

On February 4, 1939 a consignment of ten Tree Sparrows was taken from station and released at Belvidere, N. J., 46 miles west. Two of these birds were taken as returns in November of that year on return from their summer range. Records on these birds are as follows: 138-2992, banded December 14, 1938; December 31, 1938; January 1, 6, 7, 21, 22, 23, 28, 29, 31; February 2, 4, 1939. Return on November 21, 1939. 139-30517, banded February 2, 1939, February 3, 4, 1939. Return on November 20, 1939.—GUSTAVE DUMONT, JR., Dumont Banding Station, Pequannock, N. J.

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## RECENT LITERATURE

Reviews by Margaret M. Nice and Others

### BANDING

**1. Report of the Bird-Banding Committee. Progress for 1939.**—A. L. Thomson. 1940. *British Birds*, 33: 318-325. A total of 55,817 birds were ringed in Great Britain in 1939, slightly more than half being trapped birds, the others nestlings. Restrictions are placed on banding many species, especially the nestlings, some because they have proved "unremunerative", others because of the wealth of information on hand. The birds banded in greatest numbers during the last 30 years are: Song Thrush, Starling, Blackbird, Swallow, Lapwing, Chaffinch, Greenfinch, Redbreast, Manx Shearwater and Common Tern. Recoveries range from 0 to 21.5% (Merlin, *Falco columbarius aesalon*). Typical recovery percentages are: Swallow, 1.0; Song Thrush, 1.9; Greenfinch, 6.8; Common Tern, 2.5; Owls, 3.4-9.3; Hawks, 4.3-21.5; Crows, 4.7; Raven, 7.0; Common Heron, 11.9; Ducks, 13.3-20.5.

Transatlantic journeys occurred in three cases in 1939: two Puffins (*Fraterecula arctica*) ringed on St. Kilda were recovered in Newfoundland; a Great (or Northern) Skua (*Stercorarius s. skua*) ringed as a nestling in Shetland in 1939 was found dead near Boston, Mass., February, 1940.

**2. Skokholm Bird Observatory. Report for 1939.**—R. M. Lockley. 1940. 12pp. Western Telegraph, Haverfordwest. A total of 6,393 birds were ringed. It was found that with the Gannets (*Sula bassana*) the young birds range much more widely in winter than the adults. Of 216 young Cormorants (*Phalacrocorax c. carbo*) ringed in 1939 13.5% were reported shot before the end of the year.

**3. The Invasion of Bohemian Waxwings in 1931-32 and 32-33.** (Die *Bombycilla g. garrulus*—Invasion in den Jahren 1931-32 und 1932-33, und die Ergebnisse der Beringungsversuche.)—K. Warga. 1939. *Aquila*, 42-45 (1935-38): 490-528. In 12 days 1371 Waxwings were banded; 54 were recovered (3.9%): 19 in or near Budapest, 22 from the interior of Hungary; 13 from Norway, Finland and Russia. Sex was distinguished by the length and breadth of the primaries; 55% of the birds were males; 79% were juvenile.

**4. The Bohemian Waxwing Invasion into Hungary in 1937-38.** (Die 1937-38-er *Bombycilla g. garrulus* Invasion in Ungarn.)—K. Warga. 1939. *Aquila*, 42-45 (1935-38): 535-542. Three hundred were banded. One of those banded in 1932 was retaken in 1938; it had been driven into a house by a Sparrow Hawk (*Accipiter nisus*).

**5. A Study of Blue Tits by Colour Ringing.**—Hugh Kenrick. 1940. *British Birds*, 33: 307-310. One hundred and thirty *Parus coeruleus obscurus* were ringed in the author's garden with "14 different coloured rings, some plain colours, some striped." The young of each brood were banded with the same

colour; then if retrapped, the bird's origin is known and a "full set" of bands given it. Of 80 young, five were recovered in the area and one two miles away—6 and 7.5%.

A female was ringed in January, 1933. "She nested in 1933, '36, '37 and '38. When at least 6 years old she mated with a cock hatched the year before. They failed to bring off a family." Another hen had the same mate for 2 years, then when at least 5 years old, mated with a year old cock. "She deserted her eggs."

**6. Banding Woodcocks on Pennsylvania Singing Grounds.**—R. T. Norris, J. D. Beule and A. T. Studholme. 1940. *Journ. Wildlife Management*, 4 : 8-14. On a 950 acre tract of "pine barrens" 45 singing male *Philohela minor* were located. Singing grounds ranged in size from 5 x 12 to 47 x 54 feet, averaging 21 x 37 feet. A mounted male Woodcock was placed inside of a net trap; most of the males came to the decoys, uttering *took-oo* with their wings raised over their backs, and attempted to copulate. After a bird was caught and banded he usually resumed his singing activities within 5 minutes.

Other studies based on banding are Nos. 7-12, 15, 16, 25, 26, 28, 40 and 58.

## MIGRATION

**7. Migration of Black-headed Gulls in Switzerland.** (Migration des Mouettes rieusses (*Larus r. ridibundus*) en Suisse.)—Ernst Sutter. 1940. *Ornithologische Beobachter*, 37 : 1-15. Black-headed Gulls that migrate through Switzerland or winter there come from central Europe to the northeast, some from as far away as Russia. Usually the gulls return to the same place to winter, arriving from August to December, some being captured 3 and 4 winters in succession. A few changed their winter quarters. The greatest age attained is at least 11½ years. Of 916 gulls ringed at Geneva returns and recoveries came to 12.69%.

**8. Results on Banding German Greenfinches.** (Ergebnisse der Beringung deutscher Grünfinken (*Chloris chl. chloris*) mit Berücksichtigung der Auslands-Fernfunde.)—J. Eilers. 1939. *Schriften der Physik.-ökonom. Gesellschaft zu Königsberg (Pr)*, 71 : 145-176.—About one-third of the banded Greenfinches in Germany appear to be permanent residents; one third may go as far as 50-100 kilometers, while the rest migrate as far as southern France and northern Italy. In England Greenfinches migrate only some 100-200 kilometers. Of 410 birds taken in one winter 75 were adult males, 63 adult females, 182 juvenile males and 90 juvenile females.

