RECENT LITERATURE
BANDING

(See also nos. 4, 5, 17, 37)

1. The activities at Ottenby Bird Station 1959. Report 28. (Verksamheten vid Ottenby fågelstation 1959. (Meddelande nr 28 från Ottenby fågelstation).) Anna Tolstoy. 1960. *Vår Fågelvärd*, **19**: 292: 315. (English summary.) Banding was carried out from 5 April to 31 October. A total of 11,295 birds were banded. Nineteen species set new records in the number of birds captured. Recoveries totalled 204 of 49 species, including retakes at Ottenby, and 4 foreign recoveries were trapped and released. A Firecrest *(Regulus ignicapillus)* and an Alpine Accentor *(Prunella collaris)* were caught on the same day, 2 May. The prolonged migration of these two southern species, both new for Sweden, was apparently temperature-dependent and due to the combination of high barometric pressure over Russia with a break-through of warm air over these birds' breeding-grounds. Two maps show all the recoveries of Song Thrushes *(Turdus ericetorum)* and Black-headed Gulls *(Larus ridibundus)* banded at Ottenby. In this report is also included highlights from the resident game-warden's all-year records.—Louise de K. Lawrence.

2. Report from Russia on Banded Snow Geese. [Chester E. Kebbe.] 1961. *Bull. Ore. State Game Comm.*, **16**(2): 4-5. Three *Chen hyperborea* banded on July 18, 1960, at Wrangel Island were shot at Summer Lake in south-central Oregon on October 27, October 29 and November 4, 1960. A previously published note in this magazine states that all three birds were young of the year. —J. J. Hickey.

MIGRATION

3. The time of imprinting to the home region in the Collared Flycatcher *(F. albicollis)*. H. Löhrl. Zur Frage des Zeitpunktes einer Prägung auf die Heimatregion beim Halbandschnapper *(Ficedula albicollis)*. 1959. *Journal für Ornithologie*, **100**(2): 132-140. The term "imprinting" most commonly evokes a picture of goslings following a man or of real ducklings trailing in the wake of a mechanical Mallard; and it is sometimes defined as the rapid formation of stable primary stimulus-response associations *during early infancy*. But the tendency has been growing to broaden the concept to include locality-fixations acquired at specified times later in the development of the individual. In this sense imprinting has a profound bearing on bird migration. And this is the sense in which Löhrl writes of it.

He raised nestling Collared Flycatchers by hand and let them fledge in outdoor flight cages. When they had become self-supporting, he set them free 90 km. to the south, at Sigmaringen on the other side of the Alps in a region where the species does not occur. In the first test, 19 percent of the males (compared with a 4 percent return in natural populations) came back to the extralimital district of release next spring. He turned a second group loose about 2 weeks before the beginning of fall migration. A similar percentage of these returned to Sigmaringen the following year to nest. He held a third group until the end of the postjuvenal molt, after the migration of the species had already begun. None of these birds was ever seen again. Löhrl concludes that juvenile flycatchers become imprinted to the place where they happen to spend the 2 weeks just prior to migratory departure. The rate of return was much poorer for females than for males. The greater difficulty in recording females of the species partly accounts for this result, but the fact that many of the male Collared Flycatchers returning to Sigmaringen took Pied Flycatchers as mates suggests that actually few female Collared Flycatchers were present.

These findings are related to the question whether or not the young of the year of certain species find their way back to the breeding range on their first spring migration by true goal orientation. Löhrl's work explains why, even if this were the case, so few would come back to their exact birthplace to compete with their own parents for nesting territory or to inbreed if only one of the

parents had survived. But as proof of goal orientation, the experiments are inconclusive. If young birds have a way of maintaining, or continually returning to, a "standard track" (a straight-line projection of standard direction onto the terrain), they could retrace their way in spring to the locality where their fall migration began simply by following the standard track in reverse, without recourse to bicoordinate navigation. Löhrl's third group of experimentals spent the postulated imprinting period in their natal district. According to hypothesis, they should have reappeared there in the spring. Yet evidence is lacking that any did. To be sure, the situation at their natal locality is unfavorable for ready detection; but even so the probability that as many found the real home again as found the foster home seems remote.—R. J. Newman.

4. Migrational homing in Mourning Doves. Stanley W. Harris. 1961. *Journal of Wildlife Management*, **25**(1): 61-65. We Americans have all become accustomed to the basic idea of "locality imprinting." We have heard again and again of birds returning year after year to the same nesting box. But how prevalent is this custom? How many other individuals of the same species vary their nesting sites? The majority or the minority? The exaltation of positive over negative evidence has obscured the answers.

Now Harris brings us a nicely balanced report on the return and non-return of nested-trapped Mourning Doves to a 160-acre tract in Minnesota during a 3-year study. In computing adjusted rates of return, he applies a mortality rate of 51 percent for adults and 60 percent for nestlings and assumes that the total number of birds returning (the unknown) is to the total population in the study area as the number of banded birds trapped is to the total number of birds trapped. According to his calculations, nearly all the adult males still alive, and 59 percent of the adult females, came back to the area one year after banding. Smaller samples suggest that 2 years after banding all survivors of both sexes returned. In contrast, the rate for birds banded as nestlings was on the order of only 2 percent for the first 2 years, zero for the 3rd year. The average shift of banded adults from their first recorded nesting location was a mere 154 feet 1 year later, 300 feet 2 years later.

