RECENT LITERATURE

Reviews by Donald S. Farner and others

(See also Numbers 13, 34, 45, and 60.)

1. Vital Statistics of the Mochrum Cormorant. Lord David Stuart. 1948. *British Birds*, 41 (7): 194-199. Some 820 nestling *Phalacrocorax carbo carbo* (Linnaeus) were ringed at this Welsh colony between 1919 and 1939; the 172 recoveries are analyzed. Seventy-five percent were recovered in the first year, two-thirds of them shot. "A heavy mortality of juveniles begins in September and lasts for six months, thereafter the death rate remaining fairly even." The figures give "an impossibly high mortality;" it is probable that some of the rings become worn and drop off, and also "there may be a greater mortality in early life amongst ringed Cormorants than with others, because . . . they may leave the nest prematurely." As to migration, they "disperse all round the British Isles except north of the Caledonian Canal," and as far south as Spain; there "is no observable difference between the movements of first year birds and others as in the case of Gannets, *Sula bassana* (Linnaeus), in which yearlings tend to move farther to the south than the rest." The oldest bird recovered was 18 years and 3 months.—M. M. Nice.

2. Mortality of Adult and Young Mallards. E. O. Höhn. 1948. *British Birds*, 41 (8): 233-235. Recoveries of 305 banded adult *Anas platyrhynchos platyrhynchos* Linnaeus in Great Britain "showed that 65.3% died during the first year after ringing, 23.9% during the second year, 6.6% during the third year and 4.2% during subsequent years. The average length of further survival from the date of ringing was 1 year and 2 months." The longest survival period was ten years and two months. "Of 828 Mallards ringed as young, 89% died during the first year after ringing, 9.6% during the second year, 0.6% during the third year and 0.8% during succeeding years. The average period of survival was 4.5 months after ringing. This mortality is almost entirely that due to shooting."—M. M. Nice.

MIGRATION

(See also Numbers 1, 82, 83, 84, 85, and 86.)

3. Experiments on Bird Navigation. Donald R. Griffin and Raymond J. Hock. 1948. *Science*, 107 (2779): 347-349. Homing experiments in which Gannets, *Morus bassanus* (Linnaeus), were transported into unfamiliar territory, released, and followed by airplane, show clearly that, in this species, navigation in "homing" involves extensive random exploratory movements. To what extent these results can be extended to orientation in migration where routes traditionally familiar to the species are involved, is conjectural. The results of the experiments emphasize the use of visual orientation in "homing" by Gannets.—D. S. F.

4. Sensitivity of the Homing Pigeon to the Magnetic Field of the Earth. Donald A. Gordon. 1948. *Science*, 108 (2817): 710-711. The author, in a series of controlled experiments involving 20 birds, was unable to confirm the results reported by Yeagley. (*Journal of Applied Physics*, 18 (12): 1035-1063. 1947. See *Bird-Banding*, 19 (2): 78-79.)—D. S. F.

5. Orientation of Birds on Migratory and Homing Flights. 1948. *Nature*, 161 (4104): 996-998. Report of a general discussion at a meeting of the Linnaean Society of London, May 13, 1948 with Prof. G. R. de Beer presiding. A considerable portion of the discussion was devoted to criticism of Yeagley's recent paper on the subject of orientation. There was unanimity of opinion that Yeagley's theories are inadequate, if not inaccurate. The full discussion will be published in the *Proceedings of the Linnaean Society for* 1948.—R. O. Bender.

6. Bird Migration and the Concept of Continental Drift. Alfred Wolfson. 1948. *Science*, 108 (2793): 23-30. The author proposes that at least many of the intercontinental migratory and oceanic routes such as those of the Turnstone,

Arenaria interpres (Linnaeus); Sanderling, *Crocethia alba* (Pallas); Knot, *Calidris canutus* (Linnaeus); Arctic Tern, *Sterna paradisea* Pontoppidan; Greenland Wheatear, *Oenanthe oenanthe leucorhoa* (*Gmelin*); Sooty Shearwater, *Puffinus griseus* (Gmelin); Wilson's Petrel, *Oceanites oceanicus oceanicus* (Kuhl); Pacific Godwit, *Limosa lapponica baueri* Naumann; and the Pacific Golden Plover, *Pluvialis dominica fulva* (Gmelin), can best be explained by assuming a gradual separation of "breeding and feeding areas" as the result of continental drift. In this hypothesis, the author accepts Du Toit's hypothesis that the parent masses of the continents fragmented and the resultant parts began to drift apart during the Cretaceous. He further assumes that by the end of the Cretaceous "modern types [not necessarily modern species] of birds were well represented." Presumably migratory movements originated as local movements between feeding and breeding areas before or soon after the beginning of continental drift and that as these areas diverged the birds continued their use of these areas because of "their well-developed homing instinct." (p. 26.) Pleistocene glaciation, to which is frequently attributed an important role in the origin of migration, is regarded only as a modifying factor.

The hypothesis proposed in this paper is both ingenious and stimulating. Serious reflection results in the dismissal of many of the more superficial objections. However, there appear to be some difficulties which, at the moment, prevent general acceptance of the hypothesis. These are presented in a critique by Mr. Dean Amadon (*Science*, 108 (2817): 705-707. See next review.)

Students of the problems of the origin of bird migration will be interested in the parallelisms and differences between the hypotheses of a continental drift origin of bird migration as proposed by Professor Wolfson in this paper and that proposed by Alex Stimmelmayr (*Verhandlungen der Ornithologischen Gesellschaft in Bayern*, 20 (1): 101-133. 1933.) The latter assumed that the fundamental origin of bird migration is attributable to the annual changes in the relative position of the sun and that changes in the relative position of the continents and the consequent changes in seasons, climate, etc., have modified the fundamental North-South direction of migration. The first assumption may not be greatly different than Professor Wolfson's "local movements" between feeding and breeding areas. Stimmelmayr, who at times appeared to confuse historic origin and annual stimulation of migration, found his theory to be generally compatible with Wegener's geologic hypothesis of continental drift whereas Professor Wolfson's hypothesis is associated with the more rational concepts of Du Toit's. Both assumed the original migratory routes to have been modified into modern routes, at least in part, by continental drift.

The history of migration of a species is an integral part of the history of the species itself. It is certainly within the realm of possibility that the pattern of migratory behavior could pass from and through ancestral species to modern species in the same manner as many of the morphologic characteristics used traditionally in the study of evolution. *If* continental drift has occurred, and *if* the Cretaceous (or possibly early Tertiary) ancestors of these modern transoceanic migrants were migratory, then it must be conceded that there is a possibility that some modern routes may have been developed under the influence of the diverging land masses. However, it would seem to the reviewer that the probability of such an influence developing effects which persist so profoundly today are rather remote being minimized by many other influences among which would be Pleistocene glaciation, which also would have been operative. Although his mind remains open in the discussion of a continental drift hypothesis of the evolution of bird migration, the reviewer is at present inclined to feel that it is generally unnecessary to seek such a remote explanation as that involved in continental drift hypotheses. However, regardless of the ultimate fate of the continental drift hypotheses, further development of the concept will be an important and stimulating contribution to our knowledge of the origin of bird migration.—D. S. F.

7. Continental Drift and Bird Migration. Dean Amadon. 1948. *Science*, 108 (2817): 705-707. The author presents an important series of objections to Professor Wolfson's continental drift hypothesis of the evolution of migratory routes. These objections are, in briefest outline: (1) Incompatibility in time.

It is indicated that there is no reason to believe that "modern forms" were in existence in the Cretaceous and that drift may have begun in pre-Cretaceous times. Many inter-hemispheric migrants are representatives of specialized, and presumably much more recent families. (2) The continental-drift theory, of necessity, assumes a southern origin of the species. Mr. Amadon feels that this is difficult to reconcile with some of the species involved. (3) It seems difficult to assume that the origin of the migration to Europe of the Greenland Wheatear is due to continental drift without assuming the same for the migration of the Alaskan Wheatears which migrate into Asia. (4) Considering the small land mass of the southern hemisphere, migration of its breeding species is not rare. (5) Objection is registered to the statement that some birds "migrate further than is necessary to find wintering ground" until the ecologic requirements for wintering grounds are better known. The arguments concerning incompatibility in time, hinge superficially on a definition of "modern forms" and fundamentally on when, in the development of the species, the migration-behavior pattern developed and how much and by what it was subsequently modified. *If* continental drift *began* in the Cretaceous and extended into the early Tertiary, criticism on the basis of temporal incompatibility is less conclusive.—D. S. F.

8. On Continental Drift and Bird Migration. Sidney Paige. 1948. *Science,* 108 (2817): 711. Attention is called to the possibility that the origin of migration based on continental drift, as proposed by Wolfson, could as well be applied to a theory of origin of modern land masses by "deformation of the earth's crust, rising continents, subsiding basins, etc."—D. S. F.

9. Bird Migration and Pressure Patterns. H. Landsberg. 1948. *Science,* 108 (2817): 708-709. The author calls attention to the rather remarkable coincidence of some of the migratory routes with certain generalized trajectories of air currents, and speculates as to the possibility that some of the migratory routes actually represent an evolution into "pressure pattern flying." He indicates the desirability, in propounding a theory of the origin of bird migration, of "a very careful analysis of present and presumed past patterns of atmospheric currents."—D. S. F.

10. Bird Migration and Magnetic Meridians. William H. Allen. 1948. *Science,* 108 (2817): 708. The author raises the possibility of the use of magnetic forces in bird migration, particularly in relation to the Arctic Tern, *Sterna paradisea* Pontoppidan. Suggestions of the use of magnetism in migration recur frequently in the literature. Until such time that a significant effect of magnetism on protoplasm, and more particularly on some definite receptor, can be demonstrated, this does not seem to be a fruitful basis for speculation.—D. S. F.

11. Some More Problems in Bird Migration. James Hodges. 1948. *Science,* 108 (2817): 707-708. The author notes briefly the sudden appearance of the Blue Goose, *Chen caerulescens* Linnaeus, in the Mississippi Flyway. The questions of the permanency of migratory routes and the contemporary development of new routes are raised.—D. S. F.

12. The Brambling Invasion during the Winter of 1946–47 in Switzerland and Southwestern Germany. (Der Bergfinken-Masseneinfall in Winter 1946/47 in der Schweiz und in Südwestdeutschland.) Ernst Sutter. 1948. *Der Ornithologische Beobachter,* 45 (3): 98-106. This is a compilation of records from Switzerland, southwestern Germany, and northern Italy of the unprecedented invasion of the Brambling, *Fringilla montifringilla* Linnaeus, during the winter of 1946–47. Previous invasions of this magnitude occurred in the winters of 1900–01 and 1922–23, but the finches did not stay as long. The greatest concentration was at a roost in Ajoie. These birds are dependent upon the beechnut crop for winter food and select wintering grounds on the basis of food supply. This invasion was the result of a failure of the beechnut crop in Scandinavia and Denmark together with an unusually good one in Switzerland and southwestern Germany.—R. O. Bender.

