We have received recoveries on three of the eleven birds. All three were wearing only the locking band when recovered. One of the Bald Eagles lost the butt-end band within 33 days after banding.

The returns are listed below:

#A-712631. A nestling Great Horned Owl banded May 13, 1956 at Milwaukee, Wisconsin, was found dead about March 14, 1957 south of Grafton, Wisconsin.

#A-712627. A nestling Bald Eagle banded July 11, 1953 near Lake Tomahawk, Oneida County, Wisconsin, was "found dead . . . May have been shot" on January 2, 1954 at Richland, Wisconsin.

#235651. An immature female Bald Eagle was trapped and banded on October 29, 1954 at Cedar Grove, Wisconsin. We released the bird on October 31, 1954. It was found unable to fly on December 2, 1954 nine miles south of Fairmont, Martin County, Minnesota. The bird was subsequently nursed back to health and released.

We recommend that locking bands be used on all raptors requiring bands of size No. 6 or larger.—Daniel D. Berger, Cedar Grove Ornithological Station, Cedar Grove, Wisconsin, and Helmut C. Mueller, Department of Zoology, University of Wisconsin, Madison 6.

A Hummingbird in Difficulty—On the morning of June 4, 1959, attracted by the barking of my Labrador Retriever, I discovered on the ground, just outside my fenced yard, a male Ruby-throated Hummingbird, *Archilochus colubris*. As I approached, he rose into the air about three feet and flew, with evident difficulty, about five feet, then dropped to the ground again. I could see that something was trailing from him, and upon picking him up, I found a mass of matted spider-web tangled about one foot and hanging from it. Apparently the weight of the filmy web was too much for the Hummer. Although a few strands were lightly attached to the tip of one wing he was able to use his wings, and it seemed to be entirely the weight of the web which was his undoing. I untangled and removed the strands from his foot, whereupon he flew off with normal flight. Unfortunately I was not able to save the torn bits of this web, but a similar-appearing mass of cobweb weighed just under 0.01 gram.

The labels on two male Ruby-throats in the Cornell University collection indicate their weight when collected: one was 2.4 grams, the other 3.5 grams.—Sally F. Hoyt, "Aviana," Etna, New York.

RECENT LITERATURE
BANDING

(See also Numbers 21, 26, 47, 52, 59

1. The Origin of Winter Visitors to the British Isles. M. J. Goodacre. 1959. *Bird Study*, **6**(2): 37-50. This is the first of a new series of papers, based on analyses of the now quite voluminous data in the B.T.O. and British Birds banding schemes, to determine the source of birds wintering in the British Isles. This first paper, on the Blackbird *(Turdus merula)*, analyzes all the recoveries abroad of birds banded in the British Isles during the winter, the winter recoveries in Britain of Blackbirds banded abroad, and all the recoveries of Blackbirds trapped during migration at the British Bird observatories. The raw data are omitted, but the salient features are shown in the series of 16 maps and broken down to show the breeding range of the wintering British Blackbirds and the wintering distribution in Britain of populations from various parts of that breed-

ing range. These show that Blackbirds wintering in Britain come from breeding grounds in Scandinavia, Germany, Belgium, and Holland. The birds apparently cross the North Sea directly in the autumn, flying southwestward from Norway to Scotland and westward from Germany and Holland to southern England. The northernmost breeders tend to winter the farthest north. Studies of this sort, digesting and making available the results of the rapidly mounting store of banding data, are indeed most welcome.—O. L. Austin, Jr.

2. Bird-banding in Norway, 1958. Report No. 9. (Ringmerkingsoversikt, 1958). Holger Holgersen. 1959. *Sterna*, **3**(7): 269-313. (From the English summary). The 31,192 birds banded in 1958 bring the Norwegian totals up to 325,000. As usual most of the Norwegian banding is of nestlings or downy young, only 17 percent this year being of adults or fully fledged young of the year. Their banding is concentrated largely on seabirds, cormorants and gulls for the most part, through many species of land birds are also handled in numbers. Of these Starlings, Fieldfares, and Pied Flycatchers lead the list with more than 2,000 of each banded. The most interesting of the many recoveries listed are two for the Puffin, *Fraticula arctica*, one banded as a chick in Norway in July and recovered the following December in southwestern Greenland, almost 2,000 miles west-southwest from the place of banding. The second Puffin was banded as an adult in 1936 and recovered in 1957, 21 years later, certainly the age record for this species.—O. L. Austin, Jr.

3. Banding results from the Revtangen Station for 1958. (Ringmerkingsresultater fra Revtangen på Jaeren I 1958.) A. Bernhoft-Osa. 1958. *Sterna*, **3**(7): 314-320. Though the shorebird flight was poor, the banding work at the Revtangen Station was signalized as usual by the exceptional number of waders handled, 975 Dunlins, *Erolia alpina*, alone. Among the wader recoveries of interest were a *Philomacus pugnax* from Italy, a Dunlin from the Soviet Union near Archangel, and a *Tringa totanus* from Senegal, Africa. Also of interest was a fall influx of Redpolls, *Acanthis flammea*, of which 427 were banded.—O. L. Austin, Jr.

4. Results of Bird Banding in Belgium in 1958. (Resultats du Baguage des Oiseaux en Belgique (Exercice 1958).) R. Verheyen. 1959. *Le Gerfaut*, **49**(3): 291-334. The usual Belgian annual report gives no information on the amount of banding done, but lists in detail all the returns and recoveries reported, most of them of little or no significance or interest. The few outstanding records are so buried in the welter of short-time returns to the place of banding and of nearby recoveries that one hesitates to wade through the 40-odd pages of undigested and unselected material to find them.—O. L. Austin, Jr.

5. The Story of Some Herring Gulls Banded in Maine. Mr. and Mrs. G. Hapgood Parks. 1959. *Maine Field Naturalist*, **15:** 91-96. Data on 91 subsequent records (mostly recoveries) of 2,649 Herring Gulls banded in the vicinity of Milbridge, Maine, from 1937 through 1958. A number of those banded as chicks were recovered farther north (Nova Scotia, 4; New Brunswick, 2; Newfoundland, 2), and 1 was recovered on Lake Erie (Ohio).—E. Alexander Bergstrom.

6. "Homing" Cowbirds At Hawk Mountain. Maurice Broun. 1959. *Ebba News*, **22:** 27-28. Of 17 Brown-headed Cowbirds *(Molothrus ater)* transported in May from the place of capture at Hawk Mountain, Pa., 8 returned from distances of 8½ to 45½ miles. The longest of these distances was covered from the southeast, by a male bird which had previously returned from the east, south (twice) and southwest. Broun cites a 1939 record of a male Cowbird homing 184 miles in North Dakota *(Bird-Banding*, **11:** 23). Recently a female returned from Ithaca, N. Y., to Groton, Mass., about 265 miles *(Bird-Banding*, **30:**228).—E. Alexander Bergstrom.

7. Red-eyed Vireo Returns At Washington Crossing. Paul H. Fluck. 1959. *Ebba News*, **22:** 106-108. From 195 Red-eyed Vireos *(Vireo olivaceus)* banded at New Hope, Pa., from 1954 through 1958, 41 birds returned at least once. Of those banded in May, 41% returned (16 out of 39).—E. Alexander Bergstrom.

8. Glaucous-winged Gull (Larus glaucescens) Banded in British Columbia, Recovered in Japan. J. G. Sarles. 1959. *News From the Bird-Banders*, **34:** 44. A gull banded July 29, 1956 at Oak Bay, Chain Islands, British Columbia (near Victoria), was found dead in a fish net at Kushiro, Hokkaido, Japan, on December 2, 1958 (band returned). While the species does winter south to Hokkaido, presumably most of the population wintering there nests in Alaska and tends to be somewhat separate from the population which migrates down the eastern shore of the Pacific.—E. Alexander Bergstrom.

9. A Summary of Returns and Recoveries of Brewer Blackbirds at San Jose, California. L. Richard Mewaldt. 1959. *News From the Bird-Banders*, **34:** 37-39. Data from a resident population of *Euphagus cyanocephalus*, with no birds recovered more than a mile from the banding station. From 1954 to July, 1959, 413 were banded, of which at least 53 were reported or recorded later. No substantial influxes were noted.—E. Alexander Bergstrom.

10. A Banding of Chimney Swifts at Shreveport, La., and Texarkana, Arkansas. Ben B. Coffey, Jr. 1958. *Inland Bird-Banding News*, **30:** 19-20. In an effort to sample populations of Chimney Swifts *(Chaetura pelagica)* southwest of the major banding area at Memphis, Tenn., 271 birds were handled at Texarkana and 2519 at Shreveport, on October 15, 1950. The Shreveport flock included 1 from Ithaca, N. Y., and 2 from No. Mankato, Minn. From the two flocks, 27 recoveries have been reported, all from the central part of the U. S. —E. Alexander Bergstrom.

