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RECENT LITERATURE

BANDING

(See also numbers 13, 18, 43)

1. Night-Lighting: A Technique for Capturing Birds and Mammals. Ronald F. Labisky. 1959. *Illinois Natural History Survey Biol. Notes*, No. 40: 11 pp. Bright lights were used at night to temporarily blind pheasants *(Phasianus colchicus)* and certain other animals until they could be captured in a hand net. Hay and stubble fields were cruised slowly in a panel truck equipped with floodlights and spotlights. When a roosting bird was observed, the floodlights were switched off and a hand-held spotlight focused on the bird. The netter, seated on the right front fender of the truck, jumped off and attempted to net the bird from the spotlighted side. Pheasants were difficult to capture by this technique until they had been roosting for 3 to 4 hours. After midnight netting was much more effective. Fog, rain, heavy dew, and frost resulted in pheasants holding tight, whereas during strong winds and snow the birds flushed more readily.

About one in three netting attempts resulted in the capture of a pheasant. Other species readily netted by this method were: Sora Rail *(Porzana carolina)*, Virginia Rail *(Rallus limicola)*, Barn Owl *(Tyto alba)*, Vesper Sparrow *(Pooecetes gramineus)*, and Grasshopper Sparrow *(Ammodramus savannarum)*.

An earlier use of similar techniques, in Louisiana, was described by E. A. McIlhenny *(Bird-Banding*, **13**: 19-28, January, 1942.)—F. C. Bellrose.

MIGRATION

(See also numbers 38, 58, 65, 66)

2. Bird-Migration Terms. D. Lack and K. Williamson. 1959. *Ibis*, **101**(2): 255-256. For intelligible discussion of modern migration research such as the radar studies reviewed in this issue, we have need of a more precise vocabulary. Recently several British ornithologists have agreed upon pertinent terms and definitions.

Brief paraphrases of their decisions follow. *Heading*—the direction in which the flying bird is pointing. *Track*—the actual path of the bird (the resultant of its heading and the action of the wind). *Diversion-line*—a replacement for "leading line," "guiding line," and "containing line." *Reversed migration*—general movement, not primarily related to a diversion-line, in a direction opposite to the seasonally normal one. *Retromigration*—movement turned in a direction opposite to normal by a diversion-line. *Drift*—displacement from the normal route by the wind. *Lateral displacement*—the drift of a bird maintaining a constant heading in a cross wind. *Disoriented drift*—the displacement of a

bird that flies at random and thus tends to be carried in the direction of movement of the air mass. *Down-wind directed drift*—the result if a bird turns to fly down-wind. *Redetermined migration*—movement back toward the normal route or quarters after drift. *One-directional navigation*—flight on a constant heading, without correction for drift. *Goal orientation*—the directing of a flight to compensate for displacement.

Unfortunately, the proper practical usage of some of these terms is still not clear. Is, for example, the term "diversion-line" applicable to our Atlantic coast in autumn if, as often assumed, it acts not to *divert* migrants from their standard direction but to do just the opposite by placing limits on drift? And what are we to call such movements as the famous autumnal flights up the bay shore at Cape May, N. J.? These are reversed in the ordinary sense, but their relation to the guiding line is controversial. A neutral commentator cannot refer to them by either of the restricted terms "reversed migration" or "retromigration" without implying more than he wishes to suggest—R. J. Newman.

3. Detection of birds by centimetric radar—a cause of radar 'angels.' W. G. Harper. 1958. *Proceedings of the Royal Society of London*, Series B, **149:** 484-502. More than 2 years ago a pair of papers from Switzerland (see reviews, *Bird-Banding*, **29**(2): 114-116) satisfied ornithologists that birds cause the once mysterious radar echoes known as "angels," yet many meteorologists and radar experts have remained skeptical. Thus, others using radar to study birds have also tended to concentrate on aspects of angel behavior that conform to the known or assumed behavior of birds.

Harper's data, obtained inland in England with radar of moderately high power, show that angels resemble migrating birds in seasonal distribution, 24-hour patterns of changing density, reactions to weather, directions and speeds of movement, and height above the terrain. Harper further reports that a telescope mounted on a target-tracking radar permitted direct inspection of the source of radar echoes and spot identification of angels as birds.

Radar research has opportunity to achieve an ornithological discovery wholly its own by determining whether or not the general flight elevation changes systematically during the day and night. The present study provides evidence that migrants do fly at different levels on different occasions. But so far the greater visual appeal of plan-position displays, which superimpose migratory movements on a map of the terrain, seems to have distracted investigators from sustained use of range-height radar, which by portraying migration in vertical profile gives unique information regarding its altitude.—R. J. Newman.

4. The detection of bird migration by high-power radar. J. G. Tedd and D. Lack. *Proceedings of the Royal Society of London*, Series B, **149:** 503-510. Tedd and Lack discuss several of the subjects treated in the report just reviewed. They bring to bear data from English *coastal* stations quantified on a less finely graduated scale in a somewhat different way and recorded at more varied times of the day and night with more powerful apparatus (bird range exceeding 60 miles).

In the comparison of results, Harper's findings (see No. 3) will be given first. *Seasonal distribution:* (1) considerable angel activity throughout the winter months, annual maximum in March followed by an April decline to below winter levels, an upsurge in May, a June-July blank, renewed movement in August and September doubling in the latter half of autumn; (2) complete inactivity in January, a strong showing in March rising to a climax in April, a drop to near zero in May followed by a slight rise in June and July and a void in August, renewed action in September building up to a fall maximum in November. *Hour-to-hour pattern in autumn:* (1) a sharp increase in angel density just after sunset fluctuating to a weakly accentuated peak around midnight, then a pronounced decrease at 2 a.m. leading to a nocturnal minimum in the hour before sunrise and complete cessation of activity around noon; (2) not significantly different except for better sustained daytime density with a secondary peak at 10 a.m. *Speed* (adjusted to still-air value in knots): (1) minimum 19, maximum 48, mode 29; (2) minimum between 10 and 19, maximum between 50 and 59, means of 27 (spring) and 23 (fall). *Height:* heaviest densities between 2,000 and 3,000 feet, occasionally with good showings to 5,000 feet and with

even higher scatterings reaching a maximum of 16,000 feet; (2) angels concentrated in the first 2,000 feet above sea level with some to 10,000 feet.

