

return-2, and one as a return-3 and one a return-4. The details follow:—Numbers F91292, 34-8186, 34-87288, and 35-7833 were returns-1 the year after banding. No. H38889, adult female banded August 23, 1933, was not retaken until June 7, 1936, when at least four years old. No. H38832, adult male banded July 18, 1933, was not recaptured until July 31, 1935, his age then being at least three years. He was recovering from an injury to one side of his head; the wound was healing, but he had lost an eye. 35-7701, an immature male, banded September 21, 1935, was a return-1 on August 31, 1936; 35-7816, a female, banded August 3, 1935, was a return-1 September 8, 1936; and 35-7879, a female, banded September 12, 1935, was a return-1 on September 7, 1936. No. 34-8167, a young male banded August 15, 1934, was retaken July 28, 1935, and May 25, 1936. No. H17839, banded as an immature male September 9, 1932, was a return-3 on September 13, 1935, when three years old, and a return-4 September 19, 1936, now four years old.—AMELIA R. LASKEY, Nashville, Tennessee.

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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

**Banding in Switzerland.**<sup>1</sup>—This excellently-arranged report, giving a maximum of information in a minimum of space—age, sex, and distance and direction from place of banding, besides place and date of banding—shows much zeal on the part of Swiss banders. During 1934 and 1935, 49,460 birds were marked, of which 22,381 were nestlings. Birds ringed in the largest numbers were 9,109 Great Tits (*Parus major*), 7,714 Starlings (*Sturnus vulgaris*), and 3,546 Swallows (*Hirundo rustica*). Interesting age records are 9 years for a Common Buzzard (*Buteo b. buteo*), 8 years for a Great Tit, and 6 years for a Blue Tit (*Parus caeruleus*), while Mute Swans (*Cygnus olor*) have been recorded for 6 years on the same lake. As to Alpine Swifts (*Apus m. melba*), 5 birds banded in the nest in 1925 were breeding in the same locality 10 years later, and the same was true of a bird banded as an adult. Most records of the House Sparrow (*Passer domesticus*) show permanent residency, but an adult female banded June 20, 1934, was taken 125 kilometers southeast on October 29th. Data on many species show return of young to the birthplace.

**Results from Ringing Titmice.**<sup>2</sup>—The Great Tit is predominantly a permanent resident in Switzerland, yet there appears to be a regular migration of a few of the breeding birds, both old and young, to the Maritime Alps. Some of the birds present in winter have later been taken in Upper Austria.

**“Results from Ringing the Kestrel (*Falco t. tinnunculus*) in Switzerland.”**<sup>3</sup>  
—This species is both resident and migratory, often wintering in France. A female, banded as an adult in Switzerland, February 3, 1932, was killed April 10, 1935 in Sweden, 1,500 kilometers to the northeast. The oldest bird was 7 years old, but one in Germany reached an age of 9½ years.

"Old and New from the Ringing of Swifts."<sup>4</sup>—Adults of *Apus a. apus* return faithfully to their nesting sites and usually to the same boxes, pairs often nesting together for many years, although sometimes changing mates. The young birds, however, do not regularly return to the birthplace. The greatest ages reached have been 8 to 10 years.

**Banding in Sweden**<sup>5</sup>.—During 1935, 9,094 birds of 109 species were banded under the auspices of the Göteborg Museum of Natural History. This brings the total to 71,365 individuals, the percentage of recoveries being 3.6.

"Returns of Storks (*Ciconia c. ciconia* (L)) banded in the Netherlands."<sup>6</sup> In 1843, three young Storks were marked with copper plates hung from the neck; one of these was killed in France. From 1929 to 1935, 1,200 were ringed and 97 recoveries made—8 per cent. These Storks spread fanwise over Europe, and the theory of two sharply divided migration routes of the western and middle-European Storks does not hold for Holland. One bird was taken in West Africa.

"Stork Migration and the Mediterranean"<sup>7</sup>.—Storks avoid crossing the Mediterranean because they must seek a route with the best wind conditions and food possibilities.

**Migration Studies in Finland**.—By means of a "new apparatus for registering the variations of migration restlessness in caged migratory birds"<sup>8</sup> it was found in autumn that every drop in temperature stimulated restlessness in a captive Song Thrush *Turdus p. philomelos*;<sup>9</sup> and also that migrating waves of Song Thrushes and Redwings (*Turdus musicus*) closely agreed with the restlessness of a caged Song Thrush hung by an open window both as to dates and hours, the size of the waves being estimated by number of calls heard per ten minutes; there were five waves in October, the first four coinciding with falling barometric pressure, the last with rising, but at this time there was a marked fall in temperature.<sup>10</sup>

"Recent Progress in the Study of Bird Migration."—1936 *Ibis*, 6, (3): 472-630. Few more helpful services could be rendered than Dr. A. Landsborough Thomson's critical summary of this material, with its bibliography of 209 titles. Actually, the paper takes up the subject of migration where Thomson left it in 1926, though he points out that this date saw the publication of the last three comprehensive treatments, those of Wachs, Wetmore, and Thomson. The most important publication since that date, Schüz and Weigold's portfolio, deals only with palæarctic records. Most of the new material on actual migratory movement is drawn from Old World papers, for which we may adduce a number of reasons. European and Asiatic lines of movement, for one thing, lie over thickly and anciently populated lands, and the winter ranges, even in the wilds of Africa, are much better known. Many times more work has been done in Africa and southern Asia than in Central and South America. Furthermore, the primary field study of migration, which flowered and withered in America with the work of W. W. Cooke, is both an ancient and a vigorous tradition in England and on the Continent. Perhaps one reason is to be found in the fact that so much of this kind of ornithological curiosity and energy in our hemisphere is absorbed into the great national banding scheme, whose results are being buried deeper and deeper in the files at Washington, in spite of the example of Schüz and Weigold.