**9. Results from Banding Blackbirds in Silesia and Saxony.** (Beringungsergebnisse schlesischer und sächsischer Amseln (*Turdus merula merula* (L.)).) R. Weimann. 1938. *Ber. Ver. schles. Ornith.*, 23 : 1-14. About 30% of the Blackbirds migrate to France, the rest being permanent residents. Females migrate more than males; the young more than the adults. Blackbirds nesting in towns migrate as well as those nesting in the woods.

**10. A Preliminary Report on Some Experiments on Bird Migration.**—Albert Wolfson. 1940. *Condor*, 42 : 93-99. Individuals of 4 subspecies of *Juncos oreganus*, one resident and three migratory, were trapped at Berkeley, Calif. in two winters, kept in an outdoor cage and released May 23, 1938 and June 5, 1939. The migratory birds apparently left at once for the north, although the normal time of leaving is the last week of March; a number were retrapped the following winter. Only one of the migratory birds was seen a day after release; he was collected and found to have little stored fat in contrast to two of the three samples taken on June 7. Six wild resident Juncos and six migratory Juncos were collected from February 11 to March 25; "the migratory birds showed heavy fat and their testes averaged 1.5 mm. in length. The resident birds had testes 8.1 mm. long and no fat." p. 99.

The author points out that his results do not support the theories either of Rowan or Bissonette, and suggests that "the total physiological stimulus and physiological state of the bird is important in inducing its migratory and breeding behavior and not the physiological condition of one organ alone, such as the gonad." p. 98.

**11. Gonads and Migration to Winter Quarters.** (Keimdrusen und Wegzug.)—P. Putzig. 1939. *Ber. Ver. schles. Ornith.*, 24 : 36-41. Results of experiments on the American Crow (*Corvus brachyrhynchos*) (Rowan, '32), Hooded Crow (*Corvus cornix*), Black-headed and Lesser Black-backed Gulls (*Larus ridibundus*, *L. fuscus*) (Putzig, *Vogelzug*, '37) show that the loss of testes has no influence on the migration to the winter quarters. Rooks (*Corvus frugilegus*) taken on the northward migration on the Kürische Nehrung in East Prussia may have testes ranging in size from 10-3000 cubic millimeters depending on age. Castrated Hooded Crows have migrated north, although held captive until after their fellows had gone. No rudiments of the testes were found in birds retaken. One Crow was exceedingly fat.

## HOMING

**12. Further Homing Experiments with Manx Shearwaters in 1939. My Island and Our Life There.**—R. M. Lockley. 1939. *The Countryman*, 20 : 94-96 : 129-135. The two *Puffinus puffinus puffinus* that returned from Venice to Skokholm, Wales, nested again in 1939. Twelve more were shipped May 24 to Switzerland and released May 26: 3 at 5,380 feet near Berne in the Rhone Valley; one was back on its eggs June 8; 3 released at Lugano (watershed draining into the Adriatic); two were back 3 or 4 days after the bird from Berne; 3 were released near Andermatt at about 5,300 feet; two were found 2 days later in Switzerland. "It would seem that the Shearwaters, released among high mountains, amid ice and snow, far from the sea, made for the river valleys, then flew as direct as possible to Skokholm." Three birds released at the nearest point, near Basle, have not yet returned.

"It now seems that Shearwaters are not perturbed by and can fly through and above great land masses." "The experiment is not concluded; we may suppose that the birds travelled by the most direct route, 'on a compass course', no matter what obstacles were in the way."—J. J. HICKLEY.

**13. The Orientation of the Digger-wasp (*Philantus triangulum*).** (Ueber die Orientierung des Bienenwolfes (*Philantus triangulum* Fab.))—N. Tinbergen and R. J. van der Linde. 1938. *Biol. Zentralbl.*, 58 : 427-435. There are two theories of homing: orientation by means of land marks, and homing capacity over unknown regions where "a positive taxis to the source of stimulation brings about the directed return." Honey bees were shown by Wolf (1926, 1927) incapable of directed return from an unknown region; the same proved true of the digger-wasps. Rüppell (1936, 1937) has shown that oriented return from unknown regions is possible for some birds, Schmid's (*Z. vergl. Physiol.* 23 : 592-604, 1936) experiments with wood mice (*Mus sylvaticus*) and dogs point to a similar conclusion. Lockley's experiments with Shearwaters and Griffin's with Leach's Petrels give further evidence of "absolute orientation."

## WEIGHT

**14. Variability in the Body Weight of the Brambling.**—T. H. Shaw. 1939. *Bull. Fan Mem. Inst. Biol., Zool. Ser.* 9 : 241-250. *Fringilla montifringilla* is a regular migrant in Hopei Province, China; 250 specimens were weighed. The sex ratio was 119.3 males to 100 females. Weight ranged from 16 to 32 grams, averaging 21.96. Males averaged 22.71 grams, females 21.07. First year birds weigh less than adults. Monthly averages were: October 21.2 grams; November 20.9; December 23.1; March 23.2; April 23.6. As found by various American observers spring weight exceeded that in fall. Hourly records were taken on 6

birds for 4 days; the daily increase averaged 8.6%. There is a bibliography of 21 titles.

### MOLT

**15. The Molt of House Finches in the Pasadena Region, California.**—Harold and Josephine Michener. 1940. *Condor*, 42 : 140–153. Another notable example from the Micheners of a well-planned and carefully executed project based on large scale banding. From 2,000–2,500 *Carpodacus mexicanus grinnelli* are banded at this station each year with vast numbers of repeat records. The molt starts with the loss of the first primary (proximal) and ends with the growth of the sixth secondary; it lasts 3½ months (105 days), extremes being 90 and 120 days. The adults have a complete postnuptial molt beginning from May 15 to mid August. "The postjuvinal molt of the early-hatched young was found to be the same as the postnuptial molt of the adults while the latest-hatched young shortened the molt period by beginning the molt soon after leaving the nest, by retaining all juvenal flight feathers, and by molting all the other tracts more nearly at the same time. Those hatched at intermediate times varied the time of beginning the molt relative to age, molted a varying number of the flight feathers, and compressed the molt of the other tracts proportionately to the time available between the date of hatching and early November." p. 152.