The results seem capable of two interpretations: either all survivors that have nested twice in a locality return there a third time or else all 3-year-olds return to the locality where they nested the second time. Neither alternative reconciles a 59 percent return of female survivors one year after banding with a 100 percent return a year later. One may appreciate the dilemma simply by noting that, with an adult mortality of 51 percent, 49 percent of the adult females banded in the first year of the study must have been more than one year old. If the second alternative is accepted (that 100 percent of the survivors of the 49 percent returned), then the over-all return of 59 percent requires that only about 12 percent of the surviving first-nesters returned. The first alternative is mathematically more complex. It requires that roughly only 45 percent of the survivors that nested once in the area came back again. But both assumptions produce an expected return in the second year after banding much lower than the observed return as adjusted.

Harris himself is cautious in his claims. He admits that his assumptions may be inaccurate and that the small quantity of his data permits statistical error. He is not even completely convinced that the computed difference in the rates of the sexes is real, though the result accords with the experience or Löhrl with female Collared Flycatchers (see preceding review). While his work is a significant stride forward, it leaves many uncertainties to be resolved by further investigation on a larger or longer-continued scale, using this study as a prototype.—R. J. Newman.

5. Northern Waterthrush returning to same winter quarters in successive winters. D. W. Snow and B. K. Snow. 1960. *Auk*, **77**(2): 351-352. A bird mist-netted in Trinidad in December 1958 was recaptured in December 1959 in a net at the same location, in the identical position. Though the record is a welcome additional evidence of "locality imprinting" to tropical wintering grounds, it is not quite so lacking in precedent as the authors believe. In a subsequent note (*Auk*, **78**: 123), William B. Robertson has called attention to previous examples, involving other species, in Guatemala, Africa, and India. —R. J. Newman.

6. Evolutionary aspects of migration. George G. Williams. 1958? *Lida Scott Brown Lectures in Ornithology.* This paper poses a bibliographic conundrum. It is the second of two lectures delivered by Dr. Williams in 1958 at the University of California at Los Angeles, published together in one binding at an unspecified later date under a dual title and uncertain auspices, and mailed, presumably fresh from the press, to the reviewer in 1960. This second lecture occupies pp. 51-85 of the publication.

Its central thesis is that "in the normal evolution of a migration pattern, the winter home must be considered as the original point of departure." Williams refreshes this long-standing contention by attempts to link it with a process he calls "locality fixation" and defines as "the establishment in a bird's early life of a strong attachment for a locality and the persistence of this attachment into adult life." Though presumably unaware of the work of Löhrl, he presciently suggests that locality fixation may be related to, or even identical with, imprinting. The speculation eventually leads to dilemma.

All migrants returning to the breeding range in spring are potentially imprinted to localities within, or adjacent to, that range. Among the migrants setting out for the winter range in fall, little more than one-half have that advantage. Since locality-imprinting results from personal experience with the locality even by Williams' own definition, the young of the year cannot yet be imprinted to the winter range. Williams speculates that adults already fixated on the proper goal may transmit their knowledge to the new generation through the nongenetic medium of tradition—that the old since time immemorial have guided the young to the appropriate winter range. Aware of many cases in which there is evidence to the contrary, he is forced to make use of such contradictory combinations as inheritable locality-fixation and innate tradition.

Actually, the principle of imprinting forges a more constant bond between birds and their ancestral breeding range than between birds and their ancestral wintering grounds. Locality imprinting gives the breeding range theoretic primacy over the wintering range in the contemporary evolution of migration patterns. Extensions of breeding range nowadays appear to have a permanence that most independent extensions of wintering range seem to lack. Whether or not imprinting is reversible is a question for ethologists to decide, but Williams errs when he says "if locality-fixation were 'totally irreversible,' birds would never expand their ranges." Löhrl has shown that a period intervenes between the time when young leave the nest and the time when they become locality-imprinted. During this interval, they are free to wander at random. Birds hatched at the periphery of the previous range are as likely to become imprinted to localities outside it as to localities within it.

The evolutionary relationships between breeding ranges and wintering ranges today are not necessarily the same as in the past. But at a time when migration students cannot agree on the current realities of their subject, controversy over what may have happened long ago seems like sparring in a vacuum. Williams makes many points to establish his main theme. Yet all could be turned about by a different selection of examples. Certainly the viewpoints that migration is a return to an ancestral home in the north or to an ancestral home in the south are not mutually exclusive. To cite evidence in support of one is not to disprove the other.—R. J. Newman.

7. Migration across the sea. David Lack. 1959. *Ibis*, **101**(3-4): 374-399. To a degree Dr. Lack shares Dr. Williams' liking for a firm stand in the absence of conclusive evidence. He prefaces his distillation of 142 references regarding transmarine migration with the confession: "faced with the alternative between a neutral, and hence colourless, survey and the statement of positive views on incomplete evidence, I have preferred the latter method as the more likely to advance research . . ." The reviewer does not entirely agree that the clash of opposing hypotheses, objectively stated, lacks color or that this clash is less likely to stimulate further investigation than argumentative efforts to decide an issue. Happily, however, Lack's positive views are mainly centered on a single aspect of the subject—the controversy regarding the nature of migrational drift.

The survey calls attention to world-wide feats of birds crossing over water: the flight of 16 Australian species northward 600 miles across the Banda Sea; 1,600-mile journeys of land birds across the Indian Ocean, from western India to East Africa; sea-crossings of perhaps as much as 1800 miles by two New Zealand

cuckoos that winter in the Solomons, Samoa, and the Fijis; and movements of Wheatears from Greenland to Britain and the Iberian Peninsula, respectively requiring a traverse of 1400 and 2000 miles over the Atlantic. Discussion naturally focuses, however, on the observations concerning three long-studied appurtenances of the world's oceans, each with different relationships of land and water—the Gulf of Mexico, the Mediterranean, and the North Sea.

