White-throated Sparrow *(Zonotrichia albicollis)*. The practical solution for this species is to use size 1B.

In conclusion, there is still scope for much more work along this line. We know nothing as yet about subspecific or sexual differences. It is known that nestlings have eventually stouter legs than adults but we know nothing certain about actual sizes or changes with age. I think it probable that most nestlings at banding age will require bands one size larger than those given in Table III. As far as we can go now there is no substitute for good judgment in the selection of band sizes.

References

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Massachusetts Institute of Technology, Cambridge, Mass.

GENERAL NOTES

Leg color of Blackpoll and Bay-breasted Warblers.—Peterson *(Field Guide to the Birds*, 1947, p. 201) states as a distinction between these two warblers that the Blackpoll has yellowish legs and the Bay-breast blackish ones. This puzzled me because a considerable proportion of the fall birds I have handled which gave no evidence of being Bay-breasts had, however, tarsi which were mostly dark brown. Three "text-book" Bay-breasts handled this fall had gray or dark gray legs. The toes are almost the same color as the tarsi. The gray is sometimes lighter than the brown of the Blackpoll. The position seems to be that the Blackpoll has yellow legs with the tarsi more or less obscured by dark brown. In extreme cases there may be no brown. At the other extreme only the ridge of the posterior lamella (less than 1 mm. wide) and the sides and soles of the toes may be light. The real difference is brown versus gray. Field observers will have to draw their own conclusions.—Charles H. Blake, Mass. Institute of Technology, Cambridge 39, Mass.

Six-year-old Tree Swallow.—Tree swallows *(Iridoprocne bicolor)*, in my experience, are rather short-lived birds. During the past eleven years up to this summer only one has returned the fifth year after banding. On June 18, 1953, however, I trapped my second return—5. Banded on July 6, 1948, as an adult male, this bird has returned every year since, being taken this year on June 18. Thus he was then at least six years old.—William P. Wharton, Groton, Mass.

RECENT LITERATURE

BANDING

1. Vogelwarte Cooperators. (Über den Mitarbeiterstab der Vogelwarten.) 1953. F. Goethe and R. Kuhk. *Die Vogelwarte*, **16**(4): 138-143. In celebration of the 60th birthday of Dr. Rudolf Drost, Director of Vogelwarte Helgoland, the spring 1953 number of *Die Vogelwarte* is a jubilee issue. Germany has two major ornithological stations, the functions of which are somewhat similar to those of the Patuxent Research Refuge. Vogelwarte Helgoland and Vogelwarte Radolfzell are not only national banding centers, but also conduct and direct studies on migration, ecology and conservation of birds. This paper deals with German banders, tabulates the walks of life from which they come, and attempts to answer the question, "Why do they band?"—Frances Hamerstrom.

2. Trapping and Banding Operations, Lara Lake, 1952. J. McNally and D. D. Falconer. 1953. *Emu,* **53**(1): 51-70. Describes in detail the first season's activities of the waterfowl banding program initiated by the Fisheries and Game Department, Victoria, Australia. Traps and trapping techniques were adapted from those developed and currently in use in the U. S. A battery of portable, collapsible, square wire traps with funnel entrances was baited with wheat. In 7 weeks of trapping 3,481 ducks of three species were banded, mostly Gray Teal *(Anas gibberifrons),* and lesser numbers of Black Duck *(Anas superciliosa)* and Maned Geese *(Chenonetta jubata).* Each bird was weighed when caught and examined for injuries and abnormalities. Search for external sexual differences was unsuccessful in all three species; lack of time and experienced personnel prevented sexing by cloacal examination. Interference by predators with trapping operations is discussed, and the daily totals of new birds and repeats taken are analyzed and correlated with meteorological conditions and the effects of periodic nearby shooting.—O. L. Austin, Jr.

3. Results of the Bird-Banding carried out by the Ornithological Institute at Zagreb in 1949 and 1950. VII Report. (Rezultati prstenovanja ptica Ornitoloskog zavoda u Zagrebu u godinama 1949-1950. VII Izvjestaj.) Renata Kroneisl. 1952. *Larus,* **4-5**: 5-31. (With English summaries.) The 71 Yugoslavian cooperators banded 2,802 birds in 1949, and 6,127 in 1950, totalling 94 species. More Goldfinches *(Carduelis carduelis)* were banded than any other species (2,698 in 1950). Greenfinch *(Chloris chloris),* Serin *(Carduelis cannabina),* Great Tit *(Parus major),* Barn Swallow *(Hirundo rustica),* and Blackbird *(Turdus merula)* were the only others handled in significant quantities. The data for some 26 recoveries and 140 returns and retraps received during the period are listed in detail. The direction and distance are given for each recovery. An excellent practice, most helpful in locating small towns and villages that seldom appear on available maps, is that of including the coordinates with each locality mentioned.—O. L. Austin, Jr.

MIGRATION

(See also number 30)

4. The Study of the Visible Migration of Birds. 1953, *The Ibis* **95**(2): 165-354; 372-376. The introductory review by Sir Landsborough Thomson in this number of *The Ibis* provides a fitting master title for virtually the entire contents of the issue. By "the visible migration of birds" is meant migration actually in progress, as evidenced by the observed flight of diurnal migrants through the sky. Contributions to this theme are made by four reviews (G. Svärdson's "Visible migration in Fenno-Scandia" for Sweden and adjacent countries, W. H. van Dobben's "Migration in the Netherlands," D. W. Snow's "Visible migration in the British Isles," and R. E. Moreau's "Migration in the Mediterranean area") and by five papers based mainly on personal observations (D. and E. Lack's "Visible migration through the Pyrenees: an autumn reconnaissance," M. T. Myres' "Some observations on the autumn migration of hirundines through the Austrian Alps," E. J. M. Buxton's "Migration of birds observed in N. W. Germany 1942," J. K. Stanford's "Some impressions of spring migration in Cyrenaica March — May 1952," and R. E. and W. M. Moreau's "Migrants on the east coast of Spain.") Since their common ground is a method of study rather than attention to a specific central problem, these articles are rather diverse in content and varied in their degree of general interest. Nevertheless, they contain remarkably little contradiction and can be most coherently reviewed through a generalized summary along the lines of Thomson's excellent synthesis.

Bird migration is fundamentally an adaptation to seasonal changes in food supply and to the seasonally changing demands of the species on that food supply. As the chief immediate stimulus to the departure of birds, Svärdson (speaking of Scandinavia) emphasizes falling temperatures and denies that pressure conditions (anticyclonic weather) have the importance once ascribed to them. Once on its way, each species tends to proceed in a "standard direction" pointing directly toward its ultimate destination or toward an intermediate way station. Thomson apparently considers this standard direction to be fixed as regards a

given population of a species. Van Dobben, on the other hand, cites some evidence that, in the case of adult migrants, it is an absolute homing faculty continually directed *toward a given spot*, and varying in compass direction with lateral displacements of the bird. In any case, the standard direction naturally gives rise to a movement that is basically on a broad front, and nearly all the accounts contain visual evidence of this sort of movement.

Certain kinds of birds, however, are reluctant to fly over certain kinds of terrain. When confronted with a formidable expanse of unfavorable habitat, they may veer temporarily from the standard direction to continue in a narrow, concentrated stream along the borders of the barrier. Topographical features causing such an effect are called "guiding lines" or "leading lines," though they do not lead the birds *toward* the goal but lead them *away* from it. Instances are variously alluded to in which river valleys, forest borders, and even low chains of hills have acted as leading lines; but the most spectacular results occur along the edges of the sea, where the phenomenon has given rise to the British term "coasting."

This aversion of small land birds to over-water flight is often very marked; the Lacks report that solitary Blue Tits would not cross a bay only ¾ of a mile wide until joined by other parties of migrants. Yet no one seems to doubt that almost all coasting birds do eventually break away from the leading line, even when the whole expanse of the Mediterranean lies before them. It is emphasized by van Dobben that an observer at a single location is apt to get an exaggerated idea of the importance of coastwise movements because he is in a position to witness the shoreline flight in its entirety but perceives the seaward departures at only one of the many points where they are taking place. Several factors modify the influence of a leading line. Good weather, high elevation of flight, large numbers of birds on the wing, and drastic departures of the topographic path from the standard direction—all lessen the tendency of migrants to be deflected from a direct passage out over the sea. Birds tend to fly higher with tail winds, lower with head winds. Thus, favoring air currents also lessen the leading line effect.

