rank growth about seven to eight feet high remained standing all winter; the small seed and the open feeding ground beneath heavy cover made it much preferred over an adjacent food planting of Common Millet *(Setaria itatica)* and Grain Sorghum *(Sorghum vulgare)*.

Analysis of flock composition from banding data was not attempted; for, although individual flocks could be identified at times, mixing of individuals caused by trapping operations undoubtedly disturbed flock composition.—Paul Bruce Dowling, c/o August A. Busch Memorial Wildlife Area, Weldon Springs, Missouri.

Harris' Sparrow Transient Return; Other Sparrow Records.—On October 1, 1955, I secured my first return on this species, a bird banded as immature on October 13, 1953. This is the first return after banding over 8,000 individuals in the last thirty years. On May 4, 1940, a bird caught by Harry K. Hutter at Aberdeen, South Dakota was one that I banded September 16, 1937. Recoveries of this species have been: Oklahoma, 5; South Dakota and Texas, 2 each; Kansas, Minnesota and Missouri, 1 each. The Minnesota bird was banded in October and found dead the following May.

During the same period, 4,000 White-throated Sparrows have yielded no returns. three recoveries from Arkansas and one each from North Dakota, Oklahoma and Texas. The North Dakota bird was found at Southam (130 miles NW) in May after banding in September.

Gambel's Sparrows to the number of 786 have yielded a single recovery from Nebraska, two and one-half years after banding. White-crowned Sparrows, 334, and Lincoln's Sparrows, 1300, have produced neither recoveries nor returns.—O. A. Stevens, Fargo, N. D.

Bending a Net-Lane.—When using mist nets at a permanent banding station, it is often desirable to lay out permanent net-lanes in heavy cover or at its edge. At times it is hard to place posts for such net-lanes in the most desirable spots for capturing birds, because of the terrain, the location of trees and shrubs too large to move or too valuable to cut down, or the length of nets received. If a later batch of nets is different in length, it may be hard to duplicate an existing pattern of net-lanes.

One solution is to bend the net, at any desired angle, around a smooth pipe, set directly in the ground or in a pipe socket in the ground. The height above ground should be not less than that of the net posts. It is helpful to make a simple wire "S" hook to hold the top trammel near the top of the pipe, as the net will slide quite readily. If such a pipe is in a line of several nets, it has the incidental advantage of allowing very rapid access to the other side of the line. A rusty pipe, or a rough wooden pole, would tend to damage the net and be hard to handle.—E. Alexander Bergstrom.

RECENT LITERATURE

BANDING

(See also Numbers 11, 13, 24, 27, 33, 35, 44, 46)

1. Sixth Preliminary List of Recoveries of Birds Ringed in Greenland. (Sjette foreløbige liste over genfundne grønlandske ringfugle.) Finn Salomonsen. 1955. *Dansk Ornithologish Forenings Tidsskrift,* **49**(2): 130-135. (From the English Summary.) Gives the details of 36 recoveries of 7 species, including some splendid transoceanic ones. Included are a Snow Bunting from Quebec; a Wheatear from France; one Iceland Gull from Labrador, one from Scotland, another from the Faroes; six Murres and a Puffin from Newfoundland; and a score more Whitefronted Geese from Ireland.—O. L. Austin, Jr.

2. Additional Recoveries of Birds Ringed in W. Jutland. (Flere resultater af ringmaerkninger af vestjyske fugle.) *Dansk Ornithologisk Forenings Tidsskrift,* **49**(3): 186-191. (From the English summary.) From the 1167 birds (mostly juvenals) the author banded at West Jutland 1948-51, he has received 41 recoveries, an enviable 3.5 percent. He gives here the raw data without further comment.—O. L. Austin, Jr.

3. Modifications in Mass Goose Trapping Technique. Graham Gooch. 1955. *Journal of Wildlife Management,* **19**(2): 315-316. In the summer of 1953 a new method was devised for handling flightless Blue Geese *(Chen caerulescens)* and Lesser Snow Geese *(Chen hyperborea hyperborea)* for mass banding. As the geese are being herded toward the pen the goslings tend to drop to the rear. When the birds have been brought within ½ mile of the holding pen, the rear portion of the flock is segregated by a man running through the middle of the flock. The rear portion, which contains 90 percent goslings, is led directly to the pen, and the adults are placed in the pen leads. This prevents the usual trampling and plucking of goslings by the adults. The goslings in the lead pen are then segregated, banded, and released. As the young birds tend to remain in the vicinity of the pen after banding until the parents are banded and released, the number of birds deprived of parental protection is thus reduced. Mass banding was accomplished by this method without a single casualty. Peter Scott, working with Pink-footed Geese *(Anser fabalis brachyrhynchus)* in Iceland, used a similar technique.—Keith M. Standing.

4. Plastic Collars for Marking Geese. Lewis G. Helm. 1955. *Journal of Wildlife Management,* **19**(2): 316-317. To assist observers in making behavior studies on geese a plastic neck marker was developed. A strip of plastic upholsterer's fabric (Koroseal) 1½ inches wide by 6 inches long was placed around the bird's neck and the two ends stapled together. The marked birds became accustomed to the collar within a day or two. Observations indicate that these markers had no lasting effect on social habits, family groupings, or mating relations. After 4 to 6 months the plastic material became brittle, tore at the staples and fell off the bird's neck. Red, yellow, and white were the most easily observed colors. Fluorescent enamels and lacquers, which were applied to the white plastic in various combinations of stripes and circles, were visible up to ¼ mile. These collars were not successful on ducks.—Keith M. Standing.

5. Color Marking of Waterfowl. Frank A. Winston. 1955. *Journal of Wildlife Management,* **19**(2): 319. To trace the movement of waterfowl in Florida, 583 ducks trapped in the spring of 1954, mainly Blue-winged Teal *(Anas discors)* with a few Lesser Scaup *(Aythya affinis)*, Pintail *(Anas acuta)*, Shoveller *(Spatula clypeata)*, and Black Duck *(Anas rubripes)*, were banded and dyed a red color. The red ducks were easily identified either on the water or in flight. In their northern migration, reports came from both the Atlantic and Mississippi Flyways. This experiment was so successful that Florida will color ducks red, green, and yellow at three different locations during this coming fall, winter, and spring to help determine movements in and out of the state.—Keith M. Standing.

MIGRATION

(See also Numbers 24, 46, 51, 52)

6. Airborne from Gulf to Gulf. Aaron Moore Bagg. 1955. *Bull. Mass. Audubon Society,* **39**(3): 106-110, (4): 159-168. On 17 April 1954, migratory Indigo Buntings were observed in Florida and along the Atlantic coast from Long Island to Nova Scotia, but none were reported between Florida and Long Island. Bagg explains this distribution by assuming that the birds sighted in both localities were trans-Gulf migrants from Yucatan traveling with favorable winds. The birds observed from Long Island and northward overflew Florida on the 16th and rode a strong maritime tropical airflow northeastward to New England, where they were stopped by the same cold front on the 17th that halted a later-departing group in Florida. He provides complete meteorological data to substantiate his hypothesis in four easily understood meteorological charts and one vertical cross section across a cold front.

This paper could well serve as a model for any study of the influence of weather on migration. The only criticisms of it are minor indeed: Though the author uses the term "knot" correctly as a velocity in his discussion, he defines it as a "nautical mile," a distance, instead of a "nautical mile per hour," a speed. Also he uses the term "flow" in a context where readers unfamiliar with meteorological terminology might regard it as a synonym for "wind." However, reference to the charts should clear up any ambiguity.—William H. Allen.

7. Migration and Distribution. A Study of the Recent Immigration and Dispersal of the Scandinavian Avifauna. (Flyttning och Utbredning. Ett Bidrag till Kännedomen om den Skandinaviska Fågelfaunans Utbredingsdynamik.) Gunnar Otterlind. 1954. *Vår Fågelvärld,* **13**(1): 1-99. (From the ten-page English summary.) The first section summarizes changes in the Scandinavian avifauna during the past century, largely in response to cyclical variations in climate.

Otterlind analyzes the effect of migration upon such changes under two headings, prolonged and abbreviated. "Prolonged migration" is a spring migration which is extended beyond the birthplace or the earlier breeding locality but essentially in the normal migratory direction. The theory that it arises in species whose existing breeding grounds are overpopulated is supported by many records of very late arrival in new areas in species whose range is expanding. The most common cause of migratory prolongations is said to be high temperature during migration, which the Scandinavian ornithologists place great weight on as the basic stimulus to northward flights in spring (see, e.g., Gunnar Svardson, "Visible Migration Within Fenno-Scandia," *Ibis,* **95**: 181-211, esp. 192). However, this is an oversimplification in the view of other students of migration. Williamson ("The Spring Migration of the Willow Warbler in 1952," *Brit. Birds,* **47**: 177-197) acknowledges (p. 196) the remarkable conformity between the northward movement of the species and the northward movement of the spring isotherm. "This relationship, however, may be apparent rather than real, and it may be merely a secondary result of what is in our view the primary cause—namely the development of sub-tropical anti-cyclonic weather in Europe in the spring." Williamson goes on to repeat the hypothesis that: "the stable conditions of anti-cyclonic weather, with light winds and clear skies, present the optimum opportunity for the movement of large numbers of birds."