These results considerably enlarge upon the original Swiss conclusions without actually contradicting them. The occasional marked discrepancies between the findings of Harper and those of Tedd and Lack are of uncertain significance —possibly in some respects real, possibly wholly due to differences in sampling, equipment, and technique of analysis.—R. J. Newman.

5. Radar observation of birds. R. E. Richardson, J. M. Stacey, H. M. Kohler and F. R. Naka. 1958. *Proceedings Seventh Weather Radar Conference:* pp. D1-D8. The sole American contribution to our radar "symposium" is the product of firstrate electronic knowledge, superb facilities, and second-hand experience with birds. Scientists from the Massachusetts Institute of Technology were assigned the project of identifying over-water angels off Cape Cod and devising ways of eliminating them. In pursuit of a solution they called into play aircraft, high-power surveillance radar, double-beam apparatus, moving targets indicators, devices measuring the recently publicized Doppler frequency shift, and scan-by-scan motion pictures.

The authors conclude that angels are unquestionably birds. They note a drop-off in the spring density of migrants after midnight, the movement of angels ahead of storms, and the flow of presumptive land bird migration on spring evenings out over open water toward Nova Scotia, 200 miles away. The fact that Richardson, Stacey, Kohler, and Naka are not themselves ornithologists merely lends added weight to observations such as these, which conform with the ideas of ornithologists.

In one crucial respect, the M. I. T. experts differ with prevailing opinion: they believe that most angels represent individual birds. Their examination of the sources of echo by refined techniques has shown that these sources have the characteristics of discrete targets. They have computed that a lone gull 20 nautical miles away should give a very large radar return and that, were it not for the limiting effect of the horizon, single birds should be "visible" at a distance of 90 miles.

Paradoxically, such sensitivity would have serious disadvantages in migration study. Modern high-power radar compresses a view of thousands of square miles of the earth's surface onto a few square inches of screen surface; but the apparent size of the targets does not diminish in nearly the same degree. In the case of the Cape Cod set, the disproportion is so great that an even distribution of only 4 angel returns per square mile would merge into a solid sheet of light and any higher number of returns would be indistinguishable. Yet estimates based on the number of migrants seen passing before the moon rate 4 individuals per square mile as less than 15 per cent of the American average for autumn and reveal instances of as many as 500 birds per square mile. These figures should not be taken too literally, but no conceivable set of assumptions with regard to them permits one to regard an instrument with a top capacity of 4 birds per square mile as a very informative means of measuring amounts of migration. In view of the ornithological results actually achieved with high-power radar, the probability is that in practice the screen has a bird capacity considerably greater than this paper suggests.—R. J. Newman.

6. Migrational drift of birds plotted by radar. David Lack. 1958. *Nature*, **182**(4630): 221-223. The work here previewed by Dr. Lack marks the advance of analysis based on radar from its initial emphasis on conformity with pre-existing ideas about migration to the role of arbiter between opposing theories. Some writers have maintained that the shifting of Continental migrants to Britain is due to downwind drift, others that lateral displacement (in the restricted sense specified in Review No. 2) is the factor responsible. Lack compares a series of directional trends of spring migrants over the North Sea, visually estimated from angel displays, with the directions of attendant winds aloft. He finds that nearly all results fit the assumption that the birds fly on a constant heading without compensation for drift (*i.e.*, undergo "lateral displacement"). In contrast, he cites one radar observation of apparent disoriented drift under overcast skies, which in terms of results is a form of downwind drift. He concludes that lateral displacement is the usual process but

that disoriented drift, by dumping concentrations of exhausted migrants in key spots, may attract more attention. Thus two apparently contradictory points of view are neatly reconciled.

Lack's data effectively establish that leftward and rightward drift is an important feature of migration eastward across the North Sea in spring. Whether these data also prove that the birds must fly on a constant heading is not so certain. Radar does not reveal the heading of an echo directly, and an assumption that the birds were goal-oriented fits the stated results equally well.

Goal-orientation *per se* does not necessarily provide a means of traveling on a straight track to a destination. It would merely enable a bird to head always toward its goal. In a wind with cross components, a migrant endowed with such a faculty but nothing more would be subject to drift. The extent to which it could compensate would be slight in the beginning but would improve continuously with the approach to the goal. As an example, consider the case of a migrant with an air speed of 27 knots oriented toward a point 300 miles away and flying in a 9-knot cross wind. A brief excursion into differential calculus indicates that after proceeding 30 miles such a bird would have deviated at least 9 miles from the straight-line track to its destination, only half a mile less than a bird setting out for the same goal on a constant heading. Even at 50 miles the separation between the two birds would be only about 1½ miles. The methods applied in the North Sea study do not seem precise enough to distinguish consistently between two types of navigation so similar in initial effect.—R. J. Newman and Burt L. Monroe, Jr.

7. Migration across the North Sea studied by radar. Part 1, survey through the year. David Lack. 1959. *Ibis*, **101**(2): 209-234. The three-year survey of bird movements over the North Sea carried on by high-power radar stations along the lower east coast of Britain is a striking achievement. The first installment of Dr. Lack's detailed report consists of an interpretive month-by-month description of the over-water angel displays, prefaced by a discussion of the limitations of radar and followed by a listing of the basic data. Like American work with birds crossing before the moon, the study deals mainly with the varying directions and quantities of migration under different circumstances. The amount of bird movement is broadly classified in four grades without implication as to the number of individuals involved.

With the accumulation of additional records the seasonal distribution previously noted (Review No. 4) retains the same general features but assumes a smoother, more coherent form. Transmarine flights of so-called large scale appear in every month except January, and even then light movements are sometimes evident. The possible complications caused by seabird displays not of a strictly migratory nature—a factor noticeable in some of the radar observations off Cape Cod—are not discussed, but the idea of year-around migratory activity accords with English field observations of long standing.