13. The Movements of Great Tits in Finland. (Talitiaisen, *Parus major* L., voelluksista Suomessa.) Jukka Koskimies. 1948. *Ornis Fennica,* 25 (2):

29-35. This paper is based on returns and recoveries of banded birds, as well as observations at the lighthouse on Utö in southern Finland. During the period 1913-1947, 4,164 Great Tits, of which 2,970 were nestlings, were banded. Among the banded nestlings, 56 were recovered; 18 were recovered at distances from 5-200 kilometers, all during the period, October-December. Lighthouse observations indicate a pronounced movement (NE-SW) beginning in late September or early October. Spring movement is less pronounced. The incidence of movement among young tits in Finland is apparently much higher than in Switzerland.—D. S. F.

PHYSIOLOGY

(See also Numbers 45 and 82.)

14. A Comparative Study of the Hemoglobin of Representative Diving and Dabbling Ducks. Perry W. Gilbert and Charles F. Bond. 1949. *Science,* 109 (2820): 36-37. Since there are apparently no differences in hemoglobin content or red-blood-cell counts between these groups, apparently the blood of diving ducks is not adapted for increased oxygen-carrying capacity.—D. S. F.

FOOD HABITS

(See also Numbers 12, 26, 48, and 75.)

15. The Barn Owl in Michigan, its Distribution, Natural History, and Food Habits. George J. Wallace. 1948. Michigan State College., *Agricultural Experiment Station, Technical Bulletin* 208. 61 pp. *Tyto alba pratincola* (Bonaparte) is, in Michigan, restricted to the southern four tiers of counties. Although Barn Owls are primarily permanent residents, there are records of extensive displacements; it is possible that these represent dispersals of young birds. Barn Owls apparently breed at all times of the year; it is possible that more or less continuous breeding occurs during periods of abundant prey with cessation during scarcity of prey. It was found that there is a tendency to accumulate large supplies of prey at the nesting site. For example, during the spring incubation period, excess mice, "up to a maximum of 80 at one time," were stored at a nest. Number of pellets produced per day varied from one to two or three in captive owls. The number of items per pellet is "close to three." Hence, the daily quota of prey items is somewhat in excess of three. Examination of 310 pellets from a 1945 spring nesting site showed 81 percent of the items to be meadow mice (*Microtus*), corresponding closely with other results obtained by the author as well as other investigators. Of 6,815 items identified by the author during the course of the investigation, 85 percent were *Microtus*; other items included deer mice (*Peromyscus*) 4.5 percent, and shrews, 7 percent; birds, mostly *Passer domesticus* Linnaeus, were used only to the extent of 1.1 percent. Economically, the only item on the "negative" side was the small number of insectivorous shrews. This paper represents a really considerable amount of good investivation. It is unfortunate that the author consulted so very little of the extensive European literature on the species; among other things he would have found in Witherby's "Handbook of British Birds," 1938, and Niethammer's "Handbuch der deutschen Vogelkunde," 1938, that incubation is performed by the female alone and lasts from 30 to 34 days. We can all join the author in his hopes that his study "will provide a sound basis for the protective measures that Michigan barn owls seem to merit."—M. M. Nice and D. S. Farner.

16. The Eagle Owl at Home. (Le Grand-duc chez lui.) J. Burnier and R. Hainard. 1948. *Nos Oiseaux,* 14(198): 217-236. It seems to this reviewer to be unfortunate that the French name for this bird cannot be translated more literally; the Grand Duke is much better than the Eagle Owl. This paper describes two nesting eyries in detail; one found in 1946 and another in 1947, each containing two partly grown young. The eyries were located in fissures of rocky cliffs, one being at an elevation of 2000 meters. The behavior of the young in the 1947 eyrie is described in detail from observations covering a period of more than 60 hours. The food of this species is described based on observations of prey

brought to the nest by the adults and on examination of the refuse of the eyrie. Frogs, hares, meadow mice (*Microtus*), and the Rock Partridge, *Alectoris graeca* (Meisner), comprise the principal food species. Remains of a fox, *Vulpes vulpes* (Linnaeus) and an ermine, *Mustela erminea* Linnaeus, represented unusual captures. In addition to the Rock Partridge, the Carrion Crow, *Corvus corone* Linnaeus; Wood Pigeon, *Columba palumbus* Linnaeus; Little Owl, *Athene noctua* (Scopoli); Black Grouse, *Lyrurus tetrix* (Linnaeus); Ptarmigan, *Lagopus mutus* (Montin); Kestrel, *Falco tinnunculus* Linnaeus; Cuckoos, *Cuculus canorus* Linnaeus; Mistle Thrush, *Turdus viscivorus* Linnaeus; Ring Ouzel, *Turdus torquatus* Linnaeus; and a duck, *Anas* sp. were taken. Marmots, *Marmota marmota* (Linnaeus), which were common near the eyrie, were seldom captured. Hunting was observed to be more successful in foggy or rainy weather which the authors attribute to the sensitivity of the retina to infrared rays. Strong winds, on the other hand, impeded their hunting. The authors conclude that this species is deserving of absolute protection as "one of the most magnificent representatives of the alpine fauna." There are six photographs by M. Burnier and eight line drawings by M. Hainard. An interesting and useful paper.—R. O. Bender.

17. Tits and Peanuts. E. J. M. Buxton. 1948. *British Birds*, 41(8): 229-232. Unshelled peanuts were offered to Great Tits, *Parus major newtoni* Prazak, Blue Tits, *Parus caeruleus obscurus* Prazak and Coal Tits, *Parus ater britannicus* Sharpe and Dresser in 1947, but were ignored by the birds for several weeks until finally a female Great Tit tried a nut into which fat had been poured. Gradually the Great Tits learned the edibility of peanuts, but the other two species did not.—M. M. Nice.

NIDIFICATION AND REPRODUCTION

(See also 41, 44, 45, and 46.)

18. Nesting Observations on the Blackcap in the Rominter Heide. (Brutbeobachtungen bei der Mönchsgrasmücke (*Sylvia a. atricapilla*) im Gebiet der Rominter Heide.) Otto Steinfatt. 1942. *Beiträge zur Fortpflanzungsbiologie der Vögel*, 18(5): 158-164. One hundred hours were spent in blinds at two nests. Both parents incubate, the female staying on the nest from 9 to 65 minutes, averaging 29 minutes, the male from 14 to 39 minutes, averaging 26. During an all-day observation of 17 hours at a nest with four young seven days old the parents fed 176 times. At another nest of four young 10 days old where the female had disappeared, the male fed the young 173 times during the entire day. From one to three invertebrates were brought at a trip. The young leave the nest at 11 days and become independent at about 19 days.—M. M. Nice.

19. Observations on the Nesting of a Pair of Barn Swallows. (Beobachtungen über das Brutgeschäft eines Rauchschwalben-Paares (*Hirundo r. rustica* L.).) Rudolf and Annemarie Berndt. 1942. *Beiträge zur Fortpflanzungsbiologie der Vögel*, 18(4): 130-134. A pair of Barn Swallows nesting in a bird box in the Berndts' dining-room at Stekby raised four young, but the second brood died of starvation during a spell of bad weather. Three young of the first brood returned on rainy nights with their parents to the bird box until they were two months old; all five birds were banded.—M. M. Nice.

20. Breeding Biology of the Asiatic Sakers. (Einiges über die Fortpflanzungsbiologie asiatischer Würgfalken.) H. Grote. 1942. *Beiträge zur Fortpflanzungsbiologie der Vögel*, 18(3): 91-97. A review article of 11 Russian papers on five subspecies of *Falco cherrug* J. E. Gray. Incubation lasts 30 days, fledging 40. Nestlings of *Falco cherrug saceroides* (Bianchi) taken in Mongolia when very young never became tame. The home of these birds is in treeless mountains; they showed great fear when the packhorse that was carrying them approached a tree and especially when it stopped under a tree with thick branches.—M. M. Nice.

EMBRYONIC AND POSTEMBRYONIC DEVELOPMENT

21. The Growth of a Young Cuckoo. (Om en gökunges (*Cuculus canorus*) tillväxt. Några iaktagelser och jämförelser.) Viking Olsson. 1948. *Vår Fågel-*

värld, 7(2): 49-56. This is a valuable record of the rearing of a young Cuckoo by a pair of White Wagtails, *Motacilla alba* Linnaeus. The Wagtail eggs hatched on 21 July, the Cuckoo egg, two days later. On the morning of 25 July, the young Wagtails were found on the ground and were replaced in the nest, only to be thrown out again. This occurred repeatedly; both died on 27 July. Growth data are given and compared with similar data from England and Switzerland. —D. S. F.

22. Journal Notes on the Raising of a Collared Pratincole. (Tagebuchnotizen über die Aufzucht einer Brachschwalbe.) Max Müller. 1948. *Der Ornithologische Beobachter*, 45(3): 114-121. This paper describes the growth, particularly the feather development, of a young Collared Pratincole, *Glareola pratincola* (Linnaeus), taken just after hatching and raised in captivity. There is a brief description of the nesting area in the Camargue region of southern France where the bird was taken. The author found the clutch-size to be mostly three, with an occasional clutch of two, whereas Ticehurst found only clutches of two in the Province of Sind in India. There are numerous notes on behavior, three photographs, and two line drawings.—R. O. Bender.

BEHAVIOR

(See also Numbers 17, 38, 44, 52, 71, and 85.)

23. Observations on the Great Shearwater in the Breeding-Season. G. J. Broekhuysen. 1948. *British Birds*, 41(11): 338-341. A visit to the nesting grounds of *Puffinus gravis* O'Reilly in the Tristan de Cunha group in February 1948. Thousands of these birds have their burrows in the dense vegetation of tussock-grass (*Spartina arundinacea*) on the island of Nightingale. "At about 6 p.m., local time, the air above and around Nightingale became thick with the thousands of shearwaters which were wheeling around before plunging down into the dense tussock-jungle to seek their burrows . . . The noise was terrific . . . The croaking noises uttered by the birds were most peculiar, and strongly reminiscent of the noise made by the old-fashioned hooters of early motor-cars." The Greater Shearwater "is in great demand by the islanders, who come over in their open boats from Tristan to kill large numbers of the young, together with the young of the Yellow-nosed Albatross *Thalassarche ch. chlororhynchos* and the Rock-hopper Penguin (*Eudyptes c. cristatus*). The birds provide them with cooking-fat and oil for their oil-lamps." Photographs taken by flash-light are shown of young and adults.—M. M. Nice.

24. Display and Posturing in the Cape Gannet *Morus capensis*. C. A. Gibson-Hill. 1948. *The Ibis*, 90(4): 568-571. In 1945, Bird Island, east end of Algoa, South Africa, had about 25,000 pairs, about 5,500 pairs per acre. Detailed description of display and posturing, illustrated with six photographs. —D. S. F.