Since about one-third of the summer bird population of Europe winters in Africa south of the Sahara, literally millions of birds must possess standard directions that extend across the Mediterranean. Yet many species known to migrate to Africa in large numbers have hardly ever been recorded on migration over that sea. Among the more commonly observed trans-Mediterranean migrants, there is, however, in the opinion of Moreau, no evidence of a tendency to favor the short crossings, except in the case of soaring birds, which concentrate at the Straits of Gibraltar and the Bosphorus. Visible migration has been noted over the widest part of the Mediterranean, where the shore-to-shore distances approximate those involved in a flight across the Gulf of Mexico. The difficulties of most trans-Mediterranean migrants are complicated by the position of the Sahara, which makes necessary a passage over several hundred miles of desert immediately following or preceding the sea crossing. Nevertheless, the work of Stanford in Cyrenaica, on the North African coast, supports Moreau's idea that the movements are on a broad front.

In general, visible migration exhibits daily time-patterns that are the opposite of those apparent for nocturnal migration in America. Pronounced activity in the hours immediately following dawn is widely noted, and Svärdson presents tabular data demonstrating a second (late-afternoon) peak in summer for several species of early migrants. Later in autumn this afternoon peak is believed to become a nocturnal one. In contrast the Lacks report midday maxima for finches and Motacillidae passing at 7,500 feet through the Port de Gavarnie in the Pyrenees. These observers found several species crossing the mountains, even at this high elevation.

Several of the papers contain observations interpretable as *Rückzug*, or true reversed migration. Thomson suggests that such performances can best be explained as weather movements imposed upon the spring flights.

The foregoing conclusions form an impressive structure, one that is in many respects highly convincing. They should provide a tremendous stimulus to new lines of inquiry on this side of the Atlantic. But, since studies of this type find their greatest productivity on the seacoast and since so much of our population lives so far from either ocean, the majority of our observers cannot engage in them so profitably. It is perhaps no accident that on this continent the large-scale cooperative investigation of visible migration has, aside from hawk counts, so far

followed a quite different approach, with a strong emphasis on the direct study of nocturnal flight through telescopes trained on the moon.

A cross check and an integration of the data accumulated here and abroad would be thoroughly interesting, since to a large extent the two approaches suffer from opposite deficiencies. The nocturnal technique usually cannot satisfactorily detect very low movements; the diurnal method used in the *Ibis* studies would probably not reveal very high movements. Some of the students of visible migration have expressed concern regarding a possible *invisible* diurnal migration passing high overhead, and it is not reassuring that nocturnal observations have demonstrated flights of tremendous magnitude beyond the reach of the unaided eye. While it would be rash to assume that the principles governing night migration in America apply also to day migration abroad, the possibility is at least suggested that the whole architecture of European thinking regarding bird movements may be based upon experience with only part of the phenomena. Though this is a matter for consideration, it does not alter the fact that the study of visible migration, as reflected in these papers, has made, and is making, new sense out of manifestations that once seemed almost hopelessly contradictory.—R. J. Newman.

5. The Migration of the Sanderling (Crocethia alba (Pall.)) in Northern Europe. (Sandløberens *(Crocethia alba* (Pall.)) traekforhold i Nordeuropa.) L. Ferdinand. 1953. *Dansk Ornitholoolgisk Forenings Tidsskrift*, **47**(2): 69-95. (From the English summary.) The author presents his extensive observations on the movements of Sanderlings in Denmark, particularly on the west coast, and summarizes from the literature the available information on the species' movements elsewhere in northern Europe and in the arctic lands from Greenland eastward to the Taimyr Peninsula. From these data he constructs a logical and convincing picture of the probable routes followed by the species between its breeding and wintering grounds.

In the autumn the adult Sanderlings precede the young of the year southward. In western Denmark "adult birds in summer-dress begin to migrate about the middle of July. . . . They may be seen in summer-plumage a couple of weeks into August. After September 1st there are no safe records of adult birds in Denmark. The migration of the juvenile birds begins about 15th August. . . . From this time juvenile birds are predominant. The height of migration is reached the last week of August and first part of September, and then it slowly decreases towards the end of September and into October-November." Correlation of arrival and departure dates elsewhere suggests these birds are part of the flight from the Greenland and Spitsbergen breeding grounds, which strikes northern Europe from the British Isles to western Norway, moves down the coasts of the North Sea, and continues down the west coast of Europe, as is shown by southwestern recoveries of birds banded in autumn in southwestern Norway. A few stragglers occasionally winter in Denmark. The spring movement northward of this Greenland-Spitsbergen population is heavy, but not as concentrated. "From the end of March to the first days of July the Sanderling is a very common migrant along the west coast of Jutland."

On the east coast of Denmark, facing the Baltic Sea, the Sanderling is not as plentiful, and its autumn flight arrives about a fortnight later. As the dates of these movements cannot be correlated with those of the western birds, but do agree with autumn records along the north and south coasts of the Baltic, these birds are believed to come from the north Siberian breeding grounds, probably following "Palmen's classic route from the Siberian-Russian Polar Seacoast—across Onega and Ladoga—to the Gulf of Finland. . . ." As the species is very rare in spring along the Baltic, how birds from western Europe return to Siberia is unknown, if they do, unless they "travel very quickly and scatteredly across the European continent."—O. L. Austin, Jr.

6. Physiological and Climatological Factors concerning Bird Migration in Central Africa. (Fysiologiska och klimatologiska faktorer kring fågelflyttningen i Centralafrika.) Kai Curry-Lindahl. 1953. *Swedish Natural Science Research Council Yearbook 1951/52*: 143-149. (From the English summary.) Several palearctic birds were studied on their wintering grounds in Belgian Congo to determine the external and internal factors releasing the migratory urge. "The suggestion that the development of the gonads is stimulated by increasing length of

daylight cannot hold in a region where the light is constant. Probably also humidity and rainfall play a minor role as releasers of migration . . . because the climate of eastern Congo varies very little from day to day." Several races of the Yellow Wagtail from different breeding areas in Europe wintered together for several months in mixed flocks, subject to exactly the same ecological factors and external stimuli. "In spite of this the birds showed a very different gonadal development, different degrees of moulting and different dates of beginning migration. The explanation of this difference may be: 1. That southern populations of a species which are in a disposition to migrate are more sensitive to external stimuli than northern populations, in the same way as males are more sensitive than females, which has been shown by experiments. 2. That the inherent annual rhythm with its endocrinological activity is regulated by the pituitary, and that this cycle is variable in time in different populations; there may be an annual stimulation by environmental factors in the breeding areas. Or the internal cycle in birds functions in a rhythm which is established already at birth and which is automatically correlated with the seasonal variations."—O. L. Austin, Jr.

7. Contribution to the Knowledge of the Migration of the Starling (Sturnus vulgaris L.) in Croatia, Yugoslavia. (Prilog poznavanju seobe cvrljka sarenog u Hrvatskoj.) Konstantin Igalffy. 1952. *Larus*, **4-5**: 32-46. (From the German summary.) The author analyzes the 20 recoveries obtained from the 787 Starlings banded as nestlings in Croatia (112 from 1910 to 1945, 675 from 1946 to 1952) and 16 recoveries from 512 banded in neighboring Slovenia, all but four of them as nestlings. Also considered are nine Yugoslavian recoveries of Starlings banded elsewhere, one in Poland and eight in eastern Italy. The evidence indicates that the young Starlings migrate in the autumn southwestward from Yugoslavia to Italy and across the Mediterranean to winter on the coast of northern Africa. The Yugoslavian recoveries of Starlings banded in Italy—all eight banded in March 1931-1953 at a station near Ancona on the Adriatic coast—suggest the birds retrace the route northeastward in spring. It is of interest that not a single one of the Yugoslavian bandings was reported north or east of the Yugoslav border. One young Starling was recovered two years after banding; all the rest were reported in their first year. The longest flight was 2100 kilometers to Morocco. Two young banded in the same nest in June 1950 were recovered together 1300 miles distant at Constantine, Algeria, 15 February 1951.—O. L. Austin, Jr.