Besides detailed data on the molt of the House Finches, some observations are given on other species. "The late-hatched young of Song Sparrows, Mocking-birds, California Jays, California Towhees, and Spotted Towhees do not molt all the flight feathers, while the young of the earlier broods do. . . . On the other hand, immature Brewer Blackbirds and English Sparrows have never been observed to vary in any way from a complete postjuvinal molt." From observations on warblers in the spring and fall the authors conclude, "The molt must be for them much more rapid and at a more definite time than it is for the House Finches." p. 152.

### LIFE HISTORY

**16. Results from Banding White Storks in Pomerania.** (Ueber die pommerschen Beringungsergebnisse beim Weissen Storch (*Ciconia ciconia* (L.)) —R. Stadie. 1939. *Dohrniana*, 18 : 18–31. In 1934 some 3,230 pairs of Storks nested in Pomerania. Nestlings are ringed in June and July; some are reported from South Africa by September! Others progress more slowly, for young birds may be found in Bulgaria in October. Some young storks return to Europe their second summer, but others stay in Africa even through their third year. They usually become sexually mature when 4 years old. Causes of mortality are chiefly shooting by natives in Africa, and striking high power wires in Germany. Some birds fail to migrate in the fall, and most of these perish from lack of food.

**17. Changes in the White Stork Population since 1934.** (Bewegungen im Bestand des Weissen Storches seit 1934.) E. Schüz. 1940. *Orn. Monatsb.* 48 : 1–14. A census of storks in Europe in 1934 gave 44,600 pairs; in 1936 Bouet estimated 62,000 pairs in French North Africa. A table is given showing the number of pairs from 1934 to 1939 in 19 localities—Switzerland (7–11 pairs), Holland and German provinces. The records for Oldenburg show an increased number of pairs that raised no young or one young (characteristic of first attempts at breeding) occurring 3 and 4 years after a successful breeding season when the average number reared per pair ranged between 2.5 and 2.8. Weather is one decisive factor in the success of nesting; cold weather at the time of laying is unfavorable; drought means a shortage of food and perhaps influences infestation by internal parasites.

**18. The Stork in the Netherlands in 1939.** (De Oievaar (*Ciconia ciconia* (L.)) in Nederland in 1939.)—Fr. Haverschmidt. 1940. *Ardea*, 29 : 1–19. In 1929 there were 209 occupied nests, in 1934—274, in 1939—312. In 38 nests

no young were raised in 1939, in 140—3 young were raised and in 9—5 were raised; the average was 2.6 young per nest.

**19. The Nesting of the White-tailed Kite in Southern Santa Cruz County, California.**—A. C. Hawbecker. 1940. *Condor*, 42 : 106–11. Four nesting pairs of *Elanus leucurus majusculus* were found in connection with high populations of meadow mice. One pair nested twice. One pair tolerated other raptors, while the others did not. The latter were courageous in diving at human visitors “even after the young had left the nest and the second nest contained eggs.”

**20. Observations at the Nest of the Iceland Gyrfalcon.** (Beobachtungen am Horst des Isländischen Jagdfalken.)—G. H. Sherlock. 1940. *Journ. f. Ornith.*, 88 : 136–138. Excellent pictures of the female and 3 young (18–19 days old) taken from a blind 4 meters from the nest. The male did all the hunting, bringing largely Ptarmigans; he came only 3 times during 15 hours of observation. The female was molting.

**21. Studies on the Biology and Behavior of the Hazel Hen.** (Untersuchungen zur Biologie und Ethologie des Hazelhuhns.)—H. Krätzig. 1939. *Ber. Ver. schles. Ornith.*, 24 : 1–25. Very interesting paper on the development of hand-raised *Tetrastes bonasia rupestris*. Sand baths were taken at one week. There was little fear until the age of 11 days when the alarm note appeared; at first they paid no attention to noises, but later were very sensitive. There were four main stages of development: first 11 days—needed brooding, reacted only to mother's alarm note, lively; at 12–15 days—flight acquired, and temperature control, roost in trees, fearful, slow movements; at 25–30 days—down disappeared, full juvenal plumage, increasing independence, change of voice; at 80–90 days—adult plumage, quarrelsome, breaking up of brother-and-sister flock, sex-differentiated notes, territory and formation of pairs. Tests were made with models of raptorial birds; the Sparrow Hawk (*Accipiter*) had the meaning of an air enemy to them, but a Buzzard (*Buteo*) and Swan did not. Experiments were made with bad-tasting insects; the young learned to avoid them after 4.5 days.

**22. Studies on the Behavior of the Ptarmigan during Development.** (Untersuchungen zur Lebensweise des Moorschneehuhns (*Lagopus l. lagopus*) während der Jugendentwicklung.)—H. Krätzig. 1940. *Journ. f. Ornith.*, 88 : 139–165. Another paper rich in valuable observations of which only a few can be mentioned here. At 32 days the down pattern of the head disappeared and at the same time the young became independent of parental care. Behavior of the 4 hand-raised young in taking food and water is described; the first sand bath was taken at 7 days. They were not fearful until the age of 20 days; they are less sensitive to sounds than other grouse. From 20 days on they crouched when a *Buteo*, Kite or Falcon flew over; at one month a Hobby (*Falco subbuteo*) was carried near them; the males went into the “attacking attitude”, while the females were indifferent. At the age of one month the males took over the “warning” function; at two months they first showed territorial behavior. Experiments were made with models on reactions to their enemies; results were the same as with the Hazel Hens.

**23. Observations on the European Coot.** (Beobachtungen am Blässhuhn (*Fulica atra* (L.)).)—P. Ruthke. 1939. *Orn. Monatsb.*, 47 : 141–147. Males come first, settle on territories and call for mates; both defend territories from other Coots. Some pairs are tolerant of Crested Grebes, Mallards and Pochards, others are not. Nest-building takes 4–12 days; is done by both sexes and continues after the eggs are laid. The male builds other nests and platforms for resting places for the young. Both birds incubate. The male takes the first hatched young and feeds them, sometimes bringing food to the nest. All come

to the nest at night where the female broods them. A 4-day-old orphan was given to a pair with somewhat older young and it was adopted. At one month the young begin to dive and get their own food. At 8 weeks they are independent; they join other young, but also return to their parents. Occasionally there are two broods; once young of the older brood helped feed the younger. They bathe in the manner of ducks.