Out of such a reservoir of detail it is hardly possible to select the most important for second-hand reviewing. The author is kept busy holding the balance between theorists of rather single-eyed zeal, and has little chance to reveal his own philosophical reactions to the mass of new thought and new material. He feels that our ignorance of the essential requirements of bird-life is too great for significant speculation on the advantages of migration. As to its origins, the discussions of Mayr and Meise (1930) are rather sympathetically quoted in favor of a theory of post-glacial range-expansion and the necessity of historical explanation of a phenomenon which does not reflect modern geographic conditions. This does not

involve belief in a pleistocene concentration of bird-life in the tropics, but rather in a glacial eradication of northern bird-life, leaving no population with an hereditary urge to seek again their preglacial home. Thomson feels that Rowan has at least established some two-way connection between the gonads, migratory behavior, and environmental conditions. He feels that weather demonstrably affects precise dates of movement, but has little to do with the hypothetical "primary stimulus." He goes so far as to toy with the idea of an "inherent rhythm", or at least one very distantly and complexly related to "all the external conditions governing a bird's life."

There is one elementary question the present reviewer still finds unanswered—the first question every bird-bander is asked by every casual acquaintance, but which, in spite of its profound importance in the study of geographic distribution and variation, has never been seriously attacked namely, What proportion of a breeding population returns to about the same place to breed in succeeding years? Individual stations get their 10 per cent to 15 per cent returns of certain forms, but no area of, say, five or ten mile radius has been so covered as to produce an answer of higher significance. In the present paper Schenk is shown to have achieved something by indirect attack through a statistical analysis of records from all sources of recoveries in breeding season of birds banded in a previous breeding season. He finds 80 per cent within six miles of the original station, 10 per cent from 6 to 31 miles, 3½ per cent from 31 to 62 miles, and the remaining 6½ per cent at greater distances. These figures do not go very far toward answering the simple question just posed, for there are so rarely other stations within short distances in similar environments that the chances of returns at the home station are far greater than in the surrounding zones. The negative evidence is best. We at least know that of all such birds 6½ per cent breed over 62 miles away, etc., etc.—T. T. McC.

<sup>1</sup>Schifferli, A. 1936. 11. und 12. Bericht der Schweiz. Vogelwarte Sempach (1934 und 1935). *Der Ornithologische Beobachter*, 33:113-142.

<sup>2</sup>Schifferli, A. 1935. Nochmals "Ergebnisse der Schweiz. Meisenberingung." *Der Ornithologische Beobachter*, 32:57-63.

<sup>3</sup>Schifferli, A. 1935. Ringergebnisse des Turmfalken (*Falco t. tinnunculus*) in der Schweiz. *Der Ornithologische Beobachter*, 33:26-31.

<sup>4</sup>Schifferli, A. 1936. Altes und Neues aus der Mauersegler-Beringung. *Der Ornithologische Beobachter*, 33:82-85.

<sup>5</sup>Jägerskiöld, L. A. 1936. Göteborgs Naturhistoriska Museums ringmärkningar av flyttfaglar under 1935. *Göteborgs Musei Arstryck* 1936:104-122.

<sup>6</sup>Haverschmidt, Fr. 1936. Terugmeldingen van in Nederland geringde Ooievaars (*Ciconia c. ciconia* (L.)). *Ardea*, 25:112-127.

<sup>7</sup>Geyr von Schweppenburg, H. 1936. Storchzug und Mittelmeer. *Journal für Ornithologie*, 84:339-351.

<sup>8</sup>Siivonen, L. 1936. Ein neuer Apparat zur Registrierung der Intensitätsvariation der Zugunruhe bei gekäfigten Zugvögeln. *Ornis Fennica*, 13:67-69.

<sup>9</sup>Siivonen, L. and P. Palmgren. 1936. Über die Einwirkung der Temperatursenkung auf die Zugstimmung bei einer gekäfigten Singdrossel (*Turdus ph. philomelos* Brehm). *Ornis Fennica*, 13:64-67.

<sup>10</sup>Siivonen, L. 1936. Die Stärkevariation des nächtlichen Zuges bei *Turdus ph. philomelos* Brehm und *T. musicus* L., auf Grund der Zuglaute geschätzt und mit der Zugunruhe einer gekäfigten Singdrossel verglichen. *Ornis Fennica*, 13:59-63.

### LONGEVITY

**For how many Years will Birds Lay Eggs?**—Perhaps even more surprising than the long life of the Herring Gull (*Larus argentatus smithsonianus*) that lived for 45 years in confinement<sup>11</sup>, is the record of his mate as given to Dr. T. G. Pearson by the owner of the birds, Dr. Ben Royal of Morehead City, North Carolina. "Kaiser's mate laid eggs every year from 1893 until and including 1934"; during the last two years she has built a nest but has not laid. This bird lived for 42 years. Three Canada Geese (*Branta c. canadensis*) laid annually until their death at 29, 29, and 33 years of age<sup>12</sup>. The most remarkable case was that of a pair of Eagle Owls (*Bubo b. bubo*) owned by Mr. Meade-Waldo in England; in 1889 when the male was 53 years old and the female 68, they had "bred regularly since 1864, namely 32 years, having in that time raised no less than 93 young ones. They are still in the best of health".<sup>13</sup> One would like to know the previous and subsequent history of this "marvelous old pair."