25. The Function of the Head-Coloration of the Nesting Coot and other Nesting Rallidae. H. J. Boyd and Ronald Alley. 1948. *The Ibis*, 90(4): 582-593. It is suggested that the function of bright head-coloration "serves to emphasize the signal-movements employed by the young in obtaining food from adults."—D. S. F.

26. Territory Studies on a Pair of Goshawks of the Peitzer Fish Ponds. (Revierstudien an einem Habichtpaar der Peitzer Fischteiche (Niederlausitz).) Otto Schnurre. 1942. *Beiträge zur Fortpflanzungsbiologie der Vögel*, 18(3): 81-86. A pair of *Accipiter gentilis gentilis* (Linnaeus) were watched in 1936, 1938, 1939 and 1940; each year their young were destroyed by Pigeon fanciers, for Pigeons were their favorite food, despite the fact that water fowl abounded nearer their nest-site than were the dove-cotes five kilometers distant. Some Goshawks, on the contrary, live largely on water birds. A list of prey noted in the four seasons consisted of nearly 300 individuals of 41 species of birds and five species of mammals. A female Buzzard, *Buteo buteo buteo* (Linnaeus), that tried to rob the male Goshawk was killed by him; her mate called for two days, but let his young perish.—M. M. Nice.

27. Behavior of the Rock Dove. (Verhaltensweisen der Felsentaube (Haustaube) *Columba livia livia* L.). Oskar and Käthe Heinroth. 1948. *Zeitschrift für Tierpsychologie*, 6(2): 153-201. A notable study, illustrated with 72 photographs. The socially-nesting Rock Dove has adapted itself easily to domestication and there is complete agreement between the behavior of ancestor and descendant except that the breeding season of the latter has become greatly extended. Detailed description is given of instinctive bodily movements, with pictures of stretching, sun-bathing, etc. (Anseriformes and Charadriiformes do not open out their wings and feathers for sun-bathing.) Doves, Storks, Bustards, Sand-grouse do not sleep with their bills under their upper coverts. The basis of pair formation is the winning by the male Dove of a suitable nesting spot; he gives the nest call, he displays to females, and tries to lure them to the nest hole but when one enters, he, like the Grey Heron, *Ardea cinerea* Linnaeus, and House Sparrow, *Passer domesticus* Linnaeus, at first tries to drive her off. After pairing, "driving" begins, particularly with a young pair or birds using a new nest site; the male pecks his mate on the head and tries to drive her to the nest. Dr. Heinroth would grasp the male and hide him behind his back so as to give the female a chance to eat, whereupon she would stop eating and look around for her mate! The Heinroths consider both Whitman (1919) and Lorenz (1935) mistaken in their interpretations of "driving", the former explaining it as jealousy, the latter as the establishing of male dominance. The female has no fear of her mate, she caresses him and gently drives him from the nest at times. Driving is a method of impressing upon the female the location of the nest. "In the mated life of pigeons one never has the impression that the male 'exerts his authority' over his mate; there is no dominance between the partners." (p. 165.) When building, Pigeons carry one stick at a time; Whitman considered taking of several pieces of material at one time by many passerines a forward step in intelligence, but the Heinroths point out the technique is a matter of material gathered and of bill structure. Reverse mounting in coition occurs, as with Grebes and Cormorants. Pigeons usually remain mated for life. The two eggs are laid 45 hours apart; the male incubates in the daytime, the female throughout the night. Eggs hatch in 17 days, and young stay in the nest four weeks. Each male defends his nest-hole and his perch, the higher stations being the most desired. Some of Diebschlag's (1941) findings are refuted, as he kept his birds in inadequate quarters. An "appeasement movement"—slight quivering of tail and wing tips—is given by weak birds meeting a stronger and sometimes by males at the feeding dish, apparently as a sign of peaceable intentions. Appeasment postures are common with social animals, Jackdaws, Gulls, Turkeys, dogs, lions and apes. Doves that do not nest socially have no appeasing ceremony.
—M. M. Nice.

28. Aggressive Display of the Oyster-catcher. G. Edwards, E. Hoskins, and S. Smith. 1948. *British Birds*, 41(8): 236-243. Experiments with mounted birds and mirror at a nest of *Haematopus ostralegus occidentalis* Neumann with a series of excellent photographs showing the piping display, attacks of various kinds, "lure-display" and "false-sleeping" attitude, this last a substitute activity.
—M. M. Nice.

29. History of the Investigation of the Instinctive Behavior of the Nestling Cuckoo. (Zur Geschichte der Erforschung der Triebhandlungen des nestjungen Kuckucks.) Hugo Hildebrandt. 1942. *Beiträge zur Fortpflanzungsbiologie der Vögel*, 18(3): 87-91. Interesting account, starting with Jenner's remarkable observations and experiments in 1788 on the ejection of eggs and young of the host by the newly-hatched *Cuculus canorus canorus* Linnaeus; these results and later experiments by others were largely ignored until the bird-minded public was finally convinced by the moving pictures of Heinroth in 1928.
—M. M. Nice.

30. Aspects and Development of "Maternal Behavior" in Birds. (Aspects et évolution du comportement maternal chez les oiseaux.) R. Verheyen. 1948. *Le Gerfaut*, 38(2): 21-33. The author considers all behavior associated with nidification, brooding, and rearing of young as "maternal." In general he discusses two series of groups of birds, the first in terms of the amount of "ma-

ternal" behavior associated with reproduction, the second in terms of the relative amounts of "maternal behavior" displayed by the two sexes. This is an interesting discussion although there is an omission of some rather striking examples. Unfortunately there is no bibliography.—D. S. F.

31. The Use of Flower Petals in Courtship Display. K. A. Hindwood. 1948. *The Emu*, 47(5): 389-391. The author records three instances of the use of flower petals in courtship by male Blue Wrens, *Malurus cyaneus* (Latham), observed near Sydney.—L. S. F.

32. Bigamy in the Pied Flycatcher. (Bigamie beim Trauerfliegenschnäpper.) J. Peitzmeier. 1942. *Beiträge zur Fortpflanzungsbiologie der Vögel*, 18(5): 173. Two female *Muscicapa atricapilla* Linnaeus, incubated 11 eggs in one nest box in Hövelriege, Germany; nine young hatched and were fed by the two females and one male.—M. M. Nice.

33. The Proximate Orientation of the Pied Flycatcher, Musicapa hypoleuca (Pall.), Studied by the Multiple Choice Method. Lars von Haartman. 1947. *Societas Scientiarum Fennica, Commentationes Biologicae*, 10 (2): 1-55. The author describes additional experiments performed using a nesting box with a vertical panel with nine holes, only one of which leads to the nesting cavity. The eight "cul-de-sac" holes are covered until the young are hatched; after this, all holes are exposed to give multiple choice. These experiments, performed during the summers of 1944-1946, are an extension of the experiments performed by the author in 1943 (*Ornis Fennica*, 21 (3) 69-89, 1944. See Review No. 23, *Bird-Banding*, 18 (3) 138, 1947 and No. 21, 19 (1): 30, 1948.) Ten pairs were studied in 1944. Nesting boxes were also relatively upwards or downwards. Also a vertical series of nine similar boxes was used by a pair and results observed. Tests were also made by transferring a mark (a green board) from the nest-box entrance to another entrance. Experiments were also performed to determine the role, if any, of the chirping of the young in causing the adults to make the correct choice. Learning was by trial and error. The learning curves show, as a rule, a steady increase or are parabolic in shape. There are tremendous individual differences in learning. In trial and error, there is a tendency to select holes above, rather than holes below the correct one. "The position of the entrance of the nest is usually learnt in relation to structure (twigs, etc.) in the close environment of the nest box." (p. 50.) Rate of learning in multiple choice problems was as rapid in the Pied Flycatcher as in mammals. Special marks (such as a green board) at the entrance to the nest were learned quickly. Chirping by the young is not a factor in orientation, but is merely a sign denoting hunger in the young; also the number of openings and kinesthetic senses are not factors in orientation.—D. S. F.

34. A Bird Roost: la Pointe-à-la-Bise. (Un dortoir d'Oiseaux: la Pointe-à-la-Bise.) Paul Geroudet. 1948. *Nos Oiseaux*, 19 (199): 245-258. A delightful description of the evening flights of Starlings, *Sturnus vulgaris* Linnaeus, Barn Swallows, *Hirundo rustica* Linnaeus; and Sand Martins, *Riparia riparia* (Linnaeus) to their nightly roost in the reed marshes of a small preserve (1½ hectares) near Geneva. The maximum number of Starlings is reached at the beginning of October with an estimated 30,000 to 50,000 individuals being present. The swallows occur in maximum numbers during the first fifteen days of September with an estimated 40,000 to 50,000 individuals. During the summers of 1935, 1936, 1937, and 1939 the author, with the assistance of his friends, banded 6513 swallows taken at dusk in nets stretched between poles in the marsh. Of these, 3189 or 80 percent were Barn Swallows and 1324 or 20 percent were Sand Martins. The relative proportions of the two species vary from one year to another, and from day to day in the same season. The proportion of juveniles to adults taken was too variable from day to day to warrant any generalizations, but the annual totals provide significant proportions. Adults represented only 14 percent of the total number of Barn Swallows taken, but 22 percent of the total number of Sand Martins. The author believes that the lower percentage of adult Barn Swallows is due to the fact that many adults were still roosting at this season (August and September) in or near their last nests in farmyards. Recoveries from birds banded in the roost represent 0.67 percent for the Barn Swallow and 0.53 percent for the

Sand Martin. The percentage of recoveries in the roost was essentially the same for the two species (0.36 and 0.37 percent). A larger percentage of recoveries from other areas for the Barn Swallow is attributed to its living in proximity to human dwellings much of the time. This is an entertaining and worthwhile paper.—R. O. Bender.

35. Notes on the Behaviour of Blue and Long-tailed Tits in Winter Flocks. John Tooby. 1948. *British Birds*, 41 (9): 258-260. In three successive winters a special form of behavior—chasing and display flights—was seen in *Parus caeruleus obscurus* Prazak and *Aegithalos caudatus rosaceus* (Blyth) immediately before the dispersal of the winter flocks into separate pairs.—M. M. Nice.