MIGRATION

(See also Numbers 8, 10, 48, 53)

11. On the Influence of Experience in the Homing of Pigeons. (Ueber den Einfluss der Erfahrung auf das Heimfindevermögen von Brieftauben.) Hans G. Wallraff. 1959. *Zeitschrift für Tierpsychologie*, **16**(4): 424-444. (With English summary.) More than 20,000 individual flights were made from distances between 10 and 50 km. Homing improved rapidly with experience, mainly due to increasing homing speed. Previous knowledge of the release point proved much less important than general homing experience. Even for short distance orientation topographical features did not constitute essential clues.—M. M. Nice.

12. Homing Behavior of the Homing Pigeon as Conditioned by Place and Time. (Oertlich und zeitlich bedingte Variabilität des Heimkehrsverhaltens von Brieftauben.) Hans G. Wallraff. 1959. *Zeitschrift für Tierpsychologie*, **16:**(5): 513-544. (With English summary.) Results on more than 3,000 individual flights of pigeons on 159 days; 16 release points were used, situated around the home loft at Wilhelmshaven, at distances varying from 10 to 50 km. Twenty-three figures illustrate the findings which are reported in great detail. "The demonstration of local and temporal variations in homing behaviour shows (supplementary to other findings) that visual landscape orientation and celestial orientation are not sufficient to explain the homing ability."—M. M. Nice.

13. The influence of different factors on the performance of homing pigeons. (Über den Einfluss verschiedener Faktoren auf die Heimkehrleistung von Brieftauben.) Klaus Hoffmann. 1959. *Journal für Ornithologie*, **100**(1): 90-102. Hoffmann's failure to reproduce results of Matthew's sun-occlusion experiments (see *Bird-Banding*, **30**(3): 186) was but one facet of his work in Britain with pigeons of English and German stocks. Homing speeds in his series of trials over short distances of 11 and 22 km. pointed to six modifying factors. (1) *Age.*—His pigeons did not attain full homing ability until 4 months old. (2) *Experience.*—Performances of old and young birds alike, released each time over a different course, improved up to their third flight, then levelled off. (3) *Practice.*—After 11 months of inactivity, experienced homers did as poorly as inexperienced birds. (4) *Genetic heritage.*—Pigeons of the transplanted German strain performed slightly but significantly better than those of English stock. (5) *Directional effect.*—Near Cambridge, birds homed faster from the north than from the south and from the east than from the west, in sharp contrast with experience in Germany and North Carolina, where releases from the south have tended to fare best (*cf.* reviews in *Bird-Banding*, **30**(4): 237-238). (6) *Loft*

location.—Homing speeds for Cambridge compared with those for four German lofts ranked fourth and supported the idea that orienting forces vary locally.

These factors create further complexity by seeming interaction. For example, improvement with experience, no longer evident at Cambridge after the third flight, continued at a German locality until beyond the tenth flight, while at one loft in North Carolina experience seemed to exert no influence at all. Hoffmann suggests that effects of training vary with local differences in the orienting stimulus.

The older literature often stressed distinctions between proximal orientation and distance orientation. Many contemporary investigators seem to have abandoned these distinctions. Diehard proponents of the once ascendant theories of topographic search have cause to decry this shift of viewpoint as premature, to complain that homing data for short distances remain ambiguous. The present paper perhaps too readily assumes that release of a bird each time from a different direction precludes use of landmarks. Whatever their direction, releases at a distance of only 11 km. are all conducted within a circle less than 14 miles in diameter. Since visibility from aloft is extensive and since the reported homing speeds do not guarantee prompt direct-line return, pigeons turned loose from one direction should gain a familiarity with terrain useful in later releases from other directions.

Disinterment of ideas regarding the role of landscape clues in proximal orientation provides simple explanations of results that must otherwise be attributed to mysterious aberrations of an unknown force. The difficulty of topographic orientation should differ from place to place in proportion to the sameness of the country surrounding the home loft. It should vary similarly with the direction of release. Where landmarks are pronounced, homing ability should rapidly mature. Where they are subtle, more prolonged development should be required. So considered, the Cambridge data suggest a situation where a rather thorough working knowledge of terrain within the circle is attainable after release from three directions. Finally, diminished orienting ability after prolonged confinement seems more compatible with dimming memory of specific landmarks than with loss of the capacity to react to some unidentified universal stimulus. Doubtless Hoffmann has sound reasons for rejecting a topographical explanation, but he has not divulged these reasons.—R. J. Newman.

14. An audio technique for the study of nocturnal migration of birds. Richard R. Graber and William W. Cochran. 1959. *Wilson Bulletin,* **71**(3): 220-236. To the growing arsenal of instruments available for attack on the problems of nocturnal migration, Graber and Cochran have added an important new weapon, perhaps even a revolutionary one. They have transformed a widely held dream into reality by devising apparatus to record flight calls of passing birds automatically. Detailed instructions and diagrams explain how to hook up the essential items, which are a parabolic reflector, a microphone, an amplifier and a tape recorder.

The new development remedies two previous shortcomings of the auditory method of migration study. It relates the number of calls to a space of known dimensions and permits detection of these sounds from as high as 2 miles aloft, more than five times the range of the unaided ear! At the same time, it much increases an existing advantage of the aural method, the relatively high proportion of night migrants that can thereby be identified to species. No longer must the listener be content with hurried judgments; he now can have a lasting record not just of the number of sounds but of the sounds themselves—one that he can study and restudy at leisure and in critical cases even analyze by playbacks at retarded speed.

The contradictory evidence supplied in America by ordinary flight-call counting on the one hand and moon-watching on the other makes the achievement of Cochran and Graber doubly intriguing. Once, the assumption that most of the birds seen against the moon were flying too high to be heard seemed to account for at least some of the nonconformity. However, sample results obtained with the long-range apparatus and used to illustrate this paper resemble those previously revealed in this hemisphere by ordinary flight-call counting. A proper review of Cochran's and Graber's actual findings must await the scheduled publication of more complete data in a second paper.—R. J. Newman.

15. Song and Tree Sparrow weight and fat before and after a night of migration. Carl W. Helms. 1959. *Wilson Bulletin*, **71**(3): 244-253. Most published work on fat deposition in migrants has come from the laboratory. Helms has attacked the problem out-of-doors. His mean morning weight for 66 Song Sparrows netted on Plum Island, Mass., on April 5, 1958, was 1.41 grams heavier than his morning mean for 44 individuals on April 6. The average for 7 Tree Sparrows captured on April 5 was 1.15 grams greater than for 4 on April 6. In both cases, fat assessed by external examination also decreased. Roadside counts on the two days indicated a drop in Song Sparrow population from 5000 to 2000; and isolated flight calls, not identified to species, were heard during the early part of the night. From these data Helms decides that the energy reserves are greater in these sparrows prior to a migratory flight than after and that the birds show true migratory preparation involving increased fat deposition.

An interesting question arises. If the birds trapped on April 5 could have been caught again on the 6th, would they have averaged heavier or lighter than the sample actually examined on the 6th? Standard errors and standard deviations do not supply the answer. It obviously depends upon what the sparrows of the initial sample did in the intervening 24 hours. If they merely moved across the Merrimack River into Salisbury Township and resumed feeding, they might have been heavier than ever next day. That they could not have done so rests on the unproved assumption that Tree and Song Sparrows are mainly night migrants. In other words, the true meaning of any single set of "pre-flight" and "post-flight" weight data would seem to depend in important part on the unknown history of the movements in question.

Helms' discussion does not take up these matters. It turns its attention to the idea that two patterns of fat variation exist among emberizines and to instructions for sexing by inspection of the cloacal protuberance.—R. J. Newman.

16. Forty Years of Spring Migration in Southern Connecticut. Aretas A. Saunders. 1959. *Wilson Bulletin*, **71**(3): 208-219. Even in these days of many-sided technical research on migration, plain old-fashioned date-listing still has a great deal to contribute. Few ornithologists have devoted themselves so long and so faithfully to the latter activity as Aretas Saunders, whose records span more than four decades. This paper presents many of his data in tabular and graphic form and uses them chiefly to show how much the spring arrival time of 50 selected summer residents varied from year to year. At the one extreme, the species average was 5.38 days late in 1917; at the other, 6.15 days early in 1938. These figures fit an interesting long-term trend. The period of 1902 to 1934 had 15 springs of late arrival and seven early ones in contrast to only three late but 12 early from 1935 to 1949.

Saunders does not discuss the possible reasons for this trend, except to mention an abortive attempt to correlate migration with the growth of trees. Nor does he explain why he chose periods of unequal length for comparison. The dividing point happens to coincide with the beginning of a new era in field identification, marked by the publication of Peterson's *A Field Guide to the Birds* and Saunder's own *A Guide to Bird Songs*. Since the present paper incorporates an unspecified number of records by others, the increasing efficiency of observers could have had a bearing on the results. So too could the fact that the author moved three times during the study and was closer to the zone of heavy land bird migration in New England during the latter years. Saunder's failure to comment on these factors, though unfortunate, is perhaps reasonably good assurance that they were of little real importance.—R. J. Newman.