8. On the Orientation of Migratory Birds. (Sur l'orientation des oiseaux migrateurs.) E. Stresemann. 1952. *Alauda*, **20**(4): 201-212. This review paper presents a summary of some of the earlier work in the fascinating field of "the orientation of migratory birds," and more importantly brings to French readers the excellent researches in Germany of Dr. Gustav Kramer and his associates. They have conducted important investigations in the orientation of activity of caged Starlings, *Sturnus vulgaris*, and domestic pigeons under natural and experimental light conditions.—L. R. Mewaldt.

9. The Random Element in Bird Navigation. D. H. Wilkinson. 1952. *The Journal of Experimental Biology*, **29**(4): 532-560. The author has applied a careful mathematical analysis to the displacement experiments of Rüppell and Griffin. The conclusion of this analysis is that the results are exactly what would be expected on the base of random search on the part of the displaced birds. The author hesitates to assert that bird navigation is necessarily this simple and prefers to state that nothing further than this can be deduced from the presently available data.—D. S. Farner.

10. Distribution and Migration of the European Starling in North America. Brina Kessel. 1953. *The Condor*, **55**(2): 49-67. Since its establishment in New York City in 1890 and 1891, the European Starling had by 1952 expanded its range in North America to include southern Canada, the United States (except southern Florida), and extreme northeastern Mexico. It breeds only in the eastern and northern parts of its range from British Columbia, Washington, Oregon, and Utah, to Mississippi and eastward. In areas where the species breeds in some numbers many are sedentary, others are migratory, and some apparently migrate in some years and not in others. In the southwest part of its range it still occurs

only in winter, when migrants move in from the north and east. Percentages of migratory and sedentary starlings in a given population vary with geographical locality, season of the year, and the type of aggregation studied. Banding data reveal that migratory routes are to some extent determined by topographical features, although a general tendency toward migration on a northeast-southwest axis is evident.

The irregular movements of juvenal, first-year, and second-year starlings which have not yet bred, and their later random selection of breeding areas, seem to provide the mechanism whereby the species has extended its range in North America. Adults, however, which have once bred in an area, apparently return to breed in that same area year after year.

Attention is directed to certain "inadequacies in the North American banding data, principally the failure of bird-banders to distinguish at the time of banding between first-year starlings and adults." These inadequacies have prevented a better understanding of the role of age in dispersion and migration. This useful summary clarifies several aspects of the distribution and migration of the European Starling in North America.—L. R. Mewaldt.

POPULATION DYNAMICS
(See also numbers 22, 37)

11. Population Studies on Hawks. (Populationsstudien an Raubvögeln). Victor Wendland. 1952. *Journal für Ornithologie,* **93**(2): 144-153. Through the course of a 12-year period the author obtained data on the breeding hawks of a 137 square kilometer tract of forest about 25 kilometers north of Berlin. Of particular interest are the data on the Common Buzzard, *Buteo buteo buteo.* The breeding population of this species has remained quite constant at 28 to 30 pairs. Observations were made on 170 breeding pairs. The most frequent clutch size was two. The mean number of fledglings per successful pair per season was 1.41. The mean number of young produced per pair, all pairs included, was 0.91, apparently an adequate replacement for maintenance of a constant population, although immigration is not precluded. Production of young may be increased during years of abundance of rodents. In 1933, a good field mouse year, the production was 2.6 young per pair.—D. S. Farner.

12. Analysis of the Results of banding Starlings and Chaffinches in the Nest. (Verklaring der Ringintslagen Behaald op in-het-nest Geringde Spreeuwen *(Sturnus vulgaris)* en Botvinken *(Fringilla coelebs).* R. Verheyen and Geo. le Grelle. 1953. *Le Gerfaut,* **43**(1): 34-38. (from French summary.) The Belgian population of Starlings is apparently static, the births balancing the deaths. Young females breed in their second year. Approximately half the indigenous Starlings are sedentary, the remainder migratory. A few winter in southern England, but most of them in western France south to the Landes region. Both adults and young migrate equally. The mean age of 213 Starlings calculated from July 1 is 12 months.

Analysis of returns from banded nestling Chaffinches suggests the species is entering a phase of expansion, which is corroborated by its establishing colonies near human dwellings. This is apparent in all regions where male Chaffinches are not caught in the spring and the broods removed systematically for breeding and show purposes. Because of these infractions of the law the Chaffinch is becoming rare in southern Flanders and in the Walloon coal basin, despite its high rate of reproduction. The mean age of 92 Chaffinches calculated after August 1 is 13 months.—O. L. Austin, Jr.

13. The estimation of population parameters from data obtained by means of the capture-recapture method. III. An example of the practical applications of the method. P. H. Leslie, Dennis Chitty, and Helen Chitty, 1953. *Biometrika* **40**(1,2): 137-169, 1 fig. A clear account of the practical working out of the methods proposed earlier by the first two authors (see *Bird-Banding* **23**: 77 and **24**: 158). Two rodent species are used. It is concluded that *Microtus agrestis* shows pseudo-dilution during the winter because unmarked individuals do not trap as readily as marked individuals. On the other hand *Clethrionomys glareolus* agrees excellently with the theoretical deterministic model on which the

method is based. It is suggested that the parameters of some populations need to be checked by sampling methods which employ properties of the species other than those involved in the capturing methods in normal use. The reviewer agrees that any estimates of population size need most careful testing.—C. H. Blake.

14. On the utilization of marked specimens in estimating populations of flying insects. C. C. Craig. 1953. *Biometrika* **40**(1,2): 170-176. If one assumes that marked and unmarked individuals behave identically as regards recapture and that the population is stable, the author asks whether the number of recaptures of marked individuals can be used to estimate the total population. For the butterfly, *Colias eurytheme*, he arrives at quite satisfactory results by six different methods based on two mathematical models, a truncated Poisson distribution and Stevens' distribution function for groups.—C. H. Blake.

15. Time intervals between accidents—a note on Maguire, Pearson and Wynn's paper. G. A. Barnard—1953. *Biometrika* **40**(1,2): 212-213. **Further notes on the analysis of accident data.** B. A. Maguire, E. S. Pearson, and A. H. A. Wynn. 1953 *ibid.* 213-216, 1 fig. These two notes deal with the paper by Maguire *et al.* reviewed earlier (*Bird-Banding* **24**: 158). Tests are given for deciding whether a given set of events is drawn from a single exponential population.—C. H. Blake.

16. On a method of estimating biological populations in the field. C. C. Craig. 1953. *Biometrika* **40**(1,2): 216-218, 1 fig. The problem is to obtain the population within a given region by a series of observations of the distance between an individual and its nearest neighbor. With a few simple assumptions the maximum likelihood estimate of total population is derived for one of four possible cases. The method should be applicable to colonies of birds and to rafts of wintering waterfowl.—C. H. Blake.

17. A Population Study of the European Cormorant in Holland, Based on Counting and Banding Data. A. Kortlandt. The typescript of the author's English translation (121 pp., 22 photographs, 5 charts), now on file in the Division of Birds, U. S. National Museum, Washington 25, D. C., may be consulted at the museum or microfilm copies may be ordered. The original Dutch version was published in *Ardea*, **31**(3,4) and reviewed in *Bird-Banding*, **17**: 131-32 (1946).—E. Alexander Bergstrom.

FOOD HABITS
(See also number 38)

18. What Causes the Pied Flycatcher *(Muscicapa hypoleuca)* to Feed its Young? (Was reizt den Trauerfliegenschnäpper zu füttern?) 1953. Lars von Haartman. *Die Vogelwarte*, **16**(4): 157-164. Adults bring food more frequently to nests having large numbers of young. Even if additional young (beyond the normal brood size) are introduced into the nest, feeding frequency continues to rise. Polygamy not infrequently forces the female to feed the brood alone and she feeds the young about as often as they would be fed by a pair. "Food requirements of the young are fixed, and in accordance with these, and within certain limits, the parental efforts are adjusted." This was established by experimental manipulation of the number of young in nests. The adjustment of feeding frequency is governed not by the *number* of young in the nest, but by their behaviour. Under ordinary circumstances, the introduction of extra young into the nest causes feeding frequency to rise slowly, but if very hungry young are introduced the number of feedings is accelerated almost immediately.

