Obviously the above items cannot be fully interpreted. They refer only to one locality. They do, however, cause speculation as to which factors in the life histories of the species referred to, perhaps ones connected with their breeding habits, are responsible for the differences in sex ratios noted.—EDWIN A. MASON, Wharton Bird Banding Station, Groton, Massachusetts.

RECENT LITERATURE

Reviews by Margaret M. Nice

BANDING

1. Bird Banding Notes. 1942. Vol. 3, No. 4 : 57–66. Fish and Wildlife Service, Washington, D. C. Due to the difficulty of obtaining aluminum, no new permits for banding are being issued, and the banding of colony birds is discouraged. Experiments are being made with cellulose-acetate plastic for bands of sizes 5–8. During 1940 428,185 birds were banded, during 1941, 357,174, the total since 1920 coming to 4,069,501. Species banded in the greatest numbers were: Chimney Swifts, Mallards, Common Terns, Pintails, Juncos, White-throated Sparrows, Herring Gulls, Grackles, Starlings, Song Sparrows, Robins, Purple Finches and Redwings.

2. Migration of the Tricolored Red-wing in Central California. Johnson A. Neff. 1942. *Condor*, 44 : 45–53. *Agelaius tricolor* is "a species of gregarious and erratic habits", largely confined to California. Between 1924 and 1940, 19,700 were banded. There have been 93 recoveries, i.e., 0.47 per cent. These show a northwestward movement after nesting to coastal farming areas and rice-growing districts. The oldest bird reached 6½ years. Blackbird damage to rice and other grain crops has decreased since 1932.

Banding was also used in Numbers 3, 4, 14 and 15.

LIFE HISTORY

3. Supplementary Notes on the Royal Albatross. L. E. Richdale. 1942. *Emu*, 41 : 169–184, 253–264. Information on four seasons since the author's first paper (1939, *Emu*, 38 : 467). Six pairs of *Diomedea epomophora sanfordi* were banded with aluminum and colored bands. Faithfulness to mate and nesting site was found to be the rule. If a chick is raised one year, the parents take a year off before returning, nesting every other year. The egg is laid in November, it is hatched after 77–80 days, and the young bird is fledged in late September. If the egg or chick is lost, parents return the following fall; one pair that lost their chick in late March "returned after six months' freedom." One pair have been together since 1935, one since 1937, three since 1938. One female lost her mate and apparently was "forming a new alliance", (p. 180). With each pair "the female always had a much darker crown than the male."

At one nest the male sat on the eggs from 4 to 14 days at a time, 43 days in all, while his mate sat for 3 to 10 days, totalling 36. At another nest the female's periods lasted from 3 to 10 days, the male's from 3 to 5. At still another the female sat from 1 to 5 days, the male from 1 to 3. The chick takes three days to hatch. Spells at the nest shorten after hatching, none being over 5 days. These young are not deserted before they are fledged as in the case with some birds of this family, but smaller meals are given near the last and the young lose some of their extra weight. An admirable study based on the use of colored and aluminum bands.

4. Blue and Lesser Snow Geese on Southampton and Baffin Islands. T. H. Manning. 1942. *Auk*, 59 : 158–175. For every 40 pairs of Snow Geese (*Chen h. hyperborea*) on Southampton Island, there were one pair of Blue Geese (*Chen caerulescens*) and 2 or 3 mixed pairs. The geese and Herring Gulls (*Larus argentatus*) nest peaceably side by side, although the geese drive strange gulls away from their eggs. The female incubates, while the male stands guard. Adults are very fat on arrival, but lose all their fat while caring for the eggs. The author thinks "the female seldom or never leaves the nest" to eat! (p. 163.) Incubation lasts 22–23 days. As soon as the young are strong enough to follow, the parents leave and join other bands of geese. Many young are lost; some are adopted by other families. "If I picked up one of these lost birds or stopped to examine it, it would thereafter follow me as readily as its parent." Of 72 downy Snow Geese banded in 1934, 22 have been recovered—a shockingly high proportion. Fifteen of these were shot in Texas. No yearling geese are present in the nesting colonies. The author believes that Blue and Lesser Snow Geese are subspecies of one species.

