In banding some Evening Grosbeaks with a similar device, I have found that when handling several birds at once, it is useful to have more than one opened band handy. The dowel which I use is a longer rod than Mr. Shaub's, tapered to a point at one end, and grooved at the other, but it also has a middle section with parallel sides so that several bands may be kept on the rod in addition to the one for the bird at hand. This untapered and ungrooved portion of the rod may be as long as two to three inches, making the overall length of the rod six or seven inches. The rod is a little unwieldy at first, but becomes a great timesaver with practice.

It is best not to allow celluloid bands to remain open on the rod more than a half-day or full day, since if left longer they are likely to lose their springiness.—George G. Loring, 38 Sea Street, Manchester, Massachusetts.

Another "Black Mark" Against the Red Squirrel.—On Wednesday, June 23, 1948, we arrived at our isolated cabin which sits very close to the edge of high tide in Millbridge, Maine. As we approached the cabin a Spotted Sandpiper, *Actitis macularia* (Linnaeus), flushed from the path just thirty-five feet from the back door. A brief search revealed its simple, but tidy, nest with four cream-colored, irregularly brown-spotted eggs, almost in the middle of the path. Through Friday and Saturday the bird flushed whenever we left the cabin, but she always returned to the nest after very brief absences. Red squirrels were about, but they paid no apparent attention to the bird nor she to them. In fact, on Saturday as she was returning to her nest we observed a red squirrel playing about on the beach very close to her and actually twice running in a circle around her. The bird and the squirrel approached the nest simultaneously and, as the squirrel jumped almost directly over the nest, the Sandpiper fluffed her feathers and raised her wings and tail in an attitude of protest. No further incident was observed that day, but early Sunday morning we discovered that one of the eggs was missing. About mid-morning the bird's complaining cries were heard from the vicinity of the nest and she was seen running about among the beach-pea vines nearby. Then a red squirrel ran from the nest with one of the eggs in its mouth. The contents of the egg spilled out over the rocks as he scampered away. A moment later my rifle spoke, but it was too late to save even the one remaining egg. During the remainer of Sunday morning the Sandpiper returned several times to the nest, but never once did she appear at ease. She pecked about in the vicinity of the nest crying almost constantly in her plaintive way, but she was always nervously on the move. With the sun still high in the sky that afternoon she flew away and was never again seen thereabouts. The lone egg lay in the nest for the next five weeks; then it, too, disappeared.—G. Hapgood Parks, 99 Warrenton Avenue, Hartford, Connecticut.

RECENT LITERATURE

Reviews by Donald S. Farner and others

Reprints of this section may be purchased from Charles B. Floyd, 210 South Street, Boston, Massachusetts, at 75 cents each.

BANDING

(See also 7, 10, 12, 13, 14, and 23.)

1. The Pied Flycatcher. I. Ortstreue and Formation of Races. (Der Trauerfliegenschnäpper. I. Ortstreue und Rassenbildung.) Lars von Haartman. 1949. *Acta Zoologica Fennica*, 56: 1-104. A very fine study of *Muscicapa hypoleuca* (Pallas) on about four square kilometers in southwestern Finland, some 3500 hours during eight years having been devoted to the project. "In order to investigate the natural history of a species, three things are most important: field glasses, colored rings, and industry." The birds were caught in the nest boxes. Of 187 adult males, 70 (37 percent) returned; of 177 adult females, 19 (11 percent) returned; of 851 nestlings, 9 (1 percent) returned. The author

believes that the majority of surviving adult males returned to the nesting area, but that only a few of the females were *ortstreu*, the rest wandering from one place to another. (Drost and Schilling, 1940, found that 36.7 percent of second year Pied Flycatchers returned the third year.) Females that lose a brood seldom return. Studies in Germany show that there are as many females as males returning. Males fight fiercely over nest boxes. When a female appears, the male flies to the entrance and enters, giving a special song. Only the female builds. The male feeds her before incubation and sometimes during it, but often he leaves and takes up a new territory and sometimes a new mate. He usually returns to his first mate and helps her feed the young, but seldom assists with the brood of the second mate. The second territory may be at some distance from the first, even several kilometers. Chapter IV is devoted to a very interesting discussion: *Die Ortstreue der Vögel.* Tables 17 and 18 give the return percentages of adults and young in 13 studies of ten European species and 17 studies of ten North American species. Results of studies on six passerine species are presented in a number of tables and charts. Table 19 on birds banded as young is especially interesting:

Species	Return Percentage	Survival over winter	Percentage of Survivors that return
Pied Flycatcher (Finland)	1.1	23	4.8
House Wren *Troglodytes aedon*	2.1	17	12.4
Common Redstart *Phoenicurus phoenicurus*	6.0	21	28.6
Starling (Holland) *Sturnus vulgaris*	8.3	17	48.3
Song Sparrow *Melospiza melodia*	12.0	20	63.0
Redbreast *Erithacus rubecula*	10.7	23	46.5

Another table and several charts show the distance between successive nesting sites of adult males and females, and distance of the first nesting site from birthplace. Finally Table 29 shows that *Muscicapa hypoleuca* which returns least of the six species to its birthplace and former nesting place has developed four subspecies, while *Melospiza melodia* which returns most faithfully has developed 28. Each species ranges over some 10,000,000 square kilometers, so each subspecies of the Pied Flycatcher averages an area of 2,500,000 square kilometers, and each subspecies of the Song Sparrow 360,000. This careful and scholarly work is a shining example of what can be learned from banding technique: the author's own extended observations were based on a color-banded population; the comparisons and generalizations are based on detailed examination of the banding results of other students in Europe and America. This volume deserves study from all serious ornithologists, especially those interested in questions of population and speciation.—M. M. Nice.

2. Summary of the Activities of the Station for the Study of Bird Migration (Poland) for 1938. (Sprawozdanie z dzialalnósci Stacji Badania Wędrówek Ptaków za rok 1938.) Wladyslaw Rydzewski. 1949. *Acta Ornithologica Musei Zoologici Polonici*, 4(1): 1-113. During 1935 there were 300 collaborators; 27,274 birds of 126 species were banded. Species banded in greatest numbers were the White Stork, *Ciconia ciconia* (Linnaeus) 2,515; Swallow, *Hirundo rustica* Linnaeus 5,831; House Martin, *Delichon urbica* (Linnaeus) 2,628; Sand Martin, *Riparia riparia* (Linnaeus) 652; Great Tit, *Parus major* Linnaeus 1,317; House Sparrow, *Passer domesticus* (Linnaeus) 1,707; and Starling, *Sturnus vulgaris* Linnaeus 5,050. There were 567 reports of recoveries, retakes and returns of birds banded in Poland. A juvenal Common Heron banded in Poland 5 June

1935 was recovered at Gao, French Sudan. "This first heron recorded south of the Sahara confirms the fact that the vast desert does not constitute a great obstacle . . ." (p. 109.) A Bohemian Waxwing, *Bombycilla garrulus* (Linnaeus), banded 7 November 1937, lat. 50° 37′ N, long. 26° 15′ E, was recovered dead 15 November 1938, lat. 53° 16′ N, long. 23° 34′ E (345 kilometers NW of banding locality). There are records of 96 birds banded in foreign stations and recovered in Poland during 1938.—D.S.F.

3. Summary of the Activities of the Station for the Study of Bird Migration (Poland) for 1939. (Sprawozdanie z dzialalnósci Stacji Badania Wędrówek Ptaków za rok 1939.) Wladyslaw Rydzewski. 1949. *Acta Ornithologica Musei Zoologici Polonici*, 4(2): 115-221. During 1939 there were 434 collaborators. Because of the war, records are incomplete. However records of 21,855 birds of 114 species banded were obtained. Species banded in greatest numbers were Common Heron, *Ardea cinerea* Linnaeus 987; White Stork, *Ciconia ciconia* (Linnaeus) 2,654; Swallow, *Hirundo rustica* Linnaeus, 3,060; House Martin, *Delichon urbica* (Linnaeus) 1,214; Great Tit, *Parus major* Linnaeus 1,203; House Sparrow, *Passer domesticus* (Linnaeus) 1,292; Starling, *Sturnus vulgaris* Linnaeus 4,788. There are records of 693 recoveries, returns, and retakes of birds banded in Poland; further there are 45 records of birds banded at foreign stations and recovered in Poland.—D.S.F.

4. Report of the Swiss Vogelwarte at Sempach for 1947 and 1948. (Bericht der Schweiz. Vogelwarte Sempach für die Jahre 1947 und 1948. A. Schifferli. 1949. *Der Ornithologische Beobachter*, 46(6): 161-186. The season of 1948 marked the completion of 25 years' activity by Vogelwarte Sempach. During this period 225,248 birds have been banded; 9,321 were banded in 1947, 9,591 in 1948. Species banded most frequently during 1947 and 1948 respectively were Greenfinch, *Chloris chloris* (Linnaeus) 417 and 219; Chaffinch, *Fringilla coelebs* Linnaeus 348 and 436; Great Tit, *Parus major* Linnaeus 1,282 and 1,223; Blue Tit, *Parus caeruleus* Linnaeus 381 and 408; European Blackbird, *Turdus merula* Linnaeus 425 and 635; European Redstart, *Phoenicurus phoenicurus* (Linnaeus) 410 and 476; European Robin, *Erithacus rubecula* (Linnaeus) 474 and 464; and Alpine Swift, *Apus melba* (Linnaeus) 425 and 83. Since 1924 there have been 9,327 recoveries and returns. Species involved most frequently in recoveries and returns in 1947 and 1948 were Great Tit, 78; Marsh Tit, *Parus palustris* Linnaeus 28; European Blackbird, 33; European Dipper, *Cinclus cinclus* (Linnaeus) 40; Swift, *Apus apus* (Linnaeus) 70; Alpine Swift, 48; and Black-headed Gull, *Larus ridibundus* Linnaeus 96.—D.S.F.

5. Trapping and Handling Canada Geese. Harold C. Hanson. 1949. *Illinois Natural History Survey, Biological Notes* No. 20. 8 pp. Important methodological notes on traps, holding boxes, auxiliary apparatus, camouflage, and baiting.—D.S.F.

MIGRATION

(See also Numbers 2, 3, 4, 23, 60, and 61.)