The great emigrations from Norfolk toward the Continent in March and early May, rarely detected by the ordinary observer, vary in direction between northeast and southeast, and their occurrence is nearly independent of the wind direction. Autumn immigrations approach chiefly along a westward track from northern Holland, though there seem to be lesser flights southwestward from Scandinavia. Almost all these departures from the Continent occur with at least partial following winds; but, as Lack points out, the relationship is perhaps not direct, since the opposing winds of fall are associated with weather unfavorable in other respects. The records include numerous examples suggestive of reversed migration and several interpretable as redetermined migration.

Though he cites a puzzling situation in which separate downwind directed and lateral-drift movements were visible simultaneously, Lack does not enlarge upon the evidence for lateral displacement summarized in his earlier paper. Presumably he will further explore the ramifications of this subject in Part II of the present account.—R. J. Newman.

8. Roosting movements of birds and migration departures from roosts as seen by radar. W. G. Harper. 1959. *Ibis* **101**(2): 201-208. Of all the methods of migration study, radar seemingly has the least to contribute regarding the identities of the birds concerned. It does not even supply dependable

clues to size. Signal strength is affected both by the aggregation of the targets and by their altitude, but all species except the very small ones can be expected to return similar echoes under similar conditions. Nonetheless observations of the way birds identified by other means behave on the radar screen is establishing some helpful criteria.

An excellent illustration is the latest work of Harper. By watching sites of known communal roosts on radar and studying the returns emanating from them, he has been able to relate certain characteristic types of radar display with the probable type of bird responsible. Flocks of Jackdaws *(Corvus monedula)* and Rooks *(C. frugilegus)* have appeared on the screen respectively as irregular patches and huge waves of echo. The explosive departure of Starlings *(Sturnus vulgaris)* in all directions from their roosts gives returns with the form of expanding circles or arcs—"ring echoes" like those that have perplexed radar operators on both sides of the Atlantic.

Drawings based on radar displays near sunrise depict supposedly migratory movements of Rooks and Starlings from temporary roosts. The Starling flights begin as solid, or nearly solid, arcs of echo. The arcs expand laterally for a few minutes and attain a length from end to end of as much as 10 miles. In the course of their spread they reach a point where they begin to break up increasingly into patches of echo. Fragmentation into smaller and sparser pieces continues even after the arc has ceased to lengthen. Nighttime departures attributable to Starlings form less definite arcs and rapidly break up into individual pip echoes, each thought to represent a flock. Harper suggests that the uniform scattering of angels typical of nocturnal migration could result from a few massed departures.

Flight speeds computed from the radar data help to narrow down possible identities. On one occasion targets from the vicinity of Starling roosts moved at a velocity of 72 mph; but, when the effect of following winds was taken into account, the adjusted air speeds were close to the known range for Starlings, which considerably exceeds the average for small migrants in general.

Other noteworthy observations mentioned are the departure of diurnal migrations from roosts before sunrise, well-directed movements when dense fog or solid overcasts prevented celestial orientation, and the tendency of flights near their take-off point to mount gradually higher and higher into the sky.—R. J. Newman.

9. Homing of Purple Martins. William E. Southern. 1959. *Wilson Bulletin*, **71**: 254-261. Colonial-nesting birds are the most accessible subjects for homing experiments. Since the Purple Martin *(Progne subis)* is one of the few passerine birds that meet this requirement, it is surprising that the species has been so little used in such tests. The release of 8 males in 1946 in mid-air at midnight over the middle of the Gulf of Mexico and the return of 3 to their nesting sites in Baton Rouge (in a trial conducted by the Louisiana State University Museum of Zoology) proved the ability of martins to extricate themselves from a difficult situation. But until now, apparently, nothing has actually been published concerning homing performances of the species.

Southern conducted his experiments at the University of Michigan Biological Station in the summer of 1958. He trapped 16 martins, all but 2 of them females incubating or caring for young. He banded and color-marked them. Then he sent them in closed cigar boxes to release points 1.75 to 234 miles away, representing every major point of the compass. All 16 returned! Southern's paper summarizes the data of each experiment and indicates weather conditions at each point of release, but does not discuss the possible influence of weather on results.

The most remarkable performer was a bird released at night. Set free at Ann Arbor, Mich. at 10:40 p.m. on July 7, it was back in the colony by 7:15 a.m. the following morning. It had traversed the intervening 234 miles in not more than 8.6 hours. Its homing speed of 27 mph or better indicates prompt orientation and little random searching. The ability of this supposedly diurnal migrant to return so rapidly at night is made even more interesting by the complete double cloud cover, which precluded celestial naviagation.

The reviewer extended Southern's work this past summer by sending birds from the same colony by airplane to still more distant release points. The data are now being analyzed.—Douglas A. Lancaster.

10. Enquiries into visible migration. W. R. P. Bourne. 1959. *The Ring*, **2**(16): 60-61. The term *visible migration* denotes observable movements of birds actively engaged in migrating. Representatives of several European study projects dealing with the subject have chosen Kenneth Williamson and W. R. P. Bourne to operate an international clearing-house for information on work in progress. *The Ring* and *Die Vogelvarte* will publish summaries in English and German respectively. The present report briefly lists current investigations in Europe.—Stuart L. Warter.

11. Inquiries into visible migration in the autumn of 1958. W. R. P. Bourne. 1958. *The Ring*, **2**(17): 82-84. The most notable projects reported are the extensive daily observations from September 16 to October 15 under direction of the East Baltic Commission for the Study of Bird Migration and the field investigations of standard direction in Chaffinches *(Fringilla coelebs)* instituted at the Vogeltrekstation Texel in Holland. The summary closes with a list of migratory irruptions in Britain and on the Continent from June through October.—Stuart L. Warter.

12. Enquiries into visible migration. W. R. P. Bourne. 1959. *The Ring*, **2**(18): 106-110. The third consecutive article in this series presents the views of Drs. Perdeck (Holland), Ferdinand (Denmark), and von Westernhagen (Germany) on standard rules for the study of visible migration. It expresses the hope of exporting this method to the United States and of importing our techniques of organized mist-netting and moon-watching. Americans who would like to try the study of visible migration in the European manner can pick up many pointers from the discussions in this report but probably will find the instructions given too brief for them to understand fully the procedures they are to follow. Until several people here undertake such investigations, we cannot know how well important European concepts such as those involving standard directions and lines of diversion actually apply in the Western Hemisphere. —Stuart L. Warter.