5. Further Contributions to the Ornithology of the Seychelles Islands. D. Vesey-Fitzgerald. 1941. *Ibis*, 14th ser., 5 : 518–531. Great numbers of eggs are taken commercially from these islands north of Madagascar; one of the chief victims is the Wideawake Tern (*Sterna fuscata*). It arrives in May during the season of the monsoons. When a male starts to copulate, "every other male in the immediate vicinity will join in until there is a heap of fluttering birds. This 'treading' of the females on the breeding grounds has more the appearance of excited play than the actual act of copulation", (p. 523). One egg is laid; incubation lasts a month; the young can fly at two months. If breeding is too long delayed by egg-collecting, the birds suffer greatly from the heat and the young die. "When the birds are closely packed together they protect their eggs with much vigour if danger threatens. . . . When the birds nest in reduced numbers and are unable to suppress the vegetation, numbers become strangled in the trailing vines of *Cassytha* sp." (p. 525).

Frigate-birds "appear to be entirely dependent on Booby colonies for their food," (p. 520.) Red-footed Boobies (*Sula sula sula*) nest amicably with *Fregata minor aldabrensis* and *F. ariel iredalei*, but "in the air there are continual skirmishes between the two species."

White Terns (*Gygis alba monte*) are abundant and tame, and "nest in the houses." The single egg is laid on branches of trees and is not stuck on. The author replaced one with the larger egg of a Wideawake Tern; "the foster parent never dislodged" it, but the chick "was quite unable to retain its perch," (p. 530).

6. Night Desertion by Nesting Common Terns. Nelson Marshall. 1942. *Wilson Bulletin*, 54 : 25–31. Recently there has been wide-spread nesting failure among the colonies of *Sterna h. hirundo* on the islands of western Lake Erie. Many times the nesting terns deserted Starve Island about a half hour after sunset and returned from an hour to a half hour before sunrise. Daytime behavior was normal. "The underlying causes for this lapse in attentiveness, which has been studied during the past three seasons, are as yet unknown. Accompanying it there have been repeated, complete nesting failures, contrasting with reports of past success." Black-crowned Night Herons (*Nycticorax n. hoactli*) eat "eggs from unattended nests during the night", but quickly retreat "from attacks of the defending terns when the colony is well attended."

7. The Breeding Biology of *Micropus caffer streubelii* Hartlaub, the White-rumped Swift. R. E. Moreau. 1942. *Ibis*, 14th ser., 6 : 27–49. A fine study based on 1,100 hours of records made by Africans, most of them from dawn to dusk. The swifts nest on buildings of the Amani Research Station in Tanganyika Territory. They never build their own nests, but use for the most part the retort-shaped nests of *Hirundo abyssinicus*; they stick feathers over the interior of the swallow nests, gumming them together with much saliva. The

swallows spend a long time making the nest, but only get to raise one brood in it; the swifts use them for many years, one particular nest having had over 25 sets laid in it from 1929 to 1941. They lay between September and March, each nest housing three broods each season. From laying of the eggs to leaving of the young takes 9 weeks; it is probable that the same birds raise all three broods. They may copulate in the air; twice they were seen doing so at the nest entrance. Two eggs are laid; nesting success amounted to 75 per cent of the eggs laid. Of 97 eggs, 86 hatched and 74 young were fledged. The European Swift (*Micropus a. apus*) lays three eggs and is single-brooded; it has a long migration and risks dangers of hunger and cold. The Amani *Micropus*, sedentary and sheltered, has a much higher "biotic potential"; perhaps a shortage of swallows' nests is a limiting factor, or there may be more non-breeding birds than with the European Swift.

Eggs are laid 48 hours apart; incubation lasts about 21 days. Both parents incubate. All day observations showed eggs were covered from 17 to 90 per cent of the time with no correlation with rainfall or air temperature. The nest is a good heat-insulator. Thirty-one per cent of the absences lasted over an hour; the longest intervals at 7 nests lasted from 104–386 minutes. This last record took place the day before hatching. The birds may stay away practically all morning. One bird sat from 6 A.M. to 1 P. M.,"then no bird entered till they came to roost." Forty-five of the periods on the nest lasted over an hour, 11 were over 2 hours and 7 were over 3 hours each.

Fledging takes 35–47 days, averaging 42 days. At first the young were treated like the eggs so far as brooding went; infants less than 24 hours old were brooded one minute in 5 hours; when 5 days old they were left for 3½ hours; from the 8th to 12th day they were covered 40-50 per cent of the time. A single young may be fed only 4 times a day! Where two were present, the average rate for 200 minutes ranged from 1.2–1.8, the average being 1.5. It is a great pity the author does not give us, besides these 200 minute records, the *all day records*. No one but Mr. Moreau uses this 200 minute unit; when he had the all day records, he should have included them.

The young are hatched naked; they have strong claws and are active and muscular from hatching, "crawling and climbing readily." They twitter when fed from the day of hatching. They defecate out of the nest at about the 10th day and their eyes are fully open at 15 days. They leave with no coaxing, flying strongly. They may leave in the absence of the parent.

