leaving is of interest, inasmuch as there now seems evidence that northerly migration may begin for this species and other far-north nesters around mid-March, the picture usually being confused by accretions of birds which have wintered at more southerly points.—Edwin A. Mason, Arcadia Wildlife Sanctuary, Easthampton R.F.D., Mass.

RECENT LITERATURE

BANDING

1. Banding activities at Falsterbo Bird Station 1957-1958. Report No. 17. Ringmärkningsverksamheten vid Falsterbo fågelstation 1957-1958.) Bengt Fritz and Roy Nilsson. 1960. *Vår Fågelvärld*, **19:** 208-220. (English summary.) During the two years 7,798 birds of some 80 species were banded. Through a grant from the state and contributions from clubs, two new traps (one Heligoland type) and a number of mist nets were added to previous stock of equipment. In these, 11 species new for the station were caught, including such birds as Hawfinches *(Coccothraustes coccothraustes)*, Redpolls *(Carduelis flammea)* and Willow Tits *(Parus atricapillus)*. At one time, an on-the-spot Sparrow Hawk *(Accipiter nisus)* grasped the station's first Linnet *(Carduelis cannabina)* "almost out of the hands of the bander." Recoveries amounted to 106 birds. The most remarkable of these was the Redstart *(Phoenicurus phoenicurus)* which was banded 23 Sept. and 31 days later found dead on board a ship halfway between the Canary Islands and Florida. Lists of the birds banded and recoveries complete the report.—Louise de K. Lawrence.

2. Report on Bird-Ringing for 1959. Robert Spencer. 1960. *British Birds, Ringing Supplement* **55:** 457-502. A total of 242,325 birds were ringed in Great Britain in 1959, an increase of more than 41,000 over 1958. A gratifying feature is the large proportion of nestlings—28.6 percent—banded. "Colonial seabirds such as Herring Gull and Sandwich Tern contribute greatly to this, as do Blue Tit and Great Tit." Other species of which from 2,051—3,849 "nestlings" were ringed were Manx Shearwaters, Lapwings, Blackheaded Gulls, and Swallows *(Hirundo rustica)*. A total of 6,949 birds were recovered during the year; 35 pages are devoted to reporting the most significant of these. The British are certainly to be congratulated on their zeal and efficiency both in ringing and for making their results available.—M. M. Nice.

3. Recoveries in Great Britain and Ireland of Birds Ringed Abroad. E. P. Leach. 1960. *British Birds, Ringing Supplement*, **55:** 502-512. In this selected list Miss Leach notes with pleasure the "emergence of an organized ringing effort in the Iberian peninsula, a region of so much importance as a migration route." Goldfinches *(Carduelis carduelis)* ringed in Spain and Portugal are now being taken in Great Britain. "Once more there is evidence of an impressive invasion of young gulls—Great Black-backed and Herring as well as Common—from the U.S.S.R. in addition to Scandinavia, while a Herring Gull hatched in Ushant, France, arrived here from the opposite direction."—M. M. Nice.

MIGRATION

4. Bird tragedy at the dunes. Simon Sigal. 1960. *Indiana Audubon Quarterly*, **38**(2): 23-25. A severe storm, with winds of hurricane velocity and scattered hail, struck lower Lake Michigan at 10 p.m., 16 April, 1960. Subsequent surveys along 10½ miles of the southern shoreline produced a count of 3636 drowned birds of 56 species. The list included 1039 Slate-colored Juncos, 141 Yellow-bellied Sapsuckers, 32 Henslow's Sparrows, 25 White-throated Sparrows, 21 Brown-headed Cowbirds, 2 Screech Owls, and 2 Bluebirds.

Mass drownings of this sort are recurrent events over the Great Lakes. They help us to guess which species are predominantly nocturnal migrants and which are not. Their testimony differs substantially from the evidence supplied by TV kills, in which fringillids like the Slate-colored Junco, a leading subject of experimental research on migration, have been poorly represented. The data, however, are not absolutely conclusive. The possibility exists that diurnal migrants may find themselves over water at nightfall and thus be forced to continue flying after dark. Such birds, presumably, would be less adept at night flight than habitual nocturnal migrants and might die in higher proportion for that very reason.—R. J. Newman.

5. More TV tower destruction. Charles A. Kemper. 1959. *Passenger Pigeon,* **21**(4): 135-142. When a bird has met death by colliding with a stationary obstacle, the probability that it was a true night migrant is naturally much stronger than in the case of a bird that has drowned in a large lake. Yet even then the evidence falls short of unquestionable proof, as the present remarkable account shows.

When the station engineer arrived at the WEAU television installation at Eau Claire, Wisc., just before daybreak on October 1, 1959, he saw no dead birds. At 8 a.m. he noticed a great many. Dr. Kemper later estimated approximately 1200 casualties, 821 of which he and his helpers picked up, in addition to two red bats *(Lasiurus borealis).* His report emphasizes his conviction that most of the victims must have crashed into the tower in daylight. Unfortunately some crucial information, such as the amount of illumination at the time the engineer saw no birds, remains unstated. The paper goes on to speculate that the earth's magnetic lines may "converge about any tall object in the air" and that perhaps "birds and bats are sometimes sleeping in their flight, drifting along magnetic lines like an airplane following a radio beam." Taking note of the well-known echo-sounding abilities of bats, it asks, "can any other theory explain why bats should collide with a tower?" The reviewer would answer yes. One simple possibility is that migrating bats traveling at high elevations, where there are no *natural* obstructions, do not try echolocation. At any rate, the premise that the earth's magnetic lines converge on tall objects seems likely to receive little support from physicists. Likewise the premise that migrants might drift along magnetic lines half asleep in flight will strike most ornithologists as fantastic.