36. Observations on a Large Roost of Brambling in the Ajoie during the Winter of 1946-47. (Beobachtungen an einem Massenschlafplatz von Bergfinken in der Ajoie im Winter 1946-47.) Ed Gueniat. 1948. *Der Ornithologische Beobachter*, 45 (3): 81-98. This is a very useful paper describing an enormous roost of Bramblings, *Fringilla montifringilla* Linnaeus, situated in a little valley near the village of Porrentruy, Switzerland, during the winter of 1946-47. Observations of the effect of weather on the departure from and return to the roost, the dispersion of the flocks, and the variation in the number of birds using the roost throughout the winter are given. The greatest concentration was seen on March 15, when the birds left the roost in a single great flock which was estimated to be 100 meters in width, 5-7 meters in height and required 45 minutes to pass. At an estimated flight speed of 60 kilometers per hour this was 45 kilometers long and the author estimates that it contained 11 million birds. Their feeding grounds lay as much as 18 kilometers from the roost. The Brambling roosted in a thick stand of small fir over an area of 10.5 hectares located in an exceptionally well-sheltered valley. The temperature in the roost, measured by a maximum-minimum thermometer, was $\frac{1}{2}$ to $1\frac{1}{2}$°C. warmer when the temperature level was below 0°C., than on the neighboring hillside. They fed principally on beechnuts although an examination of seven stomachs disclosed the remains of spiders, beetles, fly maggots, and small seeds. Two male birds obtained on the evening of March 7, each contained 1.7 grams of food, while a female taken en route to the roost on March 15, contained 0.9 grams. Three finches (not sexed) evidently killed by Owls during the night contained only 0.1 to 0.2 grams of food. Based on Groebbel's data which showed that the daily consumption of food by an individual Brambling was from 3.5 to 4.0 g. (equivalent to about 25 beechnuts), the author calculated that *this flock consumed* 10-12 *tons of food per day or* 300-360 *tons per month.* The following spring, he observed that beech seedlings were much less common than usual in areas where the Brambling had been feeding.—R. O. Bender.

LIFE HISTORY

(See also Numbers 1, 2, 18, 19, 20, 21, and 29.)

37. Mean Longevity and Maximum Longevity in the Vertebrates. (*Longévité Moyenne et Longévité Maximum chez les Vertébrés.*) F. Bourlière. 1946. *Année Biologique*, 22 (10-12): 249-270. The author has summarized data on mean and maximum longevity for the various classes of vertebrates, including birds. The author interprets the data as indicating that potential longevity in birds is, in general, a function of size. Mean longevity in captivity for passerine birds is in the order of 20 years whereas for small rodents of approximately the same weight is 2-5 years, despite the higher metabolic rate in birds.—D. S. F.

38. Notes on the White-breasted Sea-eagle. David Fleay. 1948. *The Emu*, 48 (1): 20-31. These are an important series of notes made on birds in captivity as well as in the wild, beginning in 1935 when a male *Haliaeetus leucogaster* (Gmelin) was obtained in the Murray River Valley, New South Wales. Both sexes are bold in the presence of an intruder at the nest. The calls of the male bird are higher pitched and more rapid than those of the female. Most of the nest building is done by the male who shares consistently in the incubating although he does not incubate at night. Incubation begins with the laying of the

first egg. The following plumages are recognized: (1) brown first year, (2) white-tailed bird of second year, (3) "the almost adult" of year three, with similar demarcation to that of a mature bird, (4) "immaculate adult plumage."—D. S. F.

39. Notes on the Rate of Loss amongst Eggs and Nestlings, with Notes on Some Species. P. A. Bourke. 1948. *The Emu*, 47 (5): 321-330. Data from 60 nests indicate that, for non-passerine species, 63.5 percent of the eggs laid produce reared young; for passerine species the rate was 57.5 percent. The data are from New South Wales.—D. S. F.

40. Field notes on *Malurus elegans*, the Red-Winged Wren of Western Australia. H. O. Webster. 1948. *The Emu*, 47 (4): 287-290. Among the several interesting observations made on this species is the one that "It is very common to find more than one male or female feeding the young at the nest." (p. 290.) Incubation period is about 15 days; normal clutch is two or three.—D. S. F.

41. A Study of the Cape Canary (*Serinus canicollis canicollis*). C. J. Skead. 1948. *The Ostrich*, 19 (1): 17-44. This interesting paper is based on observations made at "Gameston," in the Kariega River Valley, near Highlands, in the Albany District, South Africa. Nest-building is performed only by the female and requires about 14 days. Incubation is done by the female and begins after the laying of the third egg even though a fourth may be laid; incubation period is about 14 days. The male feeds the incubating female on the nest. The female broods the young for three days after hatching; all are fed by the male. After the third day the female assists in feeding the young and broods them only in unfavorable weather. Female ceases spending the night with the young after the ninth, tenth, or eleventh night. The principal enemy of young birds after leaving the nest is the Fiscal Shrike, *Lanius collaris collaris* Linnaeus.—D. S. F.

42. Observations on the Distribution and Breeding of the Icterine Warbler in Sweden. (Om den gulbröstade sångarens, *Hippolais icterina* (Vieill.), förekomst och häckningsvanor i Sverige.) S. Durango. 1948. *Fauna och Flora*, 1948 (5): 186-200. In Sweden, this species breeds as far north as 60° where, however, it is infrequent; it is most abundant in Scania, Öland, Gotland and along the west coast. In southwestern Sweden, it has increased in recent years probably in response to changes in climate since the species is favored by a more maritime climate. It is found nesting on islands, in coastal areas, in woods around lakes and along the rivers. Nests usually occur in bushes and low trees about 1.5 to three meters above the ground. The nest is completed in about five days. The most frequent clutch is five. Incubation sometimes begins before the clutch is completed, more frequently after the clutch is complete. Observed incubation period is 12-16 days.—D. S. F.

43. Notes on Ciconiiform Birds in South Celebes with Special Attention to the Pied Egret. (Waarnemingen van Steltloopers (Gressores) in Zuid-Celebes, in het bijzonder van het blauw-witte reigertje, *Notophoyx picata* (Gould).) L. Coomans de Ruiter. 1948. *Limosa*, 21 (2/3): 69-83. These are notes on 13 species concerning geographic distribution; breeding areas; nests, eggs, and young; and calls.—D. S. F.

44. The Breeding Biology and Behavior of the Continental Goldfinch *Carduelis carduelis carduelis*. P. J. Conder. 1948. *The Ibis*, 90 (3): 493-497. This is an unusually excellent paper based on data obtained while the author was a prisoner of war at Eichstatt, Bavaria, during 1943. Territories were established at the time of nesting-site selection and functioned as mating and nesting stations and were only occupied when the nest was in use. "Throughout the breeding season, paired birds continued to flock in small numbers." (p. 523.) "Display postures have been separated into three categories: territorial, aggressive, and sexual 'contact' displays. Where one posture is used in different situations, confusion is avoided by differences in the time factor and the external and internal situations." (p. 523.) Nest-heights varied from 12 to 30 feet; most nests were on the north side of the tree. First egg was laid within two days after completion of nest. Incubation period was 11-12 days; eggs (three nests) were incubated 87 percent to 96 percent of the time. Incubation was by the female who was fed by the male. Young remained in the nest about 16 days.—D. S. F.

45. Contributions to the Biology of the Ruff (*Philomachus pugnax*) (*L.*) H. F. Søgaard Andersen. 1948. *Dansk Ornithologisk Forenings Tidsskrift*, 42 (3): 125-148. This paper is based on data obtained from investigations in the bird sanctuary Tipperne which is located on a peninsula in Ringkøbing Fjørd, 1929-1947. Mean breeding density for the area of 4,957 square kilometers was 3.9 per square kilometer, ranging from 2.0 to 11.0 per square kilometer. The nests were most concentrated along the roadsides, 236 per square kilometer. There is a marked tendency for nests to be built in the vicinity of the previous year's nest. Apparently, about one-fourth of the females return to the refuge the year after banding; for males the return is about 40 percent.—D. S. F.

46. The Breeding Biology of the Penduline Tit. (Zur Brutbiologie der Beutelmeise, *Remiz pendulinus* (L.)). Dieter Burckhardt. 1948. *Der Ornithologische Beobachter*, 45 (1): 17-31. The observations on which this paper is based were made in Département Bouches du Rhône in southern France from April 1947 to July 1947. This species is common in the groups of trees around the estates and along the irrigation canals. Most of the nests were in elms or willows, although other trees were used; nests were suspended either over water or dry land. Nests were built by the males, frequently with the aid of the female. Nest construction requires 10 to 25 days. The male forsakes the nest after the eggs are laid; incubation and rearing of the young are accomplished by the female alone. The male, after forsaking the nest, builds another and seeks to attract another female. Often a third nest is built. If a female is not attracted the nest is not completed. In one instance the nestling period was found to be 19 days. Young were attended for about two weeks. Strange young were driven off by the female.—D. S. F.

47. Notes on the Horsfield Bush Lark. P. A. Bourke. 1947. *The Emu*, 47 (1): 1-7. *Mirafra javanica* Horsfield is a capable vocal mimic although the author believes that such activities are restricted to the breeding season. He cites an example wherein the songs or calls of 17 species were woven within a single song by the Bush Lark. Song continues throughout the day and night with the period of greatest activity occurring at sunrise and the next greatest output at, and immediately following, sunset.—D. S. F.

48. A Contribution to Research on the European Bee-eater. (Contribution à l'étude du *Merops apiaster*.) André Rivoire. 1947. *L'Oiseau et la Revue Française d'Ornithologie*, 17 (1): 23-43. Following a review of the distribution and migration of the species, the author summarizes his observations made in southern France in 1946 where the species ordinarily appears late in May. Bee-eaters are gregarious and frequently nest in colonies. They were noted to capture dragonflies, bees and wasps, flies, some butterflies and moths, and some beeties. The food varies with availability. The nest holes were bored into the bank of a small gravel pit and opened toward the northwest; the mean distance bored into the bank was 1.75 meters. There is evidence of the rearing of a second brood.—D. S. F.

CENSUS AND POPULATION STUDIES

(See also Numbers 45, 74, 82, and 83.)

49. The Capercaillie in Finland in 1933-1942 on the Basis of Shooting-license Statistics; the Significance of these Statistics. (Metson esiintymisestä suomessa vv. 1933-42 metsästyskorttitilastojen perusteela sekä metsästyskorttitilastojen merkityksestä.) T. V. Mäki. 1946. *Suomen Riista*, 1:31-48. The population of the Capercaillie, *Tetrao urogallus* Linnaeus, in Finland has been decreasing steadily with particular scarcities in 1935 and 1939-40. Since 1934 hunting licenses and reports of kill have been required. Data on the number of birds killed per year per 100 square kilometers, with certain corrections, are used to indicate relative abundance in different areas. Settlement appears, on this basis, not to have disrupted the distribution of the species in Finland.—D. S. F.

50. The Cape St. Mary Gannet Colony, Newfoundland. O. J. H. Davies and R. D. Keyres. 1948. *The Ibis*, 90 (4): 538-546. In 1939, this colony of *Sula bassana* contained 4394 pairs, with a probable error of 369 pairs. Examination of gonads of birds from the mainland, indicate that not all birds in mature plumage are actually in breeding condition. Nesting has been attempted unsuccessfully on the mainland since 1931. The chief causes of mortality are shooting and stoning by fishermen.—D. S. F.