Two experiments were set up to determine whether number of young or behaviour of young regulated frequency of feeding. A sliding drawer box was constructed so that nests could be slipped in and out from a blind. The box was kept replenished with two young. Fed young were removed and progressively hungrier young were substituted at intervals. Feeding frequencies increased until the occupants of the box were fed about as often as if the box had contained seven young.

To test hunger calls as releasers, a two-compartment box was built. One compartment contained a single nestling; six hungry nestlings were shut up in the other, so that the adults could hear but not see them. The single nestling was offered more food than it could take. Its refusal to eat caused the adults to utter feeding cries, whereupon the six hungry young "increased their hunger concert." It is plain that hunger cries act as a releaser but their quantitative influence is not clear cut, as silent gaping also stimulates adults to feed the young. Hunger cries from the closed compartment also attracted free-flying young from other broods. This may be a mechanism holding broods together in the wild. Hunger cries may also be an adult form of greeting. The author suggests that infantile begging movements and cries, which are often part of greeting ceremonies or precursors of copulation, may have as their function the retardation of aggression or flight. This is an outstanding paper skillfully combining experimental and ecological approaches.—Frances Hamerstrom.

NIDIFICATION AND REPRODUCTION

(See also numbers 28, 29, 31, 34, 39)

19. The Shapes of Birds' Eggs. T. W. Preston. 1953. *The Auk*, **70**(2): 160-182. The author comments that the problem of defining egg shapes ". . . becomes one of finding a general equation suitable for *all* eggs, of expressing the facts in the simplest, most logical, and most convenient way, and of devising apparatus for measuring the eggs and deducing the constants." The present paper is confined to the mathematical aspects of this problem. A profile copying machine, specially developed for this study, was used to provide accurate outlines of the longitudinal section of eggs studied. Formulae are provided which allow the description of the shape of the egg in mathematical terms. A comparison of observed and calculated values is provided for 24 species. Biological implications of this study are to be presented in a later publication. The author—perhaps with tongue in cheek—lapses into highly anthropomorphic phraseology when discussing the "ingenuity" of the Murre and the "skill" of the Lapwing in fitting their eggs to his formulae.—J. C. Dickinson, Jr.

20. Calculation of Egg Volume Based on Loss of Weight During Incubation. Edvard K. Barth. 1953. *Auk*, **70**: 151-159. It is pointed out that the existing formulae for egg volumes based on linear measurements are only approximations (see No. 19 above). The author wished to determine the volume accurately as a base for finding the change in specific gravity during incubation from loss of weight. Observations on the eggs of *Larus canus* show uniform rate of weight loss until the chick starts to pip the shell, when the rate increases and accelerates until hatching. Hence the specific gravity can be used to estimate the time the egg has been incubated. The author estimates the egg volumes when the egg just floats. This method is independent of shapes. More generally, the volume may be determined by displacement at any time before the egg floats. In the laboratory this may be done very accurately. In the field weighing at specific gravity of 1 is more accurate. The author gives constants for determining the egg volumes for several species from the egg weights after known amounts of incubation.—C. H. Blake.

21. Observations on the Marsh Harrier with Particular Reference to Clutch-size and Nesting-success. Fr. Haversmidt. 1953. *British Birds*, **46**(7): 258-259. Of 15 nests of *Circus æruginosus* in Holland, four held six eggs, four five eggs, and seven four eggs. Sixty-six eggs were laid in 14 nests and 45 young fledged, 68.2 percent of success. The incubating female, "when hungry, often sits on the nest calling loudly while awaiting the arrival of the male with food. In fact I have found several nests by locating the calling female."—M. M. Nice.

22. Census of Swallows in the Sedbergh Area, N.W. Yorkshire, in 1952. E. I. Cuthbertson. 1953. *British Birds*, **46**(7): 263. In 1938 17.2 pairs of *Hirundo rustica* per 1,000 acres were found in a 4,250 tract; in 1952 27.5. In 30 nests 142 eggs were laid and 112 young fledged, 78.9 percent of success.—M. M. Nice.

23. Sexual Rhythm and Fecundity of Birds in North-west Africa. (Rythme sexuel et fécondité chez les oiseaux du Nord-Ouest de l'Afrique.) H. Heim de Balsac. 1952. *Alauda*, **20**(4): 213-242. The functions of latitude, longitude, and elevation, especially as they are considered with such external environmental factors as photoperiod, temperature, humidity, and vegetation, are thought to have a regulatory effect upon the breeding seasons and fecundity of birds. The data presented in this paper contribute substantially to our knowledge of the situation in northwest Africa and thus to our understanding of avian breeding seasons and productiveness on a worldwide basis.

Data from about four thousand nests are presented in tabular form by species and subspecies. Records from areas below 1,500 meters in elevation are tabulated separately from those obtained in mountainous areas above 1,500 meters. The date of the observation (or inclusive dates when several observations are lumped together), locality, and number of eggs or young are recorded for each species. In the table of observations above 1,500 meters, elevations are given for each locality.—L. R. Mewaldt.

24. Study of the Biology of the Short-toed Eagle. (Étude de la Biologie du circaëte Jean le Blanc.) Yves Boudoint. 1953. *Alauda*, **21**(2): 86-112. Very interesting study of *Circaëtus g. gallicus*. This is a highly territorial species. The male brings snakes to his mate before and during incubation; he brings green twigs to the nest and helps with incubation. Incubation lasts 47 days, but two pairs continued brooding addled eggs for 65 days and 90 days. The young bird stays in the nest 70 to 75 days. Of 70 feedings observed all were snakes except for two green lizards and one Goldfinch, *Carduelis carduelis*. Many details are given on life history along with three striking sketches, two of young birds, one of an adult capturing a snake.—M. M. Nice.

25. Length of Incubation in the Short-toed Eagle. (Durée de l'incubation chez le Jean-le-blanc.) A. Brosset. 1953. *Alauda*, **21**(2): 113-114. An egg hatched 47 days after it was first found.—M. M. Nice.

26. Observations on the Short-toed Eagle in Western France. (Observations du Circaëte Jean-le-Blanc dans l'Ouest de la France.) Louis Bureau. 1953. *Alauda*, **21**(2): 115-119. Incubation 46 days. In Germany this is called the Snake Eagle; its food consists practically entirely of adders and vipers with a few lizards. —M. M. Nice.

27. Incubation Periods of Birds of Prey. 1953. Margaret M. Nice. *Die Vogelwarte*, **16**(4): 154-157. Oft repeated errors in the literature on incubation periods of raptors are traced from Aristotle to modern times. It is good to be brought up short, as one is in this paper, by the shocking amount of guesswork which is passed from author to author, without investigation, as sober truth.—Frances Hamerstrom.

LIFE HISTORY

28. Nesting Life and Behavior of the Red-eyed Vireo. Louise de Kiriline Lawrence. 1953. *Canadian Field-Naturalist*, **67**(2): 47-77. An 11-year study of *Vireo olivaceus* in 16 acres of woods in central Ontario, particular attention having been paid to nine special pairs. Table I gives first arrival dates (ranging from May 1, 1942 to May 24, 1948) in relation to temperature and weather. "In 10 out of 11 years, the first arrival dates were preceded or accompanied by warm weather and SW winds. In 1948, cold weather was evidently the cause of a delayed first arrival date in this locality. . . . The territory was divided into two parts, one the 'song-area' used especially by the male and the other the 'nest-area' principally belonging to the female. The average size of a territory in a crowded year (1949) was 1.4 acres and in a year with fewer pairs (1950) 2.1 acres." A vivid description is given of a male's obtaining a mate from a flock of passing migrants through a "spectacular pursuit in loops and circles through the underbrush," all in silence until the very end when the mating note was given. The female soon began examining nesting forks, attended by the male, who courted

her with display and a "mellow continuous warbled song, containing exquisite variations of the vireo themes." Choosing the nest site and building the nest—both exclusively female activities—are described.