A table compares the recorded species composition in the October 1959 disaster with the recorded results of four previous kills at Eau Claire including the worst tower catastrophe on record (see *Bird-Banding,* **29**(4): Review 7). Valuable as these data are, they have an element of avoidable uncertainty, one rather frequent along tabulations from television towers. Large numbers of the dead migrants at Eau Claire were neither retrieved nor identified, but the account does not specify whether the method used in collecting the portion retrieved and listed was in any way selective. Therefore the future user has no assurance that the data provide a random sample even for the kills themselves. Also worthy of comment is the problem of ambiguity in dating. Should one refer to a nocturnal disaster by the date on which the dark period ended or by the date on which that period began? Practice varies. In fact, a collision dated 29 August, 1959 in Kemper's text appears in his own tables under the heading "Aug. 28." One general solution to the problem of dating would be to designate each dark period by both of the dates that encompass it, e.g., *the night of April 29-30.* —R. J. Newman.

6. Studies in visible migration at Falsterbo Bird Station. Staffen Ulfstrand. 1960. *Bird Migration,* **1**(4): 183-187. The present paper is mainly a brief review of previously published reports on autumn observations of diurnal migration at the bird station on the Falsterbo peninsula in southwestern Sweden. The topics touched upon include the importance of leading lines in hawk migration in southern Sweden, the influence of wind on the effectiveness of these leading lines and on the course of migration, and the year-to-year variation in the numbers of migrants and the timing of the big flights. Appendices list the publications with information on bird studies made at Falsterbo.—Stuart L. Warter.

7. Birding on the Ocean. Alfred O. Gross. 1960. *Audubon Magazine*, **62:** 274-277, 298-99, 310. November-December, 1960. A round-the-world trip by freighter yielded a number of records of land birds well at sea. On 10 November, 1957, at Latitude 40° 18′ north and Longitude 70° 10′ west, about 175 miles from New York, a Rusty Blackbird *(Euphagus carolinus)* reached the ship, with no sign of exhaustion. A Mourning Dove *(Zenaidura macroura)* spent about an hour on the ship and then flew off. Then a number of sparrows arrived, in good condition: three Slate-colored Juncos *(Junco hyemalis)*, one Savannah Sparrow *(Passerculus sandwichensis)*, one Grasshopper Sparrow *(Ammodramus savannarum)*, two Vesper Sparrows *(Pooecetes gramineus)*, and one Song Sparrow *(Melospiza melodia)*. A steady northwest wind blew at 20 to 25 miles an hour.

On 11 November, a Sparrow Hawk *(Falco sparverius)* lit on the ship at 40° N. 62° 53′ W., about 500 miles east of New York, remained about half an hour, then flew off to the south. On 12 November, at 39° 39′ N. 54° 51′ W., a male Snow Bunting *(Plectrophenax nivalis)* flew about the ship, apparently in good condition. On 13 November at 39° 27′ N. 46° 26′ W., about 1,269 miles from New York and 908 miles from the Azores, a female White-winged Crossbill *(Loxia leucoptera)* flew about, and then flew off to the southwest.

A Blackpoll Warbler *(Dendroica striata)* was first noted on 14 November, but was reported to have come aboard soon after the ship left New York. It spent most of its time in the warmth of the engine room, and was fed by the men. It regularly got water at a dripping faucet. The bird left the ship at the Azores, after a ride of 2,177 miles from New York, vividly illustrating how some of the many casual visitors may reach these remote oceanic islands.—E. Alexander Bergstrom.

8. Autumn "Drift-migration" on the English East Coast. David Lack. 1960. *British Birds*, **53**(8); 325-352; (9): 379-397. An analysis of the records from 1949-1959 of three English east coast observatories of the arrivals of night migrant chats (Turdinae except the genus *Turdus)*, warblers (Sylviidae) and flycatchers (Muscicapidae). "Most big and moderate arrivals occurred with an anticyclone in Scandinavia and strong south-easterly winds in the southern North Sea, but others took place in a variety of different conditions, a few with westerly winds throughout the North Sea." The most important factors were those influencing the proportion of migrants alighting on the English coast. "Alighting is probably favored by head-winds, strong cross-winds, rain and full overcast."—M. M. Nice.

POPULATION DYNAMICS

9. The Scottish Mute Swan Census 1955-56. C. P. Rawcliffe. 1958. *Bird Study*, **5**(2): 45-55 and p. 218. At the beginning of the 1955 breeding season 925 adults and 2128 non-breeders were recorded. The success of the census of 1955 and the breeding bird census was considered moderate. Actual population may be 3500-4000 swans. The non-breeders are largely in herds. Although the observed cygnets are recorded, there are no estimates of nesting success.—C. H. Blake.

10. The National Census of Heronries in Scotland 1954 with a Summary of the 1928/29 Census. Elizabeth A. Garden. 1958. *Bird Study*, **5**(2): 90-97. In 1954, 1086 nests were reported from 177 heronries of *Ardea cinera*. Almost half these heronries were first reported in 1954. The birds have increased to the north and decreased in southern Scotland without an evident decrease in adjacent England. Egg-stealing by *Corvus corone* appears to be a major predation.—C. H. Blake.