13. Concerning the migration of Wheatears. (Vom Zug des Steinschmätzers *(Oenanthe oenanthe L.))* Christine Hempel. 1957. *Die Vogelwarte*, **19**(1): 25-36. Banded Wheatears from different breeding regions and wintering in different parts of Africa use the same fall migration route through middle and southern Europe. A map of 32 band recoveries and one of breeding ranges, migration routes, and wintering areas is given for *Oenanthe o.oenanthe, O.o. leucorrhoa, O.o. schiöleri and O.o. oenanthoides.* Thirty-nine wheatears were recovered near their nest sites a year or more after banding. Bibliography of 53 titles.—Frances Hamerstrom.

14. Wader Migration in North America and its Relation to Transatlantic Crossings. I. C. T. Nisbet. 1959. *British Birds*, **52**(7): 205-215. A very interesting paper. "The relative frequency of occurrence of various American waders in Great Britain is compared with the available information on their migration patterns and abundance in North America. Some species which have occurred in Britain are rare on the American coast, while there are especially few British records of the species which are most abundant there. Species of inland habitat are relatively more frequent than those of the coast; long-distance migrants are more frequent than short-distance migrants; and species from western arctic America are much more frequent than species from eastern arctic America." Interestingly enough, "Transatlantic vagrancy occurs mainly in those species in which a part of the population has an extensive west-to-east movement within North America." As to spring records in Britain, the author suggests that the birds have "either wintered in the Old World or crossed from South America to Africa on spring migration."—M. M. Nice.

15. Ascertaining height of flight with an optical measuring device. (Ermittlung von Flughöhen mit optimischen Entfernungsmessgerät) Hans Rittinghaus. 1957. *Die Vogelwarte*, **19**(2): 90-97. On migration heights of birds passing more or less directly overhead were measured with 6-10X optical equipment, not described. Sample days of apparently voluminous migration data are presented, covering time of day, wind direction and strength, flock sizes, flight

direction, and height. Species under observation were: Rook *(Corvus frugilegus)*, Hooded Crow *(C. cornix)*, Jackdaw *(C. monedula)* and Lapwing *(V. vanellus)*. The data appear to show that certain species fly higher on spring migration than in the fall.—Frances Hamerstrom.

16. Migration at Falsterbo 1955. Report No. 14 from Falsterbo Bird Station. (Fågelsträcket vid Falsterbo år 1955.) Staffan Ulfstrand. 1959. *Vår Fågelvärld*, **18:** 131-162. (English summary.) The findings described in this report cover a period of 8 months (1 April to 30 November), the longest period ornithologists have maintained daily observations at this station. The most remarkable feature of the spring migration was the extensive movements observed in reverse direction, which reached a peak 13 and 14 April, when birds of 70 of the 74 species observed were flying southward, 44 of them in greater numbers than those seen going north. The leading lines of the Falsterbo landscape tend to create concentrations of birds leaving Sweden and to scatter those arriving, many of which, flying on broad fronts, pass by the Falsterbo observation posts unseen.

Observations during the summer months revealed not only the early start of migration of many species, but also that migration movements at Falsterbo at this time practically do not cease. Although it was difficult at times to distinguish true from reverse migration, no less than 210,000 Starlings *(Sturnus vulgaris)*, nearly 8000 Swifts *(Apus apus), and* 3000 Swallows *(Hirundo rustica)* left Sweden between the middle of June and the beginning of August.

The fall records are divided into three parts for comparison. Significant features of the whole season were 1) exceptionally high counts for a number of species; 2) bottom low records for two—the Wood Lark *(Lullula arborea)* for reasons unknown, and the Peregrine Falcon *(Falco peregrinus)* which seems indeed near extinction in Sweden; 3) "invasion" movements of, in particular, the Jay *(Garrulus glandarius)*; 4) considerably delayed migration of, especially, the raptors.

With its comprehensive synopsis in English, those interested in migration should find this well worked out report worth reading.—Louise de K. Lawrence.

POPULATION DYNAMICS

(See also numbers 29, 32, 36, 41, 42, 43, 44, 56, 57)

17. Return to Birthplace and Life Expectancy of Young Pied Flycatchers. (Geburtsortstreue und Lebenserwartung junger Trauerschnäpper *(Muscieapa h. hypoleuca* Pallas).) Eberhard Curio. 1958. *Die Vogelwelt*, **79**(5): 135-149. (English summary.) From 1950 to 1954 the author studied intensively a population of Pied Flycatchers on the 750 hectare Saubucht Sanctuary near Berlin. More than half of these birds first breed in their second year or later, one male first returning 4 years after hatching. "At least 12.4% of the males, but only 8.5% of the females returned to their birthplace." Males settled at an average distance of 546 meters from the birthplace, females at an average of 842 meters. The maximum distance was 570 kilometers. Contrary to Lack's (1947/48) theories, "Brood-size does not influence the rate of return (table 1); out of a total of 676 nestlings ringed 62 males and females were distributed at random over the range of brood-sizes observed."—M. M. Nice.

18. Homing to nest site and mortality in a marine population of the Velvet Scoter. (Nistortstreue und Sterblichkeit bei einem marinen Bestand der Samtente, *Melanitta fusca.*) Jukka Koskimies. 1957. *Die Vogelwarte*, **19**(1): 46-51. From 1948 through 1955, 37 nesting Velvet Scoter females were banded in the Aspkär Refuge. Most were grabbed by hand by one of two people approaching the nest from opposite directions. Incubating ducks did not desert. Of 76 checks on the banded ducks, 71 were retaken on the island of their previous nesting; however, most ducks were not nesting in the depression used before. The annual mortality rate of adult females in this study was at most 5 percent. Koskimies considers this biologically unnatural: the clutch size presupposes a shorter life span for adults. Velvet Scoters bred originally in the lakes of the inland boreal coniferous forests where the balance between birth and mortality rates for this species presumably developed. On the marine islands the

decimating adult mortality factors are far fewer. Juvenile mortality was 90-95%; by the end of July, of 200-250 eggs 5-10 ducklings were alive in good years—in poor years, none. Koskimies believes that these mortality rates are independent of each other rather than compensatory.—Frances Hamerstrom.