Incubation lasted 12 to 14 days and was performed entirely by the female. "The attentiveness of 5 females averaged 76 percent; the average of 38 attentive periods of 4 females was 29.2 min. and of 46 inattentive periods 9.9 min." p. 75. Table 6 shows that average periods on the nest "were shortened by 30.7 percent in response to a rise in temperature of 15 degrees F. and the inattentive periods lengthened by 23.6 percent." The male never came to the nest during incubation but maintained contact with his mate by his constant singing; he called her off the nest and fed her during her recesses. "As soon as the young hatched, the female carried away the eggshells. This appeared to be the signal for the male to visit the nest, soon after which he brought his first meal." The nestlings were fed three times as often by the female as by the male. They left the nest on the 10th or 11th day and were fed by the parents for 25 or 30 more days, during which time they completed the juvenal molt, "which did not involve flight and body feathers." In 30 nests 98 eggs were hatched and 59 young fledged, 60 percent of success.

Much study was devoted to the song with "its subtile variations and full-toned beauty." It is "influenced by individuality, time in the nesting cycle, and the purpose of the song. Some males were much faster and more persistent singers than others. The longest and most continuous sessions of singing, irrespective of the time of day, occurred after incubation began until about one or two weeks after the young fledged in July. In 4 males, there was a virtual cessation of singing during the post-nuptial moult, averaging 21 days. During August nearly all the singing was territorial and mainly due to the passing of migrants through the territories. One courtship-song and 4 variants on the song phrase theme were recorded, as well as 7 call-notes."

This is a notable paper, the only intensive and extensive study that has been made on a vireo. To my mind the most original contributions are the facts ascertained concerning the song of the species and the insight given into the relations between the sexes. Based on keen and conscientious observation and sympathetic interpretation, and beautifully written, it is a distinguished example of a life history study.—M. M. Nice.

29. The History, Behaviour, and Breeding Biology of the St. Kilda Wren. Edward A. Armstrong. 1953. *The Auk*, **70**(2): 127-150. The author of this interesting paper was fortunate enough to spend seven hours on the Island of Hirta in the St. Kilda group. These islands lie about 50 miles west of the Sound of Harris in the Outer Hebrides and are relatively inaccessible. The literature has been reviewed and Armstrong feels that, opinions to the contrary, the bird has never been near extinction. Evidence is presented which indicates that population size has fluctuated considerably. The author feels, on the basis of his and other workers' observations, that the sexual food territory concept is not proved. Data concerning the breeding cycle are presented; comparisons between this race, *Troglodytes troglodytes hirtensis* and others, *T.t.fridariensis*, *T.t.zetlandicus* and *T.t.troglodytes* are made. The breeding behaviour and biology of the St. Kilda Wren are assessed as being more closely allied to those of other northern insular races than to those of *T.t.troglodytes*. The monogamous habit of *T.t.hirtensis* is attributed to a pioneer existence with food supply as the critical factor. Observations on: the habitat, song, display, pair bond, nest building, nest lining, eggs, nestling period, food brought to nestlings, nest sanitation, fledging, dispersal, mortality and predation are included. This is a well thought out, impressive, and stimulating study—J. C. Dickinson, Jr.

BEHAVIOUR

(See also numbers 18, 28, 29, 54, 56)

30. Parallel Flight and Overshooting the Goal in Carrier Pigeons. (Danebenfliegen und Überfliegen beim Heimflug von Brieftauben.) 1953. Gustav Kramer. *Die Vogelwarte*, **16**(4): 146-148. Six carefully documented cases of

flights in which, although the homing urge was strong, the pigeons missed the home loft at the first try. Kramer suggests that during a flight a course without relevance to the goal may become set as though the pigeon were perhaps influenced by directional training of former flights or brought under the influence of accompanying pigeons. It is remarkable that after coming to rest (in a loft), the pigeon seems to "remember" and thereupon takes the right direction. The author knows of no case in which a pigeon has taken the wrong direction after a rest pause.—Frances Hamerstrom.

31. The Conflict between Drives in the Courtship and Copulation of the Chaffinch. R. A. Hinde. 1953. *Behaviour*, **5**(1): 1-31. Courtship of *Fringills coelebs* is analysed as conflict between the attacking, fleeing and sex drives. "Threat displays are used most in those situations where the conflict of drives is most acute. . . . The male Chaffinch is dominant to the female in winter. During the Spring a reversal of dominance takes place, and at the time of nesting the female dominates the male."—M. M. Nice.

32. The Physiology of the Inborn Releasing Mechanism. I. Quantitative Studies of the Gaping of Young Passerines. (Zur Physiologie der angeborenen auslösenden Mechanismen. I. Quantitative Untersuchungen über die Sperrbewegung junger Singvögel.) Heinz F. R. Prehtl. 1953. *Behaviour*, **5**(1): 32-50. A careful, detailed study involving over 4,000 gaping reactions in eight species of passerines. "In those species of seed eating birds examined the intensity and duration of the discharge of a single gaping reacton is dependent upon the kind and not upon the intensity of the stimulus. The all-or-none rule must be applied. In insect eating species the duration and intensity of the reaction is dependent upon the strength of the stimulus. . . . If any releasing stimulus is repeated it becomes ineffective when a certain number, constant for the species and state of development, has been given. . . . In some species sleep occurs in definite periods. . . . In other species the clear cut rhythm is absent but even in them sleep shows all the properties of an activity." (From the English summary.) An important contribution to the study of instinct.—M. M. Nice.

33. The Reactions of Some Nesting Passerines towards Live and Stuffed Jays. Derek Goodwin. 1953. *British Birds*, **46**(6): 193-200. Woodlark, *Lullula arborea*, parents "collapsed into distraction display" before a mounted *Garrulus glandarius;* Warblers, *Sylvia communis* and *Phylloscopus* sp. mobbed it; while Thrushes and Red-backed Shrikes, *Lanius collurio*, attacked it. Thus none of the small birds investigated risked contact with a Jay. The larger ones try to attack from behind. Sometimes a Jay "will counter-attack vigorously. I suspect that this occurs when it has either seen the nest or realizes that there is one nearby. Then, from the Jay's viewpoint, the situation changes from 'thrush making unprovoked attack' to 'thrush trying to rob me of my food' and naturally provokes aggressive feeling. . . . One can understand the biological utility of the tendency many parent birds show to defend fledglings more vigorously and noisily than they do callow young. The latter are almost certainly doomed if the nest is discovered whereas even if one fledgling is lost the others may jump overboard and escape into hiding if the predator's attention can be distracted while they do so." The author feels sure that even where the Jay population is very dense as in his home area, it is not a menace to the avifauna as its ability to find nests is not great.—M. M. Nice.

34. Brother and Sister Mating and Care of Motherless Brood by a Male Mallard. (Geschwisterehe und Führung der mutterlosen Brut durch den Erpel der Stockente *(Anas platyrhynchos.)* Waldemar Hermann. 1953. *Ornithologische Mitteilungen*, **5**(6): 109-110. Two wild Mallard eggs were hatched under a hen; the young were banded and migrated, returning to their home farmyard in the spring as a mated pair. They nested and hatched four young drakes. The father remained with the family and after the mother was killed (presumably by a fox) took charge of the small ducklings. The five migrated together and the following spring one banded drake was seen near the farm.—M. M. Nice.

WILDLIFE MANAGEMENT

(See also number 2)

35. The Question of Oceanic Oil Pollution. (Beiträge zur Frage der Ölpest auf See.) G. A. Brouwer. 1953. *Die Vogelwarte*, **16**(4): 167-170. Mass die-offs of oceanic birds from oil have occurred over a forty year period, but fortunately the dire predictions of 1925 have not been fulfilled. On the Netherlands coast there have been six catastrophic die-offs, the last of which occurred as recently as 1950. Fortunately oil pollution does not seem to have increased in proportion to the increase in numbers of oil-burning ships, perhaps in part because of better disposal practices, and partly because the earlier ships which had been converted to oil (and alternately used oil and water ballast) are gradually being replaced by modern oil burners. Maintenance of oil-free beaches is no real solution to the problem unless good oil disposal facilities are available in major harbors to prevent dumping in the open ocean.