11. The Census of Heronries 1957. J. Stafford. 1958. *Bird Study*, **5**(3): 121-125. The British population of *Ardea cinerea* may be the most consistently censused of all nongame birds. In 1957, 271 heronries (about half of those known) were counted and contained 4140 nests or nearly 16 per heronry compared with 6 per heronry in the 1954 Scottish census. Using only heronries counted in both years, nest count increased nearly 7 percent in 1957 over 1956

but was 8½ percent below 1954. Nearly identical results are obtained by comparing the reports for those counties in which all known heronries were censused. —C. H. Blake.

12. The Great Crested Grebe Sample Census 1946-1955. P.A.D. Hollom. 1959. *Bird Study*, **6**(1): 1-7. *Podiceps cristatus* were counted on bodies of water, not on nests. Two comparisons show populations in 1953 increased 15-16 percent over 1952, and in 1955 decreased 10-11 percent from 1954. Desertion of old waters and colonization of new ones shifts 2 to 3 percent of the population each year. Also, there is evidence of a considerable transfer of population from south to north. New waters may achieve a large population without lowering that of the surrounding area. It is not known at what age the species breeds nor anything about its site tenacity.—C. H. Blake.

13. The Census of Heronries 1958. J. Stafford. 1959. *Bird Study*, **6**(4): 175-179. This year 220 heronries contained 3377 nests or just over 15 per heronry. As in previous years a few new heronries were found. For those counted in both 1957 and 1958, the number of nests decreased 9.9% in 1958. A similar comparison with 1954 shows the 1958 count down 16.6%. This agrees well with a comparison between the most thoroughly covered counties.—C. H. Blake.

NIDIFICATION AND REPRODUCTION

14. Pine Grosbeak breeding in outdoor cage. (Konglebit *(Pinicola enucleator)* hekker i friluftsvoliers.) A. Bernholft-Osa. 1960. *Vår Fågelvärld*, **19:** 220-223. (English summary.) The pair, which spent the winter in the cage, began singing early in the spring. By the end of May they completed the nest and laid a clutch of 3 eggs, of which 2 hatched and 1 was infertile. The male fed the female on the nest, as he had done during the courtship period, but gave her no assistance either with building the nest or with incubation. Incubation began with the laying of the third egg and lasted 12 days. Nest life lasted 14 days. The young were fed animal and vegetable foods by regurgitation. After fledging, when the male took over most of the feeding, the female made a second and a third nesting attempt, both abortive. This suggests that the species is double-brooded. One of the young survived to adulthood, a male which began singing in February the following year.—Louise de K. Lawrence.

15. Statistical Analysis of Marchant's Data on Breeding Success and Clutch Size. Monte Lloyd. 1960. *Ibis*, **102**(4): 600-611. S. Marchant *(Ibis* **102)** kept careful records over four years (1955-1958) of numbers of nests, clutch size, and breeding success in southwest Ecuador. He concluded that 1956 would be the worst year for clutch size and general success, with no difference between 1955 and 1957 for breeding success. On the basis of such general comments by Marchant, Lloyd set up five independent pairs, each consisting of a null hypothesis and its alternate. The important points are that these are *carefully stated* pairs of *independent hypotheses*. The test used (Cochran, *Biometrics* **10:** 441) appropriately weights the data on the 20 species with sufficiently large amounts of data. The proportion of nests in which eggs were laid but no young fledged was not significantly greater in 1956 than in the other years combined (contrary to Marchant's expectation). In 1958, a year of abundant predatory snakes, total losses of eggs were significantly high as well as total losses of hatched young. Consonant with an hypothesis of predation partial losses of eggs or young were not significantly higher.

There is evidence, not formally tested for, that the poor, short 1956 season totally inhibited the breeding of several species. Clutch size was not clearly diminished in 1956. Other subsidiary hypotheses suggested by the analysis and Marchant's conclusions are also tested. Lloyd makes an interesting distinction bewteen the bird that does what it sets out to do and the bird that does not, even though the second bird with a partial loss may actually produce more young than

the first bird with complete success. Over-all predation and not weather produced excess losses. The paper should be "required reading" for anyone concerned with nesting data.—C. H. Blake.

16. The post-fledging mortality of the Kittiwake. J. C. Coulson and E. White. 1959. *Bird Study*, **6**(3): 97-102. It is shown that earlier estimates of mortality included the mortality of the bands. These lost 9.3 percent of their initial weight per year and became "illegible" after 4 years. Considering the strong site tenacity of *Rissa*, it can be fairly assumed that any breeder not appearing in its colony has died since the last breeding season. The average annual mortality of the adults thus shown is 12.4 percent from 1 May to 30 April following. The expectation of further life is 7.6 years. As the females do not breed until 3 or more years old, the breeding birds have an average longevity of 10½ years or more. A single capture-recapture experiment at the Farne Islands yielded an adult mortality of 7 percent. By using recoveries for the first 2 years after fledging only and assuming adult mortality in the second year, the mortality in the first year is 21 percent. The rate of increase of an isolated colony confirms the first breeding at 3 to 4 years of age.—C. H. Blake.

17. The Breeding Biology of the Shag *Phalacrocorax aristotelis* on the Island of Lundy, Bristol Channel. Barbara Snow. 1960. *Ibis*, **102**(4): 554-575. The species usually begins to breed when 4 years old, rarely at 3 years. On Lundy the population is relatively static, 120 to 132 nests in 1954-57. Nest site selection is by the male who returns to his previous site. New sites are chosen by new breeders. Abandonment of nest sites gives about 12 percent annual mortality for adult males; year to year recapture indicates 7 percent for adults at the prime of breeding. Little mortality occurs during the breeding season. New sites that do not produce young are not reused the next year. In successful sites the half-grown young are not subjected to prolonged drenching by spray.