**Cardinal of Thirteen Years.**<sup>14</sup>—The famous *Richmondia c. cardinalis* in Tennessee and his mate started a nest on March 28, 1936, but both this and the following nest came to grief.

For other records of longevity see Nos. 1, 3, and 4.

**"The Question of Sexual Maturity in Small Birds."**<sup>15</sup>—Some tropical birds lay eggs at very early ages; some *Ploceidæ* at eight weeks, the Shell Parakeet (*Melopsittacus undulatus*) and a Zebra Finch (*Tæniopygia castanotis*) at three and four months, and *Amadina erythrocephala* at two months. Both sexes in the *Turnicidæ* (Button-Quail) reach sexual maturity before they are four months old. In some cases climate may make a difference: in Hungary, Starlings (*Sturnus vulgaris*) regularly breed at one year of age, but in Latvia very few do so. As to Black-headed Gulls (*Larus ridibundus*), first-year birds seldom breed in Silesia and never in East Prussia, but often in Holland, Switzerland, and Hungary. Instances are given of very young birds carrying nesting-material and feeding still younger birds.

<sup>14</sup>Pearson, T. G. 1935. *Bird-Lore*, 37:412-413. Reviewed in *Bird-Banding*, April, 1936.

<sup>15</sup>Flower, S. S. 1925. Contributions to our Knowledge of the Duration of Life in Vertebrate Animals. IV. Birds. *Proc. Zool. Soc.*, Part 4:1385-1422.

<sup>16</sup>Gurney, J. H. 1899. On the Comparative Ages to which Birds Live. *Ibis*, Ser. 7, 5:19-42.

<sup>17</sup>Ganey, A. F. 1936. Notes from the Nashville Area. *The Migrant*, 7:47.

<sup>18</sup>Steinbacher, J. 1936. Zur Frage der Geschlechtsreife von Kleinvögeln. *Beiträge zur Fortpflanzungsbiologie der Vögel*, 12:139-144.

#### LIFE-HISTORY

**"Studies on the Bank Swallow, *Riparia riparia riparia* (Linnaeus) in the Oneida Lake Region."**—D. Stoner, 1936. *Roosevelt Wild Life Annals*, 4, No. 2: 121-234. Valuable data are given on weight of both adults and young, besides a great deal of material on body temperature. The temperature of adults ranged between 103.5° and 110° F., averaging 107.1°. As to the young, birds from 1 to 4 days old averaged 99.89°; from 5 to 9 days, 102.51°; from 10 to 15, 104.56°; and when able to fly, 106.24°. Both sexes excavate the burrow, build the nest, incubate, and brood the young. Eggs hatched in 14 to 16 days, young were fledged in 18 to 22 days. Soon after leaving the nest the young "engage in excavating activities. . . . But the cavities are seldom more than a few inches deep, and are used by the birds as resting places." The young are heavily infested with *Protocalliphora*. For banding purposes the adults were captured by "directing, by means of a small hand mirror, a beam of light into the burrow"; this caused such uneasiness to the bird that it usually emerged. Of 266 adults banded, 8 were recovered the following year, and of 919 young only two returned. Five adults were found in the colony in which they had been banded, the others from two to three miles away. One young bird was taken near its birthplace, the other two and a half miles away. Although there were doubtless other banded birds that were not captured, since only five days were spent in the field the second season, yet it is evident that in this species only a small proportion of adults return to their former breeding localities. There is no summary and no index.

**"Roosting Habits of the Tree Creeper."**—P. S. Kennedy. 1936. *British Birds*, 30:2-13. *Certhia familiaris britannica* excavates cavities for itself in the soft bark of sequoias that have been introduced into England. The birds go to roost after sunset in winter, but in March at sunset; they leave a few minutes before sunrise.

**"The Composer."**—F. M. Chapman. 1936. *Bird-Lore*, 38:267-273. Description of the remarkable powers of song of a Black-billed Wren (*Pheugopedius fasciato-ventris albigularis*) at Barro Colorado.

**"The St. Kilda Wren."**—1936. *Scottish Naturalist*, No. 217:9-21. Messrs T. F. Harrison and J. N. S. Buchan add this important collection of concentrated detail to their paper on territory and food habits of the same bird. (*Journ. Anim. Ecol.* 3:133-145; reviewed in *Bird-Banding*, 6, April, 1935; 73.) There is little or no discussion of implications, but the paper is a model of modern methods of

organized observation, with certain oversights, such as the irritating difficulty or impossibility of finding the dates of most of the observations, especially heinous in such tables as that of feeding rate. Convincing amounts of material are analyzed on rate of feeding young and removal of faeces, nest-material (including the "cock nests", which are sometimes used), the character of song as compared to the mainland bird, fluctuations of song-volume during July and August, and its daily periodicity, "curse notes", rate and distance of flight, the presence of dimorphism.—T. T. McC.