Lack accepts the reality of trans-Gulf migration, questions special concentration of spring migrants in the Yucatan Peninsula, and suggests that some passerines may undertake the 1000-mile crossing from Honduras direct to the United States. The data of the latter 1950's on the "trans-Gulf Timetable" and the diurnal passage of migrants over the Gulf, so far buried beneath general titles, have understandably escaped his notice. He notes that trans-Mediterranean migration bears the distinctive stamp of a presumed "migratory divide." Banding results suggest that the direction taken by most North European night migrants in autumn is either southwest or southeast, rather than south, with resultant concentration at the two ends of the Mediterranean. Lack is not entirely satisfied that the dichotomy is real, that it is anything more than an illusion created by differing facilities for banding recoveries. He further reasons that, even if such a division actually occurs, it does not necessarily indicate a preference for short crossings. He believes that the split may be due to ecological or meteorological factors, or perhaps even in part to historical ones. The evolutionary aspects of trans-Mediterranean migration and the migratory divide have facets that Williams, preoccupied with New World problems, did not explore. Banding results are to some extent countered by general observations indicating that flight across the Mediterranean takes place on a broad front.

The North Sea differs from the Gulf of Mexico and the Mediterranean in that bird movements across it are not necessarily intercontinental. There the role of drift, unmentioned by Lack with respect to the Gulf and only fleetingly referred to with regard to the Mediterranean, has attracted great attention. Though the present paper devotes more space to migration over the North Sea than to any other single topic, comment is best deferred. The publications about to be reviewed explore the subject in even greater detail.—R. J. Newman.

8. Migration across the North Sea studied by radar: Part 2, the spring departure 1956-1959. David Lack. 1960. *Ibis*, **102**(1): 26-57. Few research reports on migration have ever been so packed with conclusions as this one. It bases its judgments on the enormous amount of data accumulated by radar during nearly continuous operation in four springs and lists these data in exemplary fashion in the fine print of its appendix.

Lack is here dealing primarily with spring emigration from East Anglia; he does not imply that all his findings are true of bird migration in general. He states that the movement in question occurs most frequently in large "volume" in the first half of the night, with light winds, and after delays due to early subnormal cold. The movement does not ordinarily start when there is snow, rain, or fully overcast sky. Its density is little affected by the direction of the wind, sudden changes in temperature, or unsettled weather in general. The number of birds over the sea usually peaks between 9 and 10 p.m.; the overland maximum presumably occurs earlier. After being pinned down for long periods by unfavorable conditions, normally nocturnal migrants tend to travel also by day. Occasionally their movement starts in mid-afternoon; more rarely they stay aloft as long as 30 hours. Once spring emigration gets under way, it usually proceeds steadily night after night, without pronounced "waves" separated by long gaps during which only negligible migration is evident. The tracks of the birds, evaluated according to the presumptive wind forces exerted on them, commonly support the hypothesis of lateral drift and more rarely suggest disoriented drift. They never point to direct downwind drift.

How reliable, actually, is the radar evidence? While Lack has previously discussed this matter in considerable detail, some points remain unsatisfactorily resolved. The equipment used compresses a view of more than 33,000 square miles of the earth's surface into the frame of a 35 mm. photograph. Obviously the migrants flying over so vast an area cannot all show up as discrete entities. When the density of birds reaches a certain point, of unknown numerical value, the echoes of those at close range merge in a continuous mass. Farther from the

station the echoes gradually thin out. At intermediate ranges their number and direction of movement become easier to ascertain. The effect is presumably due to the progressive failure of radar to detect birds at the greater distances; and since this failure seems to be selective, the possibility exists that studies by long-range radar deal mainly with the behavior of migrants of special types.

Under these circumstances, the problem of quantifying migration from a radar display accurately, even in relative terms, appears formidably complex. Lack classifies the amount of migration in five grades numbered from 0 (negligible) to 4 (huge). An important consideration is whether this classification forms a linear scale, in which the actual quantities of birds represented have approximately the numerical relations of their class numbers. If the real difference between grade 1 and grade 2, for example, were much smaller than the real difference between grade 3 and grade 4, erroneous conclusions would be likely to result—particularly since the mathematical soundness of averaging class numbers would be dubious.

Consequently when radar evidence conflicts with other evidence, one cannot as yet be sure what to believe. A fuller explanation of the procedure used to classify the quantity of migration on the basis of radar photographs would be helpful to investigators employing other bases, but would not eliminate perplexities caused by a saturation of echoes and by the selective tendencies of the set at long ranges.—R. J. Newman.

10. Aspects of autumn migration, 1960. Kenneth Williamson. 1961. *Bird Migration*, **1**(5): 218-234. "Aspects" in its various datings seems to be a regularly planned feature of the new journal *Bird Migration*. Its content is diverse, but its presentation is dominated by a point of view quite unlike that reiterated by Lack. Williamson continues to correlate observed ornithological and meteorological phenomena in terms of direct downwind drift. His success along this line would be thoroughly convincing to the casual onlooker, had not so much opposing argument already appeared in print.

A primary reason why neither faction can effectively demolish the other is uncertainty regarding the point of origin of a given flight of continental migrants to Britain. Williamson, who has confidence in rare birds as markers—a confidence Lack does not share—emphasizes the "heavy influx" of Barred Warblers *(Sylvia nisoria)* early last autumn. Since this species does not breed in Norway, Williamson holds that the flights in which it was represented must have come mainly from Denmark and northwest Germany, where a southwest breeze favored downward drift, while light southwest wind in Scandinavia was precluding lateral drift from the latter source. Not until the effective area for downwind drift extended into Norway did Redstarts *(Phoenicurus phoenicurus)* begin to appear in the British Isles.