51. The Unfavorable Course of the Nesting of the Schleswig-Holstein Storks in the Summer of 1941. (Ueber den ungünstigen Verlauf des Brutgeschäfts der schleswig-holsteinischen Störche (*Ciconia ciconia*) im Sommer 1941.) Walther Emeis. 1942. *Beiträge zur Fortpflanzungsbiologie der Vögel*, 18 (5): 153-155. Counts summarized from 1934 to 1941. In this last year there were 682 unoccupied and 1830 occupied nests, of which 152 had only one adult, 924 pairs raised no young, and 754 pairs raised an average of 2.6 young. In contrast with the 55 percent of pairs that raised no young, in some years this percentage was as low as 13 and 14, although in 1938 it rose to 50. The chief factors responible for the lack of success in 1941 seemed to be a cold, late spring and a severe drought starting in May.—M. M. Nice.

52. The Territories of the Chaffinch in a Park-like Beech Forest. (Die Reviere des Buchfinken, *Fringilla c. coelebs* L., in einem hainartigen Birkenwalde.) Lars von Haartman. 1947. *Ornis Fennica*, 24 (3/4): 82-87. This study area of three hectares in southwestern Finland near Åbo contained in 1939, eight territories defended by male Chaffinches. In total there were 26 pairs of birds belonging to 14 species.—D. S. F.

53. Methods of Bird Sociological Survey on the Basis of Some Tihany Communities Investigated. Mirklós D. F. Udardy. 1947. *Archiva Biologica Hungarica*, Series II, 17: 61-88. This paper, based on observations made on the Tihany Peninsula of Lake Balaton, Hungary, since 1938, contains much thoughtful consideration of the philosophy and methods of quantitative avian ecology. Emphasized is the importance of the phenological spectrum for the study area. This gives periods of occurrence in the area for the species involved. The author's data indicate a total of 690 breeding pairs per square kilometer in open and woodland, 4056 for dense forest, and 410 for scrubby pasture. The dominant species of the open woodland were the Chaffinch, *Fringilla coelebs* Linnaeus 13.8 percent; Turtle Dove, *Streptopelia turtur* (Linnaeus) 12.3; Yellow Hammer, *Emberiza citrinella* Linnaeus 11.2; Starling, *Sturnus vulgaris* Linnaeus 7.4; and the Great Tit, *Parus major* Linnaeus 7.3. The dominant species of the dense forest were the Turtle Dove 9.9 percent; Chaffinch 9.2; Yellow Hammer 8.8; Nightingale, *Luscinia megarhyncha* Brehm 8.3; Great Tit 7.6; Blackcap, *Sylvia atricapilla* (Linnaeus) 5.8; Blackbird, *Turdus merula* Linnaeus 5.8; Golden Oriole, *Oriolus oriolus* (Linnaeus) 5.3; Red-backed Shrike, *Lanius collurio* Linnaeus 5.0. The dominant species of the scrubby pasture were the Whitethroat, *Sylvia communis* Latham 24.8 percent; Yellow Hammer 21.0; Stonechat, *Saxicola torquata* (Linnaeus) 10.9; Nightingale 9.7; Linnet, *Carduelis cannabina* (Linnaeus) 7.4; Wheatear, *Oenanthe oenanthe* (Linnaeus) 5.0.—D. S. F.

54. One Year's Census and Study of Birds in two acres of Fort Beaufort Bushveld, September, 1946, to August, 1947. J. Sneyd Taylor. 1948. *The Ostrich*, 19 (2): 122-128. The author follows the methods of his fellow South African colleague, Mr. C. J. Skead. Densities varied from 5.3 per acre (May) to 9.0 per acre (September, November, July, August). Species observed most frequently were the Fiscal Flycatcher, *Sigelus silens* (Shaw), and the Tit-babbler, *Parisoma subcaeruleum subcaeruleum* Vieillot.—D. S. F.

55. The Effect of the Severe Winters of 1928-1929 and 1939-1940 and the Influence of Winter Food on the Breeding Populations of Tits. (Über die Einwirkung der strengen Winter 1928/1929 und 1939/40 und den Einfluss der Winterfütterung auf den Brutbestand der Meisen.) Rudolf Berndt. 1941. *Die Gefiederte Welt*, 70 (7-12): 59-65; 80-81; 101-103; 117-118. Observations on the breeding populations of five species of tits in central Germany. Following the

severe winter of 1928-1929, the breeding populations were reduced 60 to 75 percent of the preceding breeding season; following the winter of 1939-1940, the breeding populations, with the exception of one which had good feeding conditions, were reduced from 0 to 50 percent of the populations of the preceding breeding season. The data suggest that, in severe winters, food supply may be a factor in regulating the size of the subsequent breeding population.—D. S. F.

56. Observations on the Winter Avifauna of Vuokkiniemi. (Beobachtungen über die winterliche Vogelfauna von Vuokkiniemi.) Leo Lehtonen. 1943. *Ornis Fennica*, 20 (4): 81-89. This paper summarizes linear censuses made in the region of Vuokkiniemi (64° 58′ N. 30° 34′ E) during the winter of 1942-1943 in a conifer-dominated wilderness with a few villages. The species of greatest dominance (percent of total individuals observed) were the Willow Tit, *Parus atricapillus borealis* Selys (33.9); Great Spotted Woodpecker, *Dendrocopos major* (Linnaeus) (15.0); the Hazel Grouse, *Tetrastes bonasia* (Linnaeus) (10.0); and the Redpoll, *Carduelis linaria* (Linnaeus) (9.3). Calculated population densities (all species) were 55 per square kilometer for mixed coniferous forest; 33 per square kilometer for fir forest, and 23 per square kilometer for pine forest, and six per square kilometer for burned-over forest.—D. S. F.

57. The Winter Avifauna of Helsinki. (Über die Wintervogelfauna von Gross-Helsinki.) Leo Lehtonen. 1948. *Ornis Fennica*, 25 (1): 1-18. This paper is a summary of the author's observations in the vicinity of Helsinki during the winters of 1933-1938, 1940-1941, and 1944-1947. Careful attention is given to ecologic distribution and to relative numbers during the different winter months. The author's data appear clearly to support his contention that the much-discussed "warm period" began to draw to a close, or at least to be temporarily interrupted, about 1937. His data show, for example that in 1933-1934 he saw during the winter, 381 individuals in 21 migratory species; in 1934-1935, he observed 1,181 individuals in 26 migratory species. Mean observations for the "warm period" were 522 individuals in 18.4 species per winter. In 1940-1941, 330 individuals in 14 migratory species were observed, whereas in 1945-1946, only 73 individuals in nine migratory species were recorded.—D. S. F.

58. Notes on the Avifauna of Southern Vichtis, Finland. (Anteckningar om fågelfaunan i södra Vichtis.) G. & H. Wallgren. 1948. *Ornis Fennica*, 25 (4): 57-66. This paper is based on miscellaneous observations for 1933-1947 with quantitative (linear) surveys in 1947. Data are calculated according to three regions: cultivated areas, Lake Enajärvi, forests. Species which are increasing in numbers are the Pied Flycatchers, *Muscicapa striata* (Pallas); Great Crested Grebes, *Podiceps cristatus* (Linnaeus), and Black-headed Gull, *Larus ridibundus* Linnaeus. Decreasing species are *Delichon urbica* (Linnaeus) (nesting sites usurped by *Passer domesticus* Linnaeus); Mallard, *Anas platyrhynchos* Linnaeus; Pochard, *Aythya ferina* (Linnaeus); Common Gull, *Larus canus* Linnaeus; Corn Crake, *Crex crex* (Linnaeus); and Partridge, *Perdix perdix* (Linnaeus). Total densities of 268 per square kilometer in winter and 526 per square kilometer in summer were recorded for the forest area.—D. S. F.

59. Twelfth Breeding-Bird Census. 1948. *Audubon Field Notes*, 2 (6): 219-244. A great deal of ecological and ornithological information is given in these 34 censuses from 17 States, from New Hampshire to Oregon, from Georgia to Texas. Two-thirds were taken in forests, the rest in marsh, scrub, edge and mixed habitats. Many of the areas have been censused for a series of years. In West Virginia 345 pairs per 100 acres were found in young spruce forest, 381 pairs in virgin spruce, 261 pairs in young deciduous forest and 362 pairs in mature deciduous forest. In Maryland five apple orchards were censused, two unsprayed, three sprayed with DDT; the density per 100 acres was as follows: unsprayed and unmowed, 234 pairs; unsprayed and infrequently mowed, 177 pairs; moderately sprayed and infrequently mowed, 122 pairs; lightly sprayed, with rye as ground cover, 120 pairs; heavily sprayed and frequently mowed, 38 pairs. These are only samples of the wealth of valuable material.—M. M. Nice.

ECOLOGY

(See also Numbers 15, 26, 50, 51, 52, 53, 55, 56, 57, 58, 82, 83, 84, and 85.)

60. Life Tables for Natural Populations of Animals. Edward S. Deevey, Jr. 1947. *The Quarterly Review of Biology*, 22 (4): 283-314. In this stimulating review, the author has used age data on a large variety of animals, including birds, as a basis for comparing the dynamics of natural populations. His "life tables," in general, show the percentage deviation from mean length of life for each age interval, the relative number of deaths (and survivals) for each of the age intervals, mortality rate at beginning of the period of each age interval, and the life expectancy of those which attain each age interval. For purposes of comparison, survivorship is expressed in terms of mean life span. Unfortunately, differences in methods of obtaining data and differences in the initial ages from life tables are calculated, prevent adequate comparison between groups of animals. The principal difficulty with birds, and other groups also, is the absence of data, for life-table purposes, during the first few months after hatching. The author points out that survivorship in birds when plotted against age on semilogarithmic paper is represented by a diagonal line (constant mortality rate regardless of age). Theoretically, the maximum life span should be 6.6 times the mean survival period. In some species, such as man, the Dall Mountain Sheep, one of the rotifers, and others, the curve is convex, i. e. mechanisms exist for stretching the mean life span toward the maximum. Theoretically, the maximum life span should be two or three times the mean life span. "On the other hand, these are, undoubtedly, species in which juvenile mortality is very heavy, but the few survivors to advanced ages die at reduced rates." (p. 312.) In such species, maximum longevity would be 15 or more times greater than mean longevity. Oysters and mackerel are probably examples.—D. S. F.

71. Once Again on the Neighborly Nesting of Peregrine Falcons and Wild Geese on the Tundra. (Nochmals über das nachbarliche Nisten von Wanderfalken und Wildgänsen in der Tundra.) H. Grote. 1942. *Beiträge zur Fortpflanzungsbiologie der Vögel*, 18 (5): 172-173. The nesting of various species of wild geese in the vicinity of eyries of *Falco peregrinus* Tunstall has been attributed to a need for protection. However, the geese start to nest two weeks before the arrival of the Falcons; they choose these sites because the snow melts sooner in front of cliffs than in the open.—M. M. Nice.

72. Report of the Severe Winter of 1946-1947 on Bird-Life. N. F. Ticehurst and P. H. T. Hartley. 1948. *British Birds*, 41 (11): 322-334. A summary of 121 reports from all parts of Great Britain under the following headings: the weather; observers; general effect upon bird life; icing of wings and feet; unusual feeding habits; weather movements; classified list of species affected.—M. M. Nice.