**The Home Life of the Chiffchaff.**<sup>16</sup>—*Phylloscopus collybita* is a territorial bird, the male spending most of his time singing high in the trees, while his mate builds the nest on or near the ground, incubates, broods, and feeds the young. The male helped feed the young at only one nest out of seven; in this case the nest was 40 centimeters above the ground and could be easily reached by the "ground-shy" male through cover. Incubation lasts 15 to 16 days; the young leave at 13 to 14 days. On a cold, rainy morning a female left her eggs 7 times during 1¾ hours; periods on the nest ranged from 5 to 19 minutes, averaging 11 minutes; periods off the nest ranged from 1 to 8 minutes, averaging 5.5 minutes. While the female has to brood the young, she feeds them every 10 to 15 minutes, but later every 4 to 5 minutes or oftener.

**"Recoveries of German Red-backed Shrikes (*Lanius c. collurio* L.)."**<sup>17</sup>—Adult males return faithfully to their nesting territories, sometimes to the very same bush, and some females do likewise. Some birds have had the same mates two years in succession. One breeding female banded July 27, 1933, was found 125 kilometers northwest at the end of July, 1935. Twenty young have returned to breed where hatched, while three have been found from 60 to 68 kilometers distant. A male banded with a red ring nested 1 kilometer from his birthplace; he had a different mate each year for four years. The first year he arrived 14 days later than the earliest of his species, but afterwards only 4 to 6 days later. This species in Silesia is a favored host of the Cuckoo (*Cuculus canorus*), but some Shrikes remove the foreign egg.

**"*Lanius collurio* L. and *Lanius senator* L. A Contribution to the Biology of Two Species of Shrikes."**<sup>18</sup>—Along the Lower Rhine the Red-backed Shrike is abundant, the Woodchat Shrike rare; neither seem to be parasitized by the Cuckoo. The territories of the former bird are always associated with hawthorns and are some two hundred by three hundred meters in size. The matter of impaling is discussed at length and many illustrations are given.

**"Behaviour of Starlings at Nesting Site."**—George Marples. 1936. *British Birds*, 30:14–21. An interesting study of the nesting life of *Sturnus v. vulgaris*, the male being a banded bird. He appropriated the box in late January, being joined by a mate a month later; on April 2d strange courtship behavior was noted in which the female pursued the male, the author calling it "branch-chasing." "The male lived somewhat in dread of his mate for, quite commonly, when she was inside the box he would fear to enter, sitting on the perch waiting until she came out." Both birds took part in nest-building, the male bringing green leaves and flowers as well as plant stems. Both birds incubated and fed the young, although the female at first drove her mate away when he came with food.

**"Observations on the Spot-backed Weaver, (*Ploceus spilonotus* Vig.)."**—R. B. Cowles. 1936. *The Auk*, 53:295–297. In South Africa flocks of these birds eat grains in fields and around pig-pens, and then "dash over to visit" some "nectar bearing flowering tree." As many as twenty-five nests were started in one large Acacia. "When the nest is partly completed the male hangs to the lower edge of the opening and with fluttering wings and loud calls moves or shakes the nest, rotating it from side to side violently, meanwhile looking alertly in all directions. Within a minute or two a female will fly up to the nest, give it a thorough inspection and depart again, for they take no part in the construction work, at least until after all the externals have been completed."

"Notes on the Field Sparrow in Michigan."—L. H. Walkinshaw. 1936. *Wilson Bulletin*, 48:94-101. Data on 70 nests: size of sets ranged from 2 to 5 eggs, most nests containing 3 and 4 eggs; in 20 out of 46 nests young were fledged, giving 43.5 per cent success. Incubation is stated to have taken only 10 days in two cases, but as in each instance one egg failed to hatch, and as the eggs were not marked as laid, this conclusion is unwarranted. The young sometimes left the nest when only six days old if disturbed. When newly hatched they weighed 1.1 grams, and when ready to leave they averaged 10.5 grams. The females did practically all the feeding, an observation which agrees with that of Lynds Jones, 1913, *Wilson Bulletin*, 25:67-71. Very little seems to have been published on the life-history of *Spizella pusilla*.

"The Breeding Biology of the Little Ringed Plover (*Charadrius dubius curonicus*)."<sup>19</sup> Both sexes share incubation, and care of the young; second broods are raised near Berlin.

"On the Fighting of Blackcock."—George K. Yeates. 1936. *British Birds*, 30:34-37. Descriptions and photographs of *Lyrurus tetrix britannicus* on a lek near a keeper's cottage in northern Scotland. "The birds may only be relied upon to fight either when they first arrive (when all the birds seem momentarily to indulge in a short joust before settling down to feeding), or on the arrival of a grey hen in their midst." "When at last they do come to grips, it is a mere mockery of a fight."

"Observations at the Nest of a Hen-Harrier (*Circus c. cyaneus* L.)."<sup>20</sup>—Females are usually ready to attack human intruders near the nest, while males are often more cautious, but the reverse was true at one nest which was watched from a blind. The male provided the food for the family for the first three or four weeks. In quiet weather more mice were captured; in windy weather more birds; while in rainy weather very little of anything was caught. The young flew at the age of 32 to 34 days; they remained in the nesting territory two or three weeks longer and were fed by the parents. When the latter came in sight, the young flew to meet them, the parents flew higher and dropped the prey, which was caught in midair by the young birds.

For other life-history studies see Bird Behavior.