As a minor cause of prolonged migration, Otterlind mentions the possibility of a bird being caught up in a flock of another species which normally nests farther north.

A third factor is the summer movement of young herons and other species, where it is said that individuals may spend long periods at a certain lake, and then return there to breed the next season. It is not clear from the summary whether there is evidence from banded birds to support this, while a number of banding studies of immatures of species known to have a tendency to random dispersal in late summer have failed to demonstrate return of such immatures as breeding birds to areas they had visited in that dispersal (see the discussion in Chapman, "Studies of a Tree Swallow Colony (Third Paper), *Bird-Banding,* **26**: 45-70, esp. 53-58).

Otterlind feels that the effect of these causes depends on a hereditary variation in the intensity of the migration instinct, that the individuals with a strong migratory instinct react most vigorously to these causes, that a selection takes places at the north edge of the breeding range toward a more pronounced migratory instinct, and that this must be the most important cause of migration such as that of the Fox Sparrow *(Passerella iliaca)* on the Pacific coast of North America. It is not clear why he dismisses the simpler belief that the more northerly races occupy habitats which are suitable in summer but unlivable in winter, and that in finding suitable winter quarters down the coast it is necessary to pass over the range which would be suitable if not pre-empted by a resident race.

Species which have moved into the Scandinavian peninsula from the south and southwest have been more successful than those from the southeast or east, primarily because of the Baltic: its topography leads to less concentration of migrants from the southeast or east, and thus less chance for a straggler to find a mate in an area where the species does not already nest regularly. Other points affecting the chance of finding a mate include: (1) a species nesting almost anywhere in deciduous woodland has less chance than one nesting, e.g., on lakes; (2) whether the species migrates in flocks; (3) whether it normally sings during the same part of the 24 hours in which it migrates; (4) the influence of islands

—partly reluctance to fly over any considerable sea distances beyond the island, partly a concentration of habitat; (5) whether males migrate earlier and can then attract the females by their song.

There are of course many instances of migration prolonged so excessively that the birds reach unsuitable habitat. The cause is said to lie in the extremely strong migratory urge of some individuals, possibly under unusually favorable weather conditions, and the shortage of individuals of the opposite sex once the bird gets beyond its normal breeding range at all. Here others might lay more stress on *unfavorable* weather such as high winds, on faulty "navigation" by certain individuals, and question whether these very distant stragglers actually make a first stop in an area a little way beyond their normal breeding range. In the long run, banding may afford some proof.

Straying in the fall migration may hinder the expansion of a species. It is thought that species normally migrating to the southeast may change to a southwest direction after colonizing a new area where winter quarters can be reached more speedily by going southwest. Definite proof seems to be lacking, while Otterlind does not refer to the many examples of species retaining an ancestral migration route which is markedly longer than a more obvious route (e.g. the Bobolink, *Dolichonyx oryzivorus,* in irrigated areas in the western United States).

An abbreviated migration is defined as a spring migration which is curtailed before the birds have reached their birthplace or earlier breeding locality. The primary cause is low temperature during the migration period, but some examples are ascribed to low vitality following a severe winter.

Further evidence that young birds are pioneers in colonizing new areas is the unusually high proportion of year-old birds appearing in new areas, in several species where plumage permits this distinction. The young birds appear more adaptable to somewhat different habitat; even though substantial losses are incurred, the final result is an expansion of range.

A solid, stimulating paper, though some of the theories expressed or implied are much more controversial than Otterlind suggests.—E. Alexander Bergstrom.

8. Meteorological and Social Factors in Autumnal Migration of Ducks. Mildred Miskimen. 1955. *The Condor,* **57**(3): 179-184. Migratory ducks were observed daily at the O'Shaughnessy Reservoir near Columbus, Ohio, from October 24 to December 12, 1951. The reservoir, on which hunting is prohibited, is surrounded by agricultural land and scattered dwellings. Black Ducks, *Anas rubripes,* Mallards, *Anas platyrhynchos,* and Lesser Scaups, *Aythya affinis* were sufficiently abundant to warrant special study. Shortly after sunrise large flocks arrived and then rested on shore or in rafts during the day. Departures were made between sunset and dark. Ducks could be heard arriving and leaving at night. No flock movements occurred during the day. Counts were made each afternoon when the ducks on shore joined the rafts on the water. The daily cycle of resting and feeding was apparently regulated by light intensity. Ducks were more active (except for actual migration) on dark, overcast days than on bright days. Population numbers decreased following evenings of clear sky. The pre-frontal conditions of overcast seemed to induce flock building. If such pre-frontal conditions lasted for several days, there would be considerable build-up before a strong cold front with its rapidly clearing sky would induce a larger migratory movement than usual.—L. Richard Mewaldt.

9. Records of the Black Brant in the Yukon Basin and the Question of a Spring Migration Route. Tom J. Cade. 1955. *Journal of Wildlife Management,* **19**(2): 321-324. Various records of the Black Brant *(Branta nigricans)* from the Yukon Basin indicate a large and regular spring movement through the basin, and suggests the need for closer attention to its movements and distribution.—Keith M. Standing.

10. The Bohemian Waxwing in Germany 1946-1954. (Der Seidenschwanz (Bombycilla garrulus) in Deutschland 1946-1954.) F. Burr. 1954. *Ornithologische Mitteilungen,* **6**(12): 245-255. This review of the status of the waxwing over the years indicated shows that there were two pronounced invasion winters, 1948-49 and 1953-54. The paths of invasion and departure were different in both cases.—R. O. Bender.

11. Bird Migration at Blåvandshuk, September 1954. (Fugletraekket ved Blåvandshuk, September 1954.) Davis Jenkins and I.C.T. Nisbet. *Dansk Ornithologisk Forenings Tidsskrift,* **49**(3): 149-181. (From the English summary.) Series of regular observations of both diurnal and nocturnal migration through the month at Jutland are compared with others made in South Sweden and South Norway during the same period. As a correlation between diurnal migrants can be established between Jutland and South Norway but not between Jutland and South Sweden, it "suggests that the September 1954 diurnal migration along West Jutland coast had its origin in Norway rather than in Sweden. The movements of night migrants were more heterogeneous. It is suggested that early in September many night flying birds were 'drifted' by easterly winds across the Baltic Sea to South Sweden and Denmark, and that later these birds redirected their flight to the south . . . following this period many night migrants appear to have crossed from Norway to Denmark in cyclonic conditions with westerly winds." Lists are given of all birds observed, and of the 48 birds of 12 species caught in a Heligoland trap and banded.—O. L. Austin, Jr.

POPULATION DYNAMICS

(See also Numbers 20, 21, 34, 44, 52)

12. An Experimental Approach to the Study of Bird Populations. V. E. Shelford. 1954. *The Wilson Bulletin,* **66**(4): 253-258. An attempt is made to show positive correlation between numbers of nests of pheasants, *Phasianus colchicus,* per 100 acres of Ohio farm land during 9 years (1936-39 and 1945-49) and the incidence of sunshine and rainfall in April of the preceeding year. Maximum reproductive success is postulated to occur through a graded set of conditions in which as April rainfall increases from about 2 to 5 inches, the amount of possible sunshine decreases from 70 to 45 percent. Other factors which influence numbers of nests and reproductive success are not evaluated or even mentioned. Although I do not deny that there may be some merit in Dr. Shelford's postulation, the evidence he presents is inadequate. The article ends with a plan for an avian research facility and a plea that such a facility be made available.—L. Richard Mewaldt.

NIDIFICATION AND REPRODUCTION

(See also Numbers 12, 53)

13. The Puerto Rican Honeycreeper (REINITA) *Coereba flaveola portoricensis* (Bryant). Virgilio Biaggi, Jr. 1955. University of Puerto Rico, Agricultural Experiment Station, Special Publication. 61pp. This little bird, mostly black with a yellow breast and weighing about 10 grams, is the commonest bird in Puerto Rico. It has adapted itself to civilization and is well loved by the inhabitants, who often put out bowls of sugar which 8 to 10 Reinitas may enjoy at one time. While breeding, however, it is strongly territorial, defending an area around the nest, although getting much of its food outside the territory. Banding with numbered and colored bands showed that pairs stayed together throughout the nesting season and that individuals remained within a restricted area for as long as 2 years. Nests are built both for roosting and nesting; these are globular structures placed at the tips of branches. Both birds build, but the female incubates and broods. Honeycreepers may steal material from a neighbor's nest even when the latter is incubating, and one bird carried off strands from her nest containing young to her nest for the next brood. The average length of periods on the nest during incubation was 42 minutes, the average time off 22 minutes, the female incubating 74 percent of the time during daylight. Young stayed in the nest for 14 days and were cared for by parents for 10 to 12 days afterwards. A good study.—M. M. Nice.