17. Migration at Ithaca in Spring 1958. I. C. T. Nisbet. 1959. *Kingbird*, **8**(4): 102-104. Here an experiment in the study of migration by ordinary field observation seeks answers to two main questions: (1) whether reliably comparable results can be obtained by different observers; (2) whether the number of migrants in a typical inland woods fluctuates markedly with changing weather conditions. On 29 mornings in the period of April 29 to May 27, seven observers took turns making 1- to 1½-hour counts of the birds in a 60-acre mixed forest. A table gives the results for the 19 commonest migratory species. Dr. Nisbet tentatively concludes that counts by different observers "can be compared reasonably well from day to day." He stresses evidence that immigration occurs almost daily during May but recognizes six well-marked waves. Four of these were of the arrested type, in the face of a cold front.

As brief and modest as this paper is, it deserves comment. One can heartily concur with the author's hope that further investigations of these matters will be widely made by others. But this study is not an ideal prototype. By trying to do two things at once, it achieves neither in an entirely clear-cut way. The variations in the number of migrants remain inextricably mixed up with potential variations due to observers. A far better plan would have been to use two independent checkers each day. Then we might have had a real measure of the error resulting from different observational abilities. Nisbet did obtain dual counts on one date but failed to report the outcome in numerical terms.

Unpublished studies of winter bird censuses designed to isolate observational variables and to test their relative importance have indicated that the problems of correctly analyzing bird counts are much more complex than the present report suggests. Even in the case of the relatively static populations of winter, one-hour counts have proved highly unreliable. The significance of results tends to be directly proportional to the numbers of birds seen, modified by their tendency to aggregate in flocks of a single species; it cannot be reduced to Nisbet's simple formula that variation by a factor of 2 is meaningful. A count of 2 birds versus a count of 1 has next to no significance; a count of 20 versus a count of 10 has a great deal more.

These remarks should not discourage field observers of migrants. Rather they should point out to them an unexploited opportunity to add new zest to their activities and to provide new knowledge by simultaneous counting with planned variations in technique.—R. J. Newman.

18. Calculations of flight directions of birds observed crossing the face of the moon. I. C. T. Nisbet. 1959. *Wilson Bulletin*, **71**(3): 237-243. The procedure outlined is an ingenious adaptation of principles laid down by Lowery and Rense, originators of the modern method of studying migration by means of the moon. The first of several such adaptations to be described in print, it has the advantage of requiring no special apparatus and no mathematical knowledge on the part of the user beyond the ability to add, subtract, divide, and multiply. Its claim to increased accuracy is more debatable.

No way exists of determining the true track of an *individual* migrant from its recorded path across the moon. The most rigorous solutions possible are subject to large irremediable errors from at least three sources. Both the system currently employed at the Louisiana State University processing center and the Nisbet method tolerate in addition a measure of avoidable inaccuracy. To state the matter in simplified form, L. S. U. analysts use precise correction factors for approximate altitudes and azimuths of the moon, while Nisbet prescribes approximate correction factors and more precise altitudes and azimuths. In some circumstances the latter combination unquestionably yields somewhat superior rigor, but it purchases this advantage at an exorbitant cost in time and effort.

The various sources of error referred to act independently and largely at random. Thus, when many individually unreliable directions are combined, errors tend to cancel and more reliable mass directional trends emerge. The proper numerical expression of these trends requires that allowance be made for variation in the size of the sample with direction. Otherwise the north-south trend may, for example, appear as much as three times as great as the east-west trend though actually inferior. Quantitative correction is as essential to sound directional analysis as qualitative correction.

Nisbet fails to make this relationship clear. His entire exposition of the procedure to follow after calculating the directions of individual birds is condensed into 17 lines. These latter instructions are incomplete and uncertain in meaning; the quantitative correction factors differ, for no expressed reason, from those already in use; and the table of factors is so brief that reliable interpolation is impossible. Thereby the extra accuracy demanded in the early phases of computation is in the end thrown away. Worse still, to justify these shortcomings, the paper uses erroneous citations and doubtful reasoning in an effort to show that the standard correctional system "cannot be quantitatively accurate."—R. J. Newman.

19. The Influx of Phalaropes in Autumn, 1957. Bryan L. Sage and Bernard King. 1959. *British Birds*, **52**(2): 33-42. Red Phalaropes *(Phalaropus fulicarius)* and Northern Phalaropes *(Lobipes lobatus)* were recorded in "more

than average numbers" in the British Isles during the autumn migration of 1957. Detailed listings of all occurrences are given on a vice-county by vice-county basis. These records are analyzed on a monthly basis and compared with similar figures for an earlier influx in 1950. Correlations of the peak of phalarope appearances in September 1957 with the passage of weather systems are shown. In the early part of the month, good weather prevailing over much of Greenland allowed migration to get off to a good start. Birds of both species were probably windborne directly from Greenland by northwesterly winds that occurred in the southwestern quadrants of northeast-moving low-pressure areas. A secondary peak developed later in the month when easterly winds prevailing between Britain and Greenland mitigated against the possibility of a direct Greenland origin for these birds involved. This second influx was correlated with a small but intense low-pressure area from the direction of the Azores. It is suggested that this depression may have picked up phalaropes *en route* in its path, carried them along in its calm center or "eye," and dropped them upon its arrival in Britain. —Stuart L. Warter.

20. Watching Migration by Radar. David Lack. 1959. *British Birds*, **52**(8): 258-267. After a brief history of bird detection by radar, 8 photographs of migration shown by radar are given, as well as 3 maps showing different types of migration. The main ornithological findings are discussed under 11 paragraphs. One of these is that much migration is carried out too high to be detected by human vision. Also, "the direction of migrants flying within visible range is sometimes different from that of birds migrating high up." Bird migration is a vastly complicated business.—M. M. Nice.

21. The migration of the Redstart and the Black Redstart as shown by band returns. (Der Zug von Hausrotschwanz *(Phoenicurus ochruros gibraltariensis)* und Gartenrotschwanz *(Ph. phoenicurus)* nach Beringungsergebnissen.) Christine Hempel and Waltraud Reetz. 1957. Die Vogelwarte, **19**(2): 97-119. This paper compiles 1876 German band returns, of which 223 are distant returns of Redstarts and 147 of Black Redstarts, as well as some material from other bandings. Most individuals of both species migrate southwest from their breeding grounds in central Europe through France, Spain, and Portugal to the wintering grounds in Africa. Although 226 migration returns of the Black Redstart were from the southwest, 19 showed migration to the southeast. Southeastward migrating Redstarts *(P. o. gibraltariensis)* do not originate in a different breeding area; both groups follow the same paths in spring and fall, as do both species. The northern populations of Black Redstarts leave the breeding grounds earlier, but do not reach France, Spain, and Africa earlier than do the central populations. Maps show breeding and wintering areas and fall and spring migration. The almost 13 pages of data on individual band returns are an impressive compilation.—Frances Hamerstrom.

22. On the migration of Titmice banded in Bretolet Pass in the Fall of 1957. (Sur la migration des Mésanges baguées au col de Bretolet en automne 1957.) Paul Géroudet. 1959. *Nos Oiseaux*, **25:** 60-61. (A brief report, with a map, of the banding recoveries received from 3968 Titmice of 3 species *(Parus major, P. caeruleus* and *P. ater)* banded in Bretolet Pass. The maximum distance traveled by one of these birds was 760 km. northwest *(Parus major)*. Most of the recoveries were from the south or southwest from the Rhone Valley.—R. O. Bender.

23. Mortality at the Dow Air Base Ceilometer. Richard L. Ferren. 1959. *Maine Field Naturalist*, **15:** 113-114. On the night of August 30-31, 1959, mortality at this airfield (near Bangor, Maine) involved at least 45 birds of 16 species. Again on the night of September 30-October 1, at least 32 birds of 11 species were involved.—E. Alexander Bergstrom.

POPULATION DYNAMICS

(See Numbers 2, 7, 34, 43, 47)

NIDIFICATION AND REPRODUCTION

(See also Numbers 47, 57)

24. The Nesting of Birds in the Nests of Social Insects. K. A. Hindwood. 1959. *The Emu*, **59**(1): 1-36. All too little attention has been paid to the interesting symbiotic relationship between certain birds and social insects. The author focuses attention on it in this fine dissertation based on his own observations and a thorough review of the literature (bibliography of more than 100 titles).

Two species of woodpeckers nest occasionally in ants' nests, and while many species of birds nest near wasps, ostensibly for protection from mutual enemies, the only species that actually builds in wasps' nests is the Gartered Trogon of South America. A total of 49 species of birds are known to use termites' nests for their nesting sites. These include 23 kingfishers, 13 parrots, 4 woodpeckers, 4 trogons, 2 puffbirds, a jacamar, and a cotinga. Hindwood gives the details for each and all of these in his annotated list and points out the many advantages that termite nests offer to hole-nesting birds, such as ease of excavation, protection, maintenance of constant temperature and humidity conditions, and possible protection from enemies.