<sup>19</sup>Prenn, F. 1936. Beobachtungen zur Lebensweise des Weidenlaubsängers (*Phylloscopus collybita* Viell). *Journal für Ornithologie*, 84:378-386.

<sup>20</sup>Ecke, H. 1936. Die Ringfunde deutscher Rotrückenwürger (*Lanius c. collurio* L.). *Der Vogelzug*, 7:123-135.

<sup>18</sup>Schreurs, T. 1936. *Lanius collurio* L. und *Lanius senator* L. Ein Beitrag zur Biologie zweier Würgerarten. *Journal für Ornithologie*, 84:442-470.

<sup>17</sup>Krösche, O. 1936. Zur Brutbiologie des Flussregenpfeifers (*Charadrius dubius curonicus*). *Beiträge zur Fortpflanzungsbiologie der Vögel*, 12:145-149.

<sup>20</sup>Hennings, H. 1936. Beobachtungen am Horst der Kornweihe (*Circus c. cyaneus* L.). *Beiträge zur Fortpflanzungsbiologie der Vögel*, 12:105-113; 150-160.

## TERRITORY

An early statement of the territorial concept was given by William Brewster, 1906, "The Birds of the Cambridge Region of Massachusetts," *Mem. Nuttall Ornith. Club*, No. IV, on pp. 62-63, as pointed out to me by Charles C. Adams, who quoted it in his article, "The Ecological Succession of Birds," 1908, *The Auk*, 25:109-153. Mr. Brewster says in part: "In my opinion the desire for exclusive possession so conspicuously shown by the male, and often by him alone, is usually the direct result of *sexual jealousy*. . . . If his concern were chiefly in respect to the food supply, it would be equally manifested at every season and towards all birds who subsist on the same food that he and his mate require—which is certainly not the case."

"Further Notes on Territory in the Great Crested Grebe."—L. S. V. Venables and D. Lack. 1936. *British Birds*, 30:60-69. From five years' observations on *Podiceps c. cristatus* the authors conclude: "Aggressive behaviour resulting in a 'territory' is exhibited by only a few individuals, the majority tolerating other individuals close to a nest. . . . The territory is not of primary significance in

pairing up, as many pairs are formed before they acquire a territory; but a male does at times acquire and defend a territory before obtaining a mate. The territory does not usually include the feeding ground of the pair, and is in all cases deserted when the young hatch. . . . The territory is associated with the neighbourhood of the actual or future nesting platforms, but does not seem of benefit to the species in this connection. The territory seems to be an individual affair, of no fundamental significance to the species."

## BIRD BEHAVIOR

"Continuity of Behavior in the Nuttall White-crowned Sparrow."—Barbara D. Blanchard. 1936. *Condor*, 38:145-150. *Zonotrichia leucophrys nuttalli* is a permanent resident on the campus of the University of California. "Each pair remained on its breeding area throughout fall and winter. Mates foraged and perched together and followed each other about." The "second mate of a polygamous male remained with him through the winter and bred with him again, disregarding a young male . . . with adjacent territory." These two females were jealous of each other; each "created for herself a sub-division of the main territory which she defended against the other female by loud singing and fighting, and in which she finally chose her nest-site. . . . Had they not been banded, I should have thought I was watching a boundary dispute between two males."

This fine study on problems of territory and relations between the sexes is based on intensive observation on a common bird marked with colored bands. The course of events compares well with that in the Song Sparrow except for the marked personal attachment between the mates throughout the year and the astonishing singing of the females.

"Courtship and Sexual Selection of the Flicker (*Colaptes auratus luteus*)." —G. K. Noble. 1936. *The Auk*, 53:269-282. A notable example of experimental technique with wild birds. The sexes in this species are alike in appearance except that the male has a black moustache. Mounted birds of both sexes were placed in the nesting tree of a pair, and the female attacked the female mount and the male the male mount. The female was caught and provided with an artificial moustache, with the result that she was relentlessly pursued by her mate. The display—the "we-cup call, the head bobbing with uptilted bill, the wing and tail fitting"—is not a means of courting the opposite sex, but "means that Flickers of both sexes employ to intimidate rivals. The extreme display is a wide-spreading of the tail and a tilting at an angle of 45 degrees or more exposing its bright yellow under surfaces to the rival." "When a female has driven off her rivals she may induce the male to mate by giving a nasal call heard on no other occasion." "After the young have left the nest the male may still defend the nesting hole but he treats both sexes of mounted birds the same way." The author concludes that "The bright yellow colors of the concealed surfaces of Flickers have not evolved through Darwinian sexual selection, that is through female choice, nor through mutual selection as defined by Huxley. Their chief function is to intimidate and hence natural selection alone is adequate to account for their genesis."

There are only two minor criticisms that occur to the reviewer, both in the realm of theory. Dr. Noble says "mature Flickers apparently have learned to recognize the moustache as a badge of maleness." How could first-year birds react in any adequate way before they "learned" the significance of this badge? Is it not more reasonable to expect it to be known instinctively? And why is not the author content at present with disproving sexual selection? Many scientists believe that natural selection is equally hypothetical.