14. Red-Footed Falcons in Ohat-Woods, near Hortobagy. L. Horváth. 1955. *Acta Zooloogica Academiae Scientiarum Hungaricae,* **1**(3-4): 245-287. A very interesting paper. In 4 rookeries from 10 to 45 pairs of this handsome little falcon, *Faclo v. vespertina,* were found, in each instance the falcon population amounting to about 13 percent of that of the Rooks, *Corvus frugilegus.* The falcons group together, sometimes as many as 3 to 5 pairs in one great tree. A preference was shown for higher nests, but not for better built ones. No nesting material is added. Male and female share incubation. Until the young were 10 days old the male brought all the food, while the feeding was done by the female. During the first 2 weeks the young received frogs, lizards, grasshoppers and fledgling birds, during the last two predominantly Orthoptera, which appear to constitute the sole diet of the adults. The identity of each prey item is given for four all day observations, Aug. 6, 7, 16, and 21. The total number of trips per day was 38, 75, 64, and 45, of which the male brought 126, the female 96. Unfortunately neither the number of young involved nor their ages is stated. Fledging takes about 28 days. Rooks and Tawny Owls, *Strix aluco,* destroy some eggs, and Goshawks, *Accipiter gentilis,* take some young. Of 105 eggs, 67.5 percent hatched, and 67.6 percent of these nestlings flew—45.7 percent of all the eggs, a figure corresponding to the success of passerines in open nests. "30 broods produced 48 successfully fledged young, this means a progeny 1.6 per nest," (p. 280).

As to incubation periods the author gives the following figures for four nests without presenting dates of laying and hatching: 21½, 22, 27, 28. In regard to nest XVI: "In egg laid on 3 June peeping of young audible on 5 July, 5 p.m. By then egg has been 20.5 days old [*sic*]. From then on I inspected this egg daily, until it finally hatched on 8 July, at about noon. Cracking up of this egg progressed very slowly, having a particularly thick shell. It is probably due to this, that hatching took place 4-4.5 days after chick's first sound only, instead of the usual 1.5-2 days," (p. 258). From June 3 to July 8 is 35 days, yet XVI is listed as hatching in 25 days. There would appear to be some confusion in the records in respect to the two short periods listed, and probably misprints in the account of nest XVI. The incubation period of other falcons has been found to last 28-29 days.—M. M. Nice.

15. Parental Care in the Whitethroat. R. W. Crowe. 1955. *British Birds,* **48**(6): 254-260. Observations on the nesting of a number of pairs of *Sylvia communis.* Tables give details of incubation, brooding and feeding at 9 nests. "The male spent longer on the nest at the start of incubation than at the end, whilst the opposite was the case in the female." The female incubated at night and did most of the brooding, but both parents fed about equally.—M. M. Nice.

16. Observations on a Pair of Nightjars at the Nest. H. R. Tutt. 1955. *British Birds,* **48**(6): 261-266. Observations at a nest of *Caprimulgus europaeus* from the hatching of the young. The chicks flew at 14 to 15 days, but returned to the nest site. They were still there when 28 and 29 days old, but at 21:40 left with their parents. The whole family were still together on and near the nest site when the young were 45 to 46 days old.—M. M. Nice.

17. The Incubation Period of the Cape White-eye. J. M. Winterbottom. 1955. *Wilson Bulletin,* **67**(2): 135-136. The first detailed observations on the nesting of *Zosterops pallida capensis* showed a minimum incubation period for the second egg of 11½ days from laying to hatching. In *Notornis,* **5**(8): 255, 1954, C. A. Flemming reviewed my "Question of Ten-Day Incubation Periods," *Wilson Bulletin,* **65**: 81-93, pointing out how the supposed 9 or 10 day incubation period of *Zosterops,* based on a guess in 1887, had been quoted all over the world, yet the careful observations on 11 or more nests showed nothing shorter than 11 to 12 days.

It is a shock indeed to find this note appended to Mr. Flemming's excellent review: "(Fisher in "The Fulmar" has stated that the incubation period of the blackbird ranges from 9 to 18 days. If this is correct, it would not be surprising if *Zosterops* sometimes had a similar period.—Ed.)" Here again—a bare statement in a book, unsupported by a shred of evidence, is brought forward to refute the results of extended correspondence with ornithologists in New Zealand

and Australia and weeks of research in libraries in an attempt to find out the truth. Will we never learn to evaluate evidence?—M. M. Nice.

18. Observations on the Summer Tanager in Northeastern Kansas. Henry S. Fitch and Virginia R. Fitch. 1955. *Wilson Bulletin*, **67**(1): 45-54. Pairs of *Piranga rubra* were well separated on the University of Kansas Natural History Reservation, so that "songs of neighboring males never were audible." The nesting of one pair was followed. On May 11 the female was first seen taking an interest in a certain fork of an elm; on May 18 she was seen carrying stems to the site, from May 21 to 24 she worked in earnest and on the 29th laid her first egg. Incubation was performed by the female; both birds fed the young. These developed rapidly: at 3 days, their eyes were open; at 6 days one hopped about on the desk while being weighed; at 7 days they were frightened from the nest by a Red-bellied Woodpecker, *Centurus carolinus;* at 10 days they flew, but were cared for by the parents for 19 more days.

The authors state "the incubation period was approximately eleven days," (p. 49). The four eggs were laid May 29 to June 1; none had hatched during the late afternoon of June 11, but two were hatched by 8:15 a.m. June 12. "The third probably hatched later this same day, as it was found to have hatched on the following morning when the nest was next examined. . . . The fourth egg did not hatch." Length of incubation is calculated from the laying of the last egg to its hatching, when all eggs hatch. As one egg did not hatch, and furthermore, as the day of hatching of the third nestling was unknown, it is completely unwarranted to conclude: "Incubation lasted eleven days," (p. 56).—M. M. Nice.

19. Determinate Laying in Barn Swallows and Black-billed Magpies. David E. Davis. 1955. *The Condor*, **57**(2): 81-87. Dr. Davis proposes that a species of bird may "be considered determinate if during the laying the addition of eggs to some nests and the removal of eggs from others both fail to produce a difference between the number of eggs laid consecutively in such nests and the number laid consecutively in an unmolested clutch." Series of eggs with gaps in the daily sequence are assumed to consist of several clutches. Although the Yellow-shafted Flicker, *Colaptes auratus,* the Wryneck, *Jynx torquilla,* the House Sparrow, *Passer domesticus,* the domestic fowl, *Gallus,* and ducks, *Anas,* may be indeterminate layers, no clear proof was found in the literature that any species is indeterminate *by the above standards.* Application of these standards to Barn Swallows, *Hirundo rustica* and Black-billed Magpies, *Pica pica,* both of which lay relatively large clutches, indicates they are determinate layers. For a population of Barn Swallows in Maryland, the normal clutch size was 5.0, whereas clutch size in nests from which eggs were removed daily (leaving one egg) averaged 4.7 eggs and in nests to which eggs were added (after the first egg was laid) averaged 4.6 eggs. Corresponding values for Black-billed Magpies in Montana were 7.2 eggs in the normal clutch, 7.0 eggs in clutches when eggs were removed, and 5.9 eggs when eggs were added. Dr. Davis suggests that the reduced averages from normal in these two sets of observations may be attributed to interference by the investigators.—L. Richard Mewaldt.

20. Nesting Studies of the Coot in Southwestern Manitoba. William H. Kiel, Jr. 1955. *Journal of Wildlife Management*, **19**(2): 189-198. Coot *(Fulica americana)* nesting was studied for four years, 1949-1952, in a pothole area in southwestern Manitoba. Census techniques, which were designed primarily for ducks and provided only an index to measure trends in the coot population, indicated declines in breeding coots during this period. The number of nests also decreased 58 percent. Cattail and bulrush were the preferred cover types for nesting. Fluctuating water levels affected the availability and attractiveness of some cover types, particularly sedge-whitetop. Nesting success of coots was 97 percent of 380 nests over the 4-year period. The mean clutch size of 169 complete clutches was 9.9 eggs. Egg hatchability was 99 percent of 1,394 eggs in successful nests with complete clutch counts. Coots had higher nesting success than over-water-nesting (73 percent) or land-nesting (50 percent) species of ducks in the study area.—Keith M. Standing.

21. Twilight for the Peregrine? (Wanderfalkendämmerung?) C. Demandt. 1954. *Ornithologische Mitteilungen* **7**(1): 5-6. The author, reviewing his records, concludes that this species now lays fewer eggs (1-2) than formerly (3-4). Although he has no explanation for the decrease in clutch size, he believes that it is the reason for the decrease in the Peregrine population.—R. O. Bender.

22. On the Nest-site of the Stock Dove. (Om skogsduvans *(Columba oenas* L.*)* häckningsmiljö.) S. Durango. 1955. *Fauna och Flora,* 1955 (1): 25-31. (From the English summary.) The Stock Dove usually nests in holes in trees, but also uses rabbit burrows in sand dunes and crevices in cliffs and old buildings. While a hole is a "fundamental element in the habitat of this species, and the holes are certainly the most common and safest nest sites in most parts of its range, where trees are scarce or absent or when terrestrial enemies are few, the Stock Dove freely nests on the ground."—O. L. Austin, Jr.