NIDIFICATION AND REPRODUCTION

(See also numbers 18, 36, 42, 65, 66, 67)

19. Variations in Engineering Features of the Nests of Several Species of Birds in Relation to Nest Sites and Nesting Materials. Walter P. Nickell. 1958. *Butler Univ. Botanical Studies,* **13**(2): 121-140. During about 35 years of field work in eastern and central North America, Nickell has "examined in the field or collected and analyzed about 20,000 nests of 169 species of birds." The bulk of his observations have been in 5 counties in southeastern Michigan and 3 in southwestern Ontario, "where 25,379 nesting records have been established for 143 species by about 50 observers of the Detroit Audubon Bird Survey in the last 12 years." Types of nests and the variable builders are: pendulous, *Icterus galbula* and *I. spurius;* pensile, *Agelaius phoeniceus, Vireo olivaceus, V. gilvus, V. flavifrons;* pendant, *Sayornis phoebe, Hirundo rustica;* attached-saddled, *Archilochus colubris, Polioptila caerulea, Myiochanes virens;* attached-statant, *Empidonax traillii, Dendroica petechia, Spinus tristis;* statant, *Turdus migratorius, Hylocichla mustelina.* The variants are described and illustrated. The vegetation characteristics involved in nest-placement are discussed and there is a discussion of nesting materials. A most useful and valuable paper which must be read to be appreciated.—R. S. Palmer.

20. Choice of Nest Place and the Releasing Stimuli for Nest Building with Some Mexican Bird Species. (Nestplatzwahl und den Nestbau auslösende Reize bei einigen mexikanischen Vogelarten.) Helmuth O. Wagner. 1959. *Zeitschrift für Tierpsychologie,* **16**(3): 297-301. (English summary.) The Blue-throated Hummingbird *(Lampornis clemenciae)* builds only in places sheltered from the rain, but its ecological environment "ranges from semi-arid regions with cactus or thorn growth to permanently humid ones covered with fir forest. . . . In some Icterid and hummingbird species . . . the breeding season starts as soon as the birds are able to find wet moss and/or flexible strands of grass for nesting material." After the eruption of the volcano Parikutin in July 1943 many birds returned to try to nest in the desolate region. Cliff Swallows *(Petrochelidon pyrrhonata)* occupied their colony under the church cornice for 3 years, gathering food for their young at a distance; but by the 4th year the nests were no longer usable as the birds had been unable to repair them with balls of mud. A pair of Western Bluebirds *(Sialia mexicana)* were able to raise one young, but House Finches *(Carpodacus mexicanus)* lost two broods from starvation. A pair of Tropical Kingbirds *(Tyrannus melancholicus)* were in full breeding state, but were unable to nest for lack of fresh strands of grass. It would seem that a favorable nesting spot so stimulated these birds that they disregarded the striking unsuitability of the general environment.—M. M. Nice.

21. The Breeding Biology of the Guillemot. (Zur Brutbiologie der Trottellumme *(Uria aalge aalge* Pont.).) Beat Tschantz. 1959. *Behaviour,* **14** (1-2): 1-100. (With 2½-page English summary.) This study is based on two seasons of observation and experimentation on the Rostinseln off the coast of Norway. The birds (the "Common Murre" of the 5th A.O.U. checklist) sit shoulder to shoulder on the nesting ledge, each pair defending its own nesting site and a narrow strip toward the landing stage. The eggs are top-shaped and vary greatly in color and markings; each pair knows its own egg. Extensive experiments established that "similarities of colour and of pattern have similar effects of producing egg-rolling," i.e. adoption of a strange egg. "Different colour or pattern have a pronounced repellent effect." The birds were able gradually to adapt themselves to eggs of different appearance. Chicks are fed only by their own parents and beg only from them. Each chick reacts to the calls of its own parents, and parents respond only to the calls of their own chicks.

A vivid description is given of the "jumping-off" the ledge after 2 or 3 evenings of "preparation" by parent and the half-grown young. The jumping-off is accompanied by an ear-deafening din from the parents and from the young

giving their "leap-calls." If the chick lands on the rocks it is killed. If it lands in the grass, "the parent flies on and alights in the sea, waiting for the young near the shore. . . . Experiments showed that mutual exchange of calls facilitates their meeting on the water near the sea." Sketches and photographs illustrate this notable study from the Zoological Institute of the University of Bern. —M. M. Nice.

22. Lapwings Breeding in Captivity and the Raising of Redshanks by a pair of Lapwings. (Kiebitzbruten in Gefangenschaft mit Aufzucht von Rotschenkeln durch ein Kiebitzpaar.) Otto v. Frisch. 1959. *Journal für Ornithologie*, **100**(3): 307-312. Very interesting account of the nesting of two pairs of hand-raised *Vanellus vanellus* in captivity. One 6-month-old male defended an area in November by calling and nest-molding; in March all three males did so. One pair hatched its own eggs and the mother took the major share of caring for the chicks. The one chick that survived at 20 days of age started to heckle the other shore birds in the flying cage by running between their legs crying *kie-wié* and driving them off. "He did this also to his own Papa, but never to his Mama."

The other Lapwing pair hatched Redshanks *(Tringa totanus)*. These left the nest when a day old; they failed to understand the Lapwing's call note and one of them tried without success to creep under an Avocet *(Recurvirostra avosetta)* and a Greenshank *(Tringa nebularia)*. After 7 hours, however, they had learned to respond to their foster mother's call note and the next day acted upon her alarm notes. When 3 months old they were released and the following day one was shot in Bergamo, Italy, some 180 miles distant.—M. M. Nice.