73. The Question of Avian Introductions in Hawaii. Harvey I. Fisher. 1948. *Pacific Science*, 2 (1): 59-64. This is an excellent discussion of the complexity of the problems of introduced species of birds in Hawaii. In almost every instance, the ecologic ramifications of an introduction have been far more complex than could possibly have been anticipated. A series of proposals to govern policy on introduced species is made. These proposals are in general sound, although it is difficult to see how any measures short of complete prohibition of introductions can prevent further ecologic catastrophes in the future.—D. S. F.

74. The Breeding Birds of Wieringermeer in 1947. (Broedvogels van de Wierengemeer in 1947.) A. L. J. van Ijzendoorn. 1948. *Limosa*, 21 (2/3): 41-69. The Wieringermeerpolder, an area of about 50,000 acres, was reclaimed from the Zuiderzee in 1930. In 1931, there were seven breeding species of birds; in 1932 there were six; four additional species were noted in 1934. Schaank's list for 1935 contained 33 species. The number of breeding species in 1937 was 48 and ten years later in 1947 the author found 57. The estimated total breeding population of all birds was about 8,600 pairs (or occupied territories). The most numerous species in 1947 were the lark, *Alauda arvensis arvensis* Linnaeus (about 2,000 pairs); the Blue-headed Wagtail, *Motacilla flava flava* Linnaeus (about

2,000 pairs); the English Sparrow, *Passer domesticus* Linnaeus (about 2,000 pairs); and the Quail, *Coturnix coturnix* (Linnaeus) (about 500 males). This and the papers which have preceded it, constitute a valuable contribution to avifaunal dynamics.—D. S. F.

75. The Marsh Tit and the Willow Tit. (*Parus palustris longirostris* Kleinschmidt et *Parus atricapillus rhenanus* Kleinschmidt.) Alfred van Beneden. 1948. *Le Gerfaut*, 38 (1): 1-20. Both of these species are extensively dependent for food on the mint, *Galeopsis tetrahit*. This is a series of observations on the relation of these two species to this source of food.—D. S. F.

76. Some Comparative Observations Concerning the Biology of the Willow Tit and the Marsh Tit. (Några jämförelser rörande talltitans, *Parus atricapillus borealis* Selys, och kärrmesens, *Parus palustris palustris* L., biologi.) S. Durango. 1944. *Ornis Fennica*, 21 (2): 33-42. In Sweden, the Willow Tit has been regarded almost exclusively as a breeding species of the coniferous forest and the Marsh Tit as a breeding species of the deciduous forest. Investigations in Finland and Norway indicate the Willow Tit to be a truly eurytropic species which breeds also in deciduous forest. Also the Marsh Tit is by no means bound to deciduous forests but also can breed in mixed forests, particularly on the forest edges.—D. S. F.

WILDLIFE MANAGEMENT AND METHODS

(See numbers 49 and 85.)

CONSERVATION

(See Numbers 15, 49, 73, 81, 82, 85, and 89.)

AVIFAUNAL DYNAMICS

(See also Numbers 42, 57, 74, 82, and 83.)

77. The Distribution of Birds and the Recent Climatic Change in the North Atlantic Area. Finn Salomonsen. 1948. *Dansk Ornithologisk Forenings Tidsskrift*, 42 (2): 85-99. This is another contribution to our knowledge of the changes in avifauna correlated with climatic changes in northern Europe and the North Atlantic. The principal avifaunal changes occur among the summer residents and accidental species. In western Greenland there have been mild climatic periods about 1820-30, 1840-50, 1870-80 and 1900- . The last did not reach its extreme development until about 1920; in 1931-1935 mean winter temperatures were about 9°C. higher than 1920. During this latest mild period, the breeding range of the White-fronted Goose, *Anser albifrons* Linnaeus, has expanded northward. The Mallard, *Anas platyrhynchos* Linnaeus, has wintered in greater numbers than in the past, whereas a later fall migration has been noted among other species. Among accidentals which have bred in western Greenland during this period are the Long-billed Marsh Wren, *Telmatodytes palustris* (Wilson); Fieldfare, *Turdus pilaris* Linnaeus; and the Canada Goose, *Branta canadensis* (Linnaeus). In addition, during 1920-41, 18 species, previously unrecorded, or known only from previous mild periods, were recorded. Among these is the Myrtle Warbler, *Dendroica coronata* (Linnaeus), which was previously recorded in 1841, 1847 (warm period 1840-50); 1878-1880 (warm period 1870-1880) and 1931, 1937 (present warm period). In Iceland there has been an increase in the sizes of the populations of some of the boreal elements in the avifauna and, furthermore, a number of southern species from America and Europe have been recorded. In the Faroe Islands during the present warm period there has been a large number of accidental occurrences of southern species and several instances of the establishment of more southern species as breeding species. In Denmark, up to about 1930, 19 more southern species appeared in Denmark as breeding species, presumably because of the milder climates. Since 1930, when summer as well as winter temperatures became higher, nine additional species appeared in Denmark whereas most of the previously immigrated species increased.—D. S. F.

ZOOGEOGRAPHY

(See Numbers 42, 43, 77, and 84.)

MORPHOLOGY AND ANATOMY

78. Studies on the Relative Development of the Brain in Birds I. (Études sur la cérébralisation chez les oiseaux I.) Adolphe Portmann. 1946. *Alauda*, 14 (1): 1-20. Using fresh weights of the major anatomical units of the brain, the author compares in a careful analysis the relationships of parts of the brain and between brain and body weight of 23 of the 49 orders of birds, as distinguished by Stresemann. In all 892 individuals of 219 species were used. In this first of a series of papers, Portmann considers the brain trunk (the brain less the cerebral hemispheres, optic lobes, and cerebellum) and the cerebral hemispheres. Within each order the rates of increase in weight of the trunk and of the cerebral hemispheres are not as great as the rate of increase in body weight. By orders, the adjusted logarithmic ratios between the body weight and the weight of the brain trunk vary from 0.40 to 0.82, and between the body weight and the weight of the cerebral hemispheres vary from 0.43 to 0.88. (The adjusted logarithmic ratio describes the slope of a curve which represents the relation of the logarithm of the weight of a portion of the brain to the logarithm of the body weight.) The adjusted logarithmic ratios by orders, where determinations are based upon at least six species for each order, are reported for the brain trunk and the cerebral hemispheres respectively as: Laro-Limicolae 0.51 and 0.66, Columbae 0.51 and 0.60, Galli 0.52 and 0.62, Ralli 0.63 and 0.80, Anseres 0.44 and 0.56, Accipitres 0.51 and 0.61, Gressores 0.62 and 0.70, Striges 0.63 and 0.72, Passeres 0.61 and 0.80, Psittaci 0.66 and 0.80, and Pici (*Jynx* excepted) 0.82 and 0.83. The author also finds that all of those orders studied with high absolute values for the degree of development of brain and certain orders with a lower development, have a nidicolous ontogeny. The nidifugous type of ontogeny was not found in any order with a high level of development of the brain.—L. R. Mewaldt.

79. Studies on the Relative Development of the Brain in Birds II. (Études sur la cérébralisation chez les oiseaux II.) Adolphe Portmann. 1947. *Alauda*, 15 (1): 1-15. Portmann employs as a "basic figure," for comparisons between groups of birds, the "weight of the brain trunk of a gallinaceous bird with body weight of the species to be examined." (p. 3.) Comparisons are based upon the Galli because no other group studied had a lower brain-trunk weight in relation to body weight. For each of 140 species (including 665 individuals) of 27 orders, the author presents the body weight in grams, the calculated "basic figure," and the indices of the brain trunk, optic lobes, cerebellum, and cerebral hemispheres as they compare to the "basic figure." These data include 18 families assigned to Passeres. By orders, his data include indices for brain trunk, optic lobes, cerebellum, and cerebral hemispheres respectively: Galli 1.00, 0.66, 0.73, 3.18; Columbae 1.12, 0.85, 0.95, 3.45; Anseres 1.38, 0.53, 1.10, 5.76; Accipitres 1.97, 1.37, 1.87, 8.58; Pici (Jynginae excepted) 1.85, 1.04, 1.76, 12.53; Striges 2.31, 0.92, 1.49, 14.37; Psittaci 2.03, 0.99, 1.55, 14.5; and the Corvidae (of Passeres) 1.72, 1.20, 1.64, 14.99. The indices of the cerebral hemispheres for other families of Passeres are considerably lower than for Corvidae, all having values below 9.00.—L. R. Mewaldt.

80. Studies on the Relative Development of the Brain in Birds III. (Études sur la cérébralisation chez les oiseaux III.— Adolphe Portmann. 1947. *Alauda*, 15 (2): 161-171. Comparisons are made, on a percentage basis, among several organs at the time of hatching from the egg for 177 birds of 53 species in 14 orders. The weight of the bird at the time of hatching (less the yolk sac and any stomach or intestinal contents) is taken as 100 percent. Percentage values are given for the brain, eyes, heart, digestive tube, and liver. In the Galli, as the body weights decrease from about 50 to 4.58 grams, the brain proportions increase from 2.74 to 6.19 percent, and in the Passeres, as body weights decrease from 13.56 to 0.78 grams, the brain proportions increase from 3.02 to 8.84 percent. Within each of these two orders, the smaller the species, the greater the proportionate brain weight. For birds of similar size at the time of hatching, the percentage values of the brain and of the eyes are greater for the nidifugous birds

than for the nidicolous birds, whereas the percentage values for the digestive tube are greater for the nidicolous birds than for the nidifugous birds. These proportions are apparently independent of the duration of incubation. The percentage values for the heart and the liver remain fairly constant. Portmann then compares the weights of the cerebral hemispheres and the brain trunk in the adult to the weights of these parts of the brain at the time of hatching. The quotients of the resulting ratios express the indices of growth. The lowest brain-trunk indices (1.29 to 2.42) are found only for nidifugous birds, the highest (5.0 to 6.3) only for nidicolous birds, whereas intermediate indices (especially between 2.4 and 4.66) occur in both types. The indices of the cerebral hemispheres vary from 2.34 to 32.58, with the lowest values for nidifugous birds (Laro-Limicolae and Galli 2.34 to 5.19) and the higher values for nidicolous birds (Passeres 9.06 to 32.58). These differences in growth indices are chiefly due to the relative development of the brain, rather than to differences in body weights. This accumulation of data in the first three parts of this series, provides an excellent basis for further studies on the degree of development of the brain in birds and points to a different approach to the problem of avain evolution.—L. R. Mewaldt.

BOOKS AND MONOGRAPHS

81. Conservation in the United States. A. F. Gustafson, C. H. Guise, W. J. Hamilton, and H. Ries. 1949. Comstock Publishing Company, Ithaca, New York. xi + 477 pp. $5.00. The preface to the third edition of *Conservation in the United States* points out that this book is presented at a time when the problems of natural-resource conservation are more critical than ever before. The exhausting demands of World War II created shortages of food, lumber, and metals that still exist. Aid to the war-torn countries is an additional drain on the country's natural wealth which is now reduced to alarmingly low levels. It is imperative now that an inventory be made of these resources, and a broad plan adopted to conserve them.