BEHAVIOR

(See also Numbers 13, 14, 53)

23. Observations on Voice and Behaviour of the Red-legged Partridge *Alectoris rufa.* Derek Goodwin. 1953. *Ibis,* **95**: 581-614. The most important paper I have found on the behavior of a member of the Galliformes. The study was made largely on tame, captive birds, but checked by observations in the wild. It is illustrated with excellent sketches of the various displays. Fourteen notes and their functions are described. "The common display, in which the conspicuous markings of flanks, face and neck are presented, is primarily threatening. It is shown when the impulse to attack is inhibited by fear or sexual feeling. Feeding movements are also shown under conditions of inhibited aggressiveness." "The male selects the nest-site and makes the nest." When the first nest is full of eggs, he makes another. When the second is full, he sits on the first and his mate sits on the second. As soon as Mr. Goodwin's male started to sit, he "shed all his former bombastic and aggressive masculinity of manner. He no longer 'sang,' displayed at me, or answered his rival's challenges. Although tame as ever, he was silent and furtive when off the nest, walking with 'feminine' stance and posture," (p. 597). Very interesting observations are given on parental care and development of the chicks with discussions of the significance of many activities and comparisons made with other species. "Any object swooping towards the chicks releases an aggressive response in the parent. Birds of prey in flight are recognized innately," (p. 612). The biological value of the chick's differing reactions in regard to food is pointed out: when it finds a supply it gives notes that attract others, but when it discovers a single large piece it dashes away with it. The crouching with tail raised high in "play" (or "frolicking") "may be of use in presenting the easily spared tail feathers to the talons of a stooping predator," (p. 608).—M. M. Nice.

24. The Winter Society of the Oregon Junco: The Flock. Winifred S. Sabine. 1955. *The Condor,* **57**(2): 88-111. A careful analysis of more than 850 hours of detailed observations on winter flocks of free-living color-marked Oregon Juncos, *Junco oreganus,* at feeding stations provides considerable insight into their social structure. Observations were made in the winter of 1948-49 at 5,000 feet elevation in Deep Springs basin in Inyo County, California and in the winter of 1949-50 at near sea level at Seattle, Washington. Juncos were marked by cementing one or two colored feathers to the deck rectrices. Marked birds included 120 Juncos (winter residents and transients) at Deep Springs and 33 Juncos (residents and winter residents) at Seattle. Unmarked birds at both locations provided additional data.

The flock apparently gains its stability from a common feeding circuit consisting of definite feeding spots. Solitary individuals and groups of various sizes move freely within this circuit. Two neighboring flocks may amalgamate without apparent hostility and there is some evidence that one of the flocks will abandon its previous feeding circuit. Visits to the feeding stations were more frequent on cold days than on warm days. Heavy snow induced visitors to mix and feed freely with the flock until the return of normal feeding conditions when they completely detached themselves. Residents and winter residents may be in the same flock. Casual visitors from other flocks are tolerated. Transients in migration feed more frequently than winter residents and probably attach themselves to flocks already formed rather than feed at random. Dispersal of a flock of winter residents during the spring migration took place in a series of abrupt disappearances. Dispersal of residents was evidenced in part by intolerance of other flock members by the dominant male and his mate. Thereafter the relatively close social relations of the resident flock in winter gave way to the wider spacing characteristic of the breeding season.—L. Richard Mewaldt.

25. Hibernation in Captive Goatsuckers. Joe T. Marshall, Jr. 1955. *The Condor,* **57**(3): 129-134. The body temperature, respiratory rate, changes in weight, and behavior of hand-fed caprimulgids in the winter of 1950-51 in Arizona are reported. Two young Trilling Nighthawks, *Chordeiles acutipennis,* each found with a broken wing in July were kept in an unheated room on essentially natural photoperiods. They took food daily until November 28, but were in a dormant state about noon the next day. That evening, when room temperature was 18.7°C., their oral temperatures were 18.6° and 19.2°. Both birds died after their body temperatures were increased to near normal with the help of an electric pad. Large deposits of fat were present on both birds, suggesting a readiness for hibernation.

Three grown Poor-wills, *Phalaenoptilus nuttallii,* were captured in the fall and fed regularly until December 28, day of the first freeze of the winter, when food withholding experiments were begun. They were kept in an unheated shed which provided room for limited flight. As long as they were fed, the birds remained active in spite of cold weather. When unfed, they became torpid for periods of from ½ day to 4 days. They were released in apparent good health in the spring. Body temperatures of torpid birds varied from 6° to 17.5°. Respiratory rates of resting but non-torpid birds were recorded at 50 to 67 per minute, whereas no visual evidence of respiratory movements were detected in torpid individuals. In contrast to the Nighthawks, which became torpid when very fat, the Poor-wills did not become torpid until they were induced to lose about 20 percent of their weight by the withholding of food. Although not directly applicable to this paper, I suggest that the detailed observations and experiments of Jukka Koskimies reported in 1950 in "The Life of the Swift, *Micropus apus* (L.), in Relation to the Weather" may be of interest to American investigators *(Annales Academiae Scientiarum Fennicae,* Series A. IV. Biologica **15:** 1-151).—L. Richard Mewaldt.

26. Experiments on Winter Territoriality of the American Kestrel, *Falco sparverius.* Tom J. Cade. 1955. *The Wilson Bulletin,* **67**(1): 5-17. After the nesting season in Southern California, resident Kestrels assume and defend winter hunting territories either in pairs or as individuals. Migratory birds impinge on these territories and establish territories of their own when they arrive during the fall. Reactions of territorial birds to a live "lure-female," a live "lure-male," a mounted "dummy-female," and a mounted "dummy-male" were studied during months from August to March. Kestrels which were trapped and banded or marked in some other manner reacted differently before and after being handled, making it necessary to experiment mainly with untrapped birds. Untrapped birds did not show alterations in responses even after many repetitions of the same "lure-" or "dummy-" presentations. Reactions to the experimental objects placed in their territories varied from apparent indifference to violent attacks. Most males and females attacked the "lure-male." Most females attacked the "lure-female," but very few males made attacks on the "lure-female." Fewer attacks were made on the dummies than on the live captives, suggesting ". . . that movements and vocalizations are stronger releasers of aggressive behavior than are form and pattern *per se.*" The possible significance of the general subordinance of the male to his mate during the breeding season is discussed.—L. Richard Mewaldt.

27. Flight-reaction and Bird Trapping. (Fluchtreaktion und Vogelfang.) W. Jahnke. 1955. *Ornithologische Mitteilungen,* **7**(4): 70-71. This short, but interesting paper illustrates ways in which bird banders can contribute to a knowledge of bird behaviour by close observation. The author points out differences in reaction to a net suspended over a mountain stream between the Dipper and Kingfisher on the one hand and the Grey Wagtail on the other. The first two fly close to the surface of the water, usually upstream, in the middle of the brook and rarely escape the net. The Grey Wagtail is able to perceive the net and turn to one side to avoid it, frequently flying over it even when it is placed at an angle. The author's drop traps (Schlagfalle) took from 1/25 to 1/50 of a second to fall after release. With them he was able to detect differences in behaviour not only between species, but also between individuals. The Black Redstart could not only escape in this time but could also seize the bait (a mealworm) and escape. The Crested Lark, which never entered the area under the trap except when snow was on the ground, could also escape. Other interesting examples are given. We banders, using the same techniques, should be able to make similar, useful contribution.—R. O. Bender.

28. Diving Reaction as a Flight Characteristic of the Common Sandpiper *(Actitis hypoleucos).* (Tauchreaktion als Fluchtäusserung beim Flussuferläufer.) F. Meyer. 1955. *Ornithologische Mitteilungen,* **7**(8): 149. This brief note describes several instances of diving from full flight as a reaction of the Common Sandpiper to danger. Similar instances have been reported for our Spotted Sandpiper.—R. O. Bender.

29. Thermal Air Currents and Their Use in Bird-Flight. G. H. Forster. 1955. *British Birds,* **48**(6): 241-253. A discussion, illustrated with eight figures, of ascending air currents and the use made of them by birds in flapless flight.—M. M. Nice.

30. Red-crested Pochard Drakes Bringing Food to their Mates. E. H. Gillham. 1955. *British Birds,* **48**(7): 322-323. In early April 1954 four pairs of *Netta rufina* were watched in a London Park. Each male dove repeatedly, and on surfacing "swam towards his mate with a bill-full of green 'weed' and shared it with her." The "weed" was the alga *Rhizoclonium hieroglyphicum.* "Later, on several occasions, I saw the hens diving as well, but although they brought the 'weed' to the surface, it was devoured immediately and they did not swim with it to their mates." June 1 and 2 the author "saw adult females diving and bringing up the same green matter for their young (aged about four weeks or over)." Here appears to be the second instance of "courtship feeding" among Anseriformes, the first example being the Wood Duck, *Aix sponsa* (Heinroth 1910). It also seems to be the first instance of a duck bringing food to her young. I wonder whether the ducks, as earlier in the season, did not bring it up for their own consumption without regard to the young who simply helped themselves. —M. M. Nice.