**24. Summer Life of the Sora Rail.**—L. H. Walkinshaw. 1940. *Auk*, 57 : 153–163.—Much information on the nesting of *Porzana carolina* in Michigan, with weights of eggs, young and adults. Six to 13 eggs are laid, the average for 39 nests being 9.35; incubation lasts from 16–19 days. “Out of 36 nests, in which 266 eggs were laid, 177 young were brought off from 22 nests, giving a success percentage for nests of 61.11 and for eggs of 66.54.”

**25. On Some Experiments with Corncrakes.**—A. G. Mason. 1940. *Irish Naturalists' Journal*, 7 : 226–237. *Crex crex* is polygamous and territorial; early in the season males paid more attention to a stuffed decoy, with which they tried to copulate, than they did to an imitation of the “craking”, but later the opposite was true. Description of experiments, of various notes of the birds, and courtship display.

**26. Social Nesting Habits of the Smooth-billed Ani.**—David E. Davis. 1940. *Auk*, 57 : 179–218. Very interesting study made in Cuba of *Crotophaga ani*, a member of the Cuculidae. This species lives throughout the year in small flocks in which males predominate; each flock “possesses a definite territory which it defends against strangers.” The birds “are very solicitous for other individuals of the flock, crowding around with great excitement when one member is hurt.” They preen each other. It “is probable that there is a flexible order of social dominance.” A communal nest is built and several females lay in it. “Often one bird, either male or female, is most interested in the nest, is most alarmed by the observer, and is most active in the building and incubation.” p. 191. “The survival of the young is about 35%.” The young remain with the flock for many months and “may breed with the parent flock.” p. 181. Territorial advertisement and courtship display are simple, and the nesting cycle is easily disturbed. “The chasing, rushing, and fighting to defend the territory are very fierce. . . . Stuffed birds placed in the territory are attacked and destroyed”, females fighting as vigorously as males. “The relationships between the adults are in some cases certainly monogamous, but in other cases, the relationships may be either polygynous or polyandrous.” Older young assist in feeding subsequent broods. Colored leg-bands were used for the identification of individuals.

**27. Great Reed Warbler and Cuckoo.** (*Drosselrohrsänger und Kuckuck.*) B. Molnár. 1939. *Aquila*, 42–45 (1935–38): 257–264.—Along the Altwasser-Körös River in Hungary *Acrocephalus arundinaceus* is heavily parasitized by *Cuculus canorus*. Single female Cuckoos have territories 1.5–2 kilometers along the bank; they mate with several males. Yet other females also lay in these territories, nests being found with 2 and 3 Cuckoo eggs. A reddish female mated with a dark male in May, with a lighter bird in June and later with still another. Cuckoos hatch in 13–14 days, leave the nest after 3 weeks. In 1935 60–90% of the Reed Warblers raised Cuckoos. “The Cuckoo increases, the Reed Warbler decreases.”

**28. Inbreeding Barn Swallows.** (Ratschläge zur Schwalbenberingung.) G. Creutz. 1938. *Vogelring*, 10(1) : 1–14.—Two cases of mothers mating with sons in *Hirundo rustica* in Germany.

**29. Observations on Breeding and Song of Wren.**—George Marples. 1940. *British Birds*, 33 : 294–303. The song of a male *Troglodytes t. troglodytes* lasted 4 seconds, and was usually followed by a pause of 6 seconds. The female did most

of the building, all of incubation and feeding of the 2 young, even driving off her mate when he came near. In 1937 T. D. Wier "watched a nest from 3 A.M. to 9.10 P.M. and records both sexes feeding 278 times in the day."

**30. Observations on Nesting of the Chiffchaff.** (Das Brutleben des Weidenlaubsängers).—O. Steinfatt. 1938. *Ber. Ver. schles. Orn.*, 23 : 20-27. Two all day observations on incubation in *Phylloscopus collybita* and three on feeding. At one nest on the 11th day of incubation (a sunny, warm day) the female incubated 70% of the daylight hours; she left 34 times, staying off from 1-17 minutes, averaging 8.2 minutes; her periods on lasted from 1-56 minutes, averaging 19.6. Another bird on the 3rd day of incubation (weather foggy, then sunny), incubated 85% of the day; she left 17 times, staying off from 2-25 minutes, averaging 8.2 minutes; her periods on ranged from 5-141 minutes, averaging 49.1.

The first nest was watched all day when the 4 young were 3 and 4 days old, and 8 and 9 days old; on the first day the female fed 99 times (6.2 times an hour), and on the second 228 times (13.4 times an hour); on the first day the first feeding came at 4.04, the last at 7.27; on the second at 3.36 and 7.06. Usually one insect was brought at a time. The male and female had practically the same foraging territory, but he troubled himself little about her and his offspring. One male had 2 mates with nests 25 meters apart. Incubation in one case lasted 15 days, fledging 13, 13 and 14 days.

There are usually two broods. In one nest two young died from a cold rain; the female fed the 11 day survivor as busily as she had all three; after a while it failed to swallow her offerings. She carried the food away, but in the next 3 minutes came back 5 or 6 times, touching the bill region of the young bird, but without result. She chipped constantly in this disturbing situation.

**31. Observations on the Warblers in the Rominter Heide.** (Beobachtungen über die Laubsänger in der Rominter Heide).—O. Steinfatt. 1939. *Ber. Ver. schles. Orn.* 24 : 41-50. In the Wood Warbler (*Phylloscopus sibilatrix*) the female builds and incubates; both parents feed. Incubation lasts 14 days.

A nest of the Willow Warbler (*Ph. trochilus*) with 5 young was watched all day when the young were 5 and 8 days old. On the first day the male fed 94 times, the female 57, totalling 151 times in 15 hours and 57 minutes, while excreta were removed 32 times. On the second day the male fed 91 times, the female 117, totalling 208 times in 16 hours, 38 minutes; excreta were removed 37 times. The young left during the 11th day.