6. Migration in Birds and Fishes. J. Verwey. 1949. *Bijdragen tot de Dierkunde*, 28: 477-503. Many fish migrate north to breed, while others migrate north after spawning, presumably to benefit from the abundance of food that develops in the colder regions, just as do the Guillemots, *Uria aalge* (Pontoppidan), some Herons and Terns. The Anchovy, *Stolephorus encrasicholus* (Linnaeus), arrives much later in cold than in warm springs. With sea animals, ". . . just as in birds the dispersion of the dates (of arrival) in early spring (March-April) is much greater than later in the season (May); this is logical because we may expect both birds and sea animals to react in a similar way to low temperatures. . . . In both birds and sea animals the old individuals often arrive earlier than the young ones." (p. 487.) In discussing "The Migration

Route and the Problem of Orientation," the author says, "I think, it is now generally agreed that we cannot do without the conviction that the young bird has inherited a certain direction in which it leaves its breeding quarters," and he cites experiments on young White Storks, *Ciconia ciconia* (Linnaeus); American Crows, *Corvus brachyrhynchos* Brehm; Hooded Crows, *Corvus cornix* Linnaeus; and Sparrow-Hawks, *Accipiter nisus* (Linnaeus). After discussing the remarkable migration of the Eel, *Anguilla anguilla* (Linnaeus), he says, "if fishes may find their spawning places with the aid of a sense of direction the chance increases that birds too may return to their breeding places with the aid of this sense, supported by an acquired knowledge of the place of departure. . . . It certainly means that we cannot do without the interpretation that water as well as land animals, at least, fishes, birds and mammals (the whales included) so to speak constantly know the points of the compass." (p. 494.) With some birds, fish and whales tradition plays a part, the young learning the route from adults. A long bibliography is appended to this informative and thought-provoking paper, as well as an "Addendum." This is a technical discussion, illustrated by mathematical formulae and a chart, by C. L. Deelder, entitled "On the Orientation of Migrating Animals" (pp. 503-504), in which the author decides that "eels migrate with the help of a sense of direction."—M. M. Nice.

7. Delayed Release of East Prussian Young Storks in West Germany by Vogelwarte Rossitten in 1933. (Die spät-Auflassung ostpreussischer Jungstörche in West Deutschland durch die Vogelwarte Rossitten 1933.) Ernst Schüz. 1949. *Die Vogelwarte,* 2: 63-78. The author summarizes the Rossitten experiments in which the orientation ability of East-Prussian young storks, *Ciconia ciconia* (Linnaeus), was studied by delaying the release of banded, and otherwise marked, birds in order to eliminate the possible influence of experienced adults. Recovery records of young storks released in East Prussia (no earlier than 7 September) after the departure of adults indicated several in either a normal SSE migration or a deviation in a southward direction to Serbia, Greece, and Crete. In 1933 a small flock followed a SW route into Italy. Records of young storks displaced to Essen and released (133) 12 September 1933 showed initially a generally normal SSE direction. However, in the high mountains there were deviations, with some tendency to compensate in northern Italy. Of considerable significance is the fact that the larger flocks followed approximately similar routes without being in actual contact with each other. A small group showed considerable deviation following a later departure; their direction was southward. The small group (20) released at Frankfort am Main 12 September 1933 apparently moved first towards SSE but soon deviated toward SSW. The very striking result of these experiments is the marked tendency, initially at least, to assume the normal SSE migratory direction.—D.S.F.

8. A Discussion on the Orientation of Birds on Migratory and Homing Flights. Recent Biological Evidence for the Methods of Bird Orientation. W. H. Thorpe. 1949. *Proceedings of the Linnaean Society of London.* Session 160, 1947-48, pt. 2: 85-94. Three aspects of orientation in migration are recognized: (1) knowing the direction in which to begin, (2) maintaining direction, (3) recognizing the goal when reached. There is a considerable accumulation of evidence which indicates that individuals of many species can recognize their previous breeding locality or the birth-locality as well as the right type of environment. In maintenance of direction the author feels that visual orientation is predominant and is possible by moonlight but not by starlight. It is pointed out that more evidence is desirable on migration at night, with heavily overcast skies. The author suspects that there may be no migration under such circumstances. In general the suggestions concerning visual orientation are in agreement with those of van Oordt (Vogeltrek, pp. 33-34, Leiden 1943). Rüppel's experiments with Hooded Crows, *Corvus cornix* Linnaeus, are accepted as an indication of an innate sense of direction presumably involving visual clues such as position of the sun. Data from homing experiments, with some exceptions, may be interpreted in terms of random wandering until familiar territory is encountered. It is

suggested that homing in pigeons may be explained on the basis of good vision, quick learning of landmarks, and rapid and efficient methods of good exploration. The Yeagley experiments are not regarded as having produced satisfactory evidence for sensitivity to either magnetic or Coriolis fields.—D.S.F.

9. Some Physical Principles of Bird Orientation. D. H. Wilkinson. 1949. *Proceedings of the Linnaean Society of London*, Session 160, 1947-48, pt. 2: 94-99. Relatively simple calculations show that the necessary detection of the slight changes in earth's magnetic field and Coriolis force by the moving bird, as in the theories of Yeagley and Ising, seems highly improbable. In the case of the use of Coriolis force as suggested by Yeagley it is a matter of slight changes in the apparent direction of gravity which means that there must be true reference direction in order to detect those changes. There is further the matter of simple centrifugal forces which could not be differentiated from Coriolis force. Ising's suggesting of detection of direction by changes in Coriolis force incident to rotating the head, likewise seems unacceptable on the basis of magnitude, these changes being in the same order as those of Brownian energy. Position of the sun is suggested as possibly important in reducing random movements in homing. —D.S.F.

10. Polish Investigations in Homing Birds and their Orientation in Space. Roman J. Wojtusiak. 1949. *Proceedings of the Linnaean Society of London*, Session 160, 1947-48, pt. 2: 99-108. This paper is of great importance in that it summarizes material from a number of important Polish papers, mostly by the author, which have been generally unavailable to American ornithologists. Nesting swallows were transported in various directions and to various distances from their nests. Direction, mountains in line of flight, atmospheric conditions (including fog) and time of day were obviously not important factors in homing success. Birds released at night were slower in returning and showed a "fluttering" type of flight rather than the normally smooth gliding type. "In many of our experiments there was noticeable a characteristic behavior of the birds at the moment of their release. The Swallows soared up into the air, described one circle or several, and then started to fly in a direct line towards their nesting site." (p. 101.) Up to 120 kilometers displacement distance there was an increase in mean homing velocity with increasing displacement distance (*e.g.* 35.5 kilometers per hour at 120 kilometers compared to 5.7 kilometers per hour at 10 kilometers). At 660 kilometers displacement distance the mean homing velocity, however, did not continue to increase but rather was maintained at a mean of 10-15 kilometers per hour. Returns from 120-150 kilometers were accomplished in one day; greater distances required more than one day. This may mean that 120-150 kilometer distances are within *familiar territory* as developed by daily flights from the nest. "The increase of homing velocity along with the increase of distance within such an area is explicable with the aid of the hypothesis that birds are actuated here by a psychical factor; self confidence in the territory which is familiar, and a state of incertitude in strange territory. . . . A bird which finds itself at a small distance from its nest is familiar with the terrain and is not alarmed by the fact that it must find its way back to the nesting site. The greater the distance the stranger becomes the locality and the greater is the bird's alarm, which impels it to a fast homing flight." (p. 102.) As the displacement distance is increased, and orientation cannot be done on the basis of optical details the "sense of orientation" becomes more important. The assumption of this "sense of direction" appears to be necessary because increasing displacement distances (beyond 120 kilometers) do not result in the decrease in mean homing velocity that should occur if there were purely random movements until "familiar territory" is encountered. In other words, in orientation in Swallows, the author suggests two basic factors: (1) a memorized type of orientation restricted to *familiar territory* as developed by daily flights and not exceeding a radius of 120 kilometers, and (2) a directional type of orientation concerning which the author raises the suggestion of a radar-type mechanism. Associated with this the author discusses the possibility of perception of infra-red rays by birds suggesting that, were this true, southward

migration in fall and northward migration in spring would be toward "lighter" areas. It would also account for the ability of his Swallows to navigate through fog although this does not appear to be a general ability among birds. Some evidence is offered in support of infra-red vision in birds and turtles. Granted, however, that such vision exists in birds and even if there were a radar-type mechanism for emission of such waves, the reviewer is unable to understand how this could be the basis for a "sense of direction" in unfamiliar territory. As the data on Swallows appear to indicate, unquestionably such a mechanism, if it exists, would be an important navigational aide but there must be a more profound mechanism if there is such a "sense of direction." It should be pointed out that the author's results with Swallows are interestingly different than those customarily experienced with homing pigeons where homing velocity is inversely related to distance of displacement. The author found in Swallows, similar to the situation in pigeons, some evidence that experience over a route, beyond familiar territory, increases mean homing velocity. This is a very interesting and important paper.—D.S.F.

11. Perception of Short Waves by Migratory Birds. (Zugvögel perzipieren Ultrakurzwellen.) Rudolf Drost. 1949. *Die Vogelwarte*, 2: 57-59. The author records observations of deviations by migratory birds on entering a radar field on Helgoland. Such behavior was observed in Jackdaws, *Coloeus monedula* Linnaeus; Rooks, *Corvus frugilegus* Linnaeus; gulls; geese; and Larks, *Alauda arvensis* Linnaeus. Preliminary experiments showed no effect of a radar field on caged European Robins, *Erithacus rubecula* (Linnaeus) and European Blackbirds, *Turdus merula* Linnaeus.—D.S.F.

12. Displacement Experiments with Great Tits and Blue Tits. (Verfrachtungen mit Kohl- und Blaumeisen *(Parus m. major* L. und *Parus c. caeruleus* L.).) Gerhard Creutz. 1949. *Die Vogelwarte*, 2: 78-93. At displacement distances up to four kilometers 39 percent of the Great Tits returned to the trapping site; the return at 4-7 kilometers was 14 percent. At 7-10 kilometers one in 25 returned; there were no returns from distances beyond ten kilometers. Blue Tits showed 45 percent return up to four kilometers; six percent at 4-7 kilometers. There was one return in six at 10-15 kilometers and no returns beyond 15 kilometers. Various considerations point to successful return as dependent on accidentally encountering familiar territory. Approximately 500 trials in the vicinity of Dresden were involved in the experiments.—D.S.F.

13. The Migration of the White Stork in French Equatorial Africa. (Les migrations de la Cigogne blanche en Afrique equatoriale française.) R. Malbrant. 1949. *L'Oiseau et la Revue Française d'Ornithologie*, 19(2): 113-117. Migration of *Ciconia ciconia* (Linnaeus) appears to be only through Chad and Ubangi. The barrier of the great equatorial forest appears to prevent penetration into Middle Congo and Gabon. Fourteen storks banded in Europe and North Africa have been recovered in Chad and Ubangi.—D.S.F.

LONGEVITY AND MORTALITY

(See also Numbers 23, 44, and 61.)

14. Great Age in a Population of Oyster Catchers. (Hohes Alter einer Population des Austernfischers *Haematopus o. ostralegus* L.) R. Drost and G. Hartmann. 1949. *Die Vogelwarte*, 2: 101-104. The banded birds among 16 pairs on the island Mellum in the summer of 1949 had a mean age of 12.55 years. If the unbanded birds are assigned ages of three years, the mean age is 9.56 years. The oldest bird was 23 years. This high average age of breeding birds agrees with the calculations of Dirksen which indicate that the loss from the laying until the young reach sexual maturity is about 90 percent, indicating an average age of 8.5 years for breeding birds.—D.S.F.