31. Notes on European Wild Pigeons. Derek Goodwin. 1955. *Avicultural Magazine,* **61**: 54-85. Very interesting comparative study of behavior. Some of the topics discussed are nest-calling; driving, which occurs when potential rivals are present, thus functioning to prevent infidelity of the female; nest-building, in which the male in all branch-nesting species steps on his mate's back when giving her twigs. Helpful suggestions are presented on "hand-rearing, imprinting, settling, etc." "Most often . . . young brought up with both their own and another species as companions (having been fed by their *own* parents and then by man) will later react socially to both species, and often to humans as well. They will generally pair most readily with their own kind, owing to mutual 'understanding' of the specific notes and displays," (p. 81). The European species are treated in detail and two pages are devoted to a comparison of European and North American species. Vivid sketches add much to the value of this thought-provoking paper.—M. M. Nice.

32. A Study of the Behavior of the Blackbird. (Bidrag til Solsortens *(Turdus m. merula* L.) biologi.) Hans Lind. 1955. *Dansk Ornithologisk Forenings Tidsskrift,* **49**(2): 76-113. (From the English summary.) A detailed study of the "territorial and social aspects, searching for food, formation of pairs, and courtship display" of this common European thrush, whose habits are most interesting in comparison to those of our somewhat similar American Robin. Of particular significance are the differences he notes between the behavior of urban and woodland Blackbirds, which "may be due to the richer and more easily accessible amount of food in urban localities. This may in winter as well as later on cause a less pronounced urge to migrate and an earlier development of the breeding motivation, a greater population density and a possibility for rearing more broods."—O. L. Austin, Jr.

WILDLIFE MANAGEMENT

(See also Numbers 3, 4, 5, 8, 20, 53)

33. Mourning Dove Investigations in Kentucky. Dan M. Russell. 1954. Dept. of Fish & Wildlife Resources, Frankfort, Kentucky, pp. 1-82, photo-offset. This "Four Year Progress Report For the Period July 1, 1949 to June 30, 1953" of the Mourning Dove studies conducted in Kentucky under the Pitman-Robertson Act is one of the soundest and most conservative of the several state reports I have seen. The management problem in Kentucky is similar to that in other southeastern states—how to allow the greatest amount of hunting without endangering the dove population. The population is at its peak in late August, early September, and declines sharply as the migrants move out before the first of October. In assessing the species' productivity, the author shows that though nesting starts in February and continues into October, the peak of the nesting is in May and June, and less than 2 percent of the season's eggs are laid after 1 September. The banding evidence indicates strongly that most of the doves shot in Kentucky are reared there—only four banded outside the state have been reported killed there, but the author wisely notes that "many more band recoveries from nestlings would be needed to support such an argument.

To determine the effects of early season hunting on the breeding population, hunters' bags were examined for the presence of breeding adults, determined by the presence or absence of glandular tissue in the crop. This showed 9.4 percent of the adults killed in September to be "in breeding condition," or 3.1 percent of the total bag. This is the only set of data I question seriously—absence of glandular tissue in the crop does not necessarily mean a bird is not in breeding condition. Its presence only indicates young are being fed.

The author recommends in conclusion that the "shooting period in Kentucky should begin no later than September 1, when the dove population in the state is at its peak. The population peak is maintained for a relatively short period, after which dove territory is not attractive to hunters." He points out earlier (p. 69) that neither length of season nor daily bag limit is "a plausible means of controlling the kill," and that "the surest way to regulate the number of doves killed in Kentucky is through manipulation of opening dates. The later the season is opened, the less doves will be killed. Days added to the terminal end of the season would quite likely provide better sportsman-management relations, [and] would probably not reduce the harvest by any appreciable amount."—O. L. Austin, Jr.

34. Some Suggested Relations of Prairie Chicken Abundance to Physical Factors, Especially Rainfall and Solar Radiation. V. E. Shelford, and R. E. Yeatter. 1955. *Journal of Wildlife Management,* **19**(2): 233-242. Linear graphs of physical conditions have failed to make possible interpretations of year-to-year relations of animal populations to weather and climate. Several separate phases of the problem are mentioned. Shortness of the usable population period, lack of on-the-area weather data, and change in cover conditions introduced difficulties in the study of paired factors. Two paired-factor diagrams are presented as tentative material. Areas not disturbed by agricultural trends are important for this type of study.—Keith M. Standing.

35. Factors Influencing the Fall Roadside Pheasant Census in Iowa. Eugene D. Klonglan. 1955. *Journal of Wildlife Management,* **19**(2): 254-262. This study was made to determine quantitatively the effects of the physical factors which affected the fall roadside census, in order to decrease the size of sample necessary to predict population changes. Two 30-mile routes in north-central Iowa were run on alternate days, beginning at sunrise, from August 1 to October 31. Complete weather data were gathered before and after the census. Rain falling during or before the run resulted in wide variation in the counts. Fog resulted in counts significantly lower than those under normal conditions. Wind direction and actual barometric pressure had no discernible effect. When frost was present the census was deleted from the results. Multiple linear regression analysis was made of the relationship of dew, wind velocity, relative humidity, cloudiness, temperature, and rate of pressure change to the number of pheasants observed per mile on each route. Application of t-test showed only the dew factor was significant for both routes. Simple linear regression of birds per mile on dew was nearly as good as the multiple regression for purposes of making adjustments in the population estimates. No allowances were made for inter-relation among the factors. Starting the counts at the same time in respect to sunrise alleviated the necessity for making time corrections. August appeared to be optimum time for conducting the census. A substitute was devised for the standard Duvdevani dew gage.—Keith M. Standing.

36. Spring Food Habits of Surface-Feeding Ducks in Maine. Malcolm W. Coulter. 1955. *Journal of Wildlife Management,* **19**(2): 263-267. This report summarizes the food contents of 72 stomachs (gizzard and gullet) taken in early spring. The 72 specimens included 39 wood ducks *(Aix sponsa)*, 20 black ducks *(Anas rubripes)*, 12 green-winged teal *(Anas carolinensis)*, and one blue-winged teal *(Anas discors)*. Stomach contents were washed, screened, separated, and measured to the nearest tenth of a cubic centimeter. Tabulation of food material was by the "percentage-by-bulk" method. The areas of collection were classified as either sedge-meadow marshes or wooded streams. In each group of birds the sedges and burweeds were found in large quantities and comprised one-half to two-thirds of the foods eaten. Almost all of the material consisted of seeds. Pondweeds, ordinarily considered important duck foods, were of low incidence, probably because they were not available. Small amounts of terrestrial and semi-terrestrial plants were recorded. Animal food, largely insect larvae, was found in 36 percent of the stomachs.—Keith M. Standing.

37. A Method for Obtaining Sage Grouse Age and Sex Ratios from Wings. Robert L. Eng. 1955. *Journal of Wildlife Management,* **19**(2): 267-272. In this study wings from 247 sage grouse of known sex or age were examined. Primary measurements obtained from wings of birds of known sex were placed into one of four molt stages with the sexes kept separate within each group. Primary measurements from birds of known age were placed into similar categories but were separated as to juveniles or adults. Sex determination was accomplished by an established difference in length of individual primaries in different stages of molt. Age determination was based upon the presence or absence of juvenile primaries 1 and 2, condition of primaries 1 and 2, or the difference in length between primaries 2 and 3 depending upon the stage of molt. Sex and age ratios obtained by this method show similarity to ratios from a group of known sex and age birds from the same areas.—Keith M. Standing.

38. Quail Preference for Seed of Farm Crops. Victor C. Michael and Stephen L. Bechwith. 1955. *Journal of Wildlife Management,* **19**(2): 281-296. This study concerns: The relative preferences of penned Bobwhite Quail *(Colinus virginianus)* for a wide variety of seeds; the effect of seed placement on the preferences; olfactory perception; food preferences of harvester ants and native rodents, principally the cotton rat; and the effects of restricted seed diets on the quail. The results, based on 600 feeding trials in which 53 different food items were offered simultaneously to the birds, indicate they prefer grass seeds over those of legumes, and seeds of annual grasses over those of perennial grasses. When offered a variety of foods with a wide range of palatability, quail search out the preferred foods whether their placement is varied or kept constant over a period of time. Harvester ants have food preferences similar to those of quail; a single colony of these ants can consume as much food as a covey of 8 to 10 quail. Cotton rats and other native rodents prefer foods of low attractiveness to quail. When fed diets of a single kind of seed for an extended period, symptoms characteristic of vitamin A deficiency developed after 20 days. Hen quail are more than twice as susceptible as cock quail to mortality from inadequate diet. —Keith M. Standing.

39. Measuring the Yield and Availability of Game Bird Foods. Verne E. Davison, L. M. Dickerson, Karl Graetz, W. W. Neely, and Lloyd Roof. 1955. *Journal of Wildlife Management,* **19**(2): 302-308. Wildlife management techniques require study of the food supply—its dependability, seasonal availability, and comparative ratings between species. Five commonly used methods of evaluating game-bird foods are mentioned. Seed traps are described and ground sampling explained. A mechanical seed-cleaner is described as an important facility in handling either seed-trap or ground-sample materials. These methods convert game-bird food analysis to pounds of seeds per acre, thus permitting comparison between: (1) Species of plants, (2) various soils provinces, (3) climatic ranges, and (4) agricultural manipulations of the food element in an environment.—Keith M. Standing.