The trait seems largely limited to hole-nesting birds, and to those that dig out their own nesting hollow. It is particularly well developed in the kingfishers, no less than 25 percent of the known species having adopted it to some degree. Perhaps of significance is its occurrence only in rather primitive arboreal birds—parrots, trogons, coraciids, picids, and one cotinga. The few higher types that have been found nesting in such situations, the House Sparrow and the Starling for instance, have appropriated nests dug there by other species, usually by kingfishers. The habit is obviously worth a great deal more study, and Hindwood's paper lays an excellent groundwork for future work on the subject.—O. L. Austin, Jr.

25. The Internal Rhythm of Reproduction in Xerophilous Birds under Conditions of Illumination and Darkness. H. A. Marshall and D. L. Serventy. 1958. *Journal of Experimental Biology*, **35**(3): 666-670. Two residents of the dry grass and scrub lands of central Australia, the Budgerygah *(Melopsittacus, undulatus)* and the Zebra Finch *(Poethila castenotis)*, have developed a peculiar adaptation to their environment in being "opportunist breeders." Instead of nesting cyclically in response to light or season, they breed irregularly during the infrequent wet spells when conditions are more propitious for them to rear their young. The authors question the widely quoted conclusions of Vaugien (1952, 1953) whose experiments with Budgerygahs led him to believe that in this species spermatogenesis is produced more readily in total darkness than in light, which they believed to be a misinterpretation of his results. Their experiments on the Zebra Finch show that "various conditions of illumination (including decreasing photoperiods) cause in both sexes greater gametogenetic activity than occurs in darkness." They conclude that "the rapid production of spermatozoa (within 60 days) is in both parrot and finch a physiological aspect of drought adaptation enabling very young birds to reproduce quickly whenever environmental conditions are propitious," and comment that "the males at least of both Zebra Finch and Budgerygah retain an ancestral capacity to respond to photostimulation. But under natural conditions any such tenacity would be often over-ridden by external inhibiters that are significant to reproductive success."—O. L. Austin, Jr.

26. Changes of Mating Within a Colony of Arctic Skuas. Kenneth Williamson. 1959. *Bird Study*, **6**(2): 51-60. This excellent study of the pairing of Parasitic Jaegers *(Stercorarius parasiticus)* made with the help of both numbered and colored bands in the Fair Isle colony shows certain aspects of the breeding behavior in the Stercorariidae closely parallel those of the several species of Laridae that have been adequately studied. The jaegers breed for the first time between the ages of 3 and 5 years, and the birds develop mating stability with age. The most unstable matings are those of birds breeding for the first or second time, "probably because a high proportion of the younger individuals are slow to attain breeding condition and tend to return late to the colony, to find that early returning partners of the previous year have already been at-

tracted to older birds in quest of a new mate. With old established birds the return and attainment of breeding condition are closely synchronized and such partnerships continue unbroken for many years. 'Divorce' among experienced birds is rare (a case is recorded) and a change in partnership normally implies the failure of the regular mate to survive the winter at sea."—O. L. Austin, Jr.

27. Wood Lark Territories. C. J. O. Harrison and J. Forster. *Bird Study*, **6**(2): 60-68. Describes the limits and vegetation of the nesting territory of a pair of *Lulula arborea* on the grounds of a private school in Surrey. Changes in the location of the nest and its surrounding territory from year to year suggest that it is the ecological "suitability of the area rather than the persistence of a particular pair that is responsible for its use in successive years." The birds occupy the territory for 6 weeks before nesting, at which time the territory covers about 28 acres. "After incubation commenced, the cock maintained only a smaller territory in the vicinity of the nest which amounted to a minimum territory of 12.1 acres."—O. L. Austin, Jr.

28. On the Breeding Biology of the Barn Swallow. (Over be Broedbrologie van de Boerenzwaluw *(Hirundo rustica* L.).) P. Herroelen. 1957-1959. *Le Gerfaut*, **47**(2): 115-126; (4): 265-278; **49**(1): 11-30. From the French summary.) Analyzes the extensive data obtained by the author during a 5-year investigation of some 80 nests of the Barn Swallow in Belgium. The author's findings largely corroborate facts already recorded for the species. Both sexes build the nest, which takes 1 to 2 weeks. Incubation by the female alone averages 14 to 15 days, but extremes of 12 to 18 days were recorded. Both sexes feed the young, which usually leave the nest at an age of 20 to 21 days with extremes of 16 to 24 days. The young return to the nest to spend the night for the first 10 or 15 days after leaving. Observations on banded birds showed year-old females returning for the first time arrive later than the older birds, and nest later with a lower degree of nesting success. Usually each pair raises two broods annually, with laying peaks in May and July. Older birds occasionally raise three broods. Later clutches average slighty smaller than the first ones, but show no significant differences in percentages of young hatched and reared.—O. L. Austin, Jr.

29. The Shelduck *(Tadorna tadorna* (L.)) in Denmark, with Special Reference to Inland Breeding. (Gravanden *(Tadorna tadorna* (L.)) i Danmark. Med saerligt henblik på yngleforekomster inde i landet.) C. M. Poulsen. 1959. *Dansk Ornithologisk Forenings Tidsskrift*, **53**(3): 155-169. (From the English summary.) With full protection since 1931 the Shelduck has increased steadily as a breeding species along the coasts of Denmark. It is now fairly common and is increasing its breeding range to the shores of inland freshwater lakes. Shelducks nesting on ponds near the coast take their young to salt water soon after hatching. Those farther inland rear the ducklings on the nearest large lake. The birds often nest in deserted fox or badger dens.—O. L. Austin, Jr.

30. Notes on the family life of a Wryneck. (Ur göktytans familjeliv.) Bertil Hanström. 1959. *Fauna och Flora*, (1-2): 1-8. Close observation of a nesting pair of Wrynecks *(Jynx torquilla)* revealed interesting habits. The male Wryneck usurped the nestbox of a pair of Great Tits *(Parus major)* by throwing out their eggs and bedding. The female appeared later, took scant notice of the new nesting facilities and gave the male no assistance in cleaning out the premises, which took 3½ days. When danger threatened, like a flash the male flew into the box and defended it from within. This maneuver gave him strategic advantage over a Starling *(Sturnus vulgaris)* which once made persistent efforts to take over the box. On the day of emergence the parent Wrynecks put pressure on the young to leave the nest cavity in various ways.—Louise de K. Lawrence.

31. Test of an Automatic Nest-Recorder. Tomoo Royama. 1959. *British Birds*, **52**(9): 295-302. A description, illustrated by a sketch, of a recorder in which an iron-detector makes a different mark on the tape at the comings and goings of the parent bird provided with iron rings on its legs from that made for the other parent. Information is presented in figures and tables of the results obtained during the last 5 days before fledging of the 7 young of a pair of Great Tits *(Parus major)* in Fuji, Japan. Data are analyzed for feeding frequencies,

daily rhythms, durations of periods at the nest, times of the first and last visits each day, and the hours at which the young left.— M. M. Nice.

32. Blue Tit Feeding Young Treecreepers. N. J. Antoine. 1959. *British Birds*, **52**(12): 432-433. The young in a nest of *Certhia familiaris* hatched 13 May; on 15 May a male *Parus caeruleus* nesting 2 feet distant was assisting in the feeding of the Treecreepers. Ten days later he was still feeding the neighbor chicks while his mate was carrying food regularly to baby Blue Tits. During the next 3 days the male Blue Tit fed the Treecreepers even more frequently than did their parents; he brought "exclusively small green caterpillars," while they brought moths and craneflies. He was seen to feed each of the 4 Treecreepers out of the nest on 29 May, then took complete charge of the two still in the nest. He "entered the nest and gave it a thorough clean, throwing debris out at the front and chattering away volubly all the time." His mate continued to care for her young. On 30 May the last Treecreepers had flown; the Blue Tits left between 8 and 12 June. It is a pity that the Antoines did not note the behavior of this confused father Blue Tit after the leaving of his neighbors' brood.—M. M. Nice.

33. Noteworthy observations of breeding biology (in) 1958. (Bemerkenswerte brutbiologische Feststellungen 1958). Gerhard Creutz. 1959. *Ornithologische Mitteilungen*, **11**: 29-31. Among the observations recorded from the Neschwitz sanctuary the following will be of interest to readers of *Bird-Banding*. A banded male Redstart *(Phoenicurus phoenicurus)* helped feed the 6 young hatched by one female, then fed the young (number not stated although there were 7 eggs) from a second nest about 90 m. distant and finally helped to raise a third family with the first female. Several instances of Cuckoo eggs in Redstart nests are also reported, but these were deposited on the edge of the nest and, hence, were not incubated. Creutz also reports on the recovery and behavior of a White Stork *(Ciconia ciconia)* which lost most of one foot in a steel trap, as well as on a 9-egg clutch for this species. No evidence could be found for the presence of a second female.—R. O. Bender.