Nesting Study of the Hobby.<sup>21</sup>—An important paper based on 338 hours of observation at four nests of *Falco s. subbuteo* in Holland. There is space to mention only a few points. The division of labor between the parents depends on the nature of the prey: when this consists of insects both parents hunt, but when it consists of birds and mammals the male is the provider, the female doing no

hunting as long as the young need brooding. The hunting territory is not defended, only the vicinity of the nest. One pair adopted a young bird a few days older than their own young, although the latter recognized it as a stranger. The young begged from an adult regardless of whether or not it carried prey; they begged from strange Hobbies flying over and also Kestrels (*Falco tinnunculus*), but not from Sparrow Hawks (*Accipiter nisus*) nor Ring Doves (*Columba p. palumbus*). Adults recognized individuals of their species either as mates or strangers at a distance of five hundred meters. A splendid study of bird behavior.

"An Attempt at an Ethogram of the European Avocet (*Recurvirostra avosetta* L.), with Ethological and Psychological Remarks."—G. F. Makkink. 1936. *Ardea*, 25:1-62. A careful study pursued under difficulties because of the impossibility of distinguishing the sexes and also because no individuals were marked. Social, sexual, and parental conduct is described in detail and illustrated by sketches. Avocets are gregarious throughout the year, yet one of their chief activities in the nesting season appears to be fighting. "They seek conflicts out of a sexual combativeness and not because they want to fight for the possession of a territory. While these fights [last the two mates take the same side, and each of them attacks the other birds." "In case of floods Avocets manage to make their nests sufficiently high to raise their eggs clear out of water, as other marsh- or shore-birds do." "About the time when the eggs hatch, the Avocet gets a second alarm-call, by means of which practically only gulls are signalized and pursued. For man, mammals and other birds apart from gulls the ordinary alarm-call is sounded. . . . The 'gull-cry' has been taken to be a part of the hereditary equipment, which enables the Avocet to announce its chief natural enemy." Thirty-five titles are given in the bibliography, but the important observations on this species by Edmund Selous in "Realities of Bird Life," 1927, London, Constable, were missed, as well as Miss E. L. Turner's article in *British Birds*, 14:194-202, 1921.

"The Nesting of the Emu." 1936, *Emu*, 35:202-210. Mr. David Fleay's account of the nesting of captive Emus (*Dromaeus novae-hollandiae*) in Melbourne has the makings of a classic. Without taking too much stock in reproductive behavior in captivity, it is doubtful whether a like sequence of psychological metamorphoses was ever recorded of any bird, wild or tame. Perhaps such revolutions of personality always occur, inscrutable beneath the surface of secretive or inexpressive behavior. But in these grotesque creatures nothing is inscrutable and nothing inexpressive; every change of mood and temper is as obvious as in an obstreperous seven-year-old child. The general sequence was about as follows.—

1. A female, "Emma," which has been the butt of a female cage-mate for months, suddenly attacks the latter and practically kills her.
2. Emma woos and wins "George," the handsomer of two remaining cage-mates (males).
3. Emma and George drive away, but do not harm, the remaining male.
4. Emma begins laying fertile eggs all over the paddock, eleven in all, to which neither of the pair pays the least attention.
5. The odd male, in turn, discards his inferiorism and bullies both George and Emma until he has to be removed.
6. Emma starts laying a new clutch, in a proper spot. George pays no attention.—is playful and affectionate with his keeper.
7. After fourth egg, George, suddenly interested, moves eggs some distance, becomes hostile to keeper, begins to incubate. Copulation stops.
8. Emma suddenly transformed into a dangerous fury, yet pays no attention to mate or nest or anyone approaching them.
9. The brooding George eats practically nothing for many weeks. Allows Emma to come to the nest to lay eggs up to eight.
10. George, perhaps feeling incapable of further responsibility, attacks Emma when she approaches the nest. She is saved by removal. No more eggs.
11. George deeply agitated by voice of incubator chick of first scattered clutch concealed near by.



12. Hatching time approaches. George viciously hostile to keeper, continually turning eggs and uttering certain sounds. Emma not interested; reintroduced, attacked at once.

13. Eggs hatch in four days, though the last four were laid during thirteen days after incubation had begun. George, worn and emaciated, at once becomes so gentle he can be picked up.

14. George's perfections as a "mother." Emma entirely without interest.—T. T. McC.

"The so-called 'Injury-feigning' in Birds." 1936. *Oologists' Record*, 16:25-37.—The Reverend F. C. R. Jourdain devotes most of these pages to a review, based on the widest reading and broadest experience, of the prevalence of this behavior in the different systematic groups, with the conclusion that, while it is not restricted to ground-nesters as strictly as Julian Huxley thought, yet most of the exceptions, such as those among the pigeons and owls, occur in groups which are still partly, and may have been primitively, ground-nesters. This does not apply to the few examples among the *Passeres*, notably among the true warblers and the thrushes. Scattered exceptions occur among the Minivets, Bulvuls, Wood-warblers, and in a small list of Australian forms recorded by A. H. Chisholm. The cases of human observation of the effect on natural enemies are few, but it has been seen to be efficient against dogs, coyotes, foxes, cats, weasels, and stoats. There is one definite record of a failure, when a Knot, exhibiting such behavior before a dog, came too close and was caught. The reviewer has himself more than once caught female Franklin's Grouse (*Canachites franklini*) in his hands under these circumstances, and cannot imagine their adopting the same behavior before natural enemies without fatal results. The bird may have an even exaggerated idea of human incompetence.