MORPHOLOGY AND ANATOMY

(See also Number 37)

40. A Study of Purple Finch Winter Weights. Fred D. Bartleson, Jr. and Ove F. Jensen. 1955. *The Wilson Bulletin,* **67**(1): 55-59. From December 16, 1946 to April 12, 1947, Mrs. Jensen recorded more than 1,300 weights of 494 Purple Finches, *Carpodacus purpureus,* in Chapel Hill, North Carolina. Biometric treatment of the weights failed to reveal detectable differences between adult males, adult females, and immature birds. Highest hourly mean weight was 26.8 grams at about 3 PM when the birds weighed 3.5 grams more than at 6 AM. During two hours following 3 PM there was a mean drop of 1.4 grams, while 2.1 grams were lost during the hours of darkness. Body weight showed a tendency to increase with decreased environmental temperature. Weights increased from late December to early February and then gradually decreased until the finches left the banding station in early April.—L. Richard Mewaldt.

41. Heart Weight in Birds. Frank A. Hartman. 1955. *The Condor,* **57**(4): 221-238. Weights of more than 1,340 hearts from 291 species and subspecies of birds in 64 families are recorded from eastern United States and from Panamà. Body weights by sex and heart weights as a percent of body weight are given for each species and subspecies. Hearts of small birds (less than 200 grams) tend to be proportionately larger than those of large birds. Hearts ranged from 0.2 percent of body weight in Tinamiformes to 2.4 percent in Apodiformes. Relatively small hearts were found in the Galliformes taken; somewhat larger were those in some Falconiformes, Gruiformes, Cuculiformes, and many Strigiformes; and relatively large hearts in Charadriiformes, Coraciiformes, and many Passeriformes. No differences in heart size between the sexes was evident. Relative heart size appears to be greater in higher latitudes, at greater elevations, and in species accustomed to sustained strenuous activity. Heart weight in birds is relatively greater than in mammals.—L. Richard Mewaldt.

42. The Measurements of the Blackbird. Alec Butterfield. 1955. *Fair Isle Bird Observatory Bulletin,* **2**(7): 295-297. Bird measurements in the standard handbooks are generally based on a limited number of specimens. As illustrated by data on some 1,061 Blackbirds *(Turdus m. merula)* measured at Fair Isle, the spread of these measurements is much greater than the handbooks suggest. Through excessive reliance on the latter, for example, L. Gurr ("A Study of the Blackbird *Turdus merula* in New Zealand, *Ibis,* **96**: 225-260) concluded that the species tends to be bigger in New Zealand (where it was introduced) than in Great Britain; actually, Gurr's figures are very close to those from Fair Isle.—E. Alexander Bergstrom.

PLUMAGES AND MOLTS

(See also Number 37)

43. Notes on the Post-juvenile Moult and First-winter Plumage in the Pheasant. Kaj Westerskov. 1955. *British Birds,* **48**(7): 308-311. A study of 2,500 *Phasianus colchicus* in New Zealand. Pheasants attain juvenile plumage when 4-5 weeks old. "All ten juvenile primaries are shed and relaced in contrast to most other *Galliformes.*" "Under field conditions young cocks of 20 weeks of age are indistinguishable from adult cocks."—M. M. Nice.

FAUNISTICS

(See also Number 55)

44. The Population of the Stork in Denmark 1952-1954. (Bestanden af Stork *(Ciconia ciconia* (L.) i Danmark 1952-1954.) Hans Johansen and Anne Bjerring. *Dansk Ornithologisk Forenings Tidsskrift,* **49**(2): 114-126. (From the English summary.) The authors tabulate the results of censuses of the Stork population carried out over the last 3 years in Denmark, and comment briefly on the population's fluctuations since the turn of the century. "From about 4,000 pairs the number dwindled to 1,000 in 1926. In 1927 it decreased to 500. Thereupon there was a rise till 1939, when the population was estimated to consist of 1,100-1,200 pairs. Since then a strong decline set in. [One suspects the German occupation as partly responsible, but the authors make no mention of it.] In 1949 the population was estimated at 300 pairs only. The census showed a further decline till 1953, when the population was smallest, numbering only 177 pairs. In 1954 a rise to 210 was registered.

"The greatest importance is attached to the change of the climate which gives cold and moist springs with unfavorable breeding conditions. Also the continued industrialization of the country with the numerous high tension wires are responsible for many Stork casualties; 35 percent of all ringed Storks recovered were found dead near these or similar lines of wires."—O. L. Austin, Jr.

45. The Status of the White Stork in the Netherlands in the Year 1950. (De stand van de ooievaar, *Ciconia c. ciconia* (Linne) in Nederland in 1950.) M. F. Morzer Bruuns and S. Braaksma. 1955. *Beaufortia,* **5**(45): 23-43. (From the English summary.) For many years down to 1946, counts of breeding pairs of White Storks in the Netherlands were made by F. Haverschmidt. In 1950 the State Forestry Service attempted a complete count, and plans to repeat this in 1955. The first count (1929) showed 209 nests, in 1939 there were 312, but in 1950 only 85, and it is believed that only a few could have been overlooked. Whether the species can maintain itself as a breeding bird in the Netherlands is uncertain.—E. Alexander Bergstrom.

46. The Crossbill Invasion of 1953 in Europe, with particular regard to Germany. (Die Fichtenkreuzschnabel *(Loxia curvirostra)*—Invasion 1953 in Europa; mit besonderer Berücksichtigung Deutschlands.) H. Bub and H. Kumerloeve. 1954. *Ornithologische Mitteilungen,* **6**(10): 205-212. This paper presents a detailed review of the reports of Crossbills in Germany during 1953. A later paper, *Ornithologische Mitteilungen,* **6**(11): 225-231, covers reports from elsewhere in Europe. The authors estimated 24,000 birds occurred in Germany and an equal number in other parts of Europe. During May the invasion reached Finland, Sweden, Holland, and Germany. In June it extended to Iceland, the British Isles, Denmark, Belgium, Holland, and northern France, Switzerland, and Italy. In late summer Crossbills from northern Europe, proved by recoveries of banded birds, occurred in southern France and Italy. Flocks were seen on Amrum as late as November. Young birds predominated. Of 179 captured near Serrahn in Mecklenburg, 75 were in the first molt, 57 in first year plumage and only 20 in adult plumage. The authors comment that many of these birds must have originated in eastern Europe as well as in northern Europe.—R. O. Bender.

FOOD

(See also Numbers 30, 36, 38, 39)

47. Crows and Magpies eating sheeps wool. (Krähen und Elstern fressen Schafwolle.) K. Mühl. 1954. *Ornithologische Mitteilungen,* **6**(11): 236. The author observed crows and magpies plucking wool from the backs of sheep on Radolfzell during snowy days and eating it. He suggests that the fat content of the wool is a welcome supplement to their diet in bad weather. Perhaps reports of magpies attacking sheep in our Western regions have the same origin.—R. O. Bender.

SONG

(See also Number 23)

48. American Bird Songs, Volume One (Second Issue). Recorded by P. P. Kellogg and A. A. Allen, published by Cornell University Records. 1954. 33 1/3 r.p.m. This is not a simple reissue of the original 78 r.p.m. album (1942), but a new selection from the great Cornell collection, covering much the same species. For example, the Sapsucker is now represented by the diagnostic drumming as well as by call notes. The Alder Flycatcher now includes the "fitz-bew" song of the more southerly race as well as the "way-be-o" of the northern race. A desirable innovation is the inclusion of several seconds of the song of a species just before it is named, giving the listener the chance to identify it on his own, but without depriving him of an identification from the record itself.

The obvious comparison is with the Stillwell records (see *Bird-Banding,* **24**: 85-86 and **25**: 170-171). The present Cornell volume now shares the advantages of 33 1/3 r.p.m. speed (quieter and greater fidelity), more of a discussion of each bird rather than just naming it, more background songs (making the principal song more lifelike without smothering it). The Stillwell records still have an edge in the variety of songs and calls presented, though this Cornell release shows an improvement. The Cornell records tend to show a variety of birds of one habitat, while the Stillwells tend to place closely related species together. Both approaches have their merits, although for difficult groups like the sparrows or warblers, it seems easier to learn the songs if related species are grouped.

This second issue ought to repeat the wide sale of the first issue; those who already have the 78 r.p.m. issue will nevertheless find much in the new issue to warrant its purchase.—E. Alexander Bergstrom.

49. The Mockingbird Sings. 1954. Cornell University Records. 10", 78 r.p.m., shellac (but very quiet), $2.50. A countrywide release of the recording made for the Massachusetts Audubon Society by the Technichord Laboratory (and distributed by the Society), of an exceptionally varied Mockingbird *(Mimus polyglottos)* in Weston, Mass., which produced songs characteristic of at least 30 other species. For comparison, the song by a Mockingbird Dr. and Mrs. Peter Paul Kellogg recorded at Miami, Florida, is included. A few iconoclasts are challenging the prevalent opinion that these imitations are conscious, and the Weston bird admirably illustrates the matter at issue. A melodious and attractive record.—E. Alexander Bergstrom.