8. Observations on Black Redstarts Breeding in London, 1941. C. B. Ashby. 1942. *British Birds*, 35 : 201–205. A pair of *Phoenicurus ochra gibraltariensis* nested in a private garden on a building damaged by air raids. They raised one brood, and on July 4 the female was sitting again. Both parents fed the second brood equally. A second cock in better plumage appeared and helped feed and clean the nest. The parents were not hostile but were disturbed, and "their efficiency in feeding the nestlings was impaired." The young left at 17 days and the female cared for them for about 12 days longer.

9. Field Observations on the Breeding Biology of the Yellow Wagtail. Stuart Smith. 1942. *British Birds*, 35 : 186–189. An excellent account of *Motacilla flava flavissima* with much information given in small compass. Family parties "keep together during the summer." "Cocks do not begin to adopt a territory until the arrival of the hens." Then there is much fighting. "Aggressive display takes the form of puffing out the breast to display the yellow under-parts, the bird meanwhile sitting back on its tail with head held erect and body stiff; very similar in appearance to a miniature pouter pigeon." The female joins the

fighting when another pair trespasses. The female builds alone, sometimes going a half mile for material. Both parents incubate and feed. The bird returning to incubate always calls the sitting mate. Data on 8 nests show incubation of the 5–6 eggs to last 12–13 days; fledging lasts 10–11 days.

10. The European Starling in California. Stanley G. Jewett. 1942. *Condor*, 44 : 79. The first record of *Sturnus vulgaris* on the western coast occurred January 10, 1942 when a male was collected from a flight of about 40. Thus in half a century the descendants of the 120 birds released in New York City in 1890 and 1891 have conquered the continent.

11. Breeding Activities of Three Common Species. N. L. Roberts. 1942. *Emu*, 41 : 185–194. Three pairs of birds nested in the same bluegum at the same time: Restless Flycatcher (*Seisura inquieta*), Magpie Lark (*Grallina cyanoleuca*), and Willie Wagtail (*Rhipidura leucophrys*). With the flycatchers, both birds built, both incubated and both fed the young. The female was on and off the nest 4 times in 23 minutes; both left the nest "to chase intruders or to snap up passing insects." The Magpie Larks fed young of a previous brood while they incubated. The parents alternated on the nest, averaging 17.2 minutes at a time. If the incubating bird was unwilling to leave, "a peck was administered." Both Wagtails incubated and also fed young of an earlier brood. "The sitting bird frequently flew off to chase the Magpies [*Gymnorhina tibicen* nesting near] and to pursue and catch insects." These birds showed "illness-feigning" when the young were approached by the author. Wagtails and Magpie Larks often nest in the same tree. All three species drove a cuckoo (*Cuculus pallidus*) out of the tree, the Wagtails being the most aggressive. All three were territorial and all respected each other's territories within the tree! Song was used to warn off trespassers, to keep the pair together, and, after the young had left the nest, to keep the family together.

BIRD BEHAVIOR

12. The "Injury-feigning" Behavior of the Florida Nighthawk. Ivan R. Tompkins. 1942. *Wilson Bulletin*, 54 : 43–49. Only the female *Chordeiles minor chapmani* was found covering eggs or young in the daytime. The spectacular nest-protecting display is described and illustrated with photographs. Young will go through part of the display from the age of 4–5 days; they "will open their mouths, spread wings (and tail when partly fledged) and hiss at the intruder, often lunging forward to bite at an extended finger." The author discusses the pertinent literature and rightly concludes that this behavior is instinctive.

13. Further Analysis of the Social Behavior of the Black-crowned Night Heron. G. K. Noble and M. Wurm. 1942. *Auk*, 59 : 205–224. Plumes of the male *Nycticorax n. hoactli* "serve to emphasize the overture and display ceremony which aids the formation of nuptial bonds. Removal of the plumes weakens the bonds, the pairs tend to disintegrate." "The rosy leg color of the breeding night heron serves to emphasize the leg movement of the snap-hiss ceremony. Coloring the legs blue-green has no effect on the speed of pair formation or on the duration of the bond." However, Allen and Mangels (1940) found that *in the wild* males paid no attention to females with pale legs, but courted those with red legs.

The guttural sex call, even in young birds treated with testosterone propionate, induced "food-begging behavior in untreated birds." Between pairs of adults, the one that first loses its nuptial color and voice may give the food-begging behavior to its mate, but it is not fed. It is difficult to know how much dependence to place upon these reactions of birds in crowded conditions in captivity. Certainly they should be checked by observations in the field.