PHYSIOLOGY

(See also Numbers 7, 8, 9, 10, 11, 31, 60, and 61.)

15. Weight and Body Temperature. Simon Rodbard. 1950. *Science,* 111(2887): 465-466. At body weights above one kilogram body temperatures for birds and mammals of the same weight are quite similar. In general for a tenfold decrease in body weight there is an increase of 1.5°C. body temperature. In mammals as body weight decreases below one kilogram body temperature declines whereas in birds temperature continues to increase 1.5°C. per tenfold decrease in body weight. The difference between small species of mammals and birds is explained in terms of the precariousness of homoiothermy incident to the relatively high surface-mass ratio and the poorer insulation in mammals.—D.S.F.

FOOD HABITS

(See also Number 61.)

16. Cross Section through a Long-term Food Habits Investigation of Several Pairs of Eagle Owls. (Querschnitt durch eine mehrjährige Nahrungskontrolle einiger Uhupaare.) Rob. März. 1940. *Beiträge zur Fortplanzungsbiologie der Vögel,* 16(4, 5, 6): 125-135; 166-172; 213-222. This paper presents data and discussion based primarily upon seven years (1933-39) of work with the pellets and prey remains of *Bubo bubo* (Linnaeus) in the Elbsandsteingebirge region of Germany. Totals of 1011 vertebrate-prey items (803 mammals, 204 birds, and four amphibians) are listed and compared with 345 items (183 mammals, 159 birds, and three amphibians) for Bohemian owls, 188 (130 mammals, 55 birds, and three amphibians and fish) for French Switzerland, and 298 (162 mammals, 117 birds, and 19 amphibians and fish) for the Åland Islands. Although he has not here written a review paper, März does integrate his work with that of Uttendörfer, Schnurre, and other European students of owls notably in relation to the question of specialization in hunting and feeding tendencies. The latter, philosophically, may be regarded as the outstanding contribution of the investigations: despite the frequency with which phenomena having some of the aspects of specialization may be seen, the evidence, critically handled, indicates that predation by these owls remains very largely a matter of response to local availability of given prey species. In short, it may be convincingly maintained that in practically every way the behavior of the European Eagle Owl parallels that of its North American counterpart the Great Horned Owl, *Bubo virginianus* (Gmelin), under a variety of living conditions.—P. L. Errington.

17. The Diet of the Long-eared Owl during the Breeding Season in Different Biotopes. (Die Ernährung der Waldohreule (*Asio otus* (L.)) zur Brutzeit in verschiedenen Lebensräumen.) Hennig Schumann. 1949. *Die Vogelwelt,* 70(2): 38-41. This paper compares the feeding habits of four pairs of Long-eared Owls in different habitats. In all instances field mice, *Microtus arvalis* Linnaeus, was the most abundant item (46-92 percent). Other small mammals constituted most of the remainder of the diets. Birds were taken to an extent of no more than 2.5 percent.—D.S.F.

18. The Food of the German Jackdaws. (Zur Kenntnis der Nahrungsbestandteile unserer Dohle *(Coloeus monedula* L.).) Heinr. Gasow. 1949. *Die Vogelwelt,* 70(5): 133-139. Examination of stomach contents from 21 Jackdaws (seven adults and 14 nestlings) taken during the summer indicated a limited use of grain and extensive use of harmful insects. Three of the seven adults showed evidence of feeding on useful plants; six of the 14 nestlings had remnants of useful plants in their stomachs. Four of the adults had been feeding on more or less harmful insects; 13 of the 14 nestlings had been fed extensively on more or less harmful insects.—D.S.F.

19. High-Speed Photography as an Aid to the Identification of Prey. Eric Hosking and Stuart Smith. 1949. *British Birds,* 42(11): 358. Eight photo-

graphs taken at 1/5000th of a second show 4 species of mammals held by Barn Owls, *Tyto alba* (Scopoli), as well as a hover-fly in the bill of a Spotted Flycatcher, *Muscicapa striata* (Pallas). Many other invertebrates have been identified by an entomologist in such pictures.—M. M. Nice.

20. Wren Feeding Young on Fish. J. S. Huxley. 1949. *British Birds,* 42(6): 185-186. A parent *Troglodytes troglodytes* (Linnaeus) nesting in an old mill building containing a trout hatchery was seen feeding its nestlings "largely or entirely" on young "trout in the early (yolk-sac) stages after hatching." —M. M. Nice.

NIDIFICATION AND REPRODUCTION
(See also Numbers 39, 43, 60, 61, and 72.)

21. The African Mountain Wagtail *Motacilla clara* at the Nest. R. E. Moreau. 1949. pp. 183-191 in *Ornithologie als biologische Wissenschaft,* edited by Ernst Mayr and Ernst Schüz. Carl Winter, Heidelberg. An interesting paper, summarizing 240 hours of observation at two nests in Tanganyika Territory. The African bird is very much like the European Grey Wagtail, *Motacilla cinerea* Linnaeus, in pose, proportions, voice and habitat. "The African bird's clutch is two eggs, against the European bird's 4-6. The African nestling period is much the longer, 16 days against 12." The African feeding rate is probably far slower, but there are few observations on this point for *cinerea.* "Daily mean feeding rate [in Africa] after brooding ceased varied from 3.6 to 5.1 per hour for the solitary nestling (overall average 4.4) and from 3.8 to 6.0 for the two young (average 5.4, only 2.7 each.)" Both parents incubated. Notes are given on the development of the young and on some experiments on eliciting "begging." —M. M. Nice.

22. Breeding Season and Clutch-size of the Wood Warbler. Elizabeth Lack. 1950. *The Ibis,* 92(1): 95-98. *Phylloscopus sibilatrix* (Bechstein) in Britain normally has a single brood per year, in the latter half of May or June. The average clutch-size is larger in May (6.0 in South Devon) than in June (5.6 in South Devon).—D.S.F.

LIFE HISTORY
(See also Numbers 21 and 60.)

23. Maturity, Place of Nesting and Changes in Population with the White Stork. (Reifung, Ansiedlung und Bestandswechsel beim Weissen Storch *(C. ciconia).*) Ernst Schüz. 1949. pp. 217-228 in *Ornithologie als biologische Wissenschaft,* edited by Ernst Mayr and Ernst Schüz. Carl Winter, Heidelberg. Banding has given much information as to the life of these fine birds. Second-year Storks may visit nests, while a very small proportion of third-year birds copulate and lay small clutches. Parental behavior may not be entirely developed in these young birds as one third-year male was seen to swallow one of his own young, and the same was true of another male believed to be young. Most of the Storks first breed at four and five years. As to the distance young birds settle from their birth-places the following percentages have been found: eight in the home village; 36 up to 10 kilometers; 22 from 10-25; 17 from 25-50; nine from 50-100; seven from 100-500; and one farther than 500 kilometers. Graphs are given showing Stork populations in Oldenburg from 1925 to 1948: pairs of Storks; percentage without fledged young; fledged young per pair; total offspring; precipitation in June. All these and other factors influencing Stork populations are discussed and a list of 29 references is given.—M. M. Nice.

24. A Juvenal Specimen of the Peacock Cuckoo. (Sobre un ejemplar joven de *Dromococcyx pavoninus* (Pelzeln).) Andres G. Giai. 1949. *El Hornero,* 9(1): 84-87. This is primarily a description of a specimen taken 11 January 1939, at Capitán Meza, Alto Paraná, Paraguay. The collector of the specimen,

Sr. Adolfo Neuntenfel, noted that it was taken from a nest of a *Todirostrum plumbeiceps plumbeiceps* (Lafresnaye), thus raising the possibility that the Cuckoo is a parasite of this species.—D.S.F.

25. Notes on a Least Bittern Nest and Young. Robert W. Nero. 1950. *Passenger Pigeon,* 12(1): 3-8. A nest with five eggs of *Ixobrychus exilis exilis* (Gmelin) was surrounded by a wire-mesh fence two feet in diameter to keep the young from leaving the vicinity, until they climbed over the fence at the age of 16 days. The eggs hatched over a five day period; the young "assumed the vertical 'freezing' pose on disturbance as early as the fourth day" and left the nest to hide as early as the fifth day. Daily body weights and tarsal lengths of the young are recorded. "By the fourth day the young stabbed out and bit at a pencil held before them . . ."; at nine days they had become expert climbers. —M. M. Nice.

26. Studies of the Nesting Birds of the Edwin S. George Reserve. Part I. The Vireos. George M. Sutton. 1949. *Miscellaneous Publications of the Museum of Zoology, University of Michigan,* No. 74: 1-37. The Yellow-throated Vireo, *Vireo flavifrons* Vieillot, is the most common of the three Vireos on the Reserve; it nested high and low in open oak-hickory woodland and was very infrequently parasitized by the Cowbird, *Molothrus ater* (Boddaert). Red-eyed Vireos, *Vireo olivaceus* (Linnaeus), nested high and low in open to dense oak-hickory woodland; they were heavily parasitized by the Cowbird, yet the "population has not fluctuated much during the fourteen year period covered by my observations." (p. 18.) Warbling Vireos, *Vireo gilvus gilvus* Vieillot, nested in fringes of trees bordering low, wet areas; they were seldom parasitized by the Cowbird. The author makes no suggestion as to why the Red-eye should be so much more vulnerable to the Cowbird than the other members of the genus. Friedmann (1929) calls the Yellow-throated a "common victim," the Warbling a "very common victim," while in reference to the Red-eye, "No species suffers more and few so much." A delightful painting is reproduced of a fledgling Yellow-throated Vireo. The young of the other two species are "far browner above than the adults": the eyes of the Red-eye are brown at the time. Young males of all species "learn to sing fairly well before leaving for the South." My own experience and that of Mrs. Louise de K. Lawrence who is making an intensive study of the Red-eyed Vireo are at variance with Dr. Sutton's statement that the males of this species ". . . regularly assist in incubation and brooding, and frequently sing on the nest." (p. 5.)—M. M. Nice.

27. Studies of Waterfowl in British Columbia. Baldpate. J. A. Munro. 1949. *Canadian Journal of Research,* D, 27: 289-307. "In British Columbia the baldpate, *Mareca americana* (Gmelin), probably occupies fourth place in numerical status among the pond-duck group of the Anseriformes." Downy young live upon aquatic insects, while adults eat the foliage and seeds of aquatic plants, grasses and algae. Females with young often combine forces. "If approached by man, they vigorously defend their young by ruses to attract attention from them . . ." by ". . . short, successive flights in front of a moving canoe, and splashing across the water in a direction leading away from the young." Baldpates commonly associate with Coots, *Fulica americana* Gmelin, and diving ducks and snatch food brought up by these divers. "In the interior it has been observed as a constant habit not only in winter, when it is necessary to survival because shoal-water feeding grounds are frozen, but in the autumn when baldpate can obtain abundant food in the conventional manner of feeding." "Commensal association begins soon after the young are hatched and it is common to see female baldpate with small young attached to flocks of diving ducks."—M. M. Nice.