50. Song-forms of the Blackcap *(Sylvia atricapilla).* (Gesangsformen der Monchgrasmücke.) S. Knecht. 1955. *Ornithologische Mitteilungen,* **7**(5): 81-84. The appearance of a new song form of the Blackcap referred to as the "Leier" song has attracted considerable attention from German and Swiss ornithologists (See *Bird-Banding,* **26**: 41). This paper reviews the present reported occurrence of the song in Germany, southern France, Spain and Mediterranean areas. The development of a new variety of song in a relatively short time is a matter of interest to systematists and other biologists.—R. O. Bender.

BOOKS

51. Bird Navigation. G. V. T. Matthews. 1955. New York: Cambridge University Press. 141 pages, ill. Matthews reviews the experimental work on "the manner in which birds find their way in unknown country; their navigation" (p. 1) and concludes that: "The reality of navigational ability in birds is an established fact. No theory of the physical basis of bird navigation remains in the field except that involving the sun. This the evidence strongly supports, and the only type of sun navigation that fits the observed facts and is satisfactory from the logical point of view is that proposed by the sun-arc hypothesis." (p. 120)

The sun-arc hypothesis assumes that: "At home the bird will become familiar with the features of the sun-arc [the path followed by the sun through the sky], and the sun's position on it at different (local) times. These will be related to the internal 'chronometer' which is also an essential part of the hypothesis. In unfamiliar surroundings the bird will have to construct the sun-arc from observation. The suggestion is that it observes the sun's movement over a small part of its arc and extrapolates to obtain the highest point. Measurement of the altitude of this point, the angle from the horizontal, and comparison with the remembered value for home, say, the previous day, will give the latitude change. The arc angle from the observed sun to this highest point when compared with that obtaining at home for the same chronometer time will give the longitude change. An alternative means of latitude determination would be for the bird to extrapolate the arc back to its base, and to measure the inclination of the arc directly." (pp. 93-94.) Once the bird had established the sun-arc, it would fly in the direction necessary to bring the observed sun-arc in coincidence with the remembered sun-arc.

In chapters 5, 6, and 7 of this book Matthews examines other hypotheses attempting to explain navigational ability (e.g. magnetic grid, Coriolis force) and, to his own satisfaction, proves them all untenable. This review examines the sun-arc hypothesis in the same manner and using the same criteria.

The sun-arc hypothesis demands that the navigating bird be able to measure the altitude of the sun above the horizon to within 1° of arc or less. This requires that (a) the bird be able to measure large angles (up to 90°) with this accuracy and (b) the bird has an artificial horizon which will serve as a datum for the measurement.

Matthews cites (p. 108) evidence that the bird's eye can discriminate within 10″ of arc, but cites none to indicate that birds can measure large angles or discriminate between different large angles. The human eye can also discriminate between very small angles, but is quite inadequate in visual estimation of large vertical angles. (To the human eye the vault of the sky appears as a flattened dome, not as a hemisphere, as it should if vertical angles of celestial bodies are to be estimated accurately.)

Matthews points out (p. 109): "Additional confidence in the possibility of a flying bird being able to measure small angles with great accuracy is given by the quite extraordinary stability of the bird's head in flapping flight . . . the head, by virture of an extremely fine compensating mechanism based on the semicircular canals, proceeds forward with a rocklike constancy." He feels that this ability which has been observed but not measured, "enables us to credit the bird with the equivalent of the 'artificial horizon' or 'bubble sextant' which enables human air navigators to measure vertical angles without reference to the visible horizon."

Here we are asked to accept the bird's ability to maintain its horizontal datum while in flight to within at least 1°, yet no experimental data are cited in proof. Maintaining this horizontal datum means that the bird must be able to determine the true vertical, the direction of the acceleration of gravity, at any time. In practice this would be impossible since other accelerations experienced by the bird in flight would, in effect, deflect the apparent vertical. Air navigators allow for this constant change in the apparent vertical by integrating observations over a period of time, thus allowing the effect of the transient accelerations to cancel out. Matthews himself recognizes that transient accelerations will be present, in his discussion of measurement of Coriolis force.

In his discussion of the possibility that the bird obtains its directional reference from the sun's azimuth position, he states (p. 68) "we must credit the birds with possession of the equivalent of a complete nautical almanac, making the necessary corrections automatically. This would seem to be unreasonable." Crediting the birds with the possession of an integrating sextant seems equally unreasonable. The only alternative is a rapidly rotating gyroscope which would always provide the bird with an absolute vertical reference and, as Matthews points out, this is "an anatomical impossibility." (p. 107)

From this discussion it would seem that the most favorable decision we can give on the bird's ability to measure the sun's angular altitude above the horizon is "not proven."

But, assuming that the bird can make this measurement, what can we say about its probable ability to extrapolate three or more observations of the sun to determine the highest point of the sun-arc? Matthews feels that this extrapolation does not present any special problem as "Extrapolation of the path of moving objects is essential in birds feeding on moving prey." (p. 116) Yet, human air navigators obtaining a position by a meridian observation (determination of the sun's position at local noon) find it necessary to make observations both before and after the sun has reached its highest point. The highest point of the extrapolated curve is very difficult to determine, even when plotted on graph paper, because the sun's change in altitude with time is very slow around local noon. Again we must say "not proven."

Again assuming that what is not proved is yet possible, what abilities would the bird need to translate its estimated position of the sun's highest point on the extrapolated arc into a longitude determination accurate to within 60 miles? To do this the bird would have to measure the arc between the observed position of the sun and its estimated noon position to within one degree of arc, if its chronometer were absolutely accurate, or have a chronometer accurate to within 4 minutes of time if the measurement of arc were absolutely accurate. None of the experiments cited confirms either of these abilities. As Matthews says, "We need information on the nature and accuracy of these chronometers independently of their function in orientation." (p. 119.) Here too, it would seem that the bird's capability to perform as required by the sun-arc hypothesis would require abilities that the bird has not been proved to possess.

In spite of the lack of experimental data to prove that the bird has the sensory equipment necessary to navigate by reference to the sun-arc, Matthews believes that he has experimental evidence to prove the hypothesis. In an experiment with pigeons he interrupted the normal day-night illumination cycle by keeping the birds from view of the sky for 6 to 9 days, meanwhile transporting them to an unfamiliar location. He claims that the majority of the conditioned birds released flew in the direction where the sun-arc would be the same as when they last saw it. A control group of pigeons, which had full view to the sun and sky during the same period of incarceration, flew in the true home direction. Matthews says (p. 102), "The results are statistically reliable and allow of no explanation other than that of the hypothesis."

Perhaps a study of topography of the release point in comparison to the release point where the birds were originally trained and of the weather during the experiment might result in an explanation "other than that of the hypothesis." Griffin in the *Quarterly Review of Biology*, **19**: 21-32 (1944) suggests several ecological clues which might canalize a bird's search for its home. Matthews regards these suggestions as "little more than anthropomorphic guesswork," but many of his readers, particularly those who distrust statistics when applied to organisms with the power of decision, might not agree.

It is unfortunate that Matthews does not give the full details of the experiment in this book. As reported here, the experiment involves an unspecified number of pigeons, flying over undescribed terrain, in unknown weather. Although full data are given for many less important experiments, the interested reader will have to consult the original paper for details on this crucial experiment.

It is also unfortunate that Matthews does not report on the results of the same experiment when conducted by Rawson and Rawson and by Kramer. Matthews lists the papers on both experiments as ("in the press") but does not report that in both cases the results obtained contradicted the results he obtained, which he claims were "statistically reliable and allowed of no explanation other than that of the hypothesis."

In reading this book one gets the impression that Matthews regards field observations, especially field observations of migratory birds, as a somewhat untidy form of scientific endeavor. He recognizes the inherent inaccuracy of his own method of observing flight directions of released homing birds, but puts his faith in statistics, saying (p. 37) "from a large number of vanishing points under a given set of conditions, a scatter diagram is built up whose orientation or lack of it, can be accepted with statistical confidence." Yet he dismisses Lowery's method of observing the passage of birds across the moon's disk, which gives a direction of flight for a migrating bird in its natural environment, in a paragraph. He states (p. 5), "the effects of wind, though important, are incidental" although in his measurements of vanishing points cited above, a relatively light wind could have a statistically significant effect on his scatter diagram unless the experimental birds are able to compensate for drift when flying an instrument heading. He closes the book with the observation that "It also seems probable that field experiments of the type we have been describing have reached their useful end, except, perhaps for trans-equatorial tests. For further progress the problem will have to be brought into the laboratory."

Matthews does not offer a convincing explanation of the role the sun-arc plays in the orientation of birds flying at night. He suggests: (p. 65) "The direction of the night's flight could be determined from the sun during the day, or about sunset and maintained as well as possible throughout the darkness with reference to topography, and possibly some general guidance from the moon and star pattern," but does not explain how a passerine bird on an overwater migration could maintain direction by reference to topography.

This book will be of interest to anyone interested in the mechanics of bird navigation. The chapters summarizing previous work in this field will be an invaluable reference to those who do not have access to an ornithological library. Perhaps the best evaluation of his exposition of the sun-arc hypothesis is given by Matthews himself in his Preface, "The path of progress in this field is littered with discarded theories and it is possible that the one at present favoured may be found inadequate."—William H. Allen.