14. Notes on the Social Behaviour of Blue Tits. M. K. Colquhown. 1942. *British Birds*, 35 : 234–240. Observations on over 70 color-ringed *Parus caeruleus obscurus*, "among which six pairs were known to have bred successfully during 1938 and 1939." Five hundred contacts were recorded. "In winter, it is difficult to tell whether a bird is paired or not; the most certain way is to watch the roost. Paired Blue Tits do not roost communally, but very often roost close to each other, while they indulge in a 'good-night' display which probably has considerable social significance in maintaining the relationship." This occurs in November and December and in spring. The female goes to roost before the male. There is a mutual roosting flight, a chase during which the male sings; he visits his mate's site and roosts nearby. He gives "an alarm note on the slightest approach of danger."

"Blue Tit combat is psychological, and not physical." "Dominance is so dependent on the territorial position at the moment of reaction and on the endocrine balance of the individual that even interspecific variations occur." "A Blue Tit seems to recognize an individual before we can determine the species." A tit dominated by another "would sometimes turn on one or more tits who were its social inferiors and threaten them, while a tit low in the social hierarchy has been seen to show extreme viciousness when it chanced on a tit that it could dominate." "G/Y was usually dominant over GG [his mate] through the winter . . . in early February . . . she definitely became the despot for a few consecutive days"; later "he resumed dominancy." In a flock "residents are dominant to nomads and the social order of the residents is related to territory."

15. Dominance in Winter Flocks of Chickadees. Frances Hamerstrom. 1942. *Wilson Bulletin*, 54 : 32–42. Observations on *Penthestes atricapillus* at feeding stations in Wisconsin; the birds were color-banded and also marked with colored tail feathers. No change in behavior was observed by the imping of colored feathers in tails of Chickadees, Blue Jays, White-breasted Nuthatches and House Wrens. "Increase in size of a winter flock is determined not only by conditions at the moment, but also by what food was available in the preceding few winters . . . Chickadees come into a new territory slowly—too slowly to fill it in one year. . . . I suspect that the key lies in tradition. Instead of reflecting this random building up from a fresh start, the territory begins its second winter with a nucleus of old-timers." Charts are given of the results of fights. "Dominance is not linear, but is practically uni-lateral (one reversal in 76 fights.)" "Old-timers appeared to have the advantage in their early encounters with new-comers." It is likely that "intolerance towards new-comers appears only in the larger flocks." All fights were about food. New-comers showed uncertainty in their behavior and this "may have caused the others to pick on him." A bird with a crippled leg was high in dominance.

16. Group Organization Among Vertebrates. W. C. Allee. 1942. *Science*, 56 : 289–293. "Dominance-subordination patterns of behavior may be based on the recognition of other members of the flock as individuals to which a proper reaction must be made. . . . Opposed to this is a type of impersonal behavior patterns such as is found in many of the groups of mice which have been studied in our laboratory. Impersonal group organization depends upon a kind of unoriented, generalized aggressiveness brought in contact with similarly unoriented lack of aggressiveness." The "moving territory" found by Dale Jenkins with a Blue Goose family is mentioned. Hens high in the peck-order lay more eggs than do their inferiors; subordinate cocks may not be allowed to tread. Of course, these phenomena take place under highly artificial conditions. The author concludes: "the dominance-subordination pattern of group behavior may be influenced by environmental factors and may have its foundation in (a)

heredity . . . (b) in the physiological state of the individual . . . (c) on experience," (p. 293).

17. The Mute Swan and the 20-10 Seconds Rule. J. M. Dewar. *British Birds*, 35 : 224–226. "British diving birds with one exception as far as is known, follow the rule of 20 seconds for the first fathom of depth of water and 10 seconds for every fathom thereafter." "The exception is the Coot which follows a 10–10 seconds rule." The 20–10 rule has been found to hold for ducks, grebes, cormorants and Alcidae. It applies to depths from 3–21 feet; at less than 3 feet the timing is correspondingly shorter.

18.Mating a Blond Ring-Dove with Two Females Simultaneously. Dorothea Ewers. 1942. *Journ. Comp. Psych.*, 33 : 75–86. A detailed account of behavior; when the females had separate nests, the male spent the morning on one and the afternoon on the other, his mates adjusting themselves to his behavior. Later one nest was used, and although the females pecked each other, they incubated and brooded side by side.

19. Curious Story of a Lyrebird. A. G. Campbell. 1942. *Emu*, 41 : 265–267. The same tame *Menura novae-hollandiae* described in the *Emu* 40 : 357 (see *Bird-Banding*, July, 1941, No. 18) occasionally visited a mirror set up outdoors; he gave strange calls, attacked the mirror and displayed before it, singing his own song and giving many imitations. In the forest he "was much interested in logs I turned over as new feeding places. When offered new food, such as dried grubs or dead beetles, he had a way of pinching or tasting them first before swallowing."