Until recently the exploitation of the waters, soils, forests, grasslands, wildlife, and minerals of the United States so completely shadowed attempts at real conservation that only a handful of specialists realized the waning status of these natural resources. Exploitation and abuse continues, and while historians point to China as the classic example of soil bankruptcy, commercial interests in the United States smash all speed records to reach the finish line of America's "inexhaustible" resources. However, an increasing number of American people realize that this race cannot continue indefinitely at its present breakneck pace. They have been jolted from their luxurious lethargy by two recent publications which call a spade a spade in presenting facts that show extractive economy is nearing environmental exhaustion.

Let those who have doubted *Our Plundered Planet* and *Road to Survival* read the third edition of *Conservation in the United States* and determine for themselves if nature's resources and man's resourcefulness have been underestimated. Here is a broad picture of our soils and other resources inseparably wedded to the land. The picture is a sobering one indeed and indicates clearly the need for long-range conservation if anything is to remain and be conserved. A weekly news-magazine recently stated that "The well-kept farms of New York State, Pennsylvania and Ohio are now far more fertile than they were when the pioneers first felled the forest." This is hardly in agreement with the statements made on page 123 in *Conservation in the United States*: "Erosion has been responsible in a measure for the abandonment of farm lands throughout the East. In New York, for example, abandonment has been at the rate of about 100,000 acres a year for several decades past. More recently, abandonment has been even more rapid." Again on page 197 it is pointed out that "Insofar as forests have contributed to national welfare and security they have served the nation well. But with full recognition of this fact, the forests were cut and used in a highly destructive manner. Only the best materials were removed. Waste and destruction during logging operations were the rule. Vast areas of fine timber were ruined by fires. And even today the level of technical practice in handling most of the nation's forests and forest lands is comparatively low." The chapter on Game and Fur Resources

certainly does not lend optimism to the outlook of the nation's wildlife. In writing of the present status of wildlife it is stated that "We have painted a rather dreary picture of wildlife conditions in the United States. Many wild creatures are gone, and others are faced with early extinction." These are conclusions reached after years of study and research, they embody the findings of federal and state agencies as well as many individual workers who have not "crested a wave of postwar pessimism" but have made valid appraisals of much data from a broad area over a long period of time.

As a broad and general reference in the field of conservation this book serves a valuable need. To anyone interested or concerned in a general picture of former resources, utilization rates,today's conservation problems, and future considerations of conservation practices this text is very useful. It is without philosophy or principle, and technical details are wanting. There are excellent plates distributed throughout the book, there is a fair selection of supplementary readings that misses some outstanding recent publications, and there is a good index. The technical subject matter is accurate, but it is so broad and general that the reader will miss many modern concepts. The chapters on soils and forestry are the strongest; those on fish and wildlife resources the weakest. For example, on page 387, under "Some wildlife increasing," the authors say that "The prairie chicken, as its name would indicate, was a bird of the open prairies, but in recent years it has moved northward 300 miles or more; it is now found in Canada." This leads the reader to believe that the prairie chicken has moved to Canada where it is flourishing in better numbers than it formerly did on its more southern range. Actually this is far from the case, and this bird is rapidly becoming a rare species in spite of its northward shift. A few more tabulations of data would be welcome. The style is very readable. Researchers will not find this book of great help; it will prove more valuable to schools, administrators, and lay readers.—Irven O. Buss.

82. The Avian Egg. Alexis L. Romanoff and Anastasia Romanoff. 1949. John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, New York. xiii + 918 pp. $14. This unique book is an amazing compendium of information on the egg of the domestic fowl, with frequent comparisons with the eggs of other species of birds. Indeed it is very difficult to think of anything, concerned with the egg of the domestic fowl, which is not discussed somewhere in this book. The first part (five chapters), "Morphogenetic Expression," is concerned with egg-laying, external characteristics of eggs, structure of eggs, formation of the egg, physiology of the female reproductive system of the domestic fowl, and related aspects. Part II (three chapters), "Biophysicochemical Phenomena," presents a very complete picture of chemical composition, physicochemical properties, and "biological properties." Included are thorough discussions of egg proteins, egg lipids, carbohydrates, pigments, enzymes, hormones, inorganic compounds, microbiology, germicidal substances, and immunologic properties. In most respects, this is the best and most important part of the book. Part III (three chapters), "Bioeconomic Importance," is concerned with food value, preservation, and industrial uses. The authors have been amazingly successful in integrating information from such a large variety of sources; more than 2600 references are cited. Unfortunately, some of the comparative tables are difficult to use because of ambiguous common names such as "Robin," "Hawk," "Hummingbird," "Blackbird," etc. Less important are a number of errors in scientific names, mostly synonyms or archaic combinations. However, these are truly unimportant when one considers the tremendous overall value and quality of the book. The authors and publishers are both to be commended for the production of this excellent treatise. It is unfortunate that increased printing costs have forced its price so high. Every ornithologist will find interesting and valuable information in this fine book.—D. S. F.

82A. The Fate of Hornborgas Lake as a Bird Lake. (Hornborgas jöns öden som fågelsjö.) Rudolf Soderberg. 1947. Bokforlaget Natur och Kultur. Stockholm. 368 pp. Paper, 19:50 Swedish Kroner; Bound, 24:50 Kroner. This important treatise traces the avifauna of Hornborgas Lake from 1867 to date during which time two periods of reclamation have occurred, beginning respectively in 1877 and 1912; the last now approaches totality. The author's own observations

extend over 40 years. The introduction contains some of the numerous political and legal ramifications involved in the last period of reclamation. A section of 102 pages is devoted to a careful tracing of the changes, qualitative and quantitative, from 1912 to 1941 by the use of five six-year periods. There was, in general, an increase in the numbers of wading birds and coots until 1930-1935 after which a gradual decline began. There was a tremendous increase from 1917 through 1930-1935, of the Black-headed Gull, *Larus ridibundus* Linnaeus. These changes and many others are carefully correlated with general ecologic changes. A section of 44 pages compares, quantitatively and qualitatively; the avifaunae of (1) the 1860's (before drainage of 1877), (2) the mid period (between drainages of 1877 and 1912) and (3) the last reclamation period. Dominant species of the first period were the Golden Plover, *Charadrius apricarius* Linnaeus; Lapwing, *Vanellus vanellus* (Linnaeus); Curlew, *Numenius arquata* (Linnaeus); Ruff, *Philomachus pugnax* Linnaeus; Wood Sandpiper, *Tringa glareola* Linnaeus; Common Snipe, *Capella gallinago* (Linnaeus); Great Snipe, *Capella media* (Latham); Corncrake, *Crex crex* (Linnaeus); Teal, *Anas crecca*Linnaeus; Mallard, *Anas platyrhynchos* Linnaeus; Tufted Duck, *Aythya fuligula* (Linnaeus); Black Tern, *Chlidonias nigra* (Linnaeus); Great Crested Grebe, *Podiceps cristatus* Linnaeus; Sedge Warbler, *Acrocephalus schoenobaenus* (Linnaeus); Blue-headed Wagtail, *Motacilla flava* Linnaeus; Meadow Pipit, *Anthus pratensis* (Linnaeus); Sand Martin, *Riparia riparia* (Linnaeus). For the mid-period the dominant species were the Coot, *Fulica atra* Linnaeus; Lapwing; Curlew; Corncrake; Mallard; Pochard, *Aythya ferina* (Linnaeus); Tufted Duck; Swan, *Cygnus olor* Gmelin; Great Crested Grebe; Sedge Warbler; Blue-headed Wagtail; Meadow Pipit; Sand Martin. Dominant species for the last reclamation period were Coot; Lapwing; Curlew; Ruff; Wood Sandpiper; Common Snipe; Dunlin, *Caldris alpina* (Linnaeus); Ringed Plover, *Charadrius hiaticula* Linnaeus; Water Rail, *Rallus aquaticus* Linnaeus; Mallard; Pochard; Common Gull, *Larus canus* Linnaeus; Black-headed Gull; Marsh Harrier, *Circus aeruginosus* (Linnaeus); Meadow Pipit; Sand Martin; Reed Bunting, *Emberiza schoeniclus* (Linnaeus). An annotated list (56 species, 97 pages) gives considerable detail concerning the history of individual species from the 1860's to date. Appendices include an annotated list of birds of the lake in the 1860's by Gustaf Kolthoff and a similar list by the author for 1907; associated with the latter is a discussion of the "original" avifauna of the Lake. This is an important contribution, one which reveals much concerning the ecologic effects of reclamation. Unfortunately, despite its 137 excellent illustrations and 22 graphs, its use will be limited since the entire text is in Swedish. There are no summaries either in Swedish or other languages. A great service could be made to wildlife conservation and ecology by making available in English at least the nucleus of this, and the author's previous papers.—D. S. F.

83. The Birds of Nantucket. Ludlow Griscom and Edith V. Folger. 1948. Harvard University Press. Cambridge, Massachusetts. 156 pp. $3.25. The little island of Nantucket, 30 miles off the southern coast of Massachusetts, has proved to be an ideal laboratory for the study of bird population changes as the result of changing environmental conditions over the years. Bird observations which date back to those of William Brewster beginning in 1870 have been continued intermittently by various observers up to the present. The early cutting off of the original hardwood forest by the inhabitants of this old whaling community, with subsequent development of open moors on the denuded land and later invasion of scrub pine and oak which is characteristic of much of the southern New England coastal plain, have brought about successive changes in the island avifauna. Superimposed on these factors the rise and fall of market hunting of shorebirds and the slaughter of gulls and terns for the feather trade have produced drastic changes in the populations of these birds. The bird population of the original deciduous forest of Nantucket was apparently never studied so we do not know all of the species which occurred there and which disappeared with the clearing of the land. It is known that the Ruffed Grouse was one of the birds which was eliminated at that time. The sandy beaches and bars in 1870 supported a fabulous population of nesting Common and Least Terns which were later almost wiped out by the plume hunters. These birds have made a very good comeback in recent years although disturbed in some places by the also increasing Laughing Gulls. The latter have in turn been retarded by the recent increase in Herring Gulls.

With the clearing of the original forest and the development of open moorland the island became an ideal stopping place for migrating Black-bellied and Golden plover and Hudsonian Curlew. The spectacular decline of these shorebirds as the result of intensive gunning, to virtual extermination by 1898 was well documented by George H. Mackay. Since complete abolition of legal shooting of shorebirds has been in effect these species have increased again, although encroachment of scrub oak and pine on the moors has made the habitat less suitable to curlew and plover, as well as Bobolink, Meadowlark and Grasshopper Sparrow. The latter was formerly present in remarkable densities and has declined greatly since the early days when the island was almost completely open country.