Other occurrences discussed by Williamson are reversed migrations from France "inexplicable except as a down-wind movement," immigrations of the Firecrest *(Regulus ignicapillus)*, which "shows a marked down-wind influence in its arrival," and a disaster at sea that caused numbers of Redwings *(Turdus musicus)* to be washed up on shore. The only American passerine that appeared in Britain during the period was a Myrtle Warbler *(Dendroica coronata)*.—R. J. Newman.

11. Observations from a light-vessel on passerine immigration into the Wash in autumn 1956. Michael Barry. 1960. *British Birds*, **53**(10): 435-443. The Wash is a broad arm of the North Sea that indents the east coast of England. Observations from a lightship at the mouth of this inlet on 16 October 1956 conflicted with previous reports from the same location by showing that the incoming migration of Lapwings, Skylarks, Starlings, and Chaffinches was mainly southwestward. Barry considers these flights a visible version of direct influxes from Scandinavia such as detected by Lack on the radar screen. However, with a change in wind from southwest to south-southeast, the directions of flight shifted more to the south, counter to the expected trend if the birds were holding a fixed heading. The paper also gives various observations for other dates and other species.—R. J. Newman.

12. Autumn migrants in Greece. R. E. Moreau. 1960. *Ibis*, **102**(3): 473-475. During a stay of nearly a month on the mainland of Greece in September and October, 1959, Moreau found surprisingly few migrants. Even Swallows

(Hirundo rustica) were sporadic, but on 8 October they loaded the wires along Navarino Bay. Toward dusk on the same day an observer on the coast of Cyrenaica, 350 miles to the south on the opposite side of the Mediterranean, noticed large flocks loosely distributed over a 3-mile front coming in from the sea. During the night the winds changed from light westerly to southerly with gale force, but all next morning Swallows continued to arrive in fairly large numbers though singly. Moreau believes that these latter birds had been crossing the sea all night. —R. J. Newman.

13. Notes on autumn migration in Greece and Crete. Richard Vaughan. 1960. *Ibis*, **102**(1): 87-92. The oversvations were made on the Peloponnesos and the islands of Paros, Kythera, and Crete, 15 August to 13 Steptember 1958. Though worthy of note because so little information is available from these key locations, they are scattered and incidental and, like the data of Moreau (see preceding review), fail to demonstrate much large-scale migration across this part of the Mediterranean.—R. J. Newman.

14. The passage of Palaearctic migrants through Eritrea. K. D. Smith. 1960. *Ibis*, **102**(4): 536-544. Eritrea is situated on the lower west shore of the Red Sea, at the southern edge of the African desert belt. Most Eurasian migrants passing directly toward that country or directly away from it must cross a vast expanse of uninhabitable terrain.

The circumstances lend special interest to Smith's observations during his many years' residence in that part of Africa. He lists in separate categories birds seen migrating there: (1) conspicuously on both spring and autumn passage, 37 species; (2) more abundantly in autumn, 23 species; (3) more abundantly in spring, 11 species; (4) in neither season, though common winter residents, 24 species. The reasons for the greater volume of migration in fall, and for the arrival of southbound migrants on dates that would be considered early even in western Palaearctic regions, are only partly explainable.—R. J. Newman.

15. Ticks from European-Asiatic birds migrating through Egypt into Africa. Harry Hoogstraal and Makrum N. Kaiser. *Science*, **133**(3448): 277-278. The authors examined 8,379 bird specimens. They found 504 immature European-Asiatic ticks. The hosts included 28 of the 57 migratory species studied. Among the ticks recovered were *Hyalomma m. marginatum* and *Haemaphysalis punctata*, vectors of pathogens causing diseases in domestic animals and associated with such human diseases as Crimean hemorrhagic fever, Q fever, tularemia, tick typhus, and brucellosis. Findings such as these give bird migration considerable epedemiological importance.—R. J. Newman.

16. Migratory birds and the dispersal of avian malaria parasites in the South Pacific. Marshall Laird. 1960. *Canadian Journal of Zoology*, **38** (1): 153-155. The report reveals that the Shining Cuckoo *(Chalcites l. lucidus)* and the Broad-billed Flycatcher *(Myiagra f. ferrocyanea)* are hosts of *Plasmodium relictum*. The cuckoo provides the second known illustration of a natural means for the dispersal of avian haematozoa into New Zealand.—R. L. Newman.

17. Ringing recoveries and the interpretation of bird-movements. Kenneth Williamson and Robert Spencer. 1960. *Bird Migration*, **1**(4): 176-181. Abroad, as in the United States and Canada, the mist net is providing new opportunities to study the migrations of small birds. In 1959-60, banders in the British Isles secured enough data to permit studies of the particular bird movements of a single year and even rough correlations with weather. Seed-eaters, which enjoyed an unusually good summer in 1959, furnished the most material.

Twenty-six of the Linnets *(Carduelis cannabina)* banded in Britain in 1959 were recovered on the continent, all but one of them tightly grouped in the main wintering area of their population, an area much smaller than the range from which they came. The 10 continental recoveries of the European Goldfinch *(Carduelis carduelis)* outnumbered such recoveries in all other years combined but were similar to the previous distribution. Even House Sparrows *(Passer domesticus)* displayed unusual movement; for the first time in history an individual banded in Britain was recorded across the English Channel. A European

Robin *(Erithacus rubecula)* banded in Suffolk in October was recovered in the Shetland Islands in the following April. The authors regard it as a continental migrant that drifted to Britain during both autumn and spring passage. Other species mentioned are *Carduelis flammea* (dramatically on the move in America in the same year) and *Chloris chloris.*

An arresting feature among several of these examples is a convergence from the banding locations to less widely spread points of recovery. One might conclude that not all members of British populations of a species fly in the same standard direction. However, if banding stations in Britain are more homogeneously distributed than recovery facilities on the continent, appearances may be deceiving.—R. J. Newman.