**32. Incubation Behavior of *Lanius ludovicianus* in North Dakota.**—A. Johnson. 1940. *Wilson Bull.*, 52 : 35-36. During 942 minutes of observation early in the incubation period, the female spent 81.3% of the time on the nest; her periods on ranged from 1-94 minutes, averaging 23; off from 0.5-28, averaging 5. The male fed her about once in 23 minutes; feeding was first observed 5 days before the laying of the first egg.

**33. Starlings with Young at Christmas.**—H. E. Forrest. 1940. *British Birds*, 33 : 314. A pair were watched feeding young in a hole in an ash tree in Shrewsbury at Christmas, 1939.

**34. Breeding Behavior of the Black-throated Green Warbler.**—F. A. Pitelka. 1940. *Wilson Bull.*, 52 : 1-18. Nest of *Dendroica virens* watched in Michigan. Nest building lasted 4 days, the male assisting on the first day, as was reported by Stanwood (*Auk*, 1910). Incubation was watched during one afternoon; the female was on 32 and 65 minutes, off for 12 and 13 minutes. When the two young were five days old, the nest was watched from dawn till dark; curiously enough they were fed 46 times, 18 by the male, 28 by the female, just as the 3 young of the same age watched by us in Massachusetts (Nice, *Bird-Banding* '32), although in our case only the female cared for the young. As with many other birds the male brought larger portions than did his mate. Charts are given show-

ing periods of attentiveness, etc. The birds were indifferent to a red squirrel, but chased off a Black and White Warbler. The parents displayed when the young left the nest, which they did at the age of 9 and 10 days. The male failed to feed the brood after this event, although they often do feed fully grown young.

**35. Territorial Aspects of the American Redstart.**—J. J. Hickey. 1940. *Auk*, 57 : 255–256. In a "heavily wooded slope in Westchester County, New York, the writer found *Setophaga ruticilla* to be a highly territorial species. Males advertised their presence by their typical well-known song and by formalized territorial displays that apparently served to define boundaries and reduce fighting. These displays consisted of short, horizontal, semi-circular flights made with stiffened wings and outspread tails. These performances were frequently observed between males, less commonly between females and never between a male and a female where a question solely of territory was involved. . . . As far as could be observed, these same performances seemed to serve as some part of the male's courtship of females."

In 1937 20 males were definitely mated, 4 apparently were not, although holding territory until late June. An "indeterminate number of unmated wandering males also exist." On June 13 "a male in the immature plumage spent the entire morning softly singing and gradually working its way along 800 yards at the top of the ridge. This bird was furiously driven off by males and females whenever it passed through their territories. Plumage notes on 48 males on territories showed that only four (8.3 per cent) were in immature plumage. All four were paired and possessed territories of the same size as those of the adult males." Territories were usually about an acre in size. "Males were silent in the presence of female Cowbirds, but females reacted with sharp hisses, a rapid snapping of the bill and much spreading of the tail." A great deal of significant information in few words.

**36. Polygamy in the English Sparrow.**—Theed Pearse. 1940. *Condor*, 42 : 124–125. A male *Passer domesticus* had two mates that were laying in the same nest; 4 eggs were considerably incubated, 2 were just started.

**37. Nesting Habits of the Leucosticte.**—Ruth Wheeler. 1940. *Condor*, 42 : 133–139. At a nest of the Sierra Nevada Rosy Finch (*Leucosticte tephrocotis dawsoni*) in the Yosemite the female incubated and brooded; both parents brought large amounts of food about once in 45 minutes; this was gathered in meadows far below the nest.

**38. A Contribution to the Biology of the Lapponian Bunting** (*Calcarius lapponicus* L.).—A. V. Mikheev. 1939. *Zoological Journal, Academy of Sciences of U. S. S. R.*, 18 (5) : 924–938. Russian with English summary. Male Lapland Buntings arrive on their breeding grounds before the females in the Timan tundra on the River Velt, the first of the males appearing May 8, of the females May 13. Each male guards his territory against other species as well as against other Longspurs. The size of the territory averaged 0.01 km. Nest building began May 31; 4–6 eggs were laid. The female incubates, both parents feed the young, gathering insect food within the limits of the territory. Fledging lasts 8–10 days. Young leave the nests in greatest numbers in early July; they start to molt between the end of July and early August; by September the first winter plumage is complete and indistinguishable from adult winter plumage.—F. A. ПИТЕЛКА.

#### BIRD BEHAVIOR

**39. Pair Formation in the Raven.** (Die Paarbildung beim Kolkraben.)—K. Lorenz. 1940. *Zeitschrift für Tierpsychologie*, 3 : 278–292. A discussion of different types of mating in birds. The impressive behavior of a tame male Raven (*Corvus corax*) towards the female is described and illustrated with photographs. This female had been previously so intimidated by the male, that she



appeared unable to carry out her part in the ceremonies and flew away. Lorenz had also two young Ravens which had behaved like a pair, but upon the disappearance of the older female, the "male" of the "pair" became the mate of the old male.

**40. Observations on Captive Robins.**—David Lack. 1940. *British Birds*, 33 : 262–270. In late February two known pairs of *Erethacus rubecula melophilus* were put in an aviary 30 x 20 x 6 feet, and one known pair and an unmated male and female were put in an aviary 30 x 12 x 6 feet. The dominant pair in each aviary bred, but the others did not. The minimum territory of a wild pair is 2000 square yards; the aviaries offered 40 and 67 square yards. The ownership changed once in one aviary and twice in the other. Territorial and aggressive behavior was modified, but the breeding behavior of the dominant pair was nearly normal. It is clear that "possession of territory is psychologically essential for nesting"; subordinate pairs showed almost "no traces of breeding behaviour." In aviary 2 the dominant male nested with both females; no young were raised, but his first mate built again and raised young. At the age of 17 days, young birds first picked up food for themselves, but they were fed by the parents until they were 32 days old.

The relationship of song and the thyroid gland is discussed. Küchler (1935) found a spring and autumn peak of activity in the thyroid in the Redbreast and the Yellow Hammer (*Emberiza citrinella*); both of these species sing in the fall. Besides the Redbreasts there were two pairs of Chaffinches (*Fringilla coelebs*) in aviary 1; the dominant pair bred, while the others "showed no traces of breeding behaviour."