34. Observations on the loss of bird broods. (Beobachtungen über die Verlustquote bei Vogelbruten.) Hans Hudde. 1959. *Ornithologische Mitteilungen*, **11**: 149-52. Observations of 1009 broods made over the period of 1949-1958 in the vicinity of Essen are presented. The data represent 83 different species and are tabulated by biotope and by nest type. Average loss was close to 30 percent, but this figure is low because not all broods were followed to departure of the young. The data are of interest but are not sufficiently complete to permit a conclusion regarding true nesting success.—R. O. Bender.

BEHAVIOR

(See also Numbers 24, 26, 27, 30, 32, 62)

35. Imprinting. Eckhard H. Hess. 1959. *Science*, **130**(3368): 133-141. An excellent summary of the subject, its history, and a brief account of the author's own experiments. Table 2 lists the number and imprintability of the animals Dr. Hess and his students have used: some 5700 ducks, geese, chickens and other galliforms, 2 sheep and 12 guinea pigs. These are rated from excellent + (wild Mallard and Canada Geese) excellent, good +, good, fair, and poor (Wood Duck, Leghorn chicks). After pointing out that the animals used by certain other investigators have been too old for imprinting, "with the result that only association learning can occur," the author concludes as to the general nature of imprinting: "Our best guess is that it is a rigid form of learning, differing in several ways from the usual association learning which comes into play immediately after the peak of imprintability."—M. M. Nice

36. Color Preferences in Imprinting Objects. Helmuth H. Schaeffer and Eckhard H. Hess. 1959. *Zeitschrift für Tierpsychologie*, **16**(2): 161-172. Colored spheres of 7" diameter were presented as imprinting objects to Vantress broiler chicks of White Rock stock at the critical ages of 13 to 16 hours; the stimuli for eliciting following ranged in effectiveness in this order: blue, red, green, orange, grey, black, yellow, white. This order bears an inverse relationship to that followed for food preferences.—M. M. Nice

37. Innate Behavior Patterns as Indicators of the Critical Period. Eckhard H. Hess and Helmuth H. Schaeffer. 1959. *Zeitschrift für Tierpsychologie*. **16**(2): 155-160. In an attempt to analyze various innate behavior patterns, 124 chicks from 1 to 44 hours old were observed for 2 minutes and the emission of distress notes, contentment notes, approaching a stimulus, fixating a stimulus, and remaining silent were recorded. The "ratio of animals showing these behaviors at different ages completely reverses itself by the time the animals are 21 hours old; the most marked change takes place from the 9th to the 20th hour after hatching." —M. M. Nice.

38. Development of the Young, Breeding Biology and Comparative Ethology of Waders. (Zur Jugendentwicklung, Brutbiologie und vergleichenden Ethologie der Limicolen.) Otto v. Frisch. 1959. *Zeitschrift für Tierpsychologie*. **16**(5): 545-583. (With English summary.) Careful, detailed observations on 13 species of waders raised in small heated indoor aviaries and on adult birds in large outdoor aviaries with natural growth and abundance of water. All the chicks found their own food from the start except the Oystercatchers *(Haemotopus ostralegus)*, Snipe *(Capella gallinago)* and Stone Curlew *(Burhinus oedicnemus)* which fed for a few days from the forceps. It was only with these three species and the Avocets *(Recurvirostra avocetta)* that the chicks of a brood stayed closely together. A 2-day old Avocet tried to brood one of its brothers, and at 14 days it adopted two baby Water Rails *(Rallus aquaticus)* and brooded them for the next 2 weeks.

Preening, stretching, and bathing movements of the adults are very much alike, differences occurring in those species with long bills. Most of the birds showed the following threat attitudes: head and bill held high signified a readiness to flee; head and bill held low meant a readiness to attack. Fifty photographs and sketches illustrate this fine paper.—M. M. Nice.

39. Notes on the Behavior of Some North American Gulls. IV. The Ontogeny of Hostile Behavior and Display Patterns. Martin Moynihan. 1959. *Behavior*, **14**(3): 214-239. Detailed description of notes and postures (illustrated by sketches) of chicks of Franklin's and Ringbilled Gulls *(Larus pipixcan, L. delawarensis)* raised at the Delta Waterfowl Research Station at Delta, Manitoba, these observations being supplemented by watching families on the marsh. The author states: "All or most of the display movements and postures of gull chicks eventually become associated with hostility, like the vocalizations, and it is not surprising, therefore, that almost all the originally flexible patterns from which they are derived seem to be hostile movements or intention movements, or the simple locomotory patterns produced by the activation of the hostile drives."

My daughter and I raised Franklin's Gulls at Delta from 1951-53, and in 1954 we saw much of Dr. Moynihan's gulls. At first he kept the Franklin's isolated, but later they had the freedom of the "Gull Yard." We had kept our gulls well fed and we never saw any friction between individuals that had grown up together, nor any pecking of strange young chicks. Dr. Moynihan's gulls on the contrary were fed at long intervals; they abused the youngest of the group and attacked a wild-caught member of the species slighty older than they. They were also unusually belligerent towards other species, including on many occasions, human beings. We believe that these gulls developed hostile attitudes to an exaggerated degree and did not present a normal picture.—M. M. Nice.

40. Photographic Studies of Some Less Familiar Birds. C.—Ruff. Photographs by C. C. Doncaster and J. B. and S. Bottomley. Text by N. Tinbergen. 1959. *British Birds*, **52**(9): 302-306. Seven fine photographs taken in Jutland of *Philomachus pugnax* in display. Dr. Tinbergen discusses the photographs and also the observations of 8 ornithologists, particularly those of Selous (1906-07), comparing the postures with those of other Laro-Limicolae that have been recently studied. Females show preference for the more conspicuously marked and dominant males. "It is interesting to see how on the one hand the Ruff is a typical wader, and how on the other it has specialized as an arena bird and developed certain traits (extreme sexual dimorphism, social courtship, males mere 'sperm carriers' with a mating territory and possessing unusual sexual vigour, females choosing) which are very similar to the characteristics of other arena birds."—M. M. Nice.

41. The calls and displays of Owls. (Ugglornas spelvanor.) Jens Wahlstedt. 1959. *Fauna och Flora*, **3-4**: 81-112. Patient study during many nights spent in the wilderness in late winter and spring over several years yielded the data contained in this remarkable account of the little-known habits of this group of raptors. The seasonal and daily rhythms, the influence of the weather on behavior, reactions to imitations, the differences between male and female call notes are discussed for six species: the Pygmy *(Glaucidium passerinum)*, Boreal *(Aegolius funereus)*, Long-eared *(Asio otus)*, Short-eared *(Asio f. flammeus)*, Tawny *(Strix aluco)*, Great Gray *(Strix nebulosa)*, and Ural *(Strix uralensis liturata)* Owls.

The most intensive owl calling occurs from dusk to midnight and at dawn. It varies in the different species. The Boreal Owl, for instance, is a decided night-caller, starting at the height of the season an hour after dusk and continuing practically without interruption all night, while the Pygmy Owl is exclusively a dawn musician. The calling of the owls is well synchronized with the activity of their prey animals, voles and mice, which are easier to see on moonlit or light nights and more in evidence towards the spring when the weather gets better and warmer.

During the breeding season the females use much the same calls as the males, and only the experienced observer with a fine ear can distinguish between them, those of the females sounding "tamer," less clear of tone. The females and the young have also their own specific notes. The author's phonetic rendering of the calls is helpfully realistic.

Owls react quickly and often aggressively to imitations of their calls. This inclination facilitates census-taking and territory-mapping, as well as the study of behavior, since the owls can be "called out" almost at will. By this device the author was able to witness the matings of the Boreal and Tawny Owls. Hovering on rapidly beating wings, the male sank down upon the female, whereupon both broke into a chorus of wild calling interrupted by weird hissing and wailing noises and accompanied by wing-clapping and bill-snapping. The Long-eared and Short-eared Owls also have special flight displays. They feature ritualized rising into the air to the accompaniment of continuous loud calling, diving, wobbling flights around the treetops, and "applauding" at which the wings are brought together under the belly with a resounding smack. The lack of a good English summary of this fine behavior study is regrettable.—Louise de K. Lawrence.

42. The fearless Grasshopper Warbler. (Den orädda gräshoppsångaren *(Locustella naevia)*. Knut Eklund. 1959. *Vår Fågelvärld*, **18**: 215. An excellent series of photographs with captions worthy of note. At the approach of a weasel the bird gave loud alarm notes, vigorously flapped its wings and flicked its tail sideways, then pursued the enemy in "wobbling" flight. The song is a continuous sibilant undertone with a sharp churring overtone of "indescribably high pitch," at intervals interrupted by nearly inaudible hiccough-like notes. This warbler ignores man's presence and may walk over his feet or perch on his hand with utmost indifference. It was first observed in mid-Sweden in 1946, but not until 1955 was breeding proved.—Louise de K. Lawrence.