18. Ground-speed and air-speed according to flock-size in migrating birds. (With Danish summary). N. O. Preuss. 1960. *Dansk Ornithologisk Forenings Tidsskrift,* **54**(3): 136-143. Seventy-one flocks of migrating Oystercatchers *(Haematopus ostralegus),* timed over a measured kilometer in Denmark, passed at air speeds of 21 to 40 mph. As in previous studies with other birds, they flew higher with fair winds than with head winds. A plotting of the number of birds per flock against ground speed indicates that the bigger a flock, the faster it travels. But when Preuss made a linear regression analysis using air speeds, the relationship was much less pronounced and without statistical significance.

The greater correlation between ground speed and flock size than between air speed and flock size suggests to the reviewer that the original influence may have been stated backwards. Perhaps we should not be asking whether bigger flocks fly faster than small ones but whether birds tend to fly in larger flocks when the wind direction is favorable for fast passage than when it is unfavorable. In the present investigation the angle of the wind to the direction of the birds varied only from 50 degrees to 100 degrees and therefore did not show what would happen with real head winds or real tail winds.—R. J. Newman.

19. Goose emigration at the Butt of Lewis. A. MacEachern and K. Williamson. 1960. *Bird Migration,* **1**(4): 182. The general pattern of spring movement was much as in previous years. The majority of the geese waited for anticyclonic weather and passed in the fourth week of April. The first three days of May brought *southward* movements of Gray Lag Geese, possibly because of deteriorating conditions to the north.—R. J. Newman.

20. Migration of the Sandhill Crane east of the Mississippi. Lawrence H. Walkinshaw. 1960. *Wilson Bulletin,* **72**(4): 358-384. In this careful study by a specialist on the species, documentive data ond citations each occupy more space than the text proper. Walkinshaw postulates three migration paths for Sandhill Cranes. Here he centers his attention on the easternmost, a northwest-southeast flight that mainly passes somewhat west of a line drawn from James Bay to eastern Georgia and presumably connects with a main wintering range in Florida. On its western side also, this flight zone seems clearly bounded. Relatively few migrating Sandhills have been reported from western Illinois, western Kentucky, or western Tennessee; none at all have been noted in Mississippi or Alabama. A map of the eastern United States with plotted points of observation shows several vacant stretches and stretches with infrequent records along the way. That such gaps can occur in the case of a bird as large and conspicuous as a crane should give pause to students of migrating passerines who are prone to draw far-reaching conclusions from an absence of records.—R. J. Newman.

21. Bird-migration terms. A. Landsborough Thompson. 1960. *Ibis,* **102**(1): 140. This letter objects to the Lack and Williamson translation of the German *Leitlinie* as "diversion-line." Thompson feels that "diversion-line" has implications that sometimes may be of dubious validity—a point the reviewer has already sought to suggest *(Bird-Banding,* **31**(1): Review 2). That *Leitlinien* always divert seems a conclusion not yet wholly warranted. Thompson recommends returning to the rendering "leading line," a term he considers properly neutral since migrants can be "led" astray as well as in the right direction. A more obviously neutral alternative sometimes used by the reviewer is simply "line of influence."—R. J. Newman.

22. Migrants at airport ceilometers. Margaret B. Hickey. 1960. *Passenger Pigeon*, **22**(1): 23-26. Eastern Kingbirds and other passerines, along with Green Herons and Black Terns, swarmed spectacularly through a ceilometer beam at Madison, Wisconsin, between 10:30 and 11:45 PM on the night of 23 May, 1952. By 1 AM the numbers had decreased approximately 50 per cent. No known mortality occurred. Next night fewer birds were in the beam, though they circled longer there and 15 of them were subsequently found dead. The specimens picked up from the grass showed no signs of injury. Seven years later —during the hour prior to 1 AM, 4 October 1959—migrants again appeared in the beam. The subsequent casualty list this time included 117 birds of 24 species, all passerine. Why birds attracted to ceilometers die on some occasions but not on others still awaits satisfactory explanation. As more and more reports like the present one become available, they may eventually suggest a reasonable working hypothesis.

Mrs. Hickey makes a challenging point. There had been no clear skies between Madison and the Canadian border for two days preceding the 1959 disaster. If her information is correct, the birds concerned must have taken wing without a clear view of sun or stars, in defiance of the opinion of some investigators that they never do so.—R. J. Newman.

NIDIFICATION AND REPRODUCTION

(See also nos. 24, 30, 39, 40)

23. Cowbird Hosts in Southern Quebec. Lewis McIver Terrill. 1961. *Canadian Field-Naturalist*, **75**(1): 2-11. A remarkable record, covering 53 years, in which 390 parasitized nests were found among 4,452 occupied nests of 42 host species. This amounts to 8.8 percent, a low figure in comparison to observations in Michigan —22.4 percent (Berger, 1951), Pennsylvania —30.7 percent (Norris, 1947), and Ohio—31.2 percent (Hicks, 1934). A few samples will be quoted from the author's annotated list: Phoebe *(Sayornis phoebe)*, 26 percent of 108 nests; Red-eyed Vireo *(Vireo olivaceus)* 42 percent of 64 nests; Song Sparrows *(Melospiza melodia)* only 12.7 percent of 486 nests, in contrast to two Ohio records—34 percent (Hicks) and 43.9 percent (Nice, 1937). Little information was found on the success of the nests. The author states: "In Quebec the fledging of even one host young per nest amongst the smaller passerines is notable. More often there are no survivors." One correction: my observations on *Molothrus ater* and Song Sparrows were made in Ohio, not in Oklahoma, a state in which the latter does not nest.—M. M. Nice.