28. Red-Eyed Vireos in Jackson Park. Margaret M. Nice. 1950. *Audubon Bulletin; Illinois Audubon Society:* No. 73: 1-4. A male *Vireo olivaceus* (Linnaeus) drove off Bronzed Grackles, *Quiscalus versicolor* (Vieillot), 100 feet from his nest, but another male Red-eye 160 feet distant. Incubation was by the

female only. Although the rate of singing varies somewhat with time of year and time of day, it probably is largely an individual characteristic; some birds when singing steadily giving from 33 to 40 phrases a minute, others from 50 to 60 and a few as many as 75.—M. M. Nice.

29. Notes on the Nesting of the Alder Flycatcher *(Empidonax traillii)* at Ann Arbor, Michigan. A. J. Berger and P. B. Holslund. 1950. *Jack-Pine Warbler*, 28(1): 7-11. Fifteen nests were found in 1948 and 22 in 1949 on two half mile tracts of swampy land along the Huron River. Fourteen of the nests were placed in nine-bark, eight in dogwood, seven in willow, three in elder and one each in honeysuckle and alder. The height above the ground ranged from 3½ to 10 feet, averaging four feet. The outcome of 24 nests was known: 31 young in 11 nests were fledged from 84 eggs, 36.9 percent success. Three nests were parasitized by the Cowbird, *Molothrus ater* (Boddaert); two were deserted, the third raised one Cowbird only.—M. M. Nice.

BEHAVIOR

(See also Numbers 21, 23, 24, 26, 27, 28, 60, 61, and 63.)

30. The Modern Concept of Instinctive Behaviour. W. H. Thorpe. 1948. *Bulletin of Animal Behaviour*, Special Number; No. 7: 2-12. 2s. 6d. "Darwin's work had two curiously antagonistic effects": (1) "the theory of natural selection led to a great development of the mechanistic-physiological theory of animal behaviour, which found its fullest expression in the work of Bethe, Loeb and Pavlov"; (2) "psychologists, stimulated by 'The Expression of Emotion in Man and Animals' . . . commenced a line of development which culminated in much modern comparative psychology—the work of Hobhouse, Lloyd Morgan, Macdougall and finally Wolfgang Kohler and the Gestalt School." The first school attempted to throw out the concept of instinct, explaining behavior in terms of chain reflexes, kineses and taxes, while the second school became so absorbed in studying modifiable aspects of behavior and the learning process that some of them "wrote and spoke as if the only animals in existence were the white rat and the cat." Such was "the impasse reached when Lorenz (1937-39) produced in its definitive form a theory of instinctive behaviour which, although owing much to the work of Craig (1918), Whitman (1919), and Heinroth (1930) is essentially new." Dr. Thorpe gives a clear statement of Lorenz' theories on instinct with some minor criticisms and summarizes them thus: "*instincts (sensu stricto* of Lorenz) are (1) inherited, (2) specific, (3) stereotyped patterns of behaviour. They are separated from other types of stereotyped inborn behaviour *(e.g.*, kineses and taxes) by being (4) released complete by, rather than guided by, the environment and (5) by their tendency to accumulate reaction specific energy. This shows itself by (6) lowering of the threshold for release and (7) by a tendency to vacuum activity." "The work of Lorenz brings into an intelligible pattern so much elaborate behaviour which otherwise as yet defies analysis and provides such attractive vistas for future research that whatever the ultimate fate of his theories there seems no doubt at all that we are justified in describing his work as one of the outstanding contributions to the advance of animal ethology made during the present century." A valuable and illuminating paper.—M. M. Nice.

31. Some Problems of Animal Learning. W. H. Thorpe. 1944. *Proceedings of the Linnaean Society of London*, Session 156, 1943-44. Pt. 2: 70-83. A very interesting paper. "*Learning* implies *that process within the organism which produces adaptive change in individual behavior as a result of experience.*" Three types of learning are discussed. (A) Habituation, "*an activity of the central nervous system whereby innate responses to mild shock and warning stimuli wane as the stimuli continue for a long period without unfavourable results.*" Citing examples from mollusks, arthropods and birds, the author suggests that most animals have "an instinctive equipment whereby they tend to take avoiding or self-protective action to (1) a wide range of stimuli which are likely to be signals for danger, especially any moving object; (2) any stimulus or situation

which is strange; (3) any stimulus at an unusually high intensity." Habituation saves the animals from responding to situations which have been found to be harmless. Habituation also has a positive aspect, for instance in food getting. (B) "*Latent Learning* or *Exploratory Learning*, or exploration for its own sake." (This is marked with Song Sparrows in the wild at the age of 5-6 weeks.) "In the 'higher' animal . . . complex behaviour patterns are now to a greater extent built up by a process of 'taking notice of' or 'investigating' a large variety of environmental factors and combinations of factors which have not any specific valence for the animal to start with." (C) *Imprinting.* "The process is confined to a very definite and usually very brief period of the individual life; once accomplished it is usually very stable"; it is "often completed long before the various specific reactions to which the imprinted pattern will ultimately become linked have been established." Dr. Thorpe suggests that imprinting may be important with insects and proposes to "extend the original definition of imprinting to cover the possibility of attachment not to a living object but to the immediate locality first perceived by the newly emerged organism, so that this particular area becomes, by a similar process, the future breeding quarters of the individual." As an example he cites colonies of bembecine wasps that for 20 years have limited themselves to two distinct corners of a baseball diamond, despite continued interference from the players, while ignoring the rest of the pasture "equal in size to six city blocks."—M. M. Nice.

32. Birds as Visual Animals. (Vögel als Augentiere.) Hannes Laven. 1949. pp. 147-152 in *Ornithologie als biologische Wissenschaft*, edited by Ernst Mayr and Ernst Schüz. Carl Winter, Heidelberg. Unlike most animal groups, birds and human beings depend principally upon sight. Both also depend upon hearing. Birds offer the best subject for behavior studies because with them we do not have to transport ourselves into an entirely different "Umwelt," as would be the case in observing those animals that rely largely on smell. Experiments on Ringed Plovers, *Charadrius hiaticula* Linnaeus, showed that if the eggs were removed, and the cavity and the bird tracks around it obliterated, the birds found the nest site with no difficulty. But if the environment to a distance of three meters was levelled off, the birds were disoriented. "With birds as visual animals the guiding sense in orientation must be sought in their eyes."—M. M. Nice.

33. The Question of Sexual Dominance. Margaret M. Nice. 1949. pp. 158-161 in *Ornithologie als biologische Wissenschaft*, edited by Ernst Mayr and Ernst Schüz. Carl Winter, Heidelberg. It has sometimes been taken for granted that in pair formation the male overawes the female. This interpretation seems to have come from a confusion of sexual and social dominance, as well as the apparent exemplification of the theory with Pigeons. Now, however, the Heinroths (see *Bird-Banding*, 20: 110—1949) have shown that with this bird there is no dominance between the pair, so the theory has lost its chief support. "The procedure in pair formation may be interpreted more simply thus: the male's behavior—his displays and even his attacks—are his signals that he is ready for a mate, and the female's notes and postures are her signals that she is ready."—M. M. Nice.

34. Observations on Buzzards Going to and Leaving the Sleeping Place, also Some General Remarks on Birds' Going to Roost. (Beobachtungen über Aufsuchen und Verlassen des Schlafplatzes beim Mäusebussard *(B. buteo)*, nebst einigen allgemeinen Bemerkungen über das Zuruhegehen der Vögel.) Ludwig Schuster. 1949. pp. 211-216 in *Ornithologie als biologische Wissenschaft*, edited by Ernst Mayr and Ernst Schüz. Carl Winter, Heidelberg. From the middle of January to the middle of March the author watched seven to eleven Buzzards going to roost in a mixed woods. The earliest flights (stormy weather) came 53 to 91 minutes before sunset, but as a rule they averaged 29 minutes before, the latest coming 40 minutes after sunset. On clear mornings the earliest flights came 48 to 55 minutes before sunrise, in overcast weather 29 minutes before. Individual birds regularly came early, others regularly late.—M. M. Nice.

35. The Behaviour of Corn-Crakes. A. G. Mason. 1950. *British Birds,* 43(3): 70-78. A revaluation of the author's papers published in 1940 and 1941 in the light of further experiences with calling up *Crex crex* (Linnaeus) by an imitation of its call and observation of its behavior to a dummy. "When a bird approached my call it behaved territorially. When it saw the dummy and made a courtship display it ceased to react territorially. . . . The changeover was brought about by the sight of the motionless dummy, which forms a stimulus to sexual behaviour (display and coition), coinciding with the cessation of my craking, which is a stimulus to territorial behaviour." The author suggests that the sexual and territorial urges may have different physiological origins. "If such is the case then territorial behaviour is not essentially sexual in origin and does not belong to the purely sexual cycle of the breeding-season, though it is usually associated with that cycle. . . . If territory is essentially a social behaviour, the opposite as it were to gregarious flocking, rather than sexual, such an anomaly as winter territory, especially when held by females, is more easily explained."—M. M. Nice.

36. Repeated Bigamy of Oyster-catcher. J. A. G. Barnes. 1950. *British Birds,* 43(1): 23-25. In both 1947 and 1948 three adult *Haematopus ostralegus* (Linnaeus) were attending one nest on the same bank in the Kent Estuary; one female laid olive-brown eggs, the other greyish-white. In 1946 the author had banded two young on this same grass bank and three adults had shown great concern. "An interested and observant signalman . . . believes that 1948 is the fifth season" . . . the trio have nested together.—M. M. Nice.

37. Some Observations on the Breeding Behavior of the Herring Gull. (Einige Beobachtungen über das Brutverhalten der Silbermöwe *(Larus argentatus).)* N. Tinbergen. 1949. pp. 162-167 in *Ornithologie als biologische Wissenschaft,* edited by Ernst Mayr and Ernst Schüz. Carl Winter, Heidelberg. The Zoological Institute of Leiden has conducted many ingenious experiments in its Herring Gull colony. Some problems investigated were: What outside factors stimulate the Gulls to breed? What inner conditions affect the readiness to react to outside stimuli? How does the Gull orient itself to its own nest? It does not find its nest by the color of its eggs, but by knowledge of the immediate surroundings. It will accept bright blue, yellow, white or black eggs, but not red eggs. Rounded and smooth objects are accepted, even rectangular blocks if the corners are rounded. As to size, a diminution repels the birds, but increase in size stimulates them, birds trying their best to cover a model eight times the normal volume. In April eggs are eaten, even by those pairs that have the nest ready for deposition. When a wooden egg was offered, the Gull gave it a great blow; then picked it up, flew up with it ten meters and dropped it, repeating the action a second time—the first time Dr. Tinbergen had seen this dropping of hard food—typically a mussel—on the nesting grounds.—M. M. Nice.