20. Food-Offering and Copulation by European Roller in Winter Quarters. R. E. and W. M. Moreau. 1941. *Ibis*, 14th ser., 5 : 614. A pair of *Coracias garrulus* were following each other about on February 21. On March 25 one fed the other with a grasshopper, then mounted. They left that day. They nest 3,000 miles to the north of Tanganyika Territory, and egg-laying would not take place for at least 3 weeks.

21. Piracy by *Lanius collurio humeralis*. R. E. and W. M. Moreau. 1941. *Ibis*, 14th ser., 5 : 614–615. A Fiscal Shrike was observed swooping at a roller, and making it drop grasshoppers.

22. Birds Eating a "Distasteful" Grasshopper. R. E. and W. M. Moreau. 1941. *Ibis*, 14th ser., 5 : 615. The Stink-grasshopper (*Zonoceros elegans*) is brightly colored, slow-moving, and has a horrible pungent odor. A monkey would not touch it, nor do poultry nor most birds. A Bulbul (*Pycnonotus tricolor*) sometimes eats it and the same was true of the wintering roller. But the Fiscal Shrike had no interest in making it drop one of these for it (the shrike).

23. Blue Jay: Brigand or Benefactor? What Did the Blue Jay Do with the Nut? Arnold Gesell. 1940. *Scientific Monthly*, 50 : 540–543. A resumé of experiences of correspondents mostly relating to the robbing of squirrels by *Cyanocitta cristata*. Nuts buried by both play a role in reforestation. Blue Jays are a pest in pecan orchards, but in Walker County, Texas the particles of acorns they drop form an important food for Bobwhite (*Colinus virginianus*). The psychological implications of the relationship between the jay and the squirrel are of considerable interest.

24. The Usurpation of Nests, Nesting Sites and Materials. Norman Favaloro. 1942. *Emu*, 42 : 268–276. Many instances are given of Australian

birds appropriating other nests while in use, utilizing old nests, or competing for hollows, in which case mixed clutches may occur. "Increasing numbers of House Sparrows and Starlings seriously interfere with the natural nesting of many of our birds," (p. 274).

25. Nest "Borrowing" Amongst Birds. P. A. Bourke. 1942. *Emu*, 41 : 277–278. Several species "regularly re-line deserted nests of other species and use them to rear their own broods." Instances are given of birds driving off the rightful owners.

26. Egg-shell Disposal by Birds. C. and D. Nethersole-Thompson, 1942. *British Birds*, 35 : 162–169, 190–200, 214–223, 241–250. A study of "how, when and why [does] the egg-shell lose its status to become a redundant, if not undesirable, body in the nest, and the part played by each sex respectively in its disposal," p. 163. Bill-rinsing after shell-disposal has been seen in the Golden Plover, Greenshank, Common Curlew and Oyster-catcher. One Greenshank brooded empty egg-shells; others have carried out every imaginable manner of disposal. A European Kingfisher carried shell fragments in beak and claws at the same trip. A Red-backed Shrike "pinned a large shell-fragment in the 'larder' on a blackthorn!" (p. 191). For species in the British List, observations are given in detail, both published and unpublished records.

POPULATION STUDIES

27. The Breeding Distribution, History and Population of the Fulmar (*Fulmarus glacialis*) in the British Isles. James Fisher and George Waterson. 1941. *Journal of Animal Ecology*, 10 : 204–273. Another admirable cooperative study of the British Trust for Ornithology. This is a thoroughly documented account (with 800 references) of the spectacular spread of the Fulmar, which until 1878 bred only on St. Kilda in the British Isles. The St. Kilda population has probably remained stationary at 21,000 pairs. "Since 1877 the population outside St. Kilda has increased from 0 to about 40,500 breeding pairs, nesting in 208 colonies in 1939", besides "61 other colonies at which breeding had not yet been proved," (p. 156).

Darling's theory of the socially stimulating effect of numbers appears to be supported by the Fulmar: no breeding takes place below a certain limit; in large colonies birds arrive earlier, lay earlier and raise more young than do those in small colonies. *How great an effect age plays is not known*, but "Members of small, new colonies are probably young birds," p. 261. "The Fulmar feeds on plankton and any oily matter it can get." "There are no predators on the Atlantic Fulmar save man," (p. 261).