The mean clutch is 3.07 eggs. Incubation period is 30-31 days. Hatching success varies from 69-73 percent, but is considerably lower at new sites. Young leave the nest at an average age of 53 days. The difficulty of feeding small hatchlings may be a major cause of death. Starvation, especially in the first 10 days of life, seemed to be common. Falling or being kicked from the nest was also significant. The mean production of young in 4 years was 1.87 per pair per year. The young appear to be still dependent on the parents at 100 days old and have then attained adult weight.

This study was carried through four seasons and part of a fifth. Hence, the first young produced were just beginning to breed. Much has been learned, but more would have been if the program had been set at the beginning to cover at least 10 years with provision for consistent methods even if the personnel changed.—C. H. Blake.

18. The Nesting Success of the Heron *Ardea cinerea* in Relation to the Availability of Food. D. F. Owen. 1960. *Proceedings of the Zoological Society of London*, **133**, Part 4: 597-617. A detailed study for six years at three heronries of the Gray Heron in southern England. Breeding started earlier in early springs, later in late springs. Size of clutch varied little, but survival of young differed markedly. When food was plentiful parents were able to raise all the young, but in bad years the youngest one or two birds died. The kind and relative numbers of prey species are analyzed, and weekly weights are given for 9 broods consisting of from 1 to 5 nestlings.—M. M. Nice.

BEHAVIOR

19. Biophysics of Bird Flight. August Raspet. 1960. *Science*, **132**: 191-200, 13 figs. This important and informative article is based on measurements made while following birds *(Coragyps atratus*, except in one case) with a specially instrumented glider. The results are quite superior to anything ob-

tained with models or frozen birds in a wind tunnel. Birds seem to be as good or better than airplanes within their limits of speed and loading. Evidence shows this is caused partly by extremely low drag or, what is essentially the same thing, low skin friction above a certain minimum speed. The author quotes an observation by Loughheed that the porosity is much greater for downward flow through the wing than for upward flow. He found that sucking some of the boundary layer down through the upper face of a glider wing reduced the drag. The Armed Forces have been experimenting along this same line recently to develop low drag airfoils.

Since the data in the article cover all the significant aerodynamic characteristics of the Black Vulture, the reviewer looks forward to a detailed comparison with a theoretical calculation of them. His first approximation is not too far out. Note that some curves the author calls "polars" are also called hodographs. The abscissae of Fig. 9 are "Mean Reynolds Number x 10^{-6}" as confirmed to me by Dr. D. F. Farrar, Jr. The author makes a significant distinction between "soaring," in which the primaries are separated at their tips, and "gliding" with the tip slots closed. The two hodographs intersect at 38 mph forward speed. Above this speed gliding yields a lower rate of sink for a given horizontal speed than does soaring. The bird generally chooses the mode with the lower relative rate of sink.

Two other important points are made. First, when soaring, the span efficiency factor of *Coragyps* is close to unity, which is its limit. Second, longitudinal stability (control of pitching movements) is partly obtained by shifting the aerodynamic center of the wing by changing its sweep forward or backward. The author is not at his best in considering energetics. He does not draw the necessary distinction between power output for a brief period during takeoff and the much lower continuous output possible. The reviewer also holds that the tail in most birds, but probably not in *Coragyps*, is the main source of longitudinal stability and that in landing it acts largely as a brake, contributing drag rather than lift.

Raspet refers to the small amount of theoretical work on flapping flight. It is pointed out that the great effective diameter of the bird wing as a propeller could produce relatively great efficiency at low speed. This idea was actually made use of by Otto C. Koppen in designing the "Helioplane" which has remarkably low take-off and landing speeds. One set of calculations the reviewer made of the efficiency of the bird wing as a propeller showed it to be above 90 percent. It is also intuitively true that the use of the wings as a propeller cannot noticeably impair their simultaneous function as airfoils. Finally the bird can alter both the pitch and the twist of its propeller, which helps maintain high efficiency over a wide range of flapping rates.

The author was killed in a glider accident in April 1960, but fortunately his work is being carried on by others.—C. H. Blake.

20. Experimental Investigation of the Behavior of Certain Passerines during the Nesting Period by Means of Natural Stimuli. E. K. Vilks. 1958. *Akademiya Nauk Latviyskoy SSR.* **6:** 177-186. Translated from Russian by David Nichols, 2373 Woolsey St., Berkeley 5, Calif. $.25. One set of experiments involved changing stimuli to later stages in the nesting cycle: 40 substitutions of nestlings for eggs and 24 substitutions of older nestlings for younger ones. If eggs had been incubated for 1-2 days the parents started immediately to care appropriately for the young. When older young were introduced into a nest feeding at once increased in frequency. In 17 cases young were replaced by eggs or younger birds. Pied Flycatchers *(Muscicapa hypoleuca)* returned to incubation after the removal of 2- and 4-day-old young. If nestlings of the Spotted Flycatcher *(M. striata)* less than 7 days of age were exchanged for younger birds, brooding was at once resumed; with a series of such exchanges brooding was extended to more than 25 days. "When the exchange was made for seven-day (or older) nestlings, the brooding reflex in none of our experiments returned and the nestlings died (unless the experiment was terminated in time.)"