43. Knowledge of the daily activity of Titmice of the genera Parus and Aegithalos. (Zur Kenntnis der Tagesaktivität de Meisen de Gattungen Parus und Aegithalos.) Jiri Felix. 1958. *Sylvia* **15**: 5-21. (From review by H. Bruns in *Ornithologische Mitteilungen*, **11**: 37.) Based on observations made near Prague in a mixed woodland from Nov. 1951 to the end of May 1953, the author reports that outside of the nesting time individual Great Tit and Blue Tit *(Parus major and P. caerulaes)* use an area no greater than 10 hectares in extent. Flocks use areas of 10-70 ha. The travel of a flock of Tits during an 8-hour day amounted to more than 3000 m., of individuals of pairs about 1500 m. Individual Tits moved at a velocity of 200 meters/hr., flocks about twice as fast. On the average, 86 percent of the day was spent in seeking food, 5 percent in preening, 5 percent resting and 10 percent in various other activities. From 16 July 1952 to 23 Jan. 1953, a flock of Longtailed Tits suffered mortality losses of 73 percent (excluding nestling deaths), principally to Hawks and Owls.—R. O. Bender.

44. Starlings flocks and birds of prey. (Starenschwärme und Greifvögel.) Wilhelm Zedler. 1959. *Ornithologische Mitteilungen*, **11**: 128-30. An interesting discussion of the manner of attack employed by Starlings on hawks as observed at the Neusiedler See. Attacks were observed on Harriers (probably only the Marsh Harrier *(Circus aeruginosus)*), the Kestrel and Lesser Kestrel *(Falco tinnunculus* and *F. naumanni)* and the Common Buzzard *(Buteo buteo)*. The author observes that these are all hawks that take their prey on or near the ground and comments that he had not observed Starling attacks on hawks which take their prey in the air. He also points out that it is proper to speak of attack rather than defense according to his experience.

Two kinds of attack maneuvers are reported. With very large flocks, 1000 or more, the Starlings fly with less organized precision and appear to "cover" the hawk for minutes at a time. With smaller flocks, 100 or less, the birds move more as a unit and the attacked bird is "taken in the middle." The hawks when attacked did not exhibit notable reaction; no attempt to seize one of the attackers was seen. They simply flew out of the area. Zedler suggests that the presence of such a mass of birds effectively occupying much of the hawk's field of vision generates a psychological pressure that compels it to flee.—R. O. Bender.

WILDLIFE MANAGEMENT

(See also Numbers 46, 50, 51)

45. Protecting Pine Buds against the Attacks of Black Game. (Bescherming der Dennenknoppen Tegen de Aanvallen van het Korhoen, *Lyrurus tetrix* (L.).) L. Nef. 1959. *Le Gerfaut*, **49**(1): 53-58. (From the French summary). The Black Game causes considerable damage to young plantations of pine on the heath lands of Belgium by nipping off the young shoots. The various chemicals commonly used to protect farm crops against damage by crows proved ineffective, but dusting the young trees with lime gave them complete protection against the birds' depredation at far lower cost.—O. L. Austin, Jr.

PHYSIOLOGY AND PSYCHOLOGY

(See Numbers 15, 25, 36, 46, 62)

MORPHOLOGY AND ANATOMY

46. Observations on the Cloacal Gland of the Eurasian Quail, *Coturnix coturnix*. William H. Coil and David K. Wetherbee. 1959. *Ohio Journal of Science*, **59**(5): 268-270. The authors describe a gland they discovered embedded in the dorsal lip of the cloaca of male *Coturnix*, which secretes a frothy fluid frequently visible on the cloaca and in the birds' droppings. They believe the secretion to be "associated with the mechanics of internal fertilization," perhaps as a lubricant. Their anatomical studies also revealed a small penis-like structure on the ventral wall of the cloaca, the first time such an organ has been reported in gallinaceous birds.—O. L. Austin, Jr.

47. Bills, Eggs, and Nests of Captured Arctic Terns *(Sterna paradisaea* Pont.) and Common Terns *(Sterna hirundo* L.). F. Søgaard Andersen. 1959. *Dansk Ornithologisk Forenings Tidsskrift*, **53**(2): 84-100. With English and Danish summaries). This paper is largely a statistical analysis of series of measurements of bills and of eggs of Common and Arctic Terns made between 1940 and 1948 in a mixed colony of the two species on the Tipperne Sanctuary near the west coast of Denmark. While the means of the bill lengths of the two species differ significantly, the measurements overlap so widely that length is not a reliable specific character. The author notes that about one-third of the Arctic Terns have a small black tip to the bill, which "seems to be due to incomplete shedding of the winter sheath of the bill, and this in turn seems to be most frequent among young birds." It is never as pronounced as the extensive black tip in all breeding Common Terns.

The eggs of the two species are practically identical in length, but those of the Arctic Tern are significantly smaller in mean breadth than those of the Com-

mon Tern. Comparison with data from Arctic Terns nesting in eastern Greenland suggests the Danish Arctic Terns lay slightly larger clutches of slightly larger eggs than the Greenland population.

Banding data from nesting adult Arctics show distributional patterns similiar to those exhibited by the Common Terns on our New England coast. The birds show strong fidelity to their nesting sites, moving very slightly, if at all, from year to year. The farthest movement was 2 kilometers from a previous site. The oldest Arctic Terns captured on their nests were 14, 10, and 10 years old respectively.—O. L. Austin, Jr.

ZOOGEOGRAPHY

(See also Numbers 1, 3, 8, 27, 28, 42, 43, 47, 64, 65, 66)

48. On the breeding distribution pattern of North American migrant birds. Robert H. Mac Arthur. *Auk*, **76**: 318-325, 1959. This paper presents information on the pattern of breeding distribution of Nearctic birds which migrate into the Neotropical region (the American continent south of the United States, including the West Indies but excluding the Mexican highlands). The species of migrants (neotropical migrants) considered are largely insectivorous passerines which breed in undisturbed climax vegetation. These relatively stable habitats are "likely to represent the conditions for which the pattern of migration gradually evolved." A basic assumption is that each species returns in spring to such environmental situations as permit it "the greatest output of reproducing progeny." Mac Arthur is one of few workers who have made good use of breeding-bird census data, including those published in *Audubon Field Notes*. A map shows "the proportion of breeding-bird individuals in undisturbed vegetation communities at that community which will migrate out of the Nearctic region in the winter."

Climate alone cannot be correlated in any simple way with the proportions of migrants in the different breeding populations. In general, the proportion of neotropical migrants is highest in the northeastern deciduous forest areas. This proportion diminishes in other areas, such as coniferous forests of the north and (especially) of the west, and becomes almost nil in chaparral, desert, and prairie habitats. "The most reasonable explanation of the pattern . . . is that where change between winter and summer in the supply of food suitable for migrants is greatest, the proportion of migrants is greatest." Moreover, the food increase which governs this proportion of migrants must be predictable (as it is not, say, in many desert areas) and must last long enough to sustain the migrant population during its summer-long sojourn. Spruce-fir forests of northern regions support as breeders relatively more migrants than do pine and redwood forests farther south. The fact that spruce has a greater foliage/wood ratio than pine ties in with the idea that "the insect-eating bird might be expected to comprise only half to two-thirds as large a percentage [of the bird population] in pine as in spruce." Mac Arthur found an interesting correlation with latitude. Thus, "in the northern areas censused, the average abundance of the neotropical migrant species is greater than that of the residents and species which move short distances. . . . On southern areas . . . the tendency is reversed . . . meaning that, on the average, non-migrant species are commoner."

This paper may well stimulate further work. For example, data on the proportion of migrant to non-migrant species and individuals in various regions during migration periods and comparison of such data with those of Mac Arthur would yield information of decided interest.—Robert A. Norris.

49. The Spread of the House Sparrow in Mexico. (Die Einwanderung des Haussperlings in Mexiko.) Helmuth O. Wagner. 1959. *Zeitschrift für Tierpsychologie*, **16**(5): 584-592. (With English summary.) *Passer domesticus* came into Mexico about 1910 both from the northeast and along the Pacific Coast, where it advanced about 200 km a year until it reached the Isthmus of Tehuantepec. The vegetation zones are shown on one map, the progress of the invasion on another. The birds cannot cross really arid areas nor unbroken virgin forest. Very high summer temperatures are a limiting factor, although such regions are repeatedly entered, only to have the population disappear. In hot areas the birds

nest in the winter and spring. Except during grain harvests the birds live almost entirely upon insects.—M. M. Nice.

50. The Decrease of the Corncrake *(Crex crex)*. Lars von Haartman. 1958. *Societas Scientiarum Fennica. Commentationes Biologicae*, **17**(2): 1-29. The marked decrease of the Corncrake in northern Europe in this century is correlated with earlier harvesting of hay and the greatly increased use of mowing machines which destroy the females, their eggs, and small chicks. The report is illustrated with 12 figures and provided with a 3-page bibliography.—M. M. Nice.