Bird species affected are tabulated on a percentage basis, and international attempts to alleviate pollution are given chronologically. "Ornithologists should continue to keep systematic records of numbers of oil-killed birds and the circumstances under which they are found."—Frances Hamerstrom.

36. A Study of Waterfowl Production on Artificial Reservoirs in Eastern Montana. Richard H. Smith. 1953. *Journal of Wildlife Management*, **17**(3): 276-291. Data on physical characteristics, vegetation, and waterfowl production were gathered on 124 of the estimated 40,000 artificial ponds in eastern Montana during three summers, 1949-1951. Ponds were classified into five size classes and five communities of vegetation, which are well described and represented by good photographs. Surface areas averaged 3.2 acres per pond. Aerial counts showed that Mallard, *Anas platyrhynchos*, comprised 43 percent; Pintail, *Anas acuta*, 18 percent; and Blue-winged Teal, *Anas discors*, 18 percent of 1,066 birds identified to species. Classification of 2,539 waterfowl by vegetative type and size of pond revealed that without exception the average usage increased with size of pond within each individual vegetative type, the differences being significant to the 1 percent level. The meadow type of vegetation, predominately Spike Rush, *Eleocharis machrostachya*, and American Bulrush, *Scirpus americanus*, was used on the average more than the other communities, but differences were not significant at the 5 percent level. The same relationships held for brood production; in addition it was noted that the "open" type of vegetation with little nesting cover produced the least broods. As a result of the establishment of artificial ponds, areas devoid of water habitat in the past now produces an average of almost two ducks per square mile. Although this figure appears small when the large area involved is considered, it becomes highly significant in terms of the total increase in production of waterfowl in eastern Montana.—Helmut K. Buechner.

37. Roadside Drumming Counts, A Spring Census Method for Ruffed Grouse. Walter H. Petraborg, Edward G. Wellein, and Vernon E. Gunvalson. 1953. *Journal of Wildlife Management*, **17**(3): 292-295. Ten drumming counts of Ruffed Grouse, *Bonasa umbellus*, were made at 1-mile intervals along each of three 10-mile census routes located in each of six game-management areas. Three counts were made along each route between 5:00 a.m. and 8:00 a.m. during each of the four years, 1949-1952. The radius of audibility was determined to be an average of one-eighth mile. The 10 stops along each 10-mile route thus represented an area of 0.491 square mile. Apparently warm, bare ground stimulates the start of drumming more than any other factor, according to these authors. Peaks of drumming occurred between April 15 and May 30, and varied as much as 2 weeks between years, depending upon weather conditions. An interesting tabulation of the statistics shows that the population density nearly doubled between 1949 and 1952, and reached a high of 105 birds per square mile in 1952, compared with 14 per square mile during the low in population level in 1945. Apparently the trends in population level can be determined through roadside drumming counts. However, more confidence could be placed in the method and statistics if an analysis of variance (to which the data lend themselves beautifully) had been applied, assuming that the results had supported the contention that the method is satisfactory.—Helmut K. Buechner.

38. Effects of Starvation on Wild Mallards. James S. Jordan. 1953. *Journal of Wildlife Management,* **17**(3): 304-311. This appears to be the first study on the effects of undernutrition on wild waterfowl. At average weekly temperatures between 26.1° and 35.6°F, a group of 10 adult male Mallards, *Anas platyrhynchos,* was fed a starvation diet 28 percent of "normal." Five drakes succumbed during the fourth week with an average loss of 47.2 percent of original body weight. In another experiment 10 adult males and 10 adult females were penned separately and deprived of access to all food for 25 days. Air temperature averaged 57.2°F. The pattern of weight loss in hens differed from drakes only in the last four days of starvation, when the percentage of average weight loss was less for the hens. Despite the similarity of the pattern, hens showed a much greater resistance to starvation. The over-all mortality rate in drakes was double that for hens, and during the last four days the rate was three times that in hens. As the longer survival period in hens did not result from an increase in percentage of original weight lost at the time of death, and a decrease in the hourly weight loss did not occur until late in the experimental period, it is concluded that hens have greater reserves of energy to draw upon during the foodless period, probably in greater fat storage. Possibly there was also a greater decrease in metabolic rate in hens during the last four days of the starvation period. It should be noted that this sex-related survival differential occurred during the breeding season. Critical body weights in drakes were reached during the third week. Two drakes died on day 18, five on days 24 and 25, and one on day 26. Only four hens had died by day 25. Surviving males lost an average of 43 percent of the original body weight; females lost 44 percent. Drakes that died lost 53 percent of the original weight; hens lost 56 percent. To test the ability to recover from the effects of starvation, the surviving two drakes and six hens were fed an unrestricted amount of commercial duck pellets for 28 days. At the end of this period all birds were in excellent health. No latent ill effects were noted after an interval of five months. —Helmut K. Buechner.

39. Tolerance of Incubating Pheasant Eggs to Exposure. R. A. MacMullan and L. L. Eberhardt. 1953. *Journal of Wildlife Management,* **17**(3): 322-330. In this pioneering study of the effects of low temperature on incubating Ringneck Pheasant, *Phasianus colchicus,* eggs, three experiments were designed to test more than 90 combinations of stage of incubation, temperature, and length of exposure. They showed that: (1) eggs in early stages of incubation are much more tolerant to lowered temperatures than eggs in advanced stages of incubation, (2) little mortality occurs above 45°F (for 22nd-day eggs exposed to this temperature the critical length of exposure lies between 8 and 10 hours), (3) high mortality occurs in eggs exposed between 5 and 6 hours at 32°F, and (4) survival is reduced as incubation progresses and as temperature is lowered. An exponential relationship between hours of exposure and incubation time is expressed by formula and shown in two graphs.

The tolerance shown to low temperatures is considerably greater than popularly supposed. For much of the incubation period, tolerance is great enough so that widespread mortality from unseasonal cold spells is not likely to occur in the wild. Exposure to a steady shower of water (60°F) and soaking in water (68-72°F) for periods of less than 10 hours caused no significant mortality. Longer exposures resulted in high mortality. Survival was high in all cases of alternating chilling and incubation, which appears to be less lethal than continuous cooling. Newly hatched chicks are much more vulnerable to lowered temperatures than eggs in any stage of incubation. Two possible causes for widespread mortality that warrant further study are: (1) changes in habits of incubating hens during prolonged cold, wet weather, and (2) effectiveness of brooding and other factors that prevent prolonged exposure of newly hatched chicks to severe cold, especially in conjunction with precipitation.—Helmut K. Buechner.

40. Hunting Pressure and its Effect on Bobwhite Quail Populations in East-Central Texas. Paul W. Parmalee. 1953. *Journal of Wildlife Management,* **17**(3): 341-345. Although data from 30 hunters secured during each of two seasons do not seem adequate as a basis for concluding that Bobwhite Quail, *Colinus virginianus,* are undershot in east-central Texas, they do support the contention. One bird per 39 acres was harvested during the 1950-1951 season, when the population density was one bird per 5.5 acres; and one bird per 90 acres was

harvested during the 1951-1952 season, when the density was one bird per 12.2 acres. Hunting success was much lower in the latter season because extreme drought conditions hampered hunting. It is believed that as the Quail are underharvested, more birds could be taken if the season were shifted from the current December 1 through January 16 to an earlier period, October 15 through November 30, when, juvenile mortality having had less time to operate, more birds would be available.—Helmut K. Buechner.

PARASITES AND DISEASES

41. Mallophaga in Birds' Nests. (Mallophagen in Vogelnestern.) Wolfdietrich Eichler. 1953. *Die Vogelwarte*, **16**(4): 170-173. Ordinarily "bird lice" are not found away from their hosts. The author states that apparently the genus *Actornithophilus* has a special predeliction for eggs. This statement appears to be based on examination of five birds' nests in which lice were found on the eggs. Of these five nests one had an unspecified number of lice on the eggs and the other four had respectively 2, 5, 3, and 1 louse. Apparently no attempt was made to investigate the number of lice on the incubating adults, so it is not clear to me how this "predeliction" was established. This paper also describes a new species *Actornithophilus laveni* from the ringed plover *(Charadrius hiaticula)*.—Frances Hamerstrom.