Various theories receive brief criticism. The author does not believe in mere incapacity through excess excitement, for birds have no reason for such excess of fear before many of the enemies involved. The point might, of course, have been made that *incapacitating* fear must have been an insupportable selective handicap. The theory of Dewar and of Friedmann, that the condition is the nervous resultant between the reactions of fear and solicitude, the instincts to protect and escape, he feels to be incompatible with his own impression that the bird is "playing to the gallery," watching the effects of its performance, modifying it according to development.—T. T. McC.

A discussion of "injury-feigning" has been the theme of recent letters to the *Auk*: by H. S. Swarth, July, 1935; F. H. Allen, January, 1936; and A. H. Chisholm April, 1936; none of these authors agrees with Friedmann's theories. It seems to the reviewer that "injury-feigning" is an instinctive behavior-pattern on the same order, for instance, as the intimidation display of the Flicker described by Noble. When an incubating or brooding bird of certain species is confronted by danger to its nest or young, it sometimes *displays in such a way as to draw attention to itself* and away from its nest or young. There is no simulation of injury in the display shown by Song Sparrows and many Wood Warblers when nearly grown young are in danger: the parents rush about near by with wings held stiffly aloft—an attitude assumed on no other occasion, at least by *Melospiza melodia*. Instead of "injury-feigning" would not a better term be that used by R. C. Murphy<sup>22</sup> in regard to the Woodcock—"nest-protecting display?"

<sup>21</sup>Schuyf, G., L. Tinbergen and N. Tinbergen. 1936. Ethologische Beobachtungen am Baumfalken (*Falco s. subbuteo* L.). *Journal für Ornithologie*, 84:337-433.

<sup>22</sup>Nest-Protecting Display of the Woodcock. 1926. *Bird-Lore*, 28:265-266.

## ECOLOGY

"The Northern Bob-white's Winter Territory."—P. L. Errington and F. N. Hamerstrom, Jr. 1936. *Agri. Exp. St. Iowa State Coll. Agri. Ames, Iowa. Research Bulletin* 201:302-443. An enormous amount of patient, well-planned work is represented in this study on *Colinus v. virginianus*; it will prove valuable

not only to conservationists and wild-life managers, but also to students of biological problems. "Winter in the northern part of the bob-white's range seems to be the one supremely critical period in the life equation of the species, and winter survival cannot exceed ability of environment to accommodate population." The authors found that "a given tract of environment is capable of accommodating a rather definitely limited population even under optimum weather conditions." Losses from predation of secure populations have been light, some 6 per cent per 90 days, but "over-populations" were reduced either through departure of the excess birds or through predation. Comparative abundance of "buffer" populations appeared to make little difference in the intensity of predation upon Bob-whites. "The limited data at hand point to considerably higher rates of increase for breeding populations which have been drastically reduced previously by emergencies, over-shooting, etc., provided that the surviving birds are well situated in strong environment." "Intensive campaigning against native predators is not advised, . . . predator control is no substitute for food and cover, and practically all control efforts that we have witnessed in the North have been futile from the standpoint of bob-white management, if not actually detrimental." An index would have helped in making available the large body of information.

"Territory and Distributional Variation in Woodland Birds." 1936. *Scottish Naturalist*, No. 218: 35-45. Mr. V. D. van Someren tries to get too much from fourteen censuses of a five-acre deciduous wood in Midlothian, from January to April inclusive, though the work was well-planned, and the suggestions stimulating. He sees and emphasizes an interesting constancy in the number of species underlying great variability in the number of individuals, which is a good start for the study of the actual requirements of those species. This is followed by an attempt to synchronize abundance or scarcity in like groups, as in three kinds of Tits, or in the Song-thrush and the Blackbird, rather successfully in the first case. But the naive suggestion of limited food-supply of each type as the factor limiting the rather constant species number will not carry us very far. Ecology, alas, is seldom so simple. If limited amounts of a given type of food equally desirable to several forms be granted, there still remains no reason for its being consumed by a single species more than by smaller numbers of each of several like-dieted species.

A systematic effort to postulate nest-positions from observed singing-posts produced a fairly positive experimental result in the case of the Song-Thrush only. The correlations of mass movements within the wood, horizontal or vertical, with the wind, are very important.

One wishes the writer might go on to an intensive study, on the same ground, of the requirements of a half-dozen of the species, (admittedly a big job), seeking those general or specific, widespread or localized, which keep the inhabitants *in*, and which therefore might suggest what keep the rest *out*, and perhaps approach the explanation of the species number.—T. T. McC.

"The Rookeries of Edinburgh."—*Scottish Naturalist*, No. 218, 1936:53-56. The British Isles remain amazingly census-minded. A count of Rook nests by the Midlothian Ornithological Club on the fifty-one square miles within the city shows a total of 3060, almost one hundred per cent more than were privately counted in 1921.—T. T. McC.

"The Avifauna of the Inland Waters of Aland."<sup>23</sup>—Censuses of water and marsh population of a large number of lakes with notations of ecological requirements and suggestions for further lines of study.

**Bird-Insect Nesting Associations.** *Ibis*, VI, 3, July, 1936, 460-471.—R. E. Moreau, of the East African Agricultural Research Station at Amani, has analyzed a surprisingly large amount of literature on this subject in addition to recent observations near Tanga by himself, Mrs. Moreau, and Mr. T. A. Baldock. Records of bird "associations" with living creatures (other than mere prey) are so seldom anything but records of two organisms occupying adjacent space that these facts come as a draft from the blue, with their certainty of a definite linkage, free in

most cases from any predatory factor and often from any self-evident requirement of an identical physical environment. Seemingly, we of the North Temperate must watch developments from the side-lines, as the spectacular instances so far recorded are practically all tropical, from Asia, Africa, Australia, and South America.