With the increase of the scrub oak and pine, which invades the moors some of the birds characteristic of this habitat so common on the southern New England coastal plain have become established. These include the Pine Warbler, Towhee, Kingbird, and Catbird which were formerly rare or absent as breeding birds. Others like the Bluebird, Prairie Warbler, Field Sparrow, Chipping Sparrow and Brown Thrasher characteristic of similar habitat on the adjoining mainland have not yet become established, thus demonstrating the retardation of population establishment on suitable habitat as the result of insulation.

Nantucket is obviously not on the main migration route of land birds which pass along the Atlantic coast. Such species common in migration on the mainland, as the Wood Pewee, Tree Swallow, Black and White Warbler, Tennessee Warbler, Black-poll Warbler (autumn) and Palm Warbler, occur only as vagrants on Nantucket. The evidence for the fluctuation in bird populations on Nantucket has been well brought together by the authors who have rightly pointed out the great opportunity for the study of population dynamics through the concentration of continuous observation of the birdlife of such coastal islands in the future.—John W. Aldrich.

84. Norwegian Animal Life. Volume 2. Birds. (Norges Dyreliv. Bind II: Fugler.) Edited by Bjørn Føyne and Johan Huus. 1948. Illustrations edited by Per Bergan. Individual sections prepared by A. Bernhoft-Osa, Aage Wildhagen, O. Olstad, P. Valeur, T. H. Schøyen, Hjalmar Broch, Edward K. Barth, Carl Mølbach-Peterson, Edvard Holt, Holger Holgerson, Gunnar Saetersdal, Bernhard Hanson, T. Soot-Ryen, and Thorvald Saetersdal. 1948. J. W. Cappelens Forlag, Oslo, Norway. vii + 564 pp. 40.50 Norwegian Kroner (Unbound, in 9 "hefter."). Most (pp. 1-449) of this unusually attractive volume consists of a narrative treatise (distribution, breeding, habits, description, etc.), of the birds (rare and accidental species excluded) of Norway according to natural groups. For example, the section (pp. 3-25) on the Fringillidae(Finkefuglene), in which *Passer domesticus domesticus* Linnaeus and *Passer montanus montanus* Linnaeus are included, refers, in a varying degree, to 25 of 27 species recorded in the checklist. As a further example, section (pp. 188-208) on Owls, includes material on ten of the eleven species recorded in the checklist: There is a brief discussion of changes in abundance of the Snowy Owl, *Nyctea scandiaca* (Linnaeus), in relation to lemmings and mice. There is a brief discussion (pp. 450-465) of bird migration by A. Bernhoft-Osa, including history of knowledge and methods of studying migration. A separate section is devoted to the birds of the arctic Norway. The systematic section (pp. 469-537) prepared by Holger Holgersen, contains apparently excellent and well-illustrated (51 figures) keys and annotated lists of species by families. For each species there is a description, a statement of general range, and a statement of range and occurrence in Norway. The volume as a whole shows remarkably fine balance as a general regional ornithologic treatise. However, the outstanding aspect of this volume is its lavish collection of truly remarkable photographs (465 black and white, 45 color); as a collection they far surpass any single treatise of this type known to the reviewer. Despite the fact that the Norwegian text may be unusable for most American ornithologists, the book with its remarkable illustrations and handsome workmanship should prove itself to be a treasured addition to the libraries of many ornithologists.—D. S. F.

85. The Atlantic Islands. The Faroe Life and Scene. Kenneth Williamson. 1948. Collins. 14 St. James's Place, S. W. 1, London. 16/ . This fascinating book is fundamentally a narration of the adventures, explorations, and observations made by the author during four years of military service in the

Faroe Islands. Because of the breadth and acuity of his observations, this book, in effect, presents a rather thorough picture of customs, folklore, history, social structure, economics, natural history, and other facets of these interesting islands and their inhabitants. Marine birds exert a profound effect on the culture and livelihood of the Faroese; ornithologists will find much of interest in the author's observations in this respect. Appendix "B" is a discussion of Faroe birds, including a briefly annotated systematic list of 203 forms. The reviewer unhesitatingly recommends this book as an interesting addition to any reading library.—D. S. F.

86. The Flight of Birds Analyzed through Slow-motion Photography. John H. Storer. 1948. Cranbrook Institute of Science. Bloomfield Hills, Michigan. xv + 94 pp. $2.50. This attractive little book introduces the reader into the problems of flight through a non-mathematical, well illustrated treatment of the essential aspects of aerodynamics. "The Bird's Flying Equipment" is a well-conceived discussion of feathers and wings. "The outer half of the wing, starting at the wrist" is likened to the propeller in mechanized air craft; the remainder of the wing is lifting surface analagous to the wings of aircraft. Basic variations in wing pattern, bearing these two aspects in mind, are then considered. The actual uses of these parts of the wing are considered in respect to different kinds of flight, illustrated by slow-motion photography. Balance and control, take-off, soaring and gliding, formation flying, flight speed, maneuverability, wing surface/body weight ratio, and diving techniques are all briefly considered. The text is well-written and the illustrations are excellently chosen. There is a one-page glossary. The brief list of eleven references disappointingly omits the rather substantial body of pertinent German literature. This is perhaps explainable by the fact that the book is obviously not intended to present a complete summary of the field. The book can be equally recommended to professional zoologists, amateur ornithologists, and laymen.—D. S. F.

87. Field Guide to the Birds of King County, Washington. Earl J. Larrison with illustrations by Elizabeth L. Curtis. 1947. The Seattle Audubon Society, 1320 East 63rd Street, Seattle 5., 66 pp., 8 pls. with a total of 62 figs. and a map. $0.60. The Introduction includes a brief biotic description of King County and suggestions on field identification and use of the key, besides suggestions for further study. The two major sections of the "key" are "Water birds" and "Land birds." The latter is subdivided in "Land birds larger than the robin" and "Land birds similar in size to or smaller than the robin." There is no key in the usual sense; under "Ducks," for example, are simply listed the various species without dichotomous comparisons. 266 species are listed. Subspecies are not considered. The common and scientific name is given for each species, followed by the length in inches, a brief description of field characters, song or call notes, nest and eggs and distribution in the Puget Sound Area. The line drawings, with a few exceptions, are very good likenesses of the species represented.—G. E. Hudson.

88. The Meanings and Etymologies of the Scientific Names of Dutch Birds. (Beteekenis en etymologie van de wetenschappelijke namen de Nederlandsche vogels.) L. Coomans de Ruiter, W. C. van Heurn and W. K. Kraak. 1948. Club van Nederlandsche Vogelkundigen, Vijgendam 2, Amsterdam C, Netherlands. 166 pp. f. 6.50. For each of 334 species and subspecies, as well as the families, recorded from the Netherlands, the derivation and meaning of the scientific name is given. There is also an interesting annotated list of the authors of the names of Dutch birds. The authors of this little book are to be highly commended for a scholarly accomplishment.—D. S. F.

89. Flight into Sunshine. Bird Experiences in Florida. Helen G. Cruickshank. 1948. Macmillan. New York. 132 pp. $5.00. A delightful book of adventures with birds and other animals in fascinating Florida—with nesting Glossy, White and Wood ibises, Snowy and American egrets, Cranes and Anhingas and many others. It is to be hoped that in future editions a map will be included. One gains a new appreciation of what is involved in the taking of the 121 superb photographs shown in the back of the book—the skill, physical

strength, endurance and devotion, as well as the deep joy and satisfaction. In easy, informal style the author tells us something of the behavior of the various species photographed and describes the bright coloration of her subjects when watched from the blind. She emphasizes the past persecution of the birds and the present gains in protection, but she warns against complacency: "All those who had a part in the saving and restoration of the multitudes of birds now found in South Florida may gain from this success the [establishment of the Everglades National Park] a new strength to continue the battle to save other wild life and the soil, the water and the forests that must be preserved if this nation is to continue great and hunger free. There can be no resting on past success or other victories. Conservation must be fought for without pause, unceasingly, like liberty itself."—M. M. Nice.

90. Days Without Time. Adventures of a Naturalist. Edwin Way Teale. 1948. Dodd, Meade. New York. 283 pp. $6.00. Twenty-nine essays on diverse aspects of nature: trees, flowers, insects, cats, wolves, toads and birds, including Robins, Crows, Snowy Owls, Red-breasted Merganser and Starlings. (I wonder what basis there is for the statement that this bird in its adopted country "has two broods in a season—sometimes even three." (p. 17.) I believe that one brood is the rule and that two broods sometimes occur, particularly in early seasons, but I have never heard of a third brood.) I fear Mr. Teale is too optimistic in saying, "The wildness of the sea is as it always has been." (p. 251.) What with pollution, over-fishing, over-killing of creatures that live in and by the sea, with oil and atomic bombs, even the sea is not safe from man. The most interesting anecdotes concern the author's specialty—insects, especially the chapters on eggs and legs. There are 144 superb photographs, informative and beautiful.—M. M. Nice.

91. Our Birds. (Nos Oiseaux.) Paul Hostie. 1946. Collection "Les jalons." No. 14. Editions "Familie et Jeunisse," 89, Rue Belliard, Bruxelles. 118 pp. This little pocket manual treats 52 of the Belgian species giving, for each, brief ecologic notes, description of adult plumage, description of nest and nesting habits, notes on food and food habits, notes on migration, notes and songs, etc. The book is prepared primarily for the purpose of acquainting laymen with the common birds of Belgium. For this purpose, despite a number of typographical errors, it seems to be quite well designed.—D. S. F.

92. The Parasitic Cuckoos of Africa. Herbert Friedmann. 1948. Monograph Number One, Washington Academy of Sciences. i-xii + 204 pp., 10 plates and map. $4.50. During the years 1924 and 1925 Dr. Friedmann went to Africa under the auspices of the National Research Council and Harvard University primarily to make field studies on the parasitic cuckoos of that continent. His observations were originally written up upon his return to the United States, but the author delayed publication on account of his belief at the time that they were too fragmentary. However, he has kept in touch by correspondence with many students of African ornithology and has now entirely rewritten his account, supplemented with what has been published during the last 25 years and the manuscript notes contributed by his many correspondents.

There are five genera of parasitic cuckoos in Africa: *Clamator* with three species; *Cuculus* with four species; *Cercococcyx* with three species; *Pachycoccyx* with a single species, and *Chrysococcyx* with four species. Each genus is considered in detail, much attention is devoted to phylogeny, migration and seasonal movements, breeding, ecology, food habits, geographic distribution and systematics, followed by a list of the known hosts of each species. One cannot examine the host list without becoming aware, as the author points out in his concluding remarks, that "the parasitic cuckoos appear to divide up both the African landscape and the African avifauna in such a way as to avoid undue host competition among themselves." It is almost superfluous to mention that the authorship of this book is a guarantee of careful and scholarly research and well-considered judgment. Dr. Friedmann is to be congratulated on producing an authoritative and interesting piece of work which will prove of great value not only to the life history student and behaviorist, but to the systematist as well. Those wishing to purchase this volume should send their orders to Dr. Harald A. Rehder, U. S. National Museum, Washington 25, D. C.—J. L. Peters.