23. The Breeding Biology of the South African Button Quail. (Zur Brutbiologie des südafrikanischen Laufhünohen, *Turnix sylvatica lepurana.*) Walter Hoesch. 1959. *Journal für Ornithologie*, **100**(3): 341-349. The little Button Quails *(Turnicidae)*, belonging to the Gruiformes, are widely distributed in warm regions throughout much of the Old World. The female, larger and more brightly colored than the male, does the courting and helps build the nest, while the male incubates the eggs and cares for the chicks. The incubation period of 13 days appears to be the shortest period known for a precocial bird. The father in the captive pair of South African Button Quails fed the chick for the first 10 days. Chicks need a great deal of parental warmth; even with an air temperature of 22°C. (72°F.) brooding was almost continuous. From the 10th day brooding decreased. Eight well-chosen photographs show mother, father and chick.—M. M. Nice.

24. Concerning the problem of mixed colonies: the Tufted Duck and Gulls. (Zum Problem der gemischten Kolonien: Die Reiherente und die Lariden.) Göran Bergman. 1957. *Die Vogelwarte*, **19**(1): 15-25. Tufted Ducks *(Aythya fuligula)* and some of the other fresh water ducks need the stimulating influence of gulls in order to establish themselves in the otherwise poor habitat of the outer islands in the Baltic Sea. Where the habitat is propitious the effect of the gulls is less noticeable. The larger the Tufted Duck colony, the less likely it is to attach itself to gulls; single ducks react most strongly. When Tufted Ducks nest among gulls, the nest is placed so the duck can watch the gulls. When no gulls are present, singles or pairs of ducks are flushed at about 70 meters by a boat. When gulls are present, but have not given the alarm signal, the flushing distance is about 17 meters. The alarm call of the gulls is a local alarm signal for ducks and other birds. Quiet gulls indicate an "all clear" signal. Bergman believes that these social reactions are learned. After repeated disturbances by man the gulls' alarm had a stronger effect in flushing ducks. This social behavior causes some fresh water ducks to nest on outlying rocks and islands even though survival of young is extraordinarily poor in these locations.—Frances Hamerstrom.

25. A study of a marked population of Great Tits at Möggingen-Radolfzell (1). (Untersuchungen an einer gekennzeichneten Population von Kohlmeisen *(Parus major)* in Möggingen-Radolfzell (1).) Gerhardt Zink. 1957. *Die Vogelwarte*, **19**(2): 81-84. A Great Tit got a new mate while laying or incubating a first clutch. The young died just before fledging. When her second clutch had hatched, it was noticed that no male was helping her feed the young,

but she fed more often than a pair of control tits. From at least the 11th to the 14th day after hatching this brood was fed by the mother tit and by a Wren *(T. troglodytes)*. The young were retarded in development, but fledged as soon as the controls. Two Great Tits incubated addled eggs longer than the normal incubation period, 24 and 30 days respectively.—Frances Hamerstrom.

26. Communal nesting of Fieldfare-Great Grey Shrike and of Fieldfare-Kestrel. (Brutgemeinschaft Wacholderdrossel-Raubwürger und Wacholderdrossel-Turmfalk.) Hansgörge Hohlt. 1957. *Die Vogelwelt*, **78**(2): 48-53. In this 6-year study one to two Great Grey Shrike *(Lanius excubitor)* pairs nested close to breeding Fieldfare *(Turdus pilaris)* colonies seven times and only once alone. Hohlt does not consider this communal nesting to be by chance, and suspects its purpose is mutual protection from nest plundering crows.

Over the 6-year period one to two pairs of Kestrels *(Falco tinnunculus)* regularly bred in close proximity to the Fieldfares. Occasionally, though seldom, the Fieldfares mobbed the Kestrels.—Frances Hamerstrom.

27. Puzzling behavior of Peregrine pairs. (Rätselhaftes Verhalten von Wanderfalken-Brutpaaren.) C. Demandt. 1957. *Die Vogelwelt*, **78**(6): 183-185. Of three pairs of Peregrines *(Falco peregrinus)* under observation in 1957, two copulated but laid no eggs and the third pair laid one egg but raised no young; of three further pairs in Westphalia, one raised two young. In Trier, Lower Saxony, two of three pairs failed to breed. In the Rhineland only 2 instead of 4-5 eyries could be found. Similar reports came from Hungary. The author points out that more intensive research than usual may have pointed up non-breeding behavior which may have occurred undetected in the past.—Frances Hamerstrom.

28. At the Nest of the Golden Oriole. (Am Nest des Pirols *(Oriolus oriolus)*.) Alfred Reinsch. 1958. *Die Vogelwelt*, **79**(5): 154-157. Daily observations at the nest of a pair of Golden Orioles showed that the female built the semi-pendant nest in 9 days and incubated for 17 days. She left the nest after approximately 30 minutes, remained off for some 6 minutes, during which time the male watched the nest. He was the first to feed the nestlings. The parents were very belligerent towards passing Magpies *(Pica pica)* and Jays *(Garrulus glandarius)*.—M. M. Nice.

29. Photographic Studies of Some Less Familiar Birds. XCIX. Alpine Swift. Hans Arn-Willi. 1959. Photographs by E. Benz and F. Oberholzer. *British Birds*, **52**(7): 221-225. Splendid photographs and fine text on *Apus melba*. "The Alpine Swift in normal flight catches insects at 60-100 kilometres an hour (37-62 m.p.h.) and it is estimated that the speed in wild chases and perhaps on journeys must reach up to 250 kilometres an hour (155 m.p.h.). It is calculated that in its daily flights this species must cover at least 350 miles and in some cases up to as much as 600 or more." One pair bred in the same nest for 11 years. One male did the same for 17 years; he was found dead in the nest in the 18th year. Incubation is by both parents and averages 20 days; fledging averages 57 days. As many as 600 insects may be brought in a ball in the parent's throat pouch. Breeding birds roost at the nest and non-breeders roost near the entrance to the tower. "Alpine Swifts form a stable population with an annual mortality of 17.8%. . . . Swiss Alpine Swifts begin their full moult in May, carry it on during the breeding season and do not finish it until they are in their winter quarters."—M. M. Nice.