38. On the Courtship and Social Displays of Three Species of Auk. P. J. Conder. 1950. *British Birds,* 43(3): 65-69. Discussion of breeding displays of the Razorbill, *Alca torda* Linnaeus, Guillemot, *Uria aalge* (Pontoppidan), and Puffin, *Fratercula arctica* (Linnaeus), on the Island of Skokholm, Pembrokshire. Billing, bowing, ecstatic posture, curiosity and feeling of intrusion are described for all the species, as well as other displays shown by only one species. "It seemed that in the auk species the social displays were almost as important as the sexual displays. All these species nest in colonies on cliffs and it is obviously impossible for them to have breeding territories of the same size as a Passerine's because of lack of space. At the same time it can be seen that the sexual displays are far less specialized or ornate than those of some Passerines and it seems that because there is so little room for displaying *à deux,* the social display has evolved to play the part of some of the missing paired displays, and has become an important part of the mechanism necessary for keeping birds keyed up to the required state of excitement."—M. M. Nice.

39. On the Breeding Biology of Tengmalm's Owl. (Aus der Fortpflanzungsbiologie des Rauhfusskauzes, *Aegolius funereus* (L.).) Rudolf Kuhk. 1949. pp. 171-182 in *Ornithologie als biologische Wissenschaft,* edited by Ernst Mayr and Ernst Schüz. Carl Winter, Heidelberg. The male owl "sings" near the hole he has chosen, and upon the approach of a female he changes his song and flies again and again to the hole, until the female enters and finds the freshly killed mice which the male has previously put in there. The male supplies all the food for his mate during egg laying and incubation and while the young are small. She stays on the nest continuously except for an early morning recess of three to nine minutes duration. The male brings four to five prey animals each night. Incubation lasts 27 days. Weights of eggs are given, as well as detailed observations on pair formation and an all-night watch at a nest with eggs. The paper lists 27 references.—M. M. Nice.

40. Dusting of Owls. Philip Manson-Bahr. 1950. *British Birds,* 43(1): 19. A Little Owl, *Athene noctua* (Scopoli), was in the habit of dusting itself in a particular spot on a tennis court in Kent.—M. M. Nice.

41. Observations on Geoffroy's Ground Cuckoo. (Beobachtungen an dem brasilianischen Bodenkuckuck *Neomorphus geoffroyi dulcis* Snethlage.) Helmut Sick. 1949. pp. 228-239 in *Ornithologie als biologische Wissenschaft,* edited by Ernst Mayr and Ernst Schüz. Carl Winter, Heidelberg. This shy Brazilian Cuckoo is a pheasant-like, forest-loving species that runs and occasionally hops, but has not been seen to fly. "A featherless bright blue patch behind the eye serves probably as a 'signal'." The only call heard was produced by a snapping of the mandibles; it seemed to express pleasure and fright. This Cuckoo follows army ants for the insects stirred up. A pair of adults was seen caring for an immature bird.—M. M. Nice.

42. "Anting" of Green Woodpecker. Kenneth Allsop. 1950. *British Birds,* 42(12): 390. A male *Picus viridis* Linnaeus stood in a huddled position and began pecking at the ground and "rummaging in its breast feathers with its bill"; it also "stuffed ants beneath each wing."—M. M. Nice.

43. Observations on a Great Tit Brood Where the Male Disappeared. (Brutbiologische Studien an einer Kohlmeisenbrut, bei der das Männchen verloren ging.) Franz Giller. 1950. *Die Vogelwelt,* 71(2): 43-46. On April 28, 1946 a nest with five eggs of *Parus major major* Linnaeus was thrown out of a box two meters from the kitchen window of the author; Starlings were believed to have been the culprits. The Great Tits renested and on May 22 intensive watching was started, when the eight young of the second attempt were about four days old. For two days the male fed much more than did his mate; then he disappeared, and the female raised the brood alone. On May 26 a new male accompanied the female and three copulations were seen; on June 2 he again came with her. On May 28 she took wool from her nest and carried it away, apparently to a new nest. Six young fledged June 5 and 6. The largest number of trips in one hour by the one bird was 36. On May 26 she fed some 320 times, on the 30th some 304. The writer calculated she flew 12,800 meters the first day, 12,160 the second, *i.e.* between seven and eight miles.—M. M. Nice.

44. Marsh-Tit Territories over Six Years. H. N. Southern and Averill Morley. 1950. *British Birds,* 43: 33-47. Color bands were used on 34 *Parus palustris* Linnaeus, four or five pairs each year. Territories varied in size from one to 16 acres, averaging six. "Changing of territories was recorded twice in the cocks and five times in the hens." Maps are given of summer and winter territories throughout the six years. Birds ". . . tended to spend more time along those parts of the margin which adjoined other territories than in any other part of their territories." "The mean expectation of survival from all territory owners ringed was 15.5 months . . ." males 19.2 months, females 13.3, but some females probably moved into unrecorded territories.—M. M. Nice.

45. Polygyny, Disruption of the Family Bond, and Adoption with the Collared Flycatcher. (Polgynie, Sprengung der Ehegemeinschaft und Adoption beim Halsbandfliegenschnäpper *(Musicapa a. albicollis).*) Hans Löhrl. 1949. *Die Vogelwarte*, 2: 94-100. Early arriving male Collared Flycatchers adopt nest boxes with considerable fighting; as the females gradually arrive, the males show them the boxes and they choose homes; the males then try to attract females to other boxes. Thus an early male may have two families started before the arrival of later males. Color-banding of a population of these birds in 21 boxes within a radius of 100 meters showed some amazing relationships. Three males had two mates and one had three, while other males remained unmated. Two of these bachelors became foster fathers to broods. One took over while the father was busy with his first family. The other *drove a father from his nest while the female was incubating and fed the young when they hatched*, while the dispossessed father adopted the second nest of a polygamous neighbor. The third mate of one male, however, had no assistance in raising her family. One male occasionally fed his mates. Another was very solicitous of both his mates, accompanying them when off the nest and calling off the second as soon as he had escorted home the first. When there were young in both nests, this male never showed any excitement if the observer visited one nest; he merely took his food to the other nest. "This seems to indicate that the excitement does not stem from 'concern' for the young, but comes from the thwarting of the normal course of the instinctive action." A very interesting paper.—M. M. Nice.

46. Behaviour of Song Thrush at Nest. John Field. 1950. *British Birds*, 43(1): 18. A parent *Turdus ericetorum* Turton puffed out its feathers, depressed its head, fanned its tail, swayed from side to side and gave loud alarm notes as the young were being banded.—M. M. Nice.

CENSUSES AND POPULATIONS

(See also Numbers 29, 60, and 61.)

47. The Index of Heron Population, 1949. W. B. Alexander. 1950. *British Birds*, 43(3): 78-80. In 1949 162 heronries of the Grey Heron, *Ardea cinerea cinerea* Linnaeus, were reported to the Edward Grey Institute, 16 more than in 1948. "The winter 1948-9 was again a mild one. . . . After the very severe winter 1946-7 the index of Heron population was found to have fallen from 94 to 54 and that after the succeeding mild winter, 1947-8, practically no recovery was found to have occurred, the index being 57." "We suggested that as Herons probably do not breed till their second summer, two mild winters would be required after a disaster to allow of any considerable increase in the breeding stock. The increase of the index after a second mild winter from 57 to 77 affords satisfactory support to this hypothesis."—M. M. Nice.

48. The Bird Population of Moist Oak-Hornbeam Woods. (Die Vogelwelt des feuchten eichen-hainbuchen-Waldes.) Otto Niebuhr. 1949. *Ornithologische Abhandlungen*, Heft 1: 1-28. O. Niebuhr and H. Bruns, Göttingen. Bird populations were measured by counting and mapping singing males in strips about 115 feet wide on four different days in seven different areas near Celle, in north-central Germany. In all areas, *Quercus robur* Linnaeus was the principal dominant tree, and in addition the following species were present in varying amounts: *Carpinus betulus* Linnaeus, *Fraxinus excelsior* Linnaeus, *Alnus glutinosa* (L.) Gaertner, and rarely *Fagus sylvatica* Linnaeus. The areas varied in size from five to about 21 acres. Total numbers of all species varied from 147 to 900 pairs per 100 acres. These figures may indicate nesting densities but cannot be considered accurate population densities since the total feeding areas of forest-edge species are not included and the areas are small. No scientific nomenclature is given for the 38 species listed. There is an attempt to analyze the bird distribution in respect to variations in height of trees in the forest canopy, species composition, age of forest, and amount of undergrowth. Since many areas contained forest-types, the areas are subdivided and the types recombined accord-

ingly. In a 200-year-old stand of oaks with considerable undergrowth, 74 percent of the birds nested in trees, 14 percent in bushes, and 12 percent on the ground. Of these 38 percent had open nests and 62 percent nested in holes. On the other hand, in thickets of small trees, 19 to 22 feet high, only 25 percent nested in trees, none in bushes, and 75 percent on the ground. No species nested in holes. The highest nesting density for all forest types was found in the first area and the lowest density in the second. On the whole this is an interesting and worthwhile attempt to correlate nesting densities with differences in vegetation but larger more uniform sampling areas would have made the bird counts more trustworthy. —S. C. Kendeigh.

ECOLOGY

(See also Numbers 6, 16, 17, 24, 26, 29, 47, 48, 60, 61, and 62.)