PHYSIOLOGY

(See also numbers 6, 23, 31, 32, 38)

42. The Sense of Hearing in Birds. (Über den Gehörsinn der Vögel.) J. Schwartzkopff. 1952. *Journal für Ornithologie*, **93**(2): 91-103. This paper is a rather condensed review of the available knowledge of this rather neglected field in which the author has been one of the leading investigators. A general evaluation of the available knowledge indicates that there is a fairly useful body of data on hearing ability in several groups of birds with reasonable agreement among investigations using different methods. With respect to actual physiology the situation is quite different. Only a scant beginning has been made toward understanding the function of the ear drum and the remainder of the sound-transmitting mechanism of the middle ear. "The explanation of the mechanics of the inner ear, the electrical and chemical processes which occur in the basilar membrane and lead to stimulation of the fibers of the auditory nerve is still a wide-open field for the investigator." This paper will be extremely useful for anyone interested in any aspect of sensory physiology or behavior in birds.—D. S. Farner.

43. Precocious Sexual Development in the Juvenal English Sparrow. John Davis. 1953. *The Condor*, **55**(3): 117-120. Three instances of precocious sexual development in juvenal male English Sparrows, *Passer domesticus* in June and July of 1952 in Los Angeles County, California are reported. Testes were enlarged (smallest 4 x 3 mm. and largest 6 x 4 mm.) and in "breeding" condition. Their juvenal plumage was worn and a few adventitious feather replacements were adult in type. The bills of two were black and the bill of the third was "noticeably darker" than that of a juvenal with small testes. The skulls of two of the birds were "completely unossified" and of the third "approximately one-fourth ossified." It is unfortunate that no reference was made to Robert W. Nero's paper *(The Wilson Bulletin*, **63**(2): 84-88) on the pattern and rate of cranial ossification in *Passer domesticus*.

Two additional instances of precocious sexual development in juvenal males are recorded from specimens in the University of California Museum of Vertebrate Zoology, collected in 1909 and 1914 by the late Joseph Grinnell in Berkeley, California.

Birds which show such gonadal development in June and July are thought probably to have left their nests prior to 1 May. Although numbers of birds with precocious gonadal development are certainly not great in a given population, their occurrence may be widespread, especially in warmer regions. The possible importance of this segment of the juvenal population to the experimental zoologist is discussed.—L. R. Mewaldt.

44. Radiosurgery and Uptake of Radioactive Iodine by the Thyroid of the Oregon Junco. Robert E. Bailey. 1953. *The Auk,* **70**(2): 196-199. This paper reports the results of experiments using iodine-131 for destroying the thyroid cells, and on the uptake and retention of a small dose of iodine-131 by the thyroid of *Junco oreganus.* For radiosurgery, three groups of four birds each were injected with 100, 200, and 400 microcuries of iodine-131 respectively. A group of four was maintained as a control and a single bird was injected with 50 microcuries. One bird from each group was autopsied 7, 18, 43, and 100 days after injection. A dose of 200 microcuries (or 12 microcuries per gram of body weight) was determined as the minimum level for destruction of the thyroid glands. It seems unfortunate that the results of this study were not contrasted with those of C. F. Winchester et. al. (Science **110:** 302-304. 1949) who reported 6 millicuries of I^{131} per 100 grams (60 microcuries per gram) of body weight as the minimum dosage required for 100 percent destruction of the thyroids in New Hampshire chicks. The second phase of the present investigation showed that 80 percent of a single injection of 4.3 microcuries of I^{131} was absorbed by the thyroids within 53 hours. By the fifth day only 20 percent was still present in these glands.—J. C. Dickinson, Jr.

SYSTEMATICS

45. On Eastern Empidonaces with Particular Reference to Variation in *E. traillii.* L. L. Snyder. 1953. Contr. Royal Ontario Mus. of Zool. and Paleont., No. 35, pp. 1-26. A summary and comparison of the differences among *Empidonax traillii, minimus,* and *virescens* in size, color, pattern, shape, habitat, gregariousness, song, and nest (pp. 1-6) show non-morphological differences to be more striking than morphological ones.

The remainder of the paper deals with variation in *E. traillii,* mainly east of the Rockies. The examination of 130 breeding specimens confirms the existence of two eastern forms: a northern one breeding from Nova Scotia across Canada to Alaska, and a more southern one which breeds from the Great Plains of the United States eastward on the prairie extension to New York. Difficulties involved in identifying Audubon's type subspecifically suggest the advisability of retaining the trinomial *traillii* for the southern form and applying *alnorum* to the northern one.

Data on such striking non-morphological differences as seem to exist, particularly in voice and nest form, are brought together from the literature and unpublished sources. The geographical distribution of these non-morphological differences appears to correspond to that of the known but much less obvious non-morphological characters of the two populations. Because of the striking non-morphological differences the author thinks it possible that ". . . one might consider that these forms of eastern *E. traillii* closely approach the threshold of specific difference." His treatment of them as subspecies seems wise, however, for the few available pertinent data indicate that the non-morphological differences may be bridged by geographic intergradation. Much more information is needed to determine the geographical extent and constancy of such non-morphological differences as voice and nest form. The many competent amateur observers located in the areas concerned could aid substantially by gathering the necessary data.—W. Earl Godfrey.

46. Early Tertiary Penguins of New Zealand. B. J. Marples. 1952. New Zealand Geological Survey, Paleontological Bulletin 20. 66 pp. Government Printer, Wellington. Nine shillings. This report contains descriptions of an important series of New Zealand penguin fossils, far more extensive than the previously available material. Four new genera *(Platydyptes, Archaeospheniscus, Duntroonornis,* and *Korora)* and five new species *(Platydyptes amiesi, Korora oliveri, Archaeospheniscus lowei, Archaeospheniscus lopdelli,* and *Duntroonornis parvus)* are described. Of great importance is the fact that the material extends from the middle Oligocene back as far as early Eocene, thus placing the origin of penguins considerably earlier than previously supposed. Interestingly, however, it is to be noted that the earliest fossils are so similar to recent species that they still cast no additional light on the phylogenetic origin of the order.—D. S. Farner.

FAUNISTICS

(See also numbers 10, 12, 55)

47. Birds of the West James Bay and Southern Hudson Bay Coasts. T. H. Manning. 1952. National Museum of Canada, Bull. 125, Biol. Ser. 43, 114 pp., 13 photos, 1 map (25 cents). This publication deals with that part of the coast of James and Hudson Bays between Moosonee, Ontario, and York Factory, Manitoba, and an adjacent strip of hinterland 15 miles wide. Thirteen introductory pages give the itineraries of the author and others, an interesting summary of previous work, and a description of the country. Although primarily a report on Manning's own summer work, information from other unpublished sources is included, and data scattered through the literature have been brought together and summarized. The annotated list contains about 235 forms (including one hybrid) of which 61 are considered to be either of hypothetical occurrence or to have been recorded erroneously. The large number of distributional details are documented satisfactorily and include some interesting extensions of known ranges. Taxonomic notes are based on study of over 750 specimens collected; counts of individuals observed in the field are also given. The author, in addition to presenting a substantial amount of original information, has performed a useful service in bringing together and summarizing data from numerous published sources on an area that is of particular interest to taxonomists.—W. Earl Godfrey.

48. The Collared Turtle Dove in Europe. James Fisher. 1953. *British Birds*, **46**(5): 153-181. A very interesting summation of "a colonization more spectacular than that of any other known land-bird." In the course of the last twenty years *Streptopelia decaocto* "has spread about 1,200 miles north-westerly across Europe from the Balkans, and has been observed at 468 different new places at least, at many of which it has become a resident breeder within a year or two of its first arrival." Three maps are included and a "selected" bibliography of nine pages.—M. M. Nice.

49. The Advance of the Ring-dove into northwestern and southern Europe. (Vordringen red Türkentaube nach Nordwest—und Südeuropa.) Jacob Huber. 1952. *Larus*, **4-5**: 47-55. A recapitulation from the literature of the recent and interesting intrusion of the Ring-dove *(Streptopelia decaocto)* into Austria, Germany, Holland, Denmark, Poland, and Italy. (See also No. 48) In Switzerland, the author's homeland, only four doubtful records have so far been reported, three of these seen in bad light, and one only heard, between May 1948 and May 1950. —O. L. Austin, Jr.