51. The Spread of the Eider in Great Britain. 1959. J. H. Taverner. *British Birds*, **52**(8): 245-258. About 100 years ago *Somateria mollissima* began to extend its breeding range in Great Britain. This trend has increased greatly since 1945, along with a striking increase in the winter range. The increase is probably largely due to protection, but "protection could not possibly have been the cause of the original spread from the Western Isles." No satisfactory explanation of this phenomenon is offered.—M. M. Nice.

52. Dispersal of Egrets on the Kanto Plain, Japan. H. Elliott McClure. 1958. *Wilson Bulletin*. **70**(4): 359-371. This study of six species of herons capable of harboring the virus of Japanese encephalitis shows that peak abundance away from colonies near Tokyo coincides with peak infection of mosquito vectors and mammalian hosts. Widespread and even distribution is shown by the increase in the number of flocks but not by their size. Dispersal is assumed from the agreement of production estimates of the Shinhama and Sagiyama colonies with peak figures on the plain obtained from aerial surveys, and the observation of red-dyed birds up to four miles from the colony where marked. However, the existence of additional large colonies along this aerial survey route at Noda and in Chiba City (Austin and Kuroda, 1953) and the well-known extensive post-breeding movement of immature herons detract considerably from this assumption. As McClure states, "This obviously is a very difficult field problem to solve without extensive banding and wide recapture. . . ." Since 1951 only 5000 nestlings have been banded on the Plain and none north of it, with very few heard from. This study certainly demonstrates that in any field study of birds a well-organized, well-distributed, and well-publicized banding organization is well-nigh indispensable.—Thomas A. Imhof.

53. Notes on the Pine Grosbeak and the White-winged Crossbill in Sweden during the invasion period 1956-57. (Om tallbit *(Pinicola enucleator)* och bändelkorsnäbb *(Loxia leucoptera)* i Sverige under invasionsperioden 1956-57). Gunnar Markgren and Stig Lundberg. 1959. *Vår Fågelvärd*, **18:** 185-205. (English summary.) The movements of the two species are discussed in detail and illustrated by several maps. Several hundred Grosbeaks were banded at the northern end of the Gulf of Bothnia and a few Crossbills in mid-Sweden. Recoveries the same year indicated a southwesterly movement by the Grosbeaks at about 10 kilometers per day during January-February and a slow eastward movement of the Crossbills in late February and March. A year later two of the Grosbeaks were recovered in Finland (62° 41′ N, 29° 40′ E). Rowanberries were abundant and devoured by both species, but the staple foods—sprucebuds and flowers for the Grosbeak, larch seeds for the Crossbill—were in short supply. Most of the invasion species stay and breed in numbers wherever food is abundant. Crossbills were found nesting in a larch tree plantation in northern Sweden. The Grosbeaks, however, appear to diverge from this habit and commonly return to their breeding ranges in northern Europe and northeastern Siberia.—Louise de K. Lawrence.

54. The occurrence in Sweden of Redpolls, Siskins, and Yellowhammers in the winters 1957-58 and 1958-59. (Gråsiskans *(Carduelis flammea)*, grönsiskans *(Carduelis spinus)* och gulsparvens *(Emberiza citrinella)* förekomst i Sverige vintrarna 1957-58 och 1958-59.) I. Lennerstedt and S. Ulfstrand. 1959. *Vår Fågelvärld*, **18:** 215-219. (English summary.) Each year a cooperative "Christmas" census is taken in Sweden from 23 December to 8 January. Results, calculated in number of birds seen per field hour, show Redpolls and Siskins notably increased in 1958-59 over the previous year, whereas the Yellowhammers decreased steadily from one winter to the other.—Louise de K. Lawrence.

55. The avifauna 1956-57 of Krankesjön and its environment. (Fågelfaunan i Krankesjön och dess omgivningar år 1956-57.) Staffan Ulfstrand. 1959. *Fauna och Flora*, **1-2:** 9-59. Frequent censuses at the southernmost of Sweden's three famous bird lakes furnished records which clearly contradicted recent assumptions that Krankesjön had lost its importance from the ornithologist's standpoint. Of the 182 species listed, 95 were transients and 86 certain or probable breeders. Only one, the Bittern *(Botaurus stellaris)*, although found at this lake in the past, was missing.—Louise de K. Lawrence.

56. The Avifauna of Bylot Island. Leslie M. Tuck and Louis Lemieux. 1959. *Dansk Ornithologisk Forenings Tidsskrift.* **53**(3): 137-154. (With Danish summary). A short description of the physiography and ecology of this large mountainous island off the north coast of Baffinland is followed by an annotated list of some 50 species of birds with the highlights of the authors' observations thereon. Tuck and Lemieux spent the summer of 1957 on the island, Tuck studying the large Murre colony, Lemieux concentrating on the Snow Geese. The annotated list contains a great deal of useful and reliable information on the species observed. In addition to the Murres and Snow Geese, the nesting data on almost all the other species observed are most welcome, as are the distributional notes from this area which has been so little studied.—O. L. Austin, Jr.

57. The Wood Sandpiper *(Tringa glareola* L.) as a Breeding Bird in Denmark. (Tinksmeden *(Tringa glareola* L.) som ynglefugl i Danmark.) Ernst Torp Pedersen. 1959. *Dansk Ornithologisk Forenings Tidsskrift*, **53**(2): 53-83. (From the English summary). This distributional study of the Wood Sandpiper at the extreme western end of its trans-Palearctic breeding range shows "the Danish breeding population numbers between 200 and 300 pairs distributed over about 50 localities . . . In many of the localities there are only one or two breeding pairs, and in many of these places the population, unfortunately is strongly threatened." A century or so ago the Wood Sandpiper was far more plentiful on the then more extensive heather moors of Denmark. The population shows some yearly variation which seems to be related to the amount of rainfall. In dry summers the birds leave when the ponds and lakes in the moors dry up, but return in following years when conditions are more propitious. The steady decline over the past century, which has been most manifest during the past 30 years, is attributed to "The intensive cultivation and draining of the moors in the latter half of the last century."—O. L. Austin, Jr.

58. Evening Grosbeak Records in the Maritimes, New England and New York/Summer of 1958. Mary S. Shaub. 1959. *Maine Field Naturalist*, **15:** 102-106. Detailed reports of observations from central New York through northern New England and in the Maritime Provinces. No less than 53 localities reported the species in June, July, or August, appreciably more than in previous years. Mrs. Shaub is interested in data even for localities where the species has become regular in summer in recent years, for purposes of comparison.— E. Alexander Bergstrom.

59. Winter Habitat Preferences of White-crowned Sparrows. L. Richard Mewaldt and Ernest B. Woon. 1959. *News from the Bird-Banders*, **34:** 1-4. At 15 sites near San Jose, Calif., White-crowned Sparrows (Zonotrichia leucophrys) were banded between October 5, 1957 and November 11, 1958. Of these, 238 were identified as *Z.l. gambelii*, 523 were identified as *pugetensis*, and 43 as *nuttalli*. While the population of the species at any one site tended to have one or the other of the two more abundant races predominating, the authors were unable to detect a habitat preference for either race.—E. Alexander Bergstrom.

SYSTEMATICS

60. Basic Systematics and Ornithogeography. R. Verheyen. 1959. *Le Gerfaut*, **49**(1): 95-101. In further developing his theory of paramorphogenesis (see *Bird-Banding* **30**; 60-61) the author proposes that the systematic relationships of birds be determined not by the considered judgment of their similarities and differences by individual scholars, but by a strictly mathematical evaluation of

all their various characters, morphological, anatomical, and ethological. Those that share 90 percent or more total taxonomic characters he would place in the same genus, those with 70 percent to the same family, with 50 percent to the same order, and so forth. How nice it would be if systematic evaluations could thus be brought into the realm of the exact sciences! One could feed a list of characters into a computer and let the machine give us all the answers.

One basic weakness in Verheyen's system is the impossibility of assigning relative mathematical values to taxonomic characters. Just how much more (or less) important taxonomically, for instance, are color and pattern than the number of primaries or rectrices, or palate structure, or type of courtship or head-scratching? This fault is not remedied by giving equal weight to each and every character, as he proposes. In addition Verheyen fails to acknowledge that the species, and to a lesser extent the subspecies, are the only "natural" taxonomic categories, that all the higher categories are still little better than groupings of convenience manufactured by man. Though I agree that "systematics ought to express relationships, which is only possible within groups of related species," I cannot see that this system would make the genus "the theoretical and practical basic unit in systematics and not the species," or that so doing would accomplish anything.—O. L. Austin, Jr.

FOOD

(See also Numbers 49, 53)

61. Some data on the diet of Black Redstart. (Quelques données bromatologiques sur le Rougequeue noir [*Phoenicurus ochruros gibraltariensis*]). Christian Erard. 1959. *Nos Oiseaux*, **25**: 13-16. Data obtained in part from observation of feeding habits and in part from stomach dissections are presented under the headings insects, other animal food, and vegetable food. Many of the food items are identified to species. No breakdown to percentages of various classes is given.—R. O. Bender.