BEHAVIOR

(See also no. 3)

24. The Comparative Ethology of the African Parrot Genus *Agapornis*. William C. Dilger. 1960. *Zeitschrift für Tierpsychologie*, **17**(6): 649-685. This is a detailed study of eight species and subspecies of a small parrot averaging from 28 to 58 grams in weight, the females weighing slightly more than the males. The author traces "the gradual loss and acquisition of various behavioral and morphological characters" from the most primitive form *cana* to the most recently evolved *personata nigrigenis*. Among the 11 trends listed are loss of sexual dichromatism, development of increasing socialization, increase in complexity of nests, and loss of reciprocal courtship feeding. One species—*A. pullaria*—usually sleeps hanging upside down, as do all species of *Loriculus*.

Agapornis is noted for the remarkable behavior of some of its species in tucking nest materials in its feathers and carrying them in this manner to its nest. "Females of *cana, taranta*, and *pullaria* bite off very small pieces of nesting material and carry them, many pieces at a time, thrust amidst the feathers of the entire body. The entire plumage is ruffled as if to receive such material every time a piece is being placed in the feathers. The feathers are compressed again during each bout of cutting the next piece . . . *A. taranta* has the unique habit

of also utilizing its own feathers as nest material." *A. roseicollis* females cut larger strips of material than the first three species; erect only the feathers of the lower back and rump meanwhile and tuck the pieces only into these feathers. The four subspecies of *personata* carry nest material only in their bills.

This comprehensive study is illustrated with many photographs including a plate in color of all eight forms of *Agapornis* involved.—M. M. Nice.

25. The Recognition of Birds of Prey, Especially the Sparrow Hawk and Hobby, by Small Birds. (Zum Erkennen von Raubvögeln, inbesondere von Sperber und Baumfalk, durch Kleinvögel.) Hermann Mohr. 1960. *Zeitschrift für Tierpsychologie*, **17** (6): 686-699. Summary in English.) During the breeding season Barn Swallows *(Hirundo rustica)* and House Martins *(Delichon urbica)* regularly mobbed Sparrow Hawks *(Accipiter nisus)* and Hobbies *(Falco subbuteo)*. They pursued the former with loud cries but tended rather to flee from the latter. "Following prolonged absence of a releasing stimulus, the swallows perform mobbing of a predatory bird as a vacuum activity."

Experiments with perched dummies showed that the swallows' "recognition scheme for a bird of prey requires that the object be three-dimensional, inconspicuously (not brightly) colored, and with a hooked beak." The most effective model was middle-sized with yellow eyes corresponding to a Sparrow Hawk. A hen turkey leading her poults warned at the appearance of a flying bird of prey long before it was visible to the human eye; she ignored a downy young pigeon in the hands of the author but when he carried a downy young Sparrow Hawk with dark eyes, recognizable only as a bird of prey by its beak, she sprang at it fiercely.—M. M. Nice.

26. The Development of Some Behavior Patterns of Hand-Raised Sparrow Hawks and Hobbies. (Ueber die Entwicklung einiger Verhaltenweisen bei handaufgezogenen Sperbern *(Accipiter n. nisus* L.) und Baumfalken *(Falco s. subbuteo* L.).) Hermann Mohr. 1960. *Zeitschrift für Tierpsychologie*, **17** (6): 700-727. (With English summary.) With both the *Accipiter* and the falcon any pointed or small red object at the level of the eyes or above served as a releaser for taking food. From 8 days on the nestling also begs from the parent or foster-parent. The Sparrow Hawks seized moving objects at 5 weeks of age, but took no interest in insects. The first attempts of the Hobbies were all directed towards the capture of insects, and only after 6 months did they show interest in living birds.

The nestlings of both species were peaceable together; indeed, if the Sparrow Hawks were not, no male would ever be raised. The large female of this species takes prey larger than herself, but the male, about half her size, kills only birds smaller than himself.

"Except in the breeding season Sparrow Hawks show no attraction to conspecifics and scarcely any inhibition to killing them. Before the beginning of breeding, the female stops hunting and is supplied with food by the male."

Sparrow Hawks taken from the nest before the age of 9 days became imprinted on human beings as parents and as sex partners. "The parent is recognized as to species, the sex partner individually." One female courted the author in her first and second spring, building a nest both years, laying eggs and incubating for 8 weeks the second year. She accepted a baby domestic chick and brooded it for a day after which time the author gave it back to its mother; it was yellow in color and peeped much like a newly-hatched Sparrow Hawk. A very interesting article.—M. M. Nice.

27. The Relation of Hormones to the Reproductive Behaviour of Birds, Referring Particularly to Parental Behaviour: a Review. Erica Eisner. 1960. *Animal Behaviour*, **8**: 155-178. A comprehensive summary of the subject including references to studies on mammals. Among other subjects there is a valuable discussion of brood patches. "In non-passerines there appears to be a good correlation between the development of patches and participation in incubation." Yet within the Passeres in some species males incubate but do not develop patches. In the author's Bengalese Finches *(Lonchura striata)* both parents incubate intensively, yet neither sex shows any suggestion of vascularization or oedema. "The ventral surface of mature birds is at all times free of down feathers," (p. 163). It is easier to induce care of chicks than incubation of eggs.