Of the three types of association the first "nest building inside insect structures," is, as the author says, the least interesting, amounting to "straightforward nest-parasitism", usually between Trogons, Parrots, Kingfishers, or Cotingids and arboreal ants or arboreal or terrestrial termites. Here at the outset, however we meet the most intriguing fact of all, that even the most aggressive "soldier" forms, intolerant of other intrusion, tolerate both the adult and the helpless young birds. In the case of the Woodpeckers the ant hosts are eaten and of course their structures damaged to some degree. Stuart Baker says that the various Indian Woodpeckers which inhabit ants' nests lay abnormal soft, transparent eggs.

Class two concerns only two parrots (one Australian, one South American) both also members of the first group, in whose nests the insects lay their eggs, which develop larvæ which are "practically commensal with the young birds."

The third class, where the observations of Moreau and his associates belong, deals mostly with Ploceids and Icterids and aculeate wasps. He (like Myers and other writers) believes the situation analagous to cases of small birds which build close to the nests of powerful raptors or about human dwellings. The first-hand observations are mostly of Sunbirds and Spermestine Weavers which nest close to "wasp combs, shaped like dagger-blades, up to seven inches long, which are common in the trees here." In this class mutual toleration is complete, the nests are practically all covered, and it is the bird which seeks the association (which, according to Myers, is a universal law of all bird-insect nest associations).  
—T. T. McC.

"The Malthusian Principle in Nature."—W. L. McAtee. 1936. *Scientific Monthly*, 42:44-456.—In this suggestive paper the author concludes that "Malthus's postulated geometric increase of population is not the rule in nature; it is merely a potentiality, rarely realized. Populations are usually checked far short of a subsistence limitation. Automatic restriction by lowering of birth rate in response to density and by a great variety of self-limiting phenomena, together with sweeping indiscriminate destruction of immature forms, involving little or no actual competition either among themselves or with adults, seem to be the principal factors involved in maintaining the stability of populations."

<sup>22</sup>Palmgren, P. 1936. Über die Vogelfauna der Binnengewässer Alands. *Acta Zoologica Fennica*, 17. 59 p.

#### PARASITES

"Biology of the Mallophaga."<sup>24</sup>—Valuable article with a bibliography of 109 titles.

<sup>24</sup>Eichler, W. 1936. Die Biologie der Federlinge. *Journal für Ornithologie*, 84:471-505.

#### BOOKS

**Ethics of Egg-Collecting.** Eric Parker. 1935. London: The Field. 120 p.5/.

—This book consists almost entirely of letters published in *The Field pro and con* on the subject of egg-collecting. Even the oölogists do not claim that their activities have any scientific value, merely asserting that they do no harm. The most pernicious aspect of the whole affair is that whenever a bird's numbers become dangerously low, egg-collectors hasten to prevent it from reproducing. They have already exterminated the White-tailed Eagle and Osprey in Great Britain and are now persecuting the Crested Tit, Dotterel, and other rare species. In this country they are playing a leading rôle, in decimating some of the species most in need of protection, among them Eagles, Duck Hawks, and our beautiful Kites.

Years ago W. H. Hudson proposed as the only remedy that private egg-collections be prohibited by law. Is not this the logical solution?

**The American Woodcock *Philohela minor* (Gmelin).** Olin S. Pettingill, Jr. 1936. Mem. Boston Soc. Nat. Hist. 9 (2): 169-391. Cloth, \$4.75; paper covers \$3.50.—The author establishes the facts that the male Woodcock has nothing to do with the care of the eggs and young, that his spectacular flight-song is given for the purpose of attracting mates, and that the "carrying" of young by the mother is purely accidental. Interesting detailed accounts are given of the flight-song performance, of the time of beginning (at about two foot-candles of light) some twenty-one minutes after sunset on clear evenings, its duration, the songs of other birds, etc. The Woodcock is a highly specialized species with little power of adaptation. "Its one reaction to all forms of danger is to crouch and remain motionless until danger is passed." Its numbers have been greatly reduced and it needs additional protection, both legal and in the form of sanctuaries.

A long bibliography is provided, but no index. Although the material is valuable, one feels that some of it could have been condensed to advantage, that too much space is devoted to quotations, and that publication in a smaller, less expensive format would have been preferable.

**Birds in the Wilderness. Adventures of an Ornithologist.** Geo. M. Sutton. 1936. N. Y. MacMillan. \$3.50.—Dr. Sutton is an adventurer, traversing the length and breadth of the continent in his search for experiences with new birds. Although this book lacks the unity of his superb "Eskimo Year," yet the chapters are full of interest, particularly those on his childhood experiences and his pet Road-runners, while the "Adventure with a Turkey Vulture" is nothing short of a classic. The book is illustrated with a dozen of the author's inimitable drawings and paintings.

**Preparation of Scientific and Technical Papers.** Sam. F. Trelease and Emma S. Yule. 1936. 3d Ed. Baltimore. Williams and Wilkins. 125-p. \$1.50.—An excellent concise guide dealing both with the fundamentals of organizing a scientific paper and with all sorts of details, ranging from the use of abbreviations to the correcting of proof. While the chief purpose is to aid the student with his first article, it also offers many helpful hints to the experienced writer.