If, however, the nestlings of these flycatchers and of Great and Crested Tits *(Parus major, P. cristatus)* were removed at 8 days and "were several times replaced with young birds," so that the nestlings apparently "remained at one and the same stage," after 2 or 3 substitutions parental feeding dropped dras-

tically and the young died. "Male flycatchers always reacted to destruction of the young by singing after a lapse of only a few minutes."

In three experiments where Pied Flycatchers were presented with two nests inside the nest box both containing eggs, both were "abandoned and covered with new nest material." Incubating female flycatchers preferred nestlings placed alongside their eggs, and parents deserted 1- and 2-day nestlings in favor of 6- and 7-day young. Thus the birds responded to the stronger of external stimuli. Very interesting work.—M. M. Nice.

21. Observations on Avadavats and Golden-breasted Waxbills. Derek Goodwin. 1960. *Avicultural Magazine*, **66**: 174-199. Delightful account of behavior of Avadavats or Strawberry Finches *(Amandava amandava)* from India and Golden-breasted Waxbills *(Amandava*, formerly *Estrilda, subflava)* from Africa. Mr. Goodwin describes happenings which well illustrate "the intense personal likes and dislikes of passerine birds." He discusses food preferences, food-begging of the young, courtship displays, nesting and parental behavior, and voice, and he provides telling sketches. "Mutual preening" . . . "involves sublimated (and not always completely sublimated!) aggression on the part of the preener and submission on the part of the preenee."—M. M. Nice.

22. Disturbance of the Mother-Child Relationship in Turkeys through the Loss of Hearing. (Störung des Mutter-Kind-Beziehung durch Gehörverlust.) Wolfgang M. Scleidt, Margret Schleidt, and Monica Magg. 1960. *Behaviour*, **16**: 254-260. Eleven *Meleagris gallopavo* poults were deafened between the 2nd and 8th days by removal of the ductus cochlearis or the columella. Deafened poults were more dependent on the caretaker than were the controls. Two deafened poults became adult; they incubated normally but consistently killed their poults as they hatched. The mothers could not hear the poults peeping and evidently treated them as nest enemies.—M. M. Nice.

ECOLOGY

23. The Dynamics of Insect and Bird Populations in Pine Woods. L. Tinbergen. 1960. *Archives Néerlandaises de Zoologie*, **13**(3): 259-473. From his boyhood Luuk Tinbergen devoted himself to ecological studies especially on birds; his death in 1955 was a severe loss to ornithology. In 1946 he had started his study on the influence of song birds on insect populations in the Hulshorst woods, paying particular attention to insect populations commonly used as prey. The present volume consists of five papers resulting from this study by Dr. Tinbergen, his colleagues, and his students.

The first paper—The Natural Control of Insects in Pine Woods. I. Factors Influencing the Intensity of Predation by Songbirds (pp. 265-343)—is by L. Tinbergen. Great and Blue Tits *(Parus major* and *P. coeruleus)* were induced to nest "in glass-backed nestboxes attached to a hide, where the birds could be observed at a distance of about 20 cm.," and the species and size of prey could be recorded. Exceedingly ingenious and detailed methods of counting the numbers of the populations of the different prey species were developed. It was found that when a prey population was low, predation was markedly low. "At moderate densities it is unexpectedly high, and at high densities it falls again below expectation." The suggested explanation is that "tits when searching for prey concentrate on one or a few species at a time, and that, by a kind of learning process, they adopt 'specific searching images' for these species." The lessened use of an abundant prey would seem to be due to the tendency of the birds to prefer a varied diet.

Part II of this paper—Conditions for Damping of Nicholson Oscillations in Parasite-Host Systems (pp. 344-379)—is by L. Tinbergen and H. Klomp. This is a highly technical discussion of A. J. Nicholson's (1933) theories, compared with the findings of these Dutch scientists. The authors conclude that "after modification of Nicholson's premises and after their adaptation to more natural

conditions many of his original ideas and starting points can be maintained and used in a working hypothesis."

Protection against Birds and Parasites in Some Species of Tenthedinid Larvae (pp. 380-447) by N. Prop analyzes the very low predation on sawfly larvae found in the first two papers in this collection. By means of exhaustive observations and experiments the author obtained very interesting results. Two gregarious sawfly species are able to intimidate approaching birds and parasites. All six species of sawflies possess a nasty resinous taste. The highly conspicuous gregarious species were attacked the least, the solitary, inconspicuous species were most attractive to their enemies.

Further Evidence for the Role of "Searching Images" in the Hunting Behaviour of Titmice (pp. 448-465) by J. H. Mook, L. J. Mook, and H. S. Heikens is a statistical study of the relationship of the Great Tit and the Bordered White Moth *(Bupalus piniarius)* in the Hulshorst woods; these "findings are in complete agreement with the results of the investigations of Tinbergen on other prey species."

Factors Governing Density in the Chaffinch *(Fringilla coelebs)* in Different Types of Wood (pp. 466-472) by P. Glas, shows that the Chaffinch population remained stable during a number of years in mixed woods, but fluctuated in pine woods, evidence that the mixed woods was the preferred habitat.

We owe a distinct debt to Drs. G. P. Baerends and L. de Ruiter through whose labors, as well as those of the different authors cited, these very valuable investigations were brought to completion and published in this notable volume.—M. M. Nice.

CONSERVATION

24. Initial Songbird Mortality Following a Dutch Elm Disease Control Program. Joseph J. Hickey and L. Barrie Hunt. 1960. *Journal of Wildlife Management*, **24**(3): 259-265. Although spraying was done on the campus of the University of Wisconsin and in a neighboring village during the dormant season, Robin *(Turdus migratorius)* mortality started about 15 days later; about 88 percent of the population was wiped out, as well as numbers of many other species. All this slaughter of our song birds is completely senseless, as *DDT does not save elm trees from Dutch elm disease.*—M. M. Nice.