**41. Antipathy in the Screech Owl.**—Leon Kelso. 1940. *Auk*, 57: 252–253. Hand-raised Screech-Owls (*Otus asio naevius*) taken from the nest before their eyes were open, showed "extreme anxiety", "then flight or fight" when the skin of a Crow was shown them at the age of 2 months. The black color and slight movement were found to be essential characteristics for releasing the aversion. The birds were unresponsive to stuffed skins of "the Goshawk, Barred and Horned Owls."

**42. Courtship Feeding in Birds.**—David Lack. 1940. *Auk*, 57 : 169–178. "In many different groups of birds the male feeds the female during courtship or incubation." Occasionally as in Terns "either sex may beg for or present food", while in the "Button Quail, *Turnix*, the normal procedure is reversed and the female feeds the male. This was perhaps to be expected, since in *Turnix* nearly all the sex behavior is reversed." The significance of the habit is discussed, its symbolic nature and finally its occurrence throughout the class Aves, with a classified list of its occurrence or absence in the different orders and families, with a request for further observations.

**43. The Releaser Concept of Bird Behaviour.**—David Lack. 1940. *Nature*, 145: 107. "Lorenz has provided a wealth of data and analysis to show that many instinctive acts in birds are 'released' not by the external situation as a whole, but by some characteristic part of it. This greatly assists in explaining the evolution of plumage patterns and rhythmical movements in display in birds, particularly with regard to their 'improbable' and specific nature." On the basis of his experience with Redbreasts, Lack suggests that "releasers are not the fundamental units of bird behaviour. Rather, the bird reacts originally to a more general situation. At a later stage (later in evolution if the releasing complex is inherited, later in the life of the individual if it is acquired; this issue is not discussed here), the bird tends to react primarily (but not necessarily exclusively) to a characteristic part of the external situation."

It seems to the reviewer that many more observations and experiments are needed to throw light on this problem.

**44. On "Taking Offense" in Birds.**—(Ueber "Anstoss-Nehmen" bei Vögeln.) F. Goethe. 1940. *Zeitschrift für Tierpsychologie*, 3 : 371-374. Many instances have been recorded of birds taking offense at individuals that appear abnormal, for instance in storks, geese and cranes. Gulls and terns marked with red were attacked by others, and the same was true of injured individuals. Young Herring Gulls and Swifts that are not well able to fly are attacked by adults. Cranes and Jackdaws attack the dominant of two fighters. Ravens and Hooded Crows attack a predator that has caught one of their fellows, then attack the injured bird! This dislike of unusual appearance and behavior in a fellow-member of the species is characteristic not only of birds but of mammals, including ourselves.

**45. Breeding Behavior of the Squid.** (Zur Fortpflanzungsbiologie von *Sepia officinalis* L.).—L. Tinbergen. 1939. *Arch. Neerland. Zool.*, 3 : 324-364. A detailed study illustrated with sketches and photographs. A male in breeding condition displays before another squid; if this is a male in breeding condition it answers with a like display; if it does not display, nor flee, a pair is formed. This is fundamentally the same picture we find in the breeding behavior of many birds. It is not only valuable to compare the behavior of other animals with that of birds, but some other animals lend themselves more readily to experiment than do birds.

**46-48. "Counting" in Birds.** Concluding Experiments on the Question of "Counting" Ability in Domestic Pigeons. (Abschliessende Versuche zur Frage des "Zähl"-vermögens der Haustaube.) W. Arndt. 1939. *Z. d. Tierpsychologie*, 3 : 88-142. The learning of Abstract Numbers by the Jackdaw. (Vom Erlernen unbenannter Anzahlen bei Dohlen.) K. Schiemann. 1940. *Ibid.*, 3 : 292-347. Experiments with Shell Parakeets on the Problem of "Counting" Ability. (Versuche an Wellensittichen zur Frage des "Zähl" vermögens.) E. Marold. 1939. *Ibid.*, 3 : 170-223.—Since 1935 O. Koehler and his students have published a number of papers on the ability of birds to "count". Their experiments are based on training to situations in which we would orient ourselves by counting. In general this training is done with food and punishment (fright). The most important experiments can be divided into two groups:

1. Choice between two quantities of objects. By changing the number of objects (grains, peas) it is possible to find the limits to which discrimination is possible for each bird. A maximum of 5-6 was found.

2. Taking of a certain number of objects (and not more or less) from one or more quantities under certain circumstances. A maximum of 6 was found.

In the past one great difficulty has been the involuntary influence of the experimenter on his subjects which invalidated experiments that seemed to show that animals may be excellent mathematicians, for instance, *Der Kluge Hans*. Moreover, the sequence of the experiments is not without influence on the results.

Arndt's paper seems to be intended as a final account of the experiments with domestic pigeons; we now have the results of training with 12 individuals. Marold performed similar experiments with 6 Parakeets and comes to almost the same conclusions. Schiemann is the first to work with tame individuals of a wild species; his 10 Jackdaws were trained in opening food boxes with numbers of dots on the cover. They learned much faster than the pigeons and parakeets.

These and other observations seem to prove that birds in experiments act as if they were able to count visual or auditory impressions. There are a few confirmatory records under natural circumstances. Similar observations have been made on mammals (monkeys). But what we know about the development of counting in children and people living under primitive conditions does not make it probable that birds really count in the way that adult and civilised people do. An exact and "scientific" counting is based on a series of words or symbols, and is thus linked with our powers of speech and writing. As long as the contrary is not proved, we have to explain the observations on "counting" by birds by assuming substitute processes, which may replace counting, also in man. These sub-

stitutes are: *a*, distinguishing between two quantities offered either simultaneously or in succession; *b*, observation and memory of the location of one or more special objects in a quantity of objects; *c*, memory of a certain "rhythm of actions" (Bierens de Haan, 1935, *Zool. Jahrb.*, 54 : 249-404) or "action up to a certain number" (Koehler).

The experiments show a great difference between individuals of the same species in their ability to "count." This is not surprising in domestic animals, that show much physical diversity. Observations with more uniform wild forms would presumably be worthwhile. The variation in ability to learn counting is greatly effected by "temperamental differences" which make the birds more or less suitable for this kind of experiments.—JOOST TER PELKWYK.