50. The Ring-dove in Yugoslavia. (Grlica kumra u Jugoslaviji.) Dragutin Rucner. 1952. *Larus*, **4-5**: 56-66. (From German translation, pp. 66-73.) The remarkable recent influx of the Ring-dove *(Streptopelia decaocto)* into Europe (see Nos. 48, 49) apparently began in the Balkans. This interesting paper traces the species' history in Yugoslavia, discusses its ecology, and theorizes on its spread. Prior to 1932 the Ring-dove was only of casual occurrence in Yugoslavia. About that time it began to gain a foothold in the eastern and southern sections of the country, and has gradually extended its range westward and northward until today it breeds commonly throughout entire Yugoslavia. The author believes its original success in the Balkans was enhanced by "ethnographic" factors, namely its protection and cultivation by the large Turkish element of the population, who regarded it sentimentally as "a bird from home." The species adapts itself readily to new surroundings, but has had its greatest success in the urban areas. It nests in the tall trees in city parks, cemeteries, and around railroad stations, and seems as at home in the heavy traffic in the city centers as in the countryside where it is observed feeding over the fallow grain fields. Its spread was hampered at first by the nest predation of the jackdaws *(Corvus monedula)* with which it associated in the southeast. Once it established itself beyond the range of the Jackdaw it spread much more rapidly.—O. L. Austin, Jr.

51. The Occupation of Denmark by the Indian Ring-dove, *Streptopelia d. decaocto* (Friv.). (Tyrkerduens *(Streptopelia d. decaocto* (Friv.) fremtraengen i Danmark.) Finn Salomonsen. 1953. *Dansk Ornithologisk Forenings Tidsskrift*,

47(2): 128-133. (From the English summary.) "The first Danish record dates back to 1948, the first breeding record to 1950. . . . The Ring-dove is now a common breeder in several localities in Jutland. . . . Everywhere it settles near human habitations and forages in cultivated fields near houses and farmyards. This ecological niche is almost unoccupied by granivorous birds of this size (except, of course, domestic fowl and doves). The fact that the Ring-dove does not virtually compete with the other species of wild doves may partly be responsible for its extremely rapid occupation of the European continent."—O. L. Austin, Jr.

52. The Nightingale and the Nutcracker in Franconia. (Nachtigall und Tannenhäher in Franken.) Konrad Gauckler. 1953. *Die Vogelwelt,* **74**(3): 91-97. Measures for Nightingale *(Luscinia m. megarhyncha)* protection were started "as early as 1487!" The range of this species has however shrunk enormously owing to the extirpation of brushy mixed hardwoods stands and the increase in coniferous plantations. The range of the Nutcracker *(Nucifraga c. caryocatactes)* on the other hand, has expanded with the man-made increase in conifers. Two excellent distribution maps give actual records. Those for Nightingales cover more than a hundred year period.—Frances Hamerstrom.

53. Checklist of New Zealand Birds. R. A. Falla, C. A. Flemming (convener), B. J. Marples, R. B. Sibson, R. H. D. Stidolph, and E. G. Turbott. 1953. Published for the Ornithological Society of New Zealand by A. H. and A. W. Reed, 182 Wakefield Street, Wellington. 10/6. This long-needed list includes not only the birds of the main and immediately adjacent islands but also those of Macquarie Island, Auckland Islands, Campbell Island, Antipodes Island, Bounty Island, Chatham Islands, and Kermadec Islands. The list is prepared on the traditional basis, assigning a common name and number to each named form, whether subspecies or species. The 333 named forms include 259 species. Only subspecies and species known definitely to have occurred wild since the coming of Europeans are admitted. The list contains nine forms now believed to be extinct and 35 introduced species. The inclusion of the New Zealand Pipit, *Anthus novaeseelandiae novaeseelandiae* (Gmelin), among the latter is obviously a typographical error. Although this list will be of very substantial usefulness *per se* it is quite likely that its major function may eventually be that of an indicator of the very extensive work which remains to be done on the systematics and distribution of New Zealand birds. In many instances the gaps in information are the obvious consequences of inadequate study collections, partly the result of well-intended but misguided legislation which has made the procurement of specimens for scientific purposes very difficult. It should be pointed out that, although the native New Zealand birds are of paramount concern, investigations of introduced species can contribute much of interest. Some of these species have been established in New Zealand for three quarters of a century; some have been self-introduced on adjacent islands. Careful studies of possible infraspecific variation among them might be fruitful.—D. S. Farner.

SONG

54. Do Migrants Sing in their Winter Quarters? (Les Migrateurs Chantent-ils dans leurs Quartiers d'Hiver?) R. Verheyen. 1953. *Le Gerfaut,* **43**(1): 52-63. The pre- and post-nuptial behavior of several palearctic passerines wintering in Belgian Congo is quite parallel, the author believes, to that of many non-migratory species that remain in Europe. Males establish territories which they defend against intrusion by others of their kind, and in which they sing to attract a mate. The song on the wintering grounds is quite feeble, in fact might easily pass unnoticed, and the territories are less extensive as a rule than the breeding territories in the north.—O. L. Austin, Jr.

BOOKS

55. Oiseaux de France. 1953. Vol. 3. No. 1. 16 pp. and a detached sheet of illustrations in black and white. 100 francs. Association pour l'Etude dans la Nature des Oiseaux de France et leur Protection. 129 Blvd. St. Germain,

Paris 6, France. Junior bird-study groups in this country might well follow the constructive procedure outlined in this bulletin, applicable anywhere. The student should observe the appearance, manner of flight, method of feeding, habitat, type of nest, and status of the bird as a migrant or year-round resident. There is no longer the necessity to collect most birds. Rather, they should be photographed. No problem should be announced until ample information has been obtained. Where popular local names are in usage care must be taken to ascertain the true name of the bird. Application of human traits and characteristics to birds is to be avoided.

The Society seeks cooperation in initiating a study to determine whether the Manx Shearwater flies directly from Skokholm in south Wales to the Bay of Gascony or whether the bird follows a course established by the presence of a food supply. Another study involves defining the nesting area of the Western Little Bustard in France. A study on Rooks continues, with submission of a separate 7-page interim report.

Other sections discuss the shorebird and tern migrations in 1951, the identification of fresh water dabbling ducks, including illustrations in black and white somewhat along the lines employed by R. T. Peterson, a similar sheet of illustrations without text on certain hawks, longevity of birds as indicated from banding records, a list of banding returns culled from other publications, and a section on the care and feeding of fledgling birds rescued from disaster. The bulletin closes with a section on miscellaneous field notes.—Wendell Taber.

56. Warning and Concealing Coloration in the Animal Kingdom. (Warn- und Tarntrachten im Tierreich.) Herbert Bruns. 1952. Frankckh'sche Verlagshandlung W. Keller, Pfizerstrasse 5-7, Stuttgart-O, Germany. This is another member of the very commendable "Kosmos" series of paper-bound popular treatises of natural-history subjects. In general the treatment in this volume is conventional. Under visual concealing devices (Tarntrachten) the author recognizes *adaptations of color* including counter-shading and devices for changing color, *mimicry* (of inanimate objects), and *somatolysis*, the obscuring of body form by the presence of stripes, spots, etc. Among the visual warning devices are included the various types of conspicuous coloration which, in one manner or other, tend to prevent potential predators from preying on the bearer. There is also a section on protective behavior patterns including brief discussions of the use of motionlessness, injury-feigning, etc. Of considerable interest are the discussions of investigations on the effectiveness of protective devices and their evolutionary origin. A substantial number of the examples are avian.—D. S. Farner.

NOTES AND NEWS

The annual meeting of the Northeastern Bird-Banding Association was held at the Cook's Canyon sanctuary of the Massachusetts Audubon Society in Barre, Mass., on November 7. Attendance was fairly good despite stormy weather, but consideration is being given to moving the meeting date into October next year and combining it with the fall field meeting. The following report by Treasurer Richard M. Hinchman showed a sound financial position for the association, though funds are limited and the printing of the ten-year index (now under preparation) will tax them severely.