25. Mute Swan in Närke, central Sweden, 1959. (Knölsvanen *(Cygnus olor)* i Närke 1959.) Nils Tarras-Wahlberg. 1960. *Vår Fågelvärld*, **19:** 227-235. (English summary.) This census was undertaken by aerial as well as field surveys. The first proved the most efficient. The importance of the reed *Phragmites communis* in the selection of breeding habitat was strikingly evident, since it is a prerequisite for the species as food and nesting material. In areas where this reed is scarce or absent, however, man's activities pouring his sewage into the lakes and lowering the water levels tend to improve living conditions for the Mute Swan and so prove to be a factor in the current increase noted of the swan population of this region.—Louise de K. Lawrence.

26. The status of certain rare woodpeckers in Sweden. (Iakttagelser av vissa sällsynta hackspettar år 1959.) Staffan Ulfstrand. 1960. *Vår Fågelvärld*, **19:** 223-226. (English summary.) The data were collected by questionnaire from observers all over Sweden. The species concerned were: the White-backed Woodpecker *(Dendrocopus leucotos)* found mostly in central Sweden and very rare there; the Middle Spotted Woodpecker *(Dendrocopus medius)* well established in the province Östergötland after an apparent northward movement; the Grey-headed Woodpecker *(Picus canus)* whose nest was found but which otherwise revealed no change in range or population density; and the Three-toed Woodpecker *(Picoides tridactylus)* whose appearance in more southern regions than earlier observed during the breeding season proved an interesting discovery. Irregular migrations, such as observed in North America, as a reason for the species' appearance in the south at that time evidently have hitherto not been noted by Swedish ornithologists.—Louise de K. Lawrence.

27. Ornithological observations at West-Spitzbergen summer 1958. (Ornitologiska iakttagelser från Väst-Spetsbergen sommaren 1958.) Sten Larson. 1960. *Vår Fågelvärld*, **19**: 193-207. (English summary.) Although the annotated list contains only 17 species, many interesting details of the behavior of these arctic birds on their breeding grounds lend original highlights to this report, most of which are covered by the English summary. Examples are: notes on the surprisingly successful defence activities of the Eider *(Somateria mollissima borealis)* against Glaucous Gulls *(Larus hyperboreus)*; on the rotating movements of the Gray Phalarope *(Phalaropus fulicarius)*; observations on the aggressive reactions of the Arctic Tern *(Sterna paradisaea)* especially in relation to man. When the radio crews had to work in or near the tern colonies and were unable to use their hands for protection, they balanced rocks large as a fist on their heads. For unmentioned reasons, the sight of the rocks stopped the terns' diving onslaughts, but at the same time seemed to "irritate them beyond measure."—Louise de K. Lawrence.

SYSTEMATICS

28. Weights of Massachusetts Quail and Comparisons with other Geographic Samples For Taxonomic Significance. Thomas H. Ripley. 1960. *Auk*, **77**(4), 445-447. Analysis of weights of Bobwhite Quail *(Colinus virginianus)* trapped in Barnstable County, Mass. in 1956 suggests the validity of a northeastern subspecies, *C. v. marilandicus*, proposed by Phillips in 1915 and supported by Aldrich in 1946. Ripley quotes Aldrich to the effect that where introduction and transplanting of game birds are employed, recognition of subspecies may be very important.

Ripley's paper does not mention the importance of the converse, that in determining a population's subspecific identity, it is vital to recognize the effect of introduction of stock from elsewhere. What are these Quail on Cape Cod (Barnstable County)? They are generally considered to be at least in part the descendants of southern stock. The great reduction of the species in eastern Massachusetts is ascribed to: "(1) overshooting; (2) mortality in heavy winter snows; (3) mortality from cold rains in the breeding season, as in 1903 and 1904; (4) above all, by the introduction of less hardy western or southern stock by sportsmen, which destroyed the original 'large, heavy and pale New England Quail.' Thus the remnant population on Cape Cod was exterminated by wet snow about 1857 and southern stock was introduced (Henry H. Fay, in *litt.* to W. Brewster). It was gone after 1860 at Nantucket (reintroduced after 1948). . . . It should be understood . . . that there has been continuous restocking by the Division of Fisheries and Game for many years. Modern skins do not match the original quail specimens found in the older collections, though Cape Cod specimens indicate survival of the original stock not later than 1872." (*The Birds of Massachusetts*, Griscom and Snyder, 1955, pp. 79-80—including a review of 134 Massachusetts specimens of this species.)

The problem is not limited to eastern Massachusetts. "The race *texanus* has been introduced widely, mainly with stock imported from Mexico, into many parts of the United States and British Columbia, within and beyond the ranges of *taylori* and *virginianus*, where, however, it has not become established. Though hybrids between *texanus* and the native races may have been common soon after introduction, neither the introduced nor the mixed stock seems to have persisted for more than a few years." (*Check-list of North American Birds*, A.O.U., 1957, p. 140.)