49. The Biological Resources of Guerrero (Mexico) with Special Reference to the Game Mammals and Birds. (Los recursos biológicos de Guerrero con referencia especial a los mamiferos y aves de caza.) A. Starker Leopold and Leopoldo Hernandez M. 1944. *Comision Impulsora y Coordinadora de la Investigacion Cientifica, Anuario* 1944: 361-390. The topography and climate of Guerrero have produced five well defined biological zones: (1) *Selva nublada* (cloud forest), a rich wet forest zone extending upward generally from about 2000 meters. Typical birds include the Long-toed Quail, *Dactylortyx thoracius* (Gambel); Tree Quail, *Dendrortyx macroura* (Jardine and Selby); Unicolored Jay, *Aphelocoma unicolor* (DuBus); Omilteme Jay, *Cyanolyca mirabilis* Nelson; and Emerald Toucanet, *Aulacorhynchus prasinus* (Gould). (2) *Encinares y Pinares montana* (Mountain oaks and pines), whose ranges are 1000-1800 meters to 1300-2100 meters. Characteristic birds are the Band-tailed Pigeon, *Columba fasciata* Say; Mearns Quail, *Cyrtonyx montezumae mearnsi* Nelson; Ant-eating Woodpecker, *Balanosphyra formicivora* (Swainson); Mexican Trogon, *Trogon mexicanus* Swainson; Flicker, *Colaptes cafer* (Gmelin); and Hepatic Tanager, *Pitanga flava* Swainson. (3) *Matorral de la Costa* (coastal brushland) from sea level to about 1000 meters. Typical birds include Western Derby Flycatcher, *Pitangus sulphratus* (Linnaeus); Squirrel-Cuckoo, *Piaya cayana* (Linnaeus); Magpie-Jay, *Callocitta formosa* (Swainson); and White-fronted Dove, *Leptotila verreauxi* (Bonaparte). (4) *Bosque Espinosa* (spiny woods), a dry sterile habitat lying between 600 and 1300 meters. Typical birds are Lesser Roadrunner, *Geococcyx velox* (Wagner); the Caracara, *Polyborus cheriway* (Jacquin); and the Ground Dove, *Columbigallina passerina* (Linnaeus). (5) *Llanos Aridos* (Arid Plains), primarily in the valley of the Rio Balsas up to 600 meters. Typical birds include the Chachalaca, *Ortalis vetula* (Wagler); Mexican Goshawk, *Buteo nitida* (Latham); and the Ruddy Ground Dove, *Columbigallina talpacoti* (Temminck). There is an annotated list of 20 species of game birds.—D.S.F.

CONSERVATION

(See Numbers 49, 65, 70, and 73.)

WILDLIFE MANAGEMENT AND METHODS

(See Numbers 5, 27, 28, 49, 65, and 74.)

PARASITOLOGY

(See also Number 60.)

50. Notes on Two Species of Calliphoridae (Diptera) Parasitizing Nestling Birds. John L. George and Robert T. Mitchell. 1948. *The Auk*, 65(4): 549-552. The data were obtained at Lake Clear Junction, New York, in June and July, 1946. Larvae of *Apaulina metallica* (Townsend) were found feeding on nestlings in one nest each of the Hermit Trush, *Hylocichla guttata* (Pallas); Chipping Sparrow, *Spizella passerina* (Bechstein); Song Sparrow, *Melospiza melodia* (Wilson); and Redstart, *Setophaga ruticilla* (Linnaeus). There were two to six larvae per nest, except 30 on a single Redstart and presumably they

were the direct cause of its death. They were external parasites. In another brood of four Chipping Sparrows, three were examined; two maggots of *Apaulina hirudo* (Shannon and Dobroscky) were found on one and five each on the others. The latter two died. The larvae were embedded beneath the skin. The authors found only one previous published reference to subcutaneous parasitism by calliphorid flies.—Ralph S. Palmer.

51. Disease of Wild Birds. (Sygdomme hos vildtlevende fugle.) M. Christiansen. 1949. *Dansk Ornithologisk Forenings Tidsskrift*, 43(3): 189-215. These are primarily the author's own observations on Danish birds. Tuberculosis was the most abundant of the bacterial diseases, especially among birds which often come in close contact with the domestic fowl, such as the English Sparrow, *Passer domesticus* Linnaeus, and the Tree Sparrow, *Passer montanus* Linnaeus, and those which feed on refuse or carrion, such as gulls, *Larus ridibundus* Linnaeus, *Larus canus* Linnaeus, and *Larus argentatus* Pontoppidan; also it was found occasionally in the Kestrel, *Falco tinnunculus* Linnaeus; Sparrow Hawk, *Accipiter nisus* Linnaeus; Common Buzzard, *Buteo buteo* (Linnaeus); Tawny Owl, *Strix aluco* Linnaeus; Golden Plover, *Pluvialis apricaria* Linnaeus; Rook, *Corvus frugilegus* Linnaeus; Chaffinch, *Fringilla coelebs* Linnaeus; Hedge Sparrow, *Prunella modularis* (Linnaeus); and others. A closely related disease has been found to be prevalent in the Wood Pigeon, *Columba palumbus* Linnaeus. "Pseudotuberculosis" *(Bacterium pseudotuberculosis rodentium)* has been found in the Partridge, *Perdix perdix* (Linnaeus); Pheasant; Wood Pigeon; Wren, *Troglodytes troglodytes* (Linnaeus); Pied Flycatcher, *Muscicapa hypoleuca* Pallas. Swine erysipelas has been found in the White Stork, *Ciconia ciconia* (Linnaeus), and Herring Gull, *Larus argentatus* Pontoppidan. Fowl pox has been found in a considerable number of species. Young Fulmars, *Fulmaris glacialis* (Linnaeus), in the Faeroe Islands are reported to be infected with psitticosis. Among the coccidioses found were renal infections in the Grey Lag-goose, *Anser anser* (Linnaeus), and the Common Eider, *Somateria mollissima* (Linnaeus). The tracheal roundworm *(Syngamus trachea)*, a common parasite in domestic birds, was encountered in the Pheasant; Partridge; Rook; Jackdaw, *Corvus monedula* Linnaeus; Magpie, *Pica pica* (Linnaeus); thrushes; and the Starling, *Sturnus vulgaris* Linnaeus.—D.S.F.

MORPHOLOGY AND ANATOMY
(See also Numbers 60 and 61.)

52. The Molt and Plumages of the Jay, *Garrulus glandarius*. (La mue et les plumages du Geai *Garrulus glandarius*.) Noël Mayaud. 1948. *Alauda*, 16: 168-179. Using a series of 55 skins collected in western France the author described a method for distinguishing jays up to about one year of age from adults. Of the 55 specimens, 15 were classed as undoubted adults by the presence of some trace of molt among the remiges, and six were classed as undoubted juvenals due to the presence of at least a few juvenal feathers, or because they were in juvenal plumage. The remaining specimens were classified as to age (19 adults and 15 juvenals) according to the shape of their remiges and rectrices. The partial juvenal molt extends to all the short feathers, to the three posterior secondaries of the wing, to the six posterior greater secondary coverts, and in about 25 percent of individuals to two or three of the alular feathers. The remainder of the remiges and their greater coverts, as well as the rectrices, are retained. The annual (post nuptial) molt is complete. Molts in the case of both age classes take place in western France between early July and the end of September. The author contrasts the appearance of adult and juvenal retrices and remiges as follows: whereas the juvenal retrices tend to have narrowly pointed and weakly pigmented tips, those of the adults tend to have more nearly square and more heavily pigmented tips; the tips of the outer alular feathers are more pointed in the juvenal; in microstructure, the barbules of the outer barbs at about the midpoint of the outer alular feathers are elongate and the barb shaft forms a rostrum-like projection in the case of the juvenal only; the black bars on the leading edge of the outer alular feathers of the juvenals are broader, less well defined, and fewer in number than in the adults; the black bars of the sixth greater upper primary

coverts are fewer in the case of juvenals than in the case of adults; and the blue of the juvenal plumage is in general less bright than that of the renewed feathers. There is a discussion, without experimental evidence, of the possible causes for the morphologic differences in barring of the blue feathers in respect to age. He feels that the morphologic detail of feather development is conditioned by daily changes in metabolic rate in both the juvenal and the adult, and that the differences found in the case of the juvenal may be attributed to a relatively high level of thyroid activity in the growing juvenal bird.—L. R. Mewaldt.

SYSTEMATICS

(See also Numbers 1, 60, 61, and 68.)

53. Geographic Variation in *Empidonax traillii*. Allan R. Phillips. 1948. *The Auk*, 65(4): 507-514. Five subspecies of the Alder Flycatcher, *Empidonax traillii* (Audubon), are recognized, these two being described as new: *alascensis*, type from Charlie Creek, Yukon River, Alaska; and *extimus*, type from Feldman, lower San Pedro River, Arizona. Characters, measurements, ranges, and various comments on each of the races are given. The name "Thicket Flycatcher" is suggested (p. 509) as appropriate for the species over its range, this being diagnostic of its habitat preference.—Ralph S. Palmer.

54. Probability in Subspecific Identification of Single Specimens. A. L. Rand. 1948. *The Auk*, 65(3): 416-432. The author discusses many interesting examples and (p. 430) arrives at these conclusions: "From a practical point of view, when individual specimens do not agree with the general series, the case should be examined with a view as to which is more probable, whether the specimen represents a stray or an individual variant. It is improbable that every case can be decided correctly. But in as much as identification as a wanderer may necessitate another heading in the faunal list, the addition of another form to the tally of those known from the area, and a range extension, it seems to me that the conservative view, other things being equal, is to consider doubtful cases as variants." He gives examples of how this treatment might be followed in a faunal list for Canada. For a valuable criticism of this article see: C. H. Blake. 1949. "Probability" in Subspecific Determination: Some Comments. *The Auk*, 66 (2): 212-213.—Ralph S. Palmer.

55. Two new Peruvian Hummingbirds of the Genus *Coeligena*. John T. Zimmer. 1948. *The Auk*, 65(3): 410-416. New subspecies of *Coeligena torquata* (Boissoneau) named are: *margaretae*, type from La Lejia, north of Chachapoyas, Perú; and *omissa*, type from Huaisampillo, southeastern Perú.—Ralph S. Palmer.

56. Taxonomic Notes on the Laughing Falcon. Pierce Brodkorb. 1948. *The Auk*, 65(3): 406-410. The species *Herpetotheres cachinnans* (Linnaeus) ranges from México to northwestern Perú. Four subspecies, previously described by other authors, currently are recognized by Brodkorb. He states (p. 410) that the similarity between the most northerly and southerly subspecies (from extremes of the species' range) "is in contradiction to Jordan's Law."—Ralph S. Palmer.

EVOLUTION

(See Numbers 1, 60, 61, and 62.)

PHOTOGRAPHY

(See also Number 19.)

57. Photographing the American Pectoral Sandpiper at Salthouse. R. P. Bagnall-Oakley. 1949. *British Birds*, 42(5): 145-146. Remarkable photographs of *Erolia melanotus* (Vieillot). In the autumn of 1948 there was a widespread visitation of these birds to the British Isles.—M. M. Nice.

58. Photographs of the Royal Albatross. L. E. Richdale. 1949. *Wild Life Series, No. 9. Otago Daily Times,* Dunedin, N. Z., 16 pp., 3/6. A series of splendid photographs of *Diomedea epomophora sanfordi* Murphy, a small colony of which nest under strict protection at Taiaroa Head, Otago Peninsula, New Zealand. The first chick was reared in 1938; of 15 young raised three have returned to their place of hatching.—M. M. Nice.

59. Bird Photography by High-Speed Electronic Flash. Eric Hosking. 1949. *British Birds,* 42(7): 240-241. Twenty-four extraordinary photographs of small passerine birds in flight to or from their nests with a description of the technique employed. These flashes that usually last 1/10,000th of a second show poses that for the most part are never caught by the human eye.—M. M. Nice.