28. Eastern Population of the Duck Hawk. J. J. Hickey. 1942. *Auk*, 59 : 176–204. An admirable study involving a deal of field work and of letter-writing. Breeding-sites of *Falco peregrinus anatum* are marked by permanency. A census of nests east of the Rockies shows 408 eyries of which 275 (67%) are in the United States, a proportion that probably reflects intensity of field work. There has been at least an 11 per cent decline in recent years, not counting a tree nesting population that has disappeared. Nesting sites are *rocky cliffs*, cut banks. gigantic trees in the Mississippi Valley before 1880, occasionally skyscrapers, The distribution of the Peregrine depends on physiography; the height of the cliff affords "isolation and protection from enemies" and thus corresponds to "cover" with other birds. There seems to be an "absolute requirement" in respect to the nest-site, viz. a hollow scraped out of dirt or gravel.

As to territorial competition, the male defends the "immediate vicinity of the

nest site" from Peregrines not his mate. "Records of males defending territory against females are rarely found in the literature of any species," p. 181. Females defend the eyries from other females. The maximum density was 5 pairs on 7 miles of escarpment. The normal set consists of 4 eggs, the average number of young is three. Around New York City at 19 eyries an average of 1.1 birds were fledged in 1939 (a normal year) and 1940 (subnormal year). There were 3 year-old females that were mated, but failed to lay; two two-year old females laid two eggs each. Some females "fail to lay year after year. This situation seems to hold at one eyrie for most of the last ten years, and it is unquestionably true at two other sites from at least 1938 to 1940 inclusive. In each case, courtship by the male lasted at least one month past the normal period", (p. 192).

"Man is the adult Peregrine's worst enemy. Birds are shot at all seasons, in States that protect them as well as in those that do not, on private lands and on public reservations," (p. 192). The menace from egg collecting has decreased, but falconers constitute a new difficulty. A very interesting discussion follows on "The Nest Site as an Ecological Magnet." "*First-class Peregrine cliffs* are *extremely high.* These so attract this species in the breeding season that Peregrines will apparently occupy them *no matter how many 'nests' are broken up or adult birds destroyed,*" (p. 196). "Gaps in population are filled according to each eyrie's value as an ecological magnet. Pairing in the Peregrine Falcon is not based on sexual selection but rather on the selection of a nesting territory." "Breeding distribution and density are found to be affected by (1) the number of cliffs and cut-banks that still afford isolation and proper eggs sites, and (2) by territorial competition," (p. 202).

A number of recommendations are made: call the bird the American Peregrine; give it legal protection; interest owners of nesting sites; keep away picnickers; watch game wardens; supervise falconers; and, in the case of skyscrapers, church spires, high bridges and large gas tanks, add some sort of protection and a box of gravel for nesting purposes.

29. The Index of Heron Population, 1941. W. B. Alexander. 1942. *British Birds,* 35 : 210–213. A summary of 132 reports on *Ardea cinerea* in the British Isles. "No reports have reached us of unusual mortality during the winter, but the effect of war conditions is reflected in the number of instances where decrease or disappearance of heronries is attributed to tree felling. In one case it is thought that Herons may have deserted their nests owing to heath-fires started by bombs, but in a heronry near London the numbers nesting were up to the average in spite of the din of anti-aircraft batteries at night." "No recovery of the Heron population from the serious setback sustained in 1940 has yet occurred. On the contrary there has been a small further decrease."

30. Fourth Census of Non-Passerine Birds in the Bird Sanctuaries of the North Shore of the Gulf of St. Lawrence. H. F. Lewis. 1942. *Canadian Field-Naturalist,* 56 : 5–8. A total of 109,584 non-passerines was counted in ten sanctuaries in 1940, a loss of 2 per cent over 1935, due largely to unexplained decrease of 13,000 out of 62,000 Atlantic Puffins (*Fratercula a. arctica*). Eiders were driven off one island by the presence of a fox. Great Black-backed Gulls (*Larus marinus*) have increased despite control measures of destroying eggs and nests—67 per cent from 1935 to 1940. This species and the Herring Gull (*Larus argentatus*) have nearly quadrupled their numbers between 1925 and 1940. The Black-back preys on eggs and young of other birds, particularly of the Southern Eider (*Somateria mollissima dresseri*).

31. On the Analysis of Productivity in Populations of the Higher Vertebrates. Paul L. Errington. 1942. *Journal of Wildlife Management,*

6 : 165–181. An examination of "compensatory reproduction" in game birds that normally rear one brood a season. With muskrats it was found that "some of the heaviest losses follow, instead of govern, the directions taken by populat on curves. Lessening of juvenile mortality from predation and disease tended to be counterbalanced by increased killing of young by older muskrats. Conversely, when predation or disease losses were heavy, muskrat intraspecific attacks tended to diminish in proportion," pp. 178–9. "Some degree of increased breeding as a result of losses of eggs or of young can be expected for a considerable variety of higher vertebrates, and an analysis of productivity of a hypothetical species (similar in behavior to the ring-necked pheasant) is outlined as an illustration of technique," (p. 179).

