathy for his hero based on "a love of what he stood for, as Frenchman, American, artist, loafer, wanderer, lover, bird-hearted observer." In his reconstruction of the story of John and Lucy Audubon one feels that the author has captured the true spirit of these two.

The book has many illuminating passages on man and nature. "Nothing ever really happened to him except birds, for he took nothing else seriously. Even his love affair, his marriage and his home were as those of the birds—a mating for life, a nesting here and there, a foraging by God's grace, a wide roaming and a sure return."

"Singing in the Wilderness" is an inspiration to read and a book that will be treasured by all lovers of nature.