BOOKS AND MONOGRAPHS

60. Ornithology as Biological Science. (Ornithologie als biologische Wissenschaft.) Edited by Ernst Mayr and Ernst Schüz. 1949. Carl Winter, Universitätsverlag, Lutherstrasse 59, Heidelberg. xii + 291 pp. 18 M. This is a collection of 28 significant papers in commemoration of the 60th birthday anniversary of Doctor Erwin Stresemann. Among the aspects of ornithology embraced are evolution and sytematics, embryology, behavior, ecology, parasitology, and migration. (See Nos. 21, 23, 32, 33, 34, 37, 39 and 41. Others will appear subsequently in *Bird-Banding.*) This collection of papers goes far to show the importance of ornithology in biological science. It should become a part of the working library of most ornithologists and many other biologists.—D.S.F.

61. Birds (Oiseaux.) J. Benoit, J. Berlioz, F. Bourlière, P. P. Grassé, E. Letard, R. Matthey, N. Mayaud, E. Oehmichen, J. Pasteels, J. Piveteau, A. Portmann, A. Rochon-Duvigneaud. 1950. Vol. 15 in *Traité de Zoologie—Anatomie, Systematique, Biologie.* Edited by Pierre-P. Grassé. Masson et Cie., 120, Boulevard Saint-Germain, Paris. viii + 1164 pp. 6000 fr. This is the first good general zoological treatment of birds since that of Stresemann (Bd. 7, Hälfte 2 in Kükenthal and Krumbach, *Handbuch der Zoologie*) published in 1927-1934. Compared with Stresemann's the present volume enjoys both the advantages and disadvantages of multiple authorship. The quality of the individual chapters varies from a few rather brief and superficial reviews to some which are excellent and deserving of the attention of all who have scientific interests in birds. The chapters by Jacques Benoit on endocrinology (pp. 290-335), urogenital system (pp. 341-379), and reproduction (pp. 384-479) are particularly outstanding. The chapter on social behavior (pp. 697-748) is a competent job in terms of the available space although there may be some disagreement with the author's (Noël Mayaud) conclusions. Two chapters are devoted to migration. J. Berlioz (pp. 1074-1088) presents its general physical aspects, routes, and possible origin. This chapter is brief with no references to the literature and no bibliography. The second chapter (pp. 1089-1099) by F. Bourlière, concerns the physiology of migration and is developed around two problems, stimulation and orientation. Within the limitation of the available pages, this chapter is a very competent evaluation of our present knowledge. The chapter on longevity (pp. 536-538) is disappointingly brief and does not strike at the core of this very interesting field. The reviewer is dismayed at the rather persistent failure to use accepted international (latinized) terminology in the chapter on myology (pp. 108-130) and the failure to refer to the classical investigations of Fürbringer and Gadow. There is a very interesting and informative review of flight (pp. 131-170) and another on terrestrial locomotion, swimming, and diving, both prepared by E. Oehmichen. Other chapters are devoted respectively to integument, skeleton, nervous system, sense organs, vision, circulation, respiration, digestion, uropygial gland, body temperature, chromosomes, biology of reproduction, embryonic development, post embryonic development, food, voice and sounds, organization of social units, ecology, origin and evolution of birds, contemporary and recent evolution, systematics, zoogeography, and origin of domestic birds including falconry and the use of cormorants in fishing. There is a detailed table of contents (pp. 1157-1164) and an excellent index (pp. 1120-1153).

The book is attractively printed and illustrated; most chapters are accompanied with adequate bibliographies. This volume can be heartily recommended as a good collection of introductory treatises to most of the aspects of ornithology. In view of this, its readability, and its reasonable price, it should become a part of the library of most serious ornithologists.—D.S.F.

62. Newer Problems of Evolution. Trans-specific Evolution. (Neuere Probleme der Abstammungslehre. Die transspecifische Evolution.) B. Rensch. 1947. Ferdinand Encke Verlag. Stuttgart. vii + 407 pp. This very interesting treatise should be of more than considerable interest to both the casual and the more serious student of evolution. This interest should arise not only from its admirable synthesis of a huge variety of materials but also from the fact that, because of wartime restrictions in communications, it has been prepared without access to the several recent well-known English-language publications in the same general field including "Systematics and the Origin of Species" by Ernst Mayr (Columbia University Press, 1942), "Evolution, the New Synthesis" by Julian Huxley (Harpers, 1942) and "Tempo and Mode in Evolution" by G. G. Simpson (Harpers, 1945). All of these deal with aspects of evolution discussed by Doctor Rensch. This affords a unique opportunity to compare conclusions reached independently and, in part, based on different materials. Although there are a few notable instances of disagreement, the reader cannot resist gaining the impression of remarkable concurrence in most aspects of fundamental philosophy.

The initial portion of Doctor Rensch's book is devoted to a concise well-written analysis of the factors involved in specific and infra-specific evolution. In the discussion of infra-specific evolution emphasis is placed on the kinds and causes of mutations, the randomness of mutations, pleiotropy and interaction of genes, the fate of genes with respect to fluctuations in populations, and mechanisms of natural selection. Naturally occurring races are classified as (1) historic, (2) geographic, (3) ecologic, (4) sexual, (5) genetic, and (6) hybrid. The genetic and selective bases of Bergmann's, Allen's, and Gloger's principles are discussed as factors in subspeciation; formation of races according to Reinig's hypothesis of allele-elimination is regarded as infrequent. Geographic races are regarded as the most important precursors of new species. The author feels that chromosome mutation, contrasted to gene mutation as a basis of specific evolution, as conceived by Goldschmidt, is an unnecessary assumption.

The remainder of the book is concerned with "trans-specific evolution." The discussion begins with the question of adequacy of random mutation and selection, the basic concepts in specific and subspecific evolution, in the explanation of trans-specific evolution involving new organs and new structural plans. An impressive amount of material is presented to show that trans-specific evolution does have a random basis and that the apparent evidence to the contrary is largely a reflection of basic restrictions of selection imposed by fundamental physical laws. Orthogenesis is to be explained primarily in terms of orthoselection bearing in mind the pleiotropic effects of genes, interaction of genes, and certain allometric considerations. Of considerable interest are the chapters (pp. 80-111) which deal with the absolute rate of evolution and the age and duration of specific and supraspecific groups. Rate of evolution is, in several ramifications, a function of environment, conditions for selection being probably the most important. "Predisposition to evolution" of existing structural plans makes the assumption of increased mutation rate during periods of evolution unnecessary. However, increased mutation rate is offered as a possible explanation of the so-called explosive developmental periods such as that of birds in the early Tertiary; development of new biotopes and other environmental changes may be also involved. The chapter on the "Phases of Specialization" (pp. 111-227) is the most detailed and most interesting portion of the book. To a certain degree the variety of specialization is a function of the variety and relative saturation or unsaturation of biocenoses. In general the greater steps in specialization appear to be irreversible. Specialization in terms of size is complex since few changes are, or can be in terms of selection, simple linear functions of body size whatever the criterion for body size may be. Of considerable interest, and speculation in terms of

mechanisms involved, are the many examples of specialization in which there is development of one organ, organ system or structure, apparently at the expense of another. These can be satisfactorily explained in terms of selection of pleiotropic genes and resulting allometric changes; certainly selection in terms of most ideal utilization of available energy and synthetic materials could be conceived to be important. Parallelisms in well separated groups such as similar primary feather formulae in different families of birds, similar wing patterns in different families of insects, etc., are explained on the basis of random mutation, parallel selection, and partly in terms of homologous genes. Orthogenesis of transspecific order is to be explained in terms of random variation and orthoselection bearing in mind pleiotropy and interaction of genes. Much attention is given to Cope's Rule as an example of orthogenesis. It is accepted as having a reasonably general validity. Characteristics associated with increase in body size suggested to be favored in orthoselection include increased power and resistance, relatively stronger skeleton (with definite limiting factors, however), increase in number of cells, relatively greater number of glomeruli (mammals), greater egg number, less intensive metabolism, etc. Cope's Rule may in reality be a temporal corollary to Bergmann's Rule. A relatively brief section (pp. 228-240) deals with over-specialization, degeneration, and extinction. Excessively developed structures are considered in terms of allometric consequences of increased body size. Degeneration is a confusing concept; many groups have disappeared with no signs of degeneration. Causes of elimination of evolutionary series include pressure from other groups, changes in environment following (irreversible) over-specialization, vigorous environmental changes, and infraspecific competition. Consideration (pp. 265-272) is given to evolution of new organs and new structural plans with the conclusion that the processes are fundamentally no different than those of speciation. The discussion (pp. 309-315) of evolution "Assendenz" of man becomes progressively more philosophical particularly in terms of effect of culture. If the acquisition of a culture is a part of evolution, man is the only species which can willfully (?) create self-imposed regressive evolution. The author is to be admired for his attempt to use an even greater breadth of sources in his discussion of "Die Evolution des Lebendigen" (pp. 316-325); however, this portion of the book does not, in the opinion of the reviewer, attain the same quality as the previous sections. Perhaps it was inadvisable to attempt such an analysis in so limited a space. The remainder of the book is essentially philosophical and, in the opinion of the reviewer, can be used with profit only by those well disciplined in the semantics of philosophy and with considerably better than average facility in German. In general Doctor Rensch has presented a thorough, well documented, and logically developed summary of our present knowledge of the evolution of infraspecific, specific, and supraspecific categories. Except for the suggestion of certain philosophic misgivings in the later sections, there is a persistently successful integration of the processes of evolution into an adequate causal system.—D.S.F.

63. He Talked with the Beasts, the Birds and the Fishes. Animal Stories. (Er redete mit dem Vieh, den Vögel und den Fischen. Tiergeschichten.) Konrad Lorenz. 1949. Dr. G. Borotha-Schoeler, xix Haupstrasse 3, Vienna. 254 pp. Inspired originally by indignation against the nature-faking books that flourish in Europe as well as in America, this small volume, with its title from a legend about Solomon and a magic ring, is a splendid introduction to animal behavior. Four of the 13 chapters are devoted to fish in aquaria, one to dogs, and one to animals that are not rewarding as pets. It is essential to choose social animals. Among birds that are easy to keep and that become attached to their owners are the Starling, *Sturnus vulgaris* Linnaeus, and the Siskin, *Spinus spinus* (Linnaeus); the former must be taken from the nest at the age of two weeks, but the latter can be captured full grown. In a chapter on the speech of animals we learn that although parrots and some Corvidae may use human speech in appropriate situations, they do not understand what they are saying, nor can they use their acquirement purposively. A delightful tale is told of the baby Greylag, *Anser anser* (Linnaeus), that became imprinted on Dr. Lorenz as her mother; he had to carry her all day in a basket and answer her location notes every hour or

so during the night. To the ornithologist the most important contribution is that on the Jackdaw, *Corvus monedula* Linnaeus, with its extraordinary behavior patterns for colonial living. This is a fascinating book, written from a wealth of experience and deep sympathy with animals. It is full of sound information, told with vividness and humor. I am happy to report that Dr. Lorenz is preparing an English translation.—M. M. Nice.