"Care of young can often be easily induced without hormone treatment both in birds and mammals." "Parental behaviour is very greatly dependent on the stimulus situation," (p. 168).

The paper constantly refers to life history studies. The author points out many problems that need further research and she warns against concluding that what has been found true for one species is necessarily true for others. This article furnishes some 200 references.—M. M. Nice.

28. Field Studies on the Behaviour of Sea-Ducklings. P. M. Driver. 1960. *Arctic, Journal of the Arctic Institute of North America,* **13**(3): 201-203. Intensive study of Eider *(Somateria mollissima)* ducklings from before hatching, based on observations in the field in the Belcher Islands, Hudson Bay, of 12 ducklings imprinted on himself and checked by observations on wild ducklings. Six notes are described, the first two starting before hatching: *brooding* note used when the duckling is being brooded by its mother, and *complaint* note uttered when it is uncomfortable. The *cohesion* call keeps the ducklings together; the *contentment* note signifies satisfaction from food or warmth. The *distress* note is given when danger threatens and is followed by a crash dive. The investigatory note is uttered when the duckling is puzzled by the sight of strange objects. The development of feeding and diving behavior is traced briefly. This article is a preliminary note to the full report on these important studies to be published later.—M. M. Nice.

29. Behavior Studies on the Bluethroat. (Verhaltens-studien am Blaukehlchen *(Luscinia s. svecica).)* Valto A. Peipnonen. 1960. *Ornis Fennica,* **37**(3): 69-83. Observations on the Red-spotted Bluethroat in Finnish Lapland during five seasons. Comparisons throughout the paper are made with Lack's exhaustive studies (1939, 1953) on the European Robin *(Erithacus rubecula).* In the latter species the sexes are alike and both are aggressive, but the female Bluethroat lacks the bright breast markings of the male and she also lacks his aggressiveness. Male Bluethroats reacted with intimidation displays to mounted males and females (as they do to live members of their species), but females paid no attention to the dummies. Male Bluethroats, like male Robins, reacted strongly to the mounted head and breast of a male of their species. Nine sketches from photographs illustrate this interesting paper.—M. M. Nice.

30. Notes on the Behaviour of Whiskered Terns. J. J. Swift. 1960. *British Birds,* **53**(1): 559-572. Observations on some 150 pairs of *Chlidonias hybrida* nesting in the Camargue, France, largely to compare the behavior of this species with that of the Black Tern *(C. niger),* studied by Baggerman, Baerends, Heikens and Mook (1916) in Holland. In the colony as a whole there was little synchronization of breeding, but within groups there was close correspondance of laying and hatching dates. Behavior of the two species was found to be very similar. In some areas they are sympatric and at times form mixed colonies; they seem to be kept apart by differences in appearance and in voice.—M. M. Nice.

31. Foot-movements in Plovers and Other Birds. K. E. L. Simmons. 1961. *British Birds,* **54**(1): 34-39. "Foot-trembling" and other movements in plovers are discussed as well as "foot-paddling" and other movements in other birds. As to the function of these various movements, the author concludes it probably lies in causing "worms of all types merely to move, and thus reveal themselves or the site of their burrows."—M. M. Nice.

32. Starling Feeds Nestling Robins. William L. Putnam. 1961. *Canadian Field-Naturalist,* **75**(1): 52-53. A pair of *Sturnus vulgaris* that had repeatedly lost their nests built on a downspout on a building were seen about August 17 feeding young *Turdus migratorius* in a nest about 20 feet from the downspout. No adult Robins were noticed then or later about the nest. On August 24 one nestling was found dead on the ground; the next day the other left. All that day it called incessantly from a tree about 100 feet from the nest, while the Starlings stayed around their territory, completely ignoring their foster child. It must have perished during the night. The author concludes that the food

call of the fledgling Robin is so different from that of the fledgling Starling that it "did not release the parental drive of the fosterer after the fledgling had left the nest." We often read of birds feeding young of other species in the nest, but seldom, except with brood parasites, hear of their subsequent fate.—M. M. Nice.

PARASITES AND DISEASES

(See nos. 15, 16)

ZOOGEOGRAPHY

33. The Little Ringed Plover in Great Britain during 1957-59. E. R. Parrinder. 1960. *British Birds*, **53**(12): 545-553. *Charadrius dubius* first nested in Great Britain in 1938. In 1959 nearly 100 pairs bred in a total of 24 counties.—M. M. Nice.

34. Four Invasions of Waxwings during 1956-60. R. K. Cornwallis. 1961. *British Birds*, **54**(1): 1-30. Bohemian Waxwings *(Bombycilla garrulus)* from northwestern Europe invaded Great Britain four seasons in succession. The chief winter food of this species consists of the berries of rowan or European mountain ash *(Sorbus aucuparia)* and the crop of these berries varies widely from year to year. The invasion type of migration is an adaptation to irregularity in food supply.—M. M. Nice.

35. On the Spotted Eagle and its occurrence in Sweden. (Aspekter på större skrikörnen *(Aquila clanga)* och dess förekomst i Sverige.) Gunnar Markgren and Martin Markgren. 1960. *Vår Fågelvärld*, **19:** 273-285. (English summary.) This is a clear and graphic report on the status of this eagle in Sweden. The bird is frequently noted in migration at Falsterbo and in the province of Scania. The rest of the records, 18 in all, are scattered over Sweden, with 50 percent concentrated in the northeastern corner of Norrland. About half are summer records. The rest, except one in May, are fall observations. Nesting was suspected by two summering pairs but not proved. In Finland across the Gulf of Bothnia the species is known to have nested.—Louise de K. Lawrence.