ECOLOGY

32. Life Zones, Biomes, or Life Forms? R. T. Peterson. 1942. *Audubon Mag.*, (formerly *Bird-Lore*), 44 : 21–30. An illuminating discussion of Merriam's 'life zones', Shelford's 'biomes', and 'life forms' or habitat niches. "The biome seems scarcely more satisfactory than the life zone in describing bird distribution, and . . . most land birds appear to conform much more readily to the physical aspect of the vegetation, of *'life form'* as some authorshave called it," (p. 25). The breeding population of Hog Island is discussed as an example of spruce climax. The author summarizes his findings thus:

> "1. The biome, although a logical concept as regards plants, is not much more satisfactory than the life zone in describing bird distribution except in the climaxes. 2. Birds that occupy the developmental stages of a biome are often found in other biomes as well. This is because the vegetational forms that compose these stages can often be duplicated in other biomes. 3. Birds that occupy the climax growth of a biome are most frequently restricted to that biome and are an indicator of it. This is because the vegetational forms that make up the climax growth are often peculiar only to that one biome. 4. Birds appear to fit the life-zone concept best in climax growths in those areas (Arctic-Alpine, Hudsonian, Canadian, etc.) where temperature coincidentally agrees with vegetation. 5. The physical aspect of the environment, which has also been called the niche, or life form, seems to be the most important factor influencing bird distribution, and this is further modified variously by climate, geographic barriers, competition with similar species of birds, population pressures, historic factors, and probably by many less tangible influences," (p.30).

33. Adaptive Coloration in a Single Faunal Association. T. H. Eaton, Jr. 1941. *Journ. Washington Acad. Sci.*, 31 : 129–135. An interesting account of the amazing array of "color adaptations among rain-forest animals" on Barro Colorado.

34. Predator Control in Southeastern Quail Management. H. L. Stoddard and E. V. Komareck. 1941. *Trans. 6th No. Am. Wildlife Conf.*, 288–293. Recommendations "to quail preserve owners that they conduct routine control of foxes, opossums, skunks, house cats, and cur dogs—preferably by night hunting." Keep wild fur-bearers' numbers "normal." Do not destroy owls or hawks except Accipiters. Buteos eat snakes that eat quail eggs. Wild Turkeys destroy quail eggs and young. "Destruction by stray cats is sometimes very serious in the case of nesting birds. The house cat is one of the few creatures that has the ability to spring on the bird during incubation and kill it." Cats are attracted by the calls of the hatching chicks.

35. The Carrying Capacity of Southeastern Quail Lands. H. L. Stoddard and E. V. Komarek. 1941. *Trans. 6th No. Am. Wildlife Conf.*, 148–155. Many factors have to be taken into consideration. It takes 10,000 acres to produce a kill of 1,000 Bobwhite. The total population averages one bird to 2–4 acres, or 2,500 to 5,000 on the 10,000 acres. This would mean from one-fifth to two-fifths of the fall population would be shot.

36. Possible Temperature Factors in North Central Pheasant Distribution. R. Bennitt and H. V. Terrill. 1940. *Trans. 5th No. Am. Wildlife Conf.*, 428–432. In the Midwest Ringneck Pheasants have failed to establish themselves south of Ohio, central Illinois, southern Iowa and Nebraska and southwestern Kansas; the authors suggest that south of this line temperatures may rise too high for the eggs, and recommend this problem as a subject for study.

37. Wildlife Conservation and Geography. R. Bennitt. 1940. *Journal of Geography*, 34 : 217–225. The present trend is all to the increase of "lower" wildlife, such as carp, grasshoppers, House Sparrows and mice; we need definitely to work for the conservation of "higher" wildlife—bass, eagles, Prairie Chickens and deer. We need to study the different environments, keeping in mind Liebig's Law of the Minimum: "a species cannot increase beyond the limit set by the *least abundant* necessary factor in its environment," (p. 223).

38. A Study of the Birds of the Big Basin of California. Robt. T. Orr. 1942. *Am. Midland Naturalist*, 27 : 273–337. An ecological study of the birds of two Redwoods Parks in the Santa Cruz Mountains, and also of the coast which is privately owned. A total of 176 days was spent in the field. Eight major associations are described with the plants and birds typical of each. An annotated list of the birds is given in which only binomials appear; habitat and food preferences are noted as well as nesting data and relations with other bird species.