64. South Carolina Bird Life. Alexander Sprunt, Jr. and E. Burnham Chamberlain. 1949. University of South Carolina Press, Columbia. xx + 585 pp., 35 colored plates, 49 photographs. $10.00. This handsome volume is an important contribution to the ornithology of the southeastern states. It comes enclosed in an attractive cardboard box with a colored plate of hawks on the front. Plates are by Dick, Dingle, Jaques and Peterson. "Ornithology in South Carolina" discusses the early work of Catesby, Bartram, Bachman, Audubon, Coues and many others, followed by the contributions of Brewster, Hoxie, Wayne and a host of recent observers. A "Type Locality List" includes 77 forms. "The Region" discusses topographic and biotic areas; "On Studying Birds" gives advice to beginners. A review of species makes up the bulk of the book. Treatment of each species generally includes a brief "Description," "Range," "Status in S.C." and a more extensive "History." The latter is a general discussion of the species, including remarks on nesting, food, migration dates, distribution, etc. The "Hypothetical List" includes only 17 forms. There is an extensive list of "Literature Cited" and a useful index. The bird life of the coastal area has been intensively studied, especially in the vicinity of Charleston, but relatively little is known of the birds of the western half of the state.' Captions under the excellent photographs give the name of the bird and the photographer but do not mention the locality or date. In a few cases the source of information on nesting is not clear. For example, nesting data for the Ruffed Grouse are apparently based on observations made outside the state. The discovery of a small population of Ivory-billed Woodpeckers in the Santee River flood plain about 1935 stands out as one of the most interesting accounts of species. More amazing is the statement that it is Sprunt's "firm and considered belief" that Carolina Paroquets occurred in the same area as late as 1936-38! Chamberlain, however, does not agree.—G. E. Hudson.

65. Bobwhites on the Rise. Verne E. Davison. 1949. Charles Scribner's Sons, New York. 150 pp. $3.75. This book describes land management for Bobwhite Quail, *Colinus virginianus* (Linnaeus), simply, clearly, interestingly and briefly. It should appeal to many readers. The author looks at the past and concludes that legal regulations and education are necessary, but that they have not increased quail populations. Predator control proved a false hope, and "Stocking is absolutely indefensible except where no quail exist close by—and then only after adequate food and shelter have grown to maturity." A look at the future indicates that some old traditions should be forgotten, and agricultural lands should be managed more specifically for production of quail. In typical Davison style, the author emphasizes the importance of food and cover. "Whether it's Florida, Texas, Michigan or New York you will find much of the land is quailless for lack of food or cover or both. It is time to manage bits of land for bobwhites, on each separate farm or ranch or timber holding where birds are wanted." The broad range of the bobwhite embraces private lands in four-and-a-half million separate ownerships. "Adequate food and cover must be grown at each location on a farm where a covey is wanted. One good winter food, plus grass and shrubby cover, will support the birds." Mr. Davison believes the best approach to successful management of these lands is through the Soil Conservation Districts. He warns against overshooting by leaving six or seven birds per covey each year, he recognizes the landowner as the custodian and producer of quail and he suggests encouraging the landowner by more favorable laws. The book is illustrated with excellent sketches, and it has a fair list of references. The technical reader might sense a bit of dogmatism and over-emphasis on the simplicity of management.—Irven O. Buss.

66. Catalog of Danish Birds. (Fortegnelse over Danmarks Fugle.) Bernt Løppenthin. 1946. Published by the *Dansk Ornithologisk Forening*, København. 121 pp. The principal portion of this treatise is a briefly annotated list of the birds of Denmark. The list is based primarily on species. For those species represented by two or more races, the species is listed as such with the subspecies listed under sub-headings. The list contains 333 species; ten of these are represented by three subspecies and 25 by two. The number of "regularly breeding" species is 163; 39 are permanent residents. The principal list gives brief notations on status and abundance for each form. This is a very useful publication. —D.S.F.

67. Popular Handbook of Indian Birds. Fourth Edition. Hugh Whistler, Fourth Edition by Norman B. Kinnear. 1949. Gurney and Jackson, 98 Great Russel Street, W.C., London. xxviii + 560 pp. 22/6. It is infrequent that a regional ornithology can be recommended as a book of interest to ornithologists with no personal experience with the region concerned. *The Popular Handbook of Indian Birds* is among the exceptional few. Three hundred and eight species are included. For each species there is a brief description; notes on field identification; statement of distribution; notes on subspecies, if any; and notes on habits, nesting, eggs, voice, and food. Although the *Popular Handbook* is a useful inventory of information on Indian birds for the beginner it is equally important in indicating the vast amount of work that remains to be done on the life histories of the birds of India. There are 24 full-page plates, of which seven are in color, and 108 figures in text. The printing and general composition of the book are excellent.—D.S.F.

68. A Contribution to the Ornithology of Northeastern Venezuela. Herbert Friedmann and Foster D. Smith, Jr. 1950. *Proceedings of the U. S. National Museum*, Vol. 100 (No. 3268): 411-535. This report is based largely on the specimens of more than 240 species and subspecies and accompanying field notes made by the junior author during a period of three and one-half years in ornithologically poorly known northeastern Venezuela. It is unusually rich in information on ecology and life history.—D.S.F.

69. The Birds of Chile. (Les Oiseaux du Chili.) Émile Housse. 1948. Masson et Cie., Éditeurs, Libraires de l'Académie de Médecine, 120 Boulevard Saint-Germain, Paris—IVe. 393 pp., 600 fr. This publication consists of a series of reprinted papers from *Les Annales des Sciences Naturelles, Zoologie*, as follows: "Les oiseaux du Chili" from Vol. 20 (10th series): 93-107, 1937 *(Geranoaetus melanoleucus* (Vieillot) only); "Les oiseaux de proie du Chili" Vol. 2 (11th series): 17-233, 1939 (Falconiformes, in part); "Les oiseaux de proie du Chili" Vol. 3 (11th series): 1-96, 1941 (Falconidae, Strigiformes); "Les oiseaux des Andes" Vol. 3: 97-161, 1941 (Tinamiformes, Spheniscifórmes, Colymbiformes, Procellariformes, Pelencaniformes); "Les oiseaux des Andes" Vol. 4 (11th series): 138-238, 1942 (Ciconiiformes, Phoenicopteriformes, Anseriformes, Galliformes, Gruiformes, Charadriiformes). There is an index for the entire collection.—D.S.F.

70. Hawks Aloft—The Story of Hawk Mountain. Maurice Broun. 1949. Dodd, Mead, and Company, 432 Fourth Avenue, New York. xv + 222 pp. $4.00. Hawk Mountain has become a symbol of a changing attitude towards hawks and a slowly growing acceptance of their normal and indispensable role in a healthful biotic community. The victory is by no means won; the Hawk Mountain Sanctuary represents a successful initial skirmish, largely because of the persistent and tenacious efforts of Maurice Broun and Rosalie Edge. *Hawks Aloft* is a well-written interesting book; the author shows excellent discretion in the selection of material in order to maintain uniform interest and readability. *Part One* (seven chapters) describes the evolution from a hawk-slaughtering site to a sanctuary of national interest and unparalleled outdoor laboratory for the study of migrating hawks. Chapter 13 presents a numerical summary of the hawks ob-

served from the sanctuary 1934-1948, with brief annotations concerning the species observed. The excellent quality of this book should carry the story of Hawk Mountain far beyond the realm of ornithology. It should consequently become a major contribution to wildlife conservation in the United States.—D.S.F.

71. Falconry and its History. (Falkenjagte og dens Historie.) C. J. Tillisch. 1949. P. Haase and Søns, Copenhagen. 161 pp. This attractive little book presents a brief, but thoroughly interesting account of falconry, discussing initially, with some historical notes, the nine species used principally in falconry in Europe. This is followed by three chapters which discuss in some detail methods of capture, taming, and training falcons and accipiters. In many respects the most interesting chapter (pp. 77-85) is that which summarizes briefly some of the evidences concerning the early history of falconry in Greece, Egypt, China, India, and the Near East where it was apparently widely practiced several centuries B.C., and its later development in central and northern Europe. There is similarly a chapter (pp. 99-123) on the present status of falconry. The chapter on falconry in Denmark, Norway, Iceland and Sweden has an English translation (pp. 129-137). Iceland Falcons, *Falco rusticolus islandus* Brünnich, have long been prized in falconry. Trading of this species was practiced generally until the 17th century when the rights were reserved for the King who distributed them widely among European royalty. Legislation protecting the species was finally passed in 1913. The number of breeding pairs in 1919 was estimated at about 100. The protective law was repealed in 1930 when the population had increased substantially. There was then a general decline resulting in a reestablishment of protection in 1940. However, the decline has continued due, in part, to poor enforcement and decreased ptarmigan populations. Possibly mink, which have escaped from fur farms, have contributed to the decline. There is a glossary (pp. 139-153) with equivalents in Danish, English, French, and German. The 64 figures include reproductions of a substantial number of old prints thereby enhancing the interesting nature of the book.—D.S.F.

72. Birds' Nests. A Field Guide. Richard Headstrom. 1949. Ives Washburn, Inc., 29 West 57th Street, New York 19. 128 pp. $2.75. This book presents an ingenious workable system for identification of the nests of nearly 300 species of birds of the United States east of the one hundredth meridian. Based primarily on site and type of habitat and secondarily on type of structure and nesting materials, this field guide should become readily usable with a minimum of practice. Ornithologists, biology teachers, and camp counselors should find it very useful. There is an index to species so that the description of the nest of each species is readily accessible. There are 61 excellent photographs of nests.—D.S.F.

73. The Awl-Birds. J. K. Stanford. 1949. The Devin-Adair Co., 23 East 26th Street, New York 10. 90 pp. After an absence of more than one hundred years, Avocets, *Recurvirostra avosetta* Linnaeus, have returned as breeding birds on the east coast of England. In an interesting piece of fiction the author has depicted the anxious efforts to protect this small colony. An egg collector is the villain and the subject of vitriolic censure. Beyond the immediate struggle to protect the Avocets one obtains many glimpses of the greater struggle to win back the finer things of pre-war life in England.—D.S.F.

74. List of Theses on the Ecology and Management of Wildlife. William P. Lawson and Neil Hotchkiss, Editors. 1950. *Wildlife Review*, 59. 62 pp. This number performs the invaluable function of systematically cataloging theses in wildlife management. "The list is reasonably complete for doctors' theses through 1948. It is incomplete for doctors' theses in 1949 and for masters' theses for the entire period." Arrangement is by subject with an index of authors.—D.S.F.