36. New breeding locality of the Murre in Sweden. (Ny häckningslokal för sillgrissla *(Uria aalge)* i Sverige.) Sten Regnell. 1960. *Vår Fågelvärld*, **19:** 285-291. (English summary.) In 1955 the islands of Källskären off the Baltic coast in central Sweden became protected by the State Conservation Authority with landing prohibition extending from 1 April to 15 July each year. The Murre has notably increased since then. In 1960 six breeding pairs were found on one island with eggs and young. This led to the correct identification of a downy young bird (previously mistaken for a Black Guillemot *(Uria grylle)* by Jonsell, VF 1959:97-128) and thus establishing breeding by the species from as early as 1957. Excellent drawings by the author depict nest-sites, eggs, and young. Four nests were found together under a leaning rock and the others in the open amid a colony of Razor-billed Auks *(Alca torda)*. At an adjacent islet, during two successive breeding seasons, a lone Murre was observed flying, always together with a Razor-bill.—Louise de K. Lawrence.

37. Bird observations in the Kalix region 1959. (Fågelobservationer i Kalix-trakten 1959.) Stig Lundberg. 1960. *Vår Fågelvärld*, **19:** 316-325. (English summary.) Observations on 15 species in this far northern part of the Gulf of Bothnia's coastland are given in this paper. Many birds were banded. Three interesting recoveries of Waxwings *(Bombycilla garrulus)* were obtained, two from Scotland and one from Russia. One of the Scottish recoveries indicated a flight by the shortest route of about 1,800 km., 500 km. of these across the North Sea, or an average of about 50 km. a day. The bird that flew southeast across most of European Russia was banded a week after the other two and accomplished the journey in 40 days. In three species first breeding records for the region were obtained, the Smew *(Mergus albellus)*, the Great Grey Shrike *(Lanius excubitor)*, and the Red-necked Phalarope *(Phalaropus lobatus)*.—Louise de K. Lawrence.

38. Red-breasted Flycatcher breeding in Scania. (Liten flugsnappare *(Muscicapa parva)* funnen häckande i Skåne.) Gustav Rudebeck. 1960. *Vår Fågelvärld,* **19:** 325-328. (English summary.) A yearly breeder since 1944 on the Baltic island of Öland, this species has now also been found nesting on the Swedish mainland. The nest was built half exposed in a crotch of a beech. This constitutes a northwesterly extension of the bird's range.—Louise de K. Lawrence.

BOOKS AND MONOGRAPHS

39. The Kirtland's Warbler. Harold Mayfield. 1960. *Bulletin 40, Cranbrook Institute of Science.* Bloomfield Hills, Michigan. 242 pp. $6.00. This attractive book is fittingly dedicated to the memory of Josselyn Van Tyne, who devoted many seasons to the study of *Dendroica kirtlandii.* Mr. Mayfield was closely associated with Dr. Van Tyne in this enterprise from 1944 till 1957 and was given all the material the latter accumulated on this warbler. The monograph covers the history, range, and life history, including mortality and reproduction, as well as a long chapter on the Brown-headed Cowbird *(Molothrus ater).*

Kirtland's Warbler nests only in northern Lower Michigan in young jack pine woods with dry and porous soil; at present considerable suitable territory is not occupied. It winters in the Bahamas. The poplation was high between 1880 and 1900, but has decreased noticeably since then. In 1951 there were less than 1,000 individuals on the nesting grounds. Mr. Mayfield believes the major inimical factor is the cowbird, which is a late arrival in the region and did not become numerous there until the 1890s. About 55 percent of the warbler's nests have been found parasitized. The author calculates that the probability of Kirtland's Warbler eggs producing fledglings "would be increased about 60 percent if there were no cowbird interference," (p. 201).

In addition to the fact of its rarity, Kirtland's Warbler is a delightful bird, handsome, fearless in respect to human beings, and possessed of a fine, distinctive song. It would be a calamity if this especially appealing species were doomed to disappear because of an overpopulation of cowbirds.

The book is clearly written and well organized, with a detailed table of contents, with each subject indicated by a heading, with excellent summaries for each of the 15 chapters, a 23-page bibliography, indices of bird species and of subjects, 6 maps, 12 very good photographs and a charming frontispiece in color by Roger Tory Peterson. I noted only one error—on p. 218, l.37, the co-author of the 1932 paper was L. B. Nice, not W. E. Schantz. Two final pages are devoted to "Problems for Future Study." In my opinion "control of the cowbird in certain chosen areas" seems of paramount importance.—M. M. Nice.

40. The Parasitic Weaverbirds. Herbert Friedmann. 1960. *Smithsonian Institution, United States National Museum,* Bull. **223:** 1-196. $1.00 Brood parasitism has developed twice in the history of weavers, as shown by the Cuckoo Finch *(Anomalospiza imberbis)* related to the ploceine weavers and in viduine species that are related to the estrildines. Brood parasitism is a comparatively new development in the weaver birds, and the similarities in egg color, nestling mouth markings, and nestling plumages in comparison to their usual estrildine hosts can be more logically explained by relationship than by mimetic evolution. "The absence of any structures or habits directly inimical to the young of the host, such as we find in the cuckoos and honey-guides, is an indication of the relative recency of the parasitic mode of breeding in the weavers," (p. 33). The author makes an interesting generalization: "Brood parasitism is merely another way of breeding: It has been established in a number of groups of birds but this fact does not imply that it is a better or more efficient way." (p. 36).

The bulk of the book is devoted to a detailed discussion of all that is known of nine parastitic weavers. The accounts are full of interest and clearly show how much more there is to be learned. This important and authoritative monograph contains four plates in color and 18 in black and white, as well as a 25-page biblography.—M. M. Nice.