#### SEX AND AGE RATIOS

**49. Sex and Age Ratios in Survival of the Californian Quail.**—John T. Emlen, Jr. 1940. *Journ. Wildlife Management*, 4 : 92-99. Records on 17,632 *Lophortyx californica*. The sex ratio averaged 112.2 males per 100 females. In early fall there were 105 males to 100 females, in winter 112 males and in late spring 127 males. Age ratios start with 200 immatures to 100 adults in the fall and change to 100:100 in late spring. Survival from "potential egg" to 1 year is calculated as 8.5%; from 6-18 months 31%; over 12 months 50%. "It is suggested that in localities where high ratios indicate low annual replacement, attention of game managers should be directed to the winter environment. In the reverse situation summer factors should receive primary attention." Fifty per cent seems a low survival rate for this bird; it would mean an average life of two years for those reaching adulthood (*Trans. Linnaean Soc. N. Y.* No. 4, 1937. pp. 190-198).

#### ECOLOGY AND POPULATION STUDIES

**50. The Bird Population of an Oxfordshire Farm.**—W. M. M. Chapman. 1939. *Journ. Animal Ecology*, 8 : 286-299. Winter censuses for 10 years (86 counts) on 125 acres resulted in 3.6-5 birds per acre on pasture (2.7 miles of hedge per 100 acres), and from 3.7-7 birds per acre on arable land. Summer censuses on 300 acres on the same farm taken 1931-34 gave two birds an acre.

**51. An 8-Year Census of Lesser Prairie Chickens.**—V. E. Davison. 1940. *Journ. Wildlife Management*, 4 : 55-62. On an area four miles square in western Oklahoma *Tympanuchus pallidicinctus* is rigidly protected, yet the birds range outside where they are shot. The cocks were counted on their "gobbling grounds", where they come every morning from late February to early June. The number of birds on each lek is constant; cocks banded on the right or left leg showed that "each male takes the same position relative to other birds on a given gobbling ground throughout the season." Sex ratios in coveys of young birds during 3 years ranged from 140 to 163 males per 100 females. The number of gobbling grounds ranged from 18-40 during 7 years, while the number of cocks from 1932-39 (1937 omitted) were as follows: 490, 606, 353, 360, 289, 266, 352. The author warns against optimistic "estimates" of Prairie Chicken populations; the Oklahoma Game and Fish Department stated that there were 5,000 Chickens on the Davison Ranch, when in reality there were less than 1,500. "Prairie Chickens of all species are so low in number that publicizing figures in excess of actuality is a menace to conservation of the birds."

**52. Range, Population, and Game Status of the Western White-winged Dove in Arizona.**—J. A. Neff. 1940. *Journ. Wildlife Management*, 4 : 117-127. The fact that *Melopelia asiatica mearnsi* gathers in large flocks that concentrate about water or food supplies, makes it exceedingly vulnerable to shooting. From 65 to 85 per cent of such a flock may be killed. Due to drought and intensive shooting this bird is "in very serious condition."

**53. The Food and Habits of the American Merganser during the Winter in Michigan, Considered in Relation to Fish Management.**—J. C. Salyer, II, and K. F. Lagler. 1940. *Journ. Wildlife Management*, 4 : 186–219. *Mergus merganser americanus* eats from  $\frac{1}{2}$  to  $\frac{1}{2}$  its weight daily in two meals. Where these birds concentrate on trout streams they can be frightened off by “Merganser drives” and can be kept from hatching ponds by mechanically exclutory or frightening devices.

**54. The Effect of Certain Land Use Practices on Populations of Breeding Birds in Southwestern Ohio.**—C. A. Dambach and E. E. Good. *Journ. Wildlife Management*, 4 : 63–76. Markedly larger populations were found when farms were replanned for soil conservation. The average number of pairs per 100 acres on large meadows was 48; on meadows strip-cropped 93; on small grains not strip-cropped 10, on small grains in strips 27; in grazed woods 111, in protected woods 225. An encouraging outlook.

**55. Original and Present Breeding Ranges of Certain Game Birds in the United States.**—R. C. McClanahan. 1940. Bur. Biol. Surv. Wildlife Leaflet BS 158. Washington, D. C. 21 pp. An illuminating series of maps. The decrease in the breeding ranges of the Trumpeter Swan, of ducks and geese, grouse, the Sandhill Crane, Woodcock and others is appalling. A few species have invaded new regions, either of their own accord—Prairie Chicken and Ring-necked Duck, or through introduction by man—Bobwhite and California Quail. The Ruffed Grouse is shown as having originally nested in northeastern Oklahoma; although this seems probable, I was not able to find a single record of the occurrence of this species in the state. The map of the Lesser Prairie Chicken extends its present range too far to the east in Oklahoma. On the map of the Bobwhite the present range is not given at all except where it has been introduced; presumably it is fairly coincident with the former range, although its numbers in many places are greatly reduced. The Mourning Dove has the proud distinction of a country-wide distribution both in the past and present. A most interesting pamphlet, well worth careful study.

#### BOOKS

**56. The Status and Distribution of Wild Geese and Wild Duck in Scotland.**—International Wildlife Inquiry, II. John Berry. 1940. Cambridge University Press. Macmillan. N. Y. 190 pp. \$3.25. A most valuable inquiry into the numbers of waterfowl. The book gives a Summary of the status of Wildfowl in each faunal area (there are 12 of these shown on a large map), then reports on each species of geese and ducks with general discussions, bibliography and index. The picture is a disturbing one:—incredibly long shooting seasons—from August through February,—accessibility of former wild haunts through the motor car; shooting over decoys; excessive shooting; increase of enemies, such as crows, gulls, pike and Mute Swans; drainage and afforestation; the break up of estates which had formerly served as virtual sanctuaries. There are many items of great interest. Canada Geese were introduced 200 years ago and breed in the wild in some districts. “Although the migratory habit has been largely lost, the geese gather into flocks in autumn and move down to winter in definite districts as do the home-bred Greylag. These naturalized Canada Geese are extremely wary, and as hard to shoot as any other species,” p. 53. Some ducks have greatly increased their ranges—Goosander, Red-breasted Merganser, Tufted Duck and Pochard. The killing of Goosanders and Mergansers removes the chief enemies of the pike; the pike eat each other, “migrating salmon smolts and parr” and young ducks. “For the conservation of the salmon, as well as for that of the wildfowl, the writer considers that in such circumstances the *Merginae* may do materially more good than harm.” p. 164.