30. An Historic Series of Cuckoo Photographs. Oliver G. Pike. 1959. *British Birds*, **52**(7): 226-228. A remarkable series of 12 photographs from the film taken 30 May, 1922 of Edgar Chance's Cuckoo A. They show her arrival with empty bill at the Meadow Pipit's nest, her leaning forward and picking up a pipit's egg, her moving on to the nest to lay her own egg, and her departure with the pipit's egg in her bill. The time spent at the nest was just 10 seconds. Six of these stills appeared in Chance's "The Truth about the Cuckoo" (1940). Mr. Pike, who already had had 18 years' experience photographing birds with a ciné-camera, writes: "I was thrilled with my success: it was my greatest moment in a long experience of bird photography."—M. M. Nice.

31. Juncos in the Great Smoky Mountains. James T. Tanner. 1958. *Migrant*, **29**(4): 61-65. The Slate-colored Junco *(Junco hyemalis carolinensis)* nests freely in the Great Smokies, especially at higher elevations. In courtship the male "spreads and droops his tail, droops his wings, and frequently sings a quiet, Goldfinch-like warble which carries only a short distance, very different from the regular song." Incubation is by the female and lasts about 12 days; young leave the nest on the 12th or 13th day. The nesting success of the 84 nests found lay between 35-40%. Interestingly enough, the "average date of laying the first egg is about eleven days later for each thousand feet increase in altitude."—M. M. Nice.

BEHAVIOR

(See also numbers 17, 21, 22, 24, 25, 27, 29, 62, 63)

32. Observations on the Semi-collared Flycatcher in its Macedonian Breeding Region. (Beobachtungen am Halbringsschnäpper, *Ficedula semitorquata*, im mazedonischen Brutgebiet.) Eberhard Curio. 1959. *Journal für Ornithologie*, **100**(2): 176-209. (English summary.) After some years' study on the Pied and Collared Flycatchers *(Ficedula (Muscicapa) hypoleauca* and *F. albicollis)* the author observed the closely related *F. semitorquatta* in Macedonia. Here in a beech forest 1,000 meters above sea level he watched 10 breeding pairs and 5 unmated birds from 8 to 24 May, 1958. After a description, illustrated with delightful sketches, of the actions of his subjects, he presents two detailed tables comparing the social behavior of the three species. "Nearly all differences in behavior between the Pied and Collared Flycatchers, on the one hand, and the Semi-collared Flycatcher on the other, occur during pair formation ceremonies." Behavior toward enemies and caring for the nesting hole does not differ appreciably. The frequency of courtship feeding—2.7 times per hour in the Pied, once an hour in the Collared and once in 2 hours in the Semi-collared—reflects the warmth of the climates in which the 3 species live.—M. M. Nice.

33. Behavior Studies on the Domestic Hen. Second Part. (Verhaltensstudie über das Haushuhn,—dessen Lebensart, 2. Teil.) Erich Baeumer. 1959. *Zeitschrift für Tierpsychologie*, **16**(3): 284-296. (English summary.) Another fine paper by Dr. Baeumer (see *Bird-Banding*, **28**(3): 172, for a review of Part I.) This article is concerned with the fighting between adult cocks, between hens, and between cockerels and adult hens above them in the pack order. It is illustrated by remarkable photographs—one taken at 1/3000th of a second—and sketches of threatening, fighting, and defeated birds. "A defeated cock hides his head, thus covering the red parts which obviously release attack, or goes into complete hiding for a time, in order to escape persecution by the victor." This study is a must for the many people concerned with dominance questions in domestic fowls; it is a striking example of the amazing range of behavior patterns shown by these birds when watched in freedom in an environment that is rich and varied.—M. M. Nice.

34. The Behavior of Some Estrildine Finches. (Zum Verhalten einiger Prachtfinken (Estrildinae).) Peter Kunkel. 1959. *Zeitschrift für Tierpsychologie*, **16**(3): 302-350. (English summary.) A long and detailed study from Dr. Otto Koehler's Institute at Freiburg of the likenesses and differences in the behavior of 10 species of Estrildine "Finches." These little birds belong to the Ploceidae. They "show mutual preening and roosting in rows. The mates of a pair keep together for a long time, perhaps for life. Within the aviary, conspecifics keep together in a flock; they know each other individually and repel newcomers. Individual distances do not exist." Their songs are expressions of "sexual mood, but never of territorial fighting motivation." Young of the Grey Waxbill *(Estrilda troglodytes)* left the nest at 14-16 days, flew well at 16-19 days, started carrying nesting material at 23-25 days, began singing at 37-39 days and courting at 38-40 days. These last three activities disappeared with the onset of the juvenal molt at 54-56 days.—M. M. Nice.

35. The Form and Duration of the Display Actions of the Goldeneye *(Bucephala clangula).* Benjamin Dane, Charles Walcott, and William H. Drury. 1958. *Behaviour*, **14**(4): 265-281. Analysis of displays through motion picture film; 2 plates show flock displays, 16 show male displays, 8 show female displays, and 8 show copulatory behavior. Each display movement proved to be a "stereotyped action." "In most cases the duration of the movement has proven to be the most accurate measurement of this rigidity."—M. M. Nice.

36. Swallowing of own young ("kronism") by birds and its significance. (Das Verschlingen eigener Junger ("Kronismus") bei Vögeln und seine Bedeutung.) Ernst Schüz. 1957. *Die Vogelwarte*, **19**(1): 1-15. As altricial animals swallow or try to eat their own young in the wild more frequently than used to be supposed, and as this has both theoretical and practical significance, Schüz makes the excellent suggestion that a descriptive word be coined. He proposes *kronism* from the ancient Greek myth about Kronos, son of Uranus, who ate his own children.