As Ripley is undoubtedly familiar with the history of this species in Massachusetts, his paper should be read as an argument that (1) his 282 trapped birds are descendants of the original native stock, with no significant mixture with the numerous introductions, in an area where the native birds were not just low in numbers but almost entirely extirpated; *or* (2) that under the influence of environment (Bergmann's Rule?), the *texanus* imports were modified in a relatively few generations to resemble the original stock in size, and differ significantly from their ancestral stock. Either of these propositions would be uncommonly interesting, if expanded and if supported by evidence. Unless one of these propositions is pressed to a successful conclusion, Ripley's data lack much relationship to Phillips' *marilandicus*.—E. Alexander Bergstrom.

BOOKS AND MONOGRAPHS

29. Atlas of European Birds. K. H. Voous. 1960. Thomas Nelson & Sons Limited, London. 284 pp., 419 maps, numerous photos. Size 10½ x 14". Price $15. No student of birds can afford to be without this excellent collection of maps showing at a glance the world-wide distribution of each of the 419 species of European birds. Nothing conveys the importance and significance of a species' range as does a map. The series given here present most clearly and dramatically the known distributional data for all the European species. These include, of course, a large number of North American species whose holarctic distribution is seldom appreciated by students who limit their perspective to North American birds.

While the book is worth the price for the maps alone, it goes a great deal farther. It is illustrated with some of the best black and white photographs available of, for a rough guess, at least 95 percent of the species covered, and each species is given from 300 to 500 words of text describing its faunal type, distribution, present status, habitat, food, and migratory movements. The text is written simply and clearly, and as the author himself translated it into English from the original Dutch edition, it is free of the usual errors and inconsistencies that so often mar translations of technical works.

More has been written on the birds of Europe than on those of any other part of the world, and the inquisitive reader can choose from a wealth of comprehensive texts in several languages still in print. Were I limited to a single volume on European birds for my reference shelf, I would unhesitatingly select this one as head and shoulders above any other I have seen for comprehensive inclusion of essential factual material, particularly from the distributional point of view. —O. L. Austin, Jr.

30. Birds of Anaktuvuk Pass, Kobuk, and Old Crow. A Study in Arctic Adaptation. Laurence Irving. 1960. *United States Museum Bulletin*, No. 217: 1-409. $2.00. Dr. Irving has had many years of experience in Alaska where he specialized in physiological researches on metabolic problems of arctic birds and mammals. In this book he describes the natural history and ecology of the birds at three localities in the interior of Alaska. He then discusses migration and origins, residence in the Arctic, biological aspects of migration and nesting, and, particularly important, arctic metabolic economy of warm-blooded animals. To mention only two findings: "Many arctic nesting populations of migratory birds arrive fat after rapid flights from distant wintering places." Not much difference was discovered in the thickness of feathers between arctic and tropical birds that were systematically related, but in the former species the contour feathers had "less rigid terminal barbs with barbules containing extended fine processes," thus enabling the retention of more insulating air by the arctic birds.

Dr. Irving speaks very highly of the keen interest in wild life taken by the mountain Eskimos and of the great help these people were to him. This volume makes a notable contribution both to the natural history and physiology of birds in the Arctic.—M. M. Nice.

31. Fauna of the Aleutian Islands and Alaska Peninsula. Olaus J. Murie. 1959. U. S. Fish and Wildlife Service, *North American Fauna*, No. 61: 1-406. $1.25. In 1913 the Aleutian Islands were set aside as a National Wildlife Refuge. Dr. Murie led expeditions in 1925, 1936, and 1937 to every island in the chain to investigate the fauna. Besides these observations the report incorporates all published records for the region. The first 26 pages discuss geography and geology, climate, environment and biotic distribution, and vegetation. Birds are treated in 234 pages and mammals in about 100. The final 40 pages are devoted to "Invertebrates and Fishes Collected in the Aleutians, 1936-38," by Victor B. Scheffer.

On the treeless Aleutians, "although the temperature is mild—neither very low in winter nor very high in summer—there is a minimum of sunshine and a maximum of fog, rain, and storm." Dr. Murie discusses the dark pigmentation of many animals supposedly in response to the high humidity of the region, and the frequent occurrence of giantism as shown in Song *(Melospiza melodia)* and Savannah Sparrows *(Passerculus sandwichensis)*, the Alaskan brown bear, and much sea life.

It is shocking to read of the destruction wrought by blue foxes. In a paragraph on "Birds vs. Blue-Fox Industry" the author writes: "On some of the smaller islands birds have been almost eliminated, and on many islands such birds as eider ducks have ceased to nest, except on a few offshore pinnacles where they can find protection. The cackling goose and lesser Canada goose have become so scarce that it is somewhat doubtful whether they can survive in the Aleutians. . . . Certain rare species, too, are threatened. The whiskered auklet is not abundant, and the Cassin's auklet has become very scarce."

There is something radically wrong when the Fish and Wildlife Service give permission to people to *stock a National Wildlife Refuge with predators* that destroy the birds the refuge was established to preserve!—M. M. Nice.

32. The Trumpeter Swan. Its History, Habits and Population in the United States. Winston E. Banko. 1960. *North American Fauna,* **63:** 1-214. U. S. Government Printing Office, Washington 27, D. C. Price $1.00. A handsome monograph with fine photographs and delightful sketches. Once an abundant and widespread species in North America, nesting from Missouri and Indiana to Alaska, *Olor buccinator* was brought through exploitation by the fur trade for over 100 years and shooting by settlers to a dangerously low point by 1900. Thanks to strict protection its numbers are estimated to reach at present about 1500, the majority of which are in British Columbia. The population is now as large as the present year-round accommodations available in our already stocked refuges can support, hence the problem is now one of transplanting breeding stock to other favorable localities. Life history and habits are excellently treated, thanks to Mr. Banko's wide personal experience with these birds and knowledge of the literature. A valuable report.—M. M. Nice.