Modern inventions have “reduced the numbers of wildfowl from hundreds, or thousands, of millions to figures which come perilously near to being countable.”

p. v. Few suggestions are given as to the protection of the waterfowl. To an American there are two that are obvious: sanctuaries, and drastic curtailment of the open season, particularly the abolition of spring shooting.

**57. Bird Reserves.**—E. C. Arnold. 1940. With 9 coloured plates from paintings by the author. Witherby. London. 215 pp. 15/. An enthusiastic account of the author's purchase of a pond; his labors to increase its attractiveness and of the satisfaction he gained thereby. An annotated list is given of the 106 visitors to the "Mere", all written in entertaining, informal style. We may heartily agree with the author when he writes, "For to my mind bird protection is nowadays far more a matter of preserving bird haunts than of making laws to protect birds, which may easily, like the Kentish plover, be exterminated by progress in the form of bungalows, though officially protected by the law."

**58. Bill and the Bird Bander.**—Edna H. Evans. 1939. John C. Winston Co. Phila. 220 pp. \$1.50. A lively book on banding, a surprising amount of sound information being given in entertaining form through the situation of an eager boy helping the "Professor" band pelicans, skimmers, terns, and many other birds in Florida. The book is illustrated with 76 photographs and is provided with an index. An excellent book for boys and girls.

**59. Texas Bird Adventures.**—Herbert Brandt. 1940. Bird Research Foundation. Cleveland, Ohio. 192 pp. \$3.00. An enthusiastic account of a collecting trip to the Chisos Mountains and to a great cattle ranch south of the Red River. Much of the narrative is interesting, but when the author tries "fine writing" he is not so successful. Two notable birds, the Scissortail Flycatcher and Mississippi Kite receive special tributes. There are a number of excellent sketches by George Sutton. According to the advertisement this book "will be welcomed by bird lovers everywhere." I wonder. It is my experience that "bird lovers" prefer to read "intimate studies" where the birds are not robbed of their eggs.

**60. The Great Naturalists Explore South America.**—Paul R. Cutright. 1940. Macmillan. N. Y. 340 pp. \$3.50. Part One of this book gives a brief account of the Great Naturalists; Part Two is a compilation from their works on different animals—mammals, birds, reptiles, insects. The author has shown much industry in gathering into various chapters incidents from many writers, but he is not always as critical as he should have been, either in his choice of authorities or in his own conclusions. For instance, on p. 168 he makes two erroneous statements as to migration of birds. "It is well known that birds are very regular in their migratory travels: they generally leave a given region on a definite date and return on a day which can be specified." "Light may be a very important factor in the migration of birds; however, biologists agree that these flights are initiated each year through the activity of the sexual glands." It is strange that such a book should have been written by a man who has not himself been in South America.

**61. Romance of the National Parks.**—James Harlean. 1939. Macmillan. N. Y. 240 pp. \$3.00. This handsome book treats first of the "History" of the older parks—Yellowstone and Yosemite and of the heroic labors of John Muir; and second of "Journeys", describing briefly "Magnificent Mountains of the Northwest", "The Pioneer Western Parks", "The Old Southwest" and "East of the Mississippi." It is a tragic story: heart breaking efforts of devoted men with a passion for unspoiled nature and vision for the future, largely frustrated by indifference and greed. We have a few magnificent areas supposedly preserved for posterity, yet even these have been made too accessible to throngs of sight-seers, and none are safe from attacks by predatory interests. The quotations of the noble words of John Muir constitute one of the best features of the book. Most of the 123 photographs show us the grandeur of nature; it seems a pity to

have included views of hotels and cabins. There is an index, but no mention of where one should write to get free information on the parks. A strong plea is made for "many more wilderness areas."

This is an admirable book, beautifully illustrated, a testimonial to the unselfish endeavors of those who have labored to save some places in nature from exploitation, and a warning lest we lose even these.

**62. The Birds of Buckeye Lake, Ohio.** (Misc. Publ. Museum of Zoology, University of Michigan, No. 44.)—Milton B. Trautman. May 7, 1940. 466 pp. Frontispiece and 15 plates. 2 Maps. \$2.50.

This very detailed and extended report covers a region of approximately 44 square miles centered about Buckeye Lake in east central Ohio. The field work and observations covered a period of twelve years from February 1, 1922 to February 1, 1934 and were conducted chiefly by the author with assistance from various organizations and individuals. By means of the published accounts of early travels the original primitive conditions of the area are deduced; from published sources and recollections of the older inhabitant, the rapid changes that took place between 1821 and 1890, coincident with the settling of the area and advances of agriculture are described. Further advances and "improvements" between 1891 and 1920, and from 1921 to 1934 are likewise traced. Some space is devoted to discussion, the changes in the status of various groups and individual species of birds as they were affected by the general changes in the area during "historic times" (*i. e.*, since 1751). Additional subjects covered include localities and conditions between 1922 and 1934, climatic conditions, wintering birds, nesting and summering birds, ecology of birds in the swamp lowlands, distribution and relative abundance of birds throughout the year, sources of data, etc.

The 288 forms of birds recorded from the area are discussed in considerable detail; the status of each is given, earliest and latest recorded dates of arrival and departure, median arrival and departure dates, and much interesting and valuable information on habits, life history, food, changes of status and seasonal fluctuation.

This is probably the most ambitious and comprehensive survey of the bird life of a limited area that has yet been undertaken in this country. The quantity and quality of the field notes and the many sides of the investigation attest to Mr. Trautman's industry and his close attention to detail. From the very beginning of the study he appears to have had a definite final objective in view; this objective he has now attained in a most creditable manner. The Birds of Buckeye Lake should stand as a model to anyone attempting a similar piece of work.—J. L. P.