SONG

(See also Number 41)

62. Family Tradition in Song Development of the Bullfinch. (Familientradition in der Gesangsentwicklung des Gimpels *(Pyrrhula pyrrhula* L.).) Jürgen Nicolai. 1959. *Journal für Ornithologie*, **100** (1): 39-46. Young male Bullfinches raised in captivity learn their songs from their fathers; at the age of 7 weeks they concentrate on their fathers' songs with intent expressions and heads held obliquely. At the same time their early sexual behavior develops; the young males react like females to their fathers. Examples are given of particular songs being transmitted in one family to sons, and in another to sons, grandsons and great-grandsons. Spectrograms are shown of similar motifs in songs of father and son as well as a sample of the very simple song of a wild Bullfinch.

In a great many species of small passerines the young scatter at about 4 weeks of age. With Song Sparrows *(Melospiza melodia)* I found (1943:149) that "the possession of similar songs is no proof of close relationship between the singers, as neither brothers, fathers and sons, or grandfathers and grandsons, have had similar songs, while, on the other hand, birds known to be unrelated have shown this phenomenon. Particular songs were neither inherited nor learned during the first 4 weeks." One hand-raised bird learned his songs at the age of 3 months. —M. M. Nice.

63. A Field Guide to Bird Songs of Eastern and Central North America. Recorded by the Laboratory of Ornithology, Cornell University, under the direction of Peter Paul Kellogg and Arthur A. Allen, in collaboration with Roger Tory Peterson. 1959. Houghton-Mifflin Co., Boston. Album of two 12″ records, 33 1/3 r.p.m., $10.00.

Each song is accompanied by a page reference to the current (1947) edition of Peterson's [Eastern] *Field Guide to the Birds*. However, while this is the most useful comparison, the records can readily be used with any other guide

in the current checklist order. The names follow the 4th A.O.U. *Checklist* rather than the 5th (so as to correspond to the field guide itself), but the album back shows the latest names as well. The album even includes an alphabetic index, as an aid to beginners.

The sound quality is generally high, comparable to other Cornell releases. To my ear, the record was least successful in the very high frequencies (which have always been recognized as the most difficult to record). The Blackpoll Warbler, in particular, came through poorly, perhaps by selection of an unusually weak or high song. By comparison, it was much less audible than any of the three Blackpolls on the Ontario record *(Songs of Warblers of Eastern North America,* see review in *Bird-Banding,* **29:** 261).

The album includes such rare species as Whooping Crane, Everglades Kite and Ivory-billed Woodpecker. It includes the one eastern warbler—Bachman's—omitted from the Ontario record (not considering the problematical Sutton's). In comparison with other records, it has a greater variety of waterbirds and shorebirds. While it may be unkind to look for more after such an abundance, the album does devote space to a number of songs of only limited value for field identification, while omitting some species where songs or calls are of major value: for example, Roseate Tern, Saw-whet Owl, Red Crossbill and Snow Bunting. No doubt even Cornell's wealth of recordings still has a few gaps. The Yellow Rail is represented by its second song, generally considered the source of William Brewster's mysterious "kicker" in eastern Massachusetts, rather than by the ticking notes considered typical of the species in its centers of abundance as a breeding bird in Canada.

The species given include many for which Peterson's *Field Guide* gives no description, or only a general one. The beginner can learn songs far quicker from the combination of record and book than by book alone. Even the most experienced field man is likely to find some songs here which he has not had the opportunity to hear in the field.

The inclusion of so many species in one album was accomplished partly by giving each only briefly. The album includes over 300 species, generally one individual and one song. By comparison, while the Ontario record (limited to warblers) has only 38 species, it is rich in examples—170 individuals, and 400 songs. Considering less specialized records, the three Stillwell releases (see *Bird-Banding,* **24:** 85-86; **25:** 170-171; and **28:** 183) also give a much better idea of the variety of songs within a single species.

The new album is a real bargain, considering the number of species listed. It takes first place as an album to be recommended as the start of a collection of bird songs, at least for eastern North America.—E. Alexander Bergstrom.

BOOKS

64. Complete Field Guide to American Wildlife: East, Central, and North. Henry Hill Collins, Jr. 1959. Harper and Brothers, Publishers, New York. 683 pages illustrated. Price $6.95. This latest addition to the plethora of guide books now on the market is most ambitious in scope. It covers "all species of birds, mammals, reptiles, amphibians, food and game fishes, sea shells, and the principal marine invertebrates occurring annually in North America east of the Rockies and north of the 37th parallel." Describing some 1400 species adequately within the limited size of a pocket book as this one does is no mean achievement. The volume is almost twice as thick as the Houghton-Mifflin series of guides, but identical in other dimensions. While a trifle bulky to carry in a side or hip pocket, it will fit neatly into a small haversack and is an ideal size for carrying in a car glove compartment. It is a fine handy little book for the bird watcher who would like to know the correct identification of the many other interesting biota he encounters in his rambles afield.

The book presents a number of innovations. One is the small range maps which show the general distribution of each species quickly, clearly, and in less space than words. Another is a series of comparison charts listing the pertinent identification marks for groups of similar birds, which strike me as particularly ingenious and useful. Another novelty in this country, which I first saw in a Japanese bird guide published some 30 years ago, is the picturing of each species' egg with the bird.

The text is exceptionally well done, both in arrangement, in coverage, and in style. The presentation is clear and fresh, the writing professionally polished. The author's researching is sound and shows a good knowledge of his subject, particularly in the birds, and he has successfully achieved a combination of the best features of the Peterson and Audubon guides, and added quite a bit of new material of his own.

The best I can say of the bird plates by Russell Francis Peterson (no kin) is that they are adequate. The birds in the color plates are stiff, wooden, and have a decoy-like aspect. The color reproduction is only fair. The color plates of the reptiles and amphibians, the fishes, and the invertebrates are far superior in every way to those of the birds.—O. L. Austin, Jr.

65. The Bird World of the South Caspian Lowlands. (Die Vogelwelt des Südkaspischen Tieflandes.) Ernst Schüz. 1959. Schweizerbart'sche Verlagsbuchhandlung. Stuttgart. 199pp. In the past the Caspian Sea was a wonderful refuge for water birds and a spectacular place to watch migration. After tracing the history of ornithological observation in this region, starting with Gmelin in 1770, Dr. Schüz tells of his own experiences there from February to May 1956. Most of the book is devoted to an annotated list of 327 species (210 of which nest) in the region between the south coast of the Caspian Sea and the Elburz Mountains. Ecology is discussed, as well as the migration picture, and the dangers confronting the birds, these dangers stemming almost entirely from human activities. The fall in the level of the Caspian Sea benefits only the flamingos, for they prefer shallow, very salty water. Oil on the water and the beaches takes a heavy toll, as does irresponsible killing of the birds. Dr. Schüz stresses the great and pressing need for education of the people in respect to wildlife and for the establishment of nature reserves. An interesting, thorough piece of work.—M. M. Nice.

66. The Birds of the Saskatchewan River, Carlton to Cumberland. C. Stuart Houston and Maurice G. Street. 1959. *Spec. Publ. No.* 2, *Sask. Nat. Hist. Soc.*: 1-205. This well-annotated list of a limited area in central Saskatchewan contains 259 species, plus 7 hypotheticals which appear in proper order but not in boldface. It adds Barred Owl to the Saskatchewan list and to the hypothetical list Greater Scaup, Eskimo Curlew, Little Gull, and Pine Warbler. In Nipawin alone breeding evidence is presented for 141 of the 241 species on the local list. The introductory material includes 17 pages of history and biography, 7 pages of description of the area, and 2 pages of banding summary. The AOU Check-List is followed faithfully, and binomials are used except in a few cases where subspecifically-identified specimens are cited. Each species account includes its status in each of five areas along the river, numbers of individuals recorded—concrete evidence of past and present abundance—egg dates, notes on nest material, food, habitat, and banding totals with recoveries and returns from these birds. Among the fascinating distribution items is the fact that, although the region is on Mountain Time and lies between the 101st and 104th meridians, Eastern Kingbird, Eastern Phoebe, and Rose-breasted Grosbeak are more common than their western counterparts, while Baltimore Oriole completely supplants Bullock's. Especially interesting to me were the accounts of the White Pelican, Trumpeter Swan, Canada Goose, Sharp-tailed Grouse, Whooping Crane, Forster's Tern, and Common Raven.—Thomas A. Imhof.

NEBBA FINANCIAL STATEMENTS, 1958

The general account reflects a continuation of long issues of *Bird-Banding*, at the new, higher printing costs. Despite a further increase in income from dues and subscriptions, the operating deficit was greater than for the previous year. We expect slight reductions in the length of issues. Any reader who can persuade a friend to become a member will help us greatly in efforts to continue long issues.

The disbursement of $265 from the Research Fund supported tern banding on Cape Cod (Massachusetts), on a small scale. For the 1960 season, we hope that a worthwhile program can be carried on with volunteer help, in June and early July. Anyone in a position to help is invited to get in touch with Dr. W. H. Drury, Jr., Drumlin Farm, So. Lincoln, Mass.