33. The Birds of West-Central Ellesmere Island and Adjacent Areas. David F. Parmelee and S. D. MacDonald. 1960. *National Museum of Canada Bulletin* No. 169. 1-103. $1.50. From 16 April to 27 September, 1955 the authors investigated the bird life largely of the Fosheim Peninsula lying north of the 79th parallel. Twenty species were found "reproductively successful in one of the coldest and driest regions of the world," although in some summers they do not breed at all. Little evidence was found of a shorter breeding cycle than obtains in regions farther south. Details are given of the authors' experiences with each bird species. Among the most interesting are the descriptions of the close bond between the Turnstone *(Arenaria interpres)* and Knot *(Calidris canuta)*. "From the first of their actual nesting, the Turnstones seemed to be completely tolerant of one another and also of Knots which walked unmolested close to Turnstone eggs. Other species they chased vigorously. . . . Knot and Turnstone families band together in large numbers during the fledging period." This concentration serves as a real protection against Long-tailed Jaegers, *(Stercorarius longicaudus)*. A very interesting study, full of information on nesting in the Arctic.—M. M. Nice.

34. Birds of North Carolina. Pearson, T. G., Brimley, C.S., and Brimley, H. H., revised by Wray, D. L. and Davis, H. T. 1960. [dated 1959] N. C. State Museum, Raleigh, 434 pp., illustrated. Price $5.00. This volume was scheduled for publication several year ago and has been delayed by a printer's strike. The procedure of revision was to make a few minor deletions from the 1942 edition and to add, in a different type, some introductory matter and notes to many species. The illustrations are essentially the same as in the previous edition. A number are from the originals for the first edition of Peterson's "Field Guide"; two are added here from the third edition. The older illustrations, evidently printed from the plates used in 1942, are quite worn and will certainly not stand further use.

Most state bird books suffer from the attempt to do too many things at once. A popular account of the ecology and general distribution of bird life within a state is seldom compatible with a scientific statement of the differences between subspecies and the details of their distribution. The original authors may be held responsible for treating subspecies in the same way as species. North Carolina is unfortunate in being the meeting ground of a rather large number of subspecies. It is also unfortunate that no extensive collecting has been done in the northern Piedmont where the reviewer lives. Much remains to be learned in

this area; the subspecies of the loggerhead shrike, for instance, apparently vary with season. Further, as species often shift the boundaries of their breeding ranges, why should it be tacitly assumed that the boundaries between subspecies are permanent?

The revisers' attempt to bring the nomenclature into line with the current A.O.U. Check-List in general has succeeded. However, in the Rufous-sided Towhee *alleni* is retained in place of *rileyi*, and the stated distributions do not agree with Dickinson's monograph. *Sphyrapicus varius appalachiensis* Ganier is omitted. The omission of *Passerella iliaca zaboria* Oberholser 1946 is puzzling, for the U. S. National Museum has North Carolina specimens of it. In spite of all this, the book will be useful to the bird students of its state. Any future edition should be an entirely new book.—C. H. Blake.

35. Ducks, Geese, and Swans. Herbert H. Wong. 1960. Lane Book Company, Menlo Park, California. 65 pp. Price $2.95. This "Sunset Junior Book" is unusual. Drawings by William D. Berry of hundreds of waterfowl, including more than 100 in color, are authentic and tastefully done. The many line drawings include barley sprouts, immature aquatic insects, a U. S. Fish and Wildlife Service bird-band, and a map showing refuges and waterfowl management areas in western United States. The text is written especially for young people. A. Starker Leopold and Matthew E. Vessel served as consultants.

The book considers waterfowl in general including their special adaptations, food, and general ecology. Sections on migration, bird-banding, and refuges are balanced with discussions of dangers to waterfowl, including natural enemies and hunting pressures. Each of the species of swans, geese, and ducks found in the United States is discussed and figured. Also included are some exotics commonly found in parks. A short section on "water-bird companions" includes figures and a discussion of the Coot, and figures of grebes, a loon, and a cormorant.

The binding, paper, print, and the reproduction of the figures are excellent. Two minor errors: (1) transposed captions for the goldeneyes (p. 46) and (2) an impression that about one out of every six bands put on American birds (should be restricted to waterfowl) is returned (p. 55), are minor in the overall consideration. Of special interest is the message to elementary teachers and students on the disposition of bird-bands found. Although written for use in western United States, its coverage of waterfowl makes it nearly as useful for middle and eastern United States and for Canada.—L. Richard Mewaldt.

NEBBA FINANCIAL STATEMENTS, 1959-60

These figures cover the fiscal year from November 1, 1959 through October 31, 1960. The general account closed the year firmly in the black (after two deficit years), partly through some reduction in average length of issues, but also through increased dues, subscription, and back issue receipts. Actual cash on hand at the end of the fiscal year was lower than a year earlier, mostly because of expenditures on indexes (indexes on hand are not given any cash value in the statements).

The Nantucket Ornithological Research Station completed another long season; funds remaining will be used during 1961, for a shorter season.

Sales of mist nets were very heavy, including many foreign shipments. While no loans were outstanding at the beginning or end of the year, temporary loans reached a peak of nearly $1000 in June (1960), to finance more shipments from Japan. Our working capital in this account is still modest for the sales involved, particularly considering seasonal peaks in demand and the time it takes to obtain nets from the maker. Over 1500 nets were shipped during the year.