BIRDS AND THEIR FOOD

39. Bobwhite Foods and Conservation Farming. Verne E. Davison. 1942. *Journal of Wildlife Management*, 6 : 97–109. Practical suggestions for producing food and shelter for *Colinus virginianus*.

40. A Three-Year Trial with a Feed Patch for Song Birds. Geo. J. Wallace. 1942. *Journal of Wildlife Management*, 6 : 110–117. Millet and sunflower planted on 1½ acres attracted migrating fringillids, especially Indigo Buntings (*Passerina cyanea*) in the fall.

41. The Food of the Blackbird (*Turdus merula* L.) in Successive Years. W. E. Collinge. 1941. *Ibis*, 14th ser., 5 : 610–613. Beneficial in England when not too numerous; often too abundant in fruit-growing districts.

PARASITES, ECOLOGY AND CLASSIFICATION

42. The Parasite Fauna of the White Stork and its Relationships to the Problems of Ecology, Phylogeny and the Original Home of the Storks. (Die Parasitenfauna des weissen Storches und ihre Beziehungen zu Fragen der Oekologie, Phylogenie und der Urheimat der Störche.) L. Szidat. 1940. *Zeits. f. Parasitenkunde*, 11 : 563–592. Internal parasites of the Gray Heron (*Ardea cinerea*) are not at all like those of the Storks—either White (*Ciconia ciconia*) or Black (*C. nigra*). The Trematodes of European Storks are related to the Trematodes of South Africa. The author believes that storks originated in central Africa and herons in South America. He mentions Wegener's theory that America and southern Europe and Africa were joined at the beginning of the Tertiary.

43. The Mallophaga as an Aid to the Classification of Birds. G. H. E. Hopkins. 1942. *Ibis*, 14 ser., 6 : 94–106. Mallophaga "pass their entire life on the body of their host, transferring from one individual to another only when these come into close contact," (p. 94.) "As their hosts have evolved, the Mallophaga have evolved also, but more slowly. Since their environment is extremely uniform, their evolution has evolved more slowly than that of their hosts." Host-relationships are "highly specific," (p. 96.) If two groups of birds have three "genera of Mallophaga in common their close relationship is established," (p. 101). According to the author, a study of these external parasites shows that Flamingoes belong to the Anseriformes, that *Scopus* is nearer to the Charadriiformes than to the Storks, and that Bustards do not belong with the Gruiformes, but are an ancient and primitive group—Otidiformes—related to the Galliformes.

BOOKS

44. Ornithologists of the United States Army Medical Corps. Edgar E. Hume. 1942. Baltimore. Johns Hopkins Press. 583 pp. $5.00. This handsomely printed book with 110 illustrations gives fairly full biographies of 36 ornithologists connected with the United States Army Medical Corps. In the early days it was the custom for a surgeon-naturalist to be attached to major surveying parties sponsored by the government. Army posts in the West afforded opportunities for work in virgin country. We are told much of the professional—army and medical—lives of these men, some of it concerned with Indian fighting and the Civil War, as well as their natural history activities. Beside the most eminent ornithologists—Bendire, Coues, Cooper and Mearns—there are many less well known—Heerman, Kennerly, Merrill, Shufeldt, Casey, Woods and Woodhouse—, and finally a number whose bird interests were rather slight. We find fascinating reading of the early days of ornithology in this country, and many quotations from the writings of these naturalists. Besides the biographies, the book contains a foreword by Dr. Wetmore giving tribute to the influence of Baird in encouraging these young ornithologists, a conclusion telling of the many scientific contributions made by the Army Medical Corps, and a good index. A sidelight on the amount of labor entailed in the preparation of the volume is given by the sentence acknowledging indebtedness to those who furnished information; it extends for 4½ pages—the longest sentence this reviewer has ever met. An excellent reference book for those interested in the history of ornithology.

45. Man Stands Alone. Julian Huxley. 1941. N. Y. Harpers. 300 pp. (The American edition of The Uniqueness of Man. London. Chatto and Windus.) A collection of 15 thought-provoking essays reprinted from various English and American journals. All are concerned with biology; some chiefly with birds, The Intelligence of Birds, The Courtship of Animals, The Way of the Dodo—; some with all life—The Size of Living Things, Origins of Species, and Mice and Men—; and some primarily with human beings—evolution, eugenics and social problems. The author is gifted with a happy way of presenting these fundamental problems clearly, simply and convincingly. "To a biologist who is not afraid of being a humanist as well, the essence of human life is seen in social relationships," (p. x).