52. Storks. (Störche.) Horst Siewert. Newly published and added to by Rolf Dirksen. 1955. Bertelsmann. Gütersloh. 246 pp. 6.85 RM. In 1932 Horst Siewert's notable book on the biology of the Black and White Storks appeared; it was illustrated with 80 of his fine photographs. Now Rolf Dirksen has republished most of the text and 23 of the plates (the others were destroyed during the War). The additions consist of seven photographs taken by others, a sympathetic chapter on the life of the author, scientific chapters on range and change of status of the White Stork, and its migration, homing and age, and two pages of bibliography. Thus we have a valuable and up-to-date contribution to ornithology, written with insight and deep love for the wild.—M. M. Nice.

53. Prairie Ducks. Lyle K. Sowles. 1955. Stackpole Co., Harrisburg, Pa. and Wildlife Management Institute, Washington, D. C. 193 pp. $4.75. In 1944 Albert Hochbaum published his notable "Canvasback on a Prairie Marsh" devoted largely to the diving ducks on Delta Marsh at Delta, Manitoba. Now comes the companion volume treating the five species of puddle ducks nesting at Delta Marsh. Both books are illustrated with Al Hochbaum's inimitable sketches. Dr. Sowles spent 5 years—1946 to 1950—on this problem. A vast amount of valuable factual material is presented on migration and spring arrival, homing, home range and territoriality, nesting terrain, nesting season, nesting behavior, mortality, renesting—a subject on which the author found much new and definite information—hen and brood behavior, autumn behavior, and the shooting season. In regard to predator control campaigns, when one is reduced, another usually increases. "Methods to control all the predators in our wild waterfowl marshes have so far been found to be ineffective and costly," (p. 127). Renesting "is a compensating factor for early season predator loss."

In Table 14 (p. 97), there is an obvious misprint in the incubation period of the Barn Owl; it should be 32-34 days, not 14 days. The incubation period of the Carolina Chickadee is longer than 11 days; that of the Song Sparrow (p. 133) is 12-13, not 11-12. The book is excellently organized with abundant subtitles and a good summary for each chapter. There are 27 tables, 45 charts, lists of common and scientific names of plants and animals, a 6-page bibliography and an excellent index. All in all, an important contribution to our knowledge of the behavior, ecology and biology of ducks.—M. M. Nice.

54. World Outside My Door. Olive Bown Goin. 1955. Macmillan. N. Y. 184 pp. $3.50. An interesting account of the vertebrate animal life—chiefly amphibia and reptiles—in the author's garden in Gainesville, Florida. Two chapters are devoted to birds; charts are given of the number of visitors to the feeding shelf on two all day watches: May 9, 1950 the most popular hour was 10-11, the next most popular, 6-7 p.m.; on Feb. 14, 1951 peaks came at 9-11 and 1-2 with the highest at 4-5. There are 9 charming sketches of tree frogs, a flying squirrel and other animals. It is a pity that the 14 others did not treat of like subjects instead of supposedly humorous cartoons of the Goin family.—M. M. Nice.

55. Birds in Massachusetts/When and Where to Find Them. Wallace Bailey. 1955. College Press, South Lancaster, Mass., publ. by the author. Paper bound, 239 pages. If this pocket-sized book is a fair example of what the binocular and telescope fraternity means by ornithology, as the several favorable, uncritical reviews it has received locally in the Boston region suggest, it is high time the hitherto innocuous, enjoyable, and instructive game of "bird golf" is outlawed before its more rabid and uninhibited devotees ruin it for themselves.

Serious ornithologists here and abroad have come more and more of late to appreciate the value of sight records honestly made and carefully evaluated, and even to accept as valid observations on species for which confirmative specimen evidence is lacking. The publication of a book such as this not only justifies the skepticism with which conservative ornithologists have always regarded sight records of rarities, it sets back indefinitely the acceptance of the few that might be genuine, casts suspicion on the reliability of the bird golfers' reports of the commonest, most unmistakable species, and further entrenches the diehard belief that the presence of no species in a given area can be authenticated except by a collected specimen. The book is unbelievably bad. Its worst fault is its failure to establish any sound criteria for the evaluation of sight records. The bird golfers evidently believe that if enough reports are made of a given rarity, or if it is identified by a "reliable expert," its occurrence must be accepted as fact despite the lack of specimen evidence. Anything is possible, for as wise old Peter Sushkin remarked, "Birds have wings and sometimes use them," so why shouldn't the Arctic Loons, Western Grebes, Bridled Terns, European Whimbrels, Sandhill Cranes, Fork-tailed Flycatchers, and a score and more other "exotics" the list-padders claim to have seen in Massachusetts really have occurred there?

A sight record is only as reliable as its maker, and who is to judge the relative capabilities and honesty of the observers? The sharpest, most careful observer can be fooled in the field only too easily. Furthermore, no amount of duplication or corroboration of questionable identities can make a single one of them valid. I, for one, refuse to regard the Arctic Loon and any of the other sundry varieties "accepted" by this book as occurring in Massachusetts until a specimen is collected, no matter who says he saw the bird.

The source of most of the author's material is the Massachusetts Audubon Society's *Records of New England Birds,* a periodical compendium of sight records reported by its members, largely without strict evaluation. The author claims also to have consulted the other essential literature on the subject, but he has apparently neglected important sources, most glaringly the records of the banders. And though he claims to have seen the 4th Edition A.O.U. Check-List and its supplements, the number of mistakes in both common and scientific names (I counted 21 gross errors in the latter alone) is incredible.

The work is ostensibly "Sponsored by the Massachusetts Audubon Society," which seems to make that worthy organization largely responsible for it. However, anyone cognizant of the capabilities of its able secretariat and editorial staff will realize after reading a page or two that not one of them could possibly have had a chance to edit the typescript or to correct proof before publication. The myriad of grammatical and typographical errors, mis-spellings, inconsistencies, and contradictions throughout the text are inexcusable. The writing style is awful—wordy, redundant, tautological, full of needless jargon. In the face of such obvious carelessness and inattention to the details of his presentation, what are we to think of the author's reliability as a field observer, or as a judge of the observations of others?

Casual editing by anyone who knows the first principles of simple English composition would have saved the author at least 10 percent of his printing costs. Had he submitted his typescript to any of the many reputable ornithologists in New England and taken their advice, he would have saved every cent of them. I presume the book is on sale at Audubon House, but the less it is referred to (except for laughs) and the sooner it is forgotten by those seriously interested in the birds of Massachusetts, the better.—O. L. Austin, Jr.

(*Ed. Note:* this review reached me the first week in October, 1955, before publication of *The Birds of Massachusetts/ An Annotated and Revised Check List,* by Ludlow Griscom and Dorothy E. Snyder (which will be reviewed in our April issue). That list admits no species unless there is "a specimen, a banding record by a reputable ornithologist, or a recognizable photograph on file and readily available for examination." The authors reject reports of a number of species referred to by Bailey.)

NOTES AND NEWS

At the recent annual meeting of the Northeastern Bird-Banding Association, on October 1, 1955, Dr. Charles H. Blake retired as president. He had served the Association well in that position, since January, 1948, and now hopes to find time to carry out more of his many ideas for the improvement of banding techniques and the better interpretation of banding results. This issue includes two of his papers, and during the coming year we will publish three more. Dr. Blake is presently in Jamaica, helping to establish a permanent banding scheme, under a Fulbright grant.

We welcome as the new president of the Association Mr. Edwin A. Mason, Director of the Arcadia Wildlife Sanctuary of the Massachusetts Audubon Society (mail address: Easthampton R.D., Mass.), since 1944. For many years he worked with Mr. William Wharton at the latter's extensive banding station in Groton, Mass. He has contributed a number of papers to *Bird-Banding* and other journals, and is widely known as the designer of the Mason ground trap, one of the best traps yet devised.

At the annual meeting, the Committee on Trap Standards presented a preliminary draft of the proposed standards. Copies may be obtained free (from the chairman, Mr. Parker C. Reed, 27 Hayes Ave., Lexington 73, Mass.) by those who would like to offer suggestions on the standards, or who would like to have the benefit of the tentative standards in trap design and construction.

A mimeographed list showing which back issues of *Bird-Banding* are in stock may be obtained upon request from the Secretary-Treasurer, Mr. Johnson. We are always willing to print requests for back issues which may be lacking in this stock. If any readers who have no further use for older issues care to give them to the Association, they would be very welcome, and would help to fill requests.

The April issue will include full details of the financial statement for the fiscal year ending October 31, 1955, which was quite encouraging. It will be possible to print more pages of *Bird-Banding* during 1956 than in the past. While we have a number of good papers awaiting publication, this increase in the average size of issues will make room for more papers, and make it possible to print them more quickly than for the past year or two. The editor would also welcome more general notes; we never have too many, and often have too few. Every active banding station ought to have data in its files for at least one note.

Readers are reminded that Dr. Farner is handling the review section of *Bird-Banding* during the absence of Dr. Austin in the Antarctic.