In all birds the average number of eggs laid exceeds the average number fledged. While this is partly due to chance, kronism is a normal phenomenon in certain species. Schüz lists kronism in the White Stork *(C. ciconia)*, Kestrel *(Falco tinnunculus)*, and Red-backed Shrike *(Lanius colluris)*; suspected kronism in the Black Stork *(C. nigra)*, Pied Wagtail *(Motacilla alba)*, and Magpie *(P. pica)*; and attacking young in the Heron *(Ardea cinerea)*, Bullfinch *(P. pyrrhula)*, and the House Sparrow *(Passer domesticus)*. Schüz suggests that White Stork kronism may be attributable to immaturity: fledging success is 1.78 with 3-year-old parents, 1.94 with 4-year-old parents, and 2.27 with 5-year-old parents. He indicates that when White Storks breed for the first time, kronism may be usual. Schüz considers kronism to be an important mechanism of population control, hitherto overlooked, and discusses the causes for such drastic types of behavior in the Stork and in a variety of other species as well.—Frances Hamerstrom.

37. Winter utilization of sheep flocks by Starlings. (Der Star *(Sturnus vulgaris)* als winterlicher Nutzniesser von Schafherden.) Karl Mühl. 1957. *Die Vogelwarte*, **19**(1): 36-38. Flocks of Starlings spent the greater part of the day in cold snowy weather feeding and taking cover beneath flocks of sheep. Sometimes two or three individuals rode 5-600 yards on the back of a sheep. The same Starling flocks appeared to utilize the same sheep flocks day after day.—Frances Hamerstrom.

38. Observations at the roost of three species of harriers. (Beobachtungen am Schlafplatz von drei Weihen-Arten.) Gerhard Haas. 1957. *Die Vogelwarte*, **19**(1): 54-55. At Federsee *Circus aeruginosus*, *C. cyaneus* and *C. pygargus* each roost on fall migration in the vegetational type used for nesting. Up to 15 Marsh Harriers may roost together. A 7-10 harrier roost is about 80 meters in diameter. The larger the congregation of Marsh Harriers the larger the roosting area and the longer it takes them (up to 55 minutes) to settle down for the night. Singles of Montagu's and Hen Harriers coming in to roost at Starling *(Sturnus vulgaris)* roosts were driven off by massed jointly-operating flocks of Starlings. Haas has also seen Starling flocks show this defense mechanism toward Buzzards *(B. buteo)*, and Merlins *(Falco columbarius)*, but not toward Goshawks *(Accipiter gentilis)*.—Frances Hamerstrom.

CONSERVATION

(See also numbers 50, 60)

39. Birds and Aircraft on Midway Islands, 1957-58 Investigations. Dale W. Rice. 1959. *Special Scientific Report—Wildlife*, No. 44, U. S. Dept. of the Interior, Fish and Wildlife Service, Washington, D. C. 49 pp. Continuation of the investigation reported in *Bird-Banding*, **29**: 254-55.

After a second season of intensive field work at Midway, the Fish and Wildlife Service has modified its conclusions on two points of population dynamics:

(a) it is probable that the previous censuses underestimated the number of Laysan and Black-footed Albatrosses, by underestimating the number of unemployed

birds. Perhaps only about 67% of adult birds breed in any one year. The number of subadult birds (those which have not yet reached breeding age, roughly 7 years) is also thought to be greater than earlier estimated;

(b) the adult mortality rate during the period the bird spends at sea is very low —probably less than 5% a year (compare a rate of about 25%, for the full year, for Common Terns in Massachusetts).

This second season of field work did not modify the basic conclusions on possible control measures (to reduce collisions with aircraft):

(a) elimination of updrafts by leveling dunes will reduce the strike frequency by 80% or more, and is "the only practical means for immediately reducing the strike hazard";

(b) in January through March, 1958, some 30,000 albatrosses (mostly Laysan) were killed, in areas near the runways. This killing seemed to have no effect on the number of birds striking aircraft. "It is apparent that any killing program, regardless of its magnitude, would not result in an effective reduction in albatross populations during its first season of operation, and could not come even close to eliminating the portion of the population which appear in the air over runways in less than 5 or more years." As to the Laysan albatross, 35% of the total breeding population nests on Midway, and Rice concluded that "no large-scale reduction in numbers would be advisable from the standpoint of perpetuation of these species." He also concluded that "Black-footed albatrosses should be given complete protection at all times, as they constitute a negligible hazard to aircraft, and their total population is relatively low, and perhaps decreasing."

One survey of birds striking aircraft showed that a little under 17 planes out of every 100 landing or taking off during daylight hours were struck by albatrosses. Usually no damage to the plane was reported; about 7% of these strikes (or about 1 plane in 100) did some damage. "Most of this damage was minor; none of it was serious enough to place the aircraft in immediate danger of crashing." One squadron using the field actively for 10 months reported 12 planes damaged, and total costs $82,819. This figure becomes somewhat less impressive when broken down into its components: "$77,970 was counted as depreciation, calculated at $565 for each day that the plane was unable to fly."

The Navy Department requested these investigations, and gave the Fish and Wildlife Service full cooperation in making them, including the unstinted use of Navy aircraft and photographic equipment. However, as this issue goes to press, it has been learned that the Navy Department has overridden the conclusions of the report. They plan a program to kill all Laysan albatrosses at Sand Island, for as many years as may be necessary. While the Fish and Wildlife Service has raised no further objections, a rising tide of protests from conservationists is becoming evident.

Apparently the killing of the albatrosses is intended to ease the maintenance of long-range radar patrol planes. As the report shows, any real change in the number of strikes will take several years to develop by this method. The planes themselves are essentially an early post-war model, propeller-driven, probably obsolescent now, let alone 5 years from now—particularly considering probable advances in ultra-powerful land radar. At the end of 5 or 8 years from now, will we find that we have slaughtered a third of the world's population of Laysan albatrosses about the time that the last radar picket plane becomes a museum piece?

Considering that further levelling of the land near the runways would eliminate 80% of the present damage, and that no major damage has been reported in all the years planes have used Midway, the Navy's plans for wholesale slaughter need further review. The Defense Department would find more support for its pleas of dire necessity in the name of national defense if similar pleas had not been used so often in the past for unimpressive ends—such as the attempted taking over of national wildlife refuge lands for target ranges.

The reputation of the United States among thoughtful people the world over rests not only in how intelligent a use of sheer force we make in an emergency, but also in how well we avoid destroying other values just because of the temporary needs or desires of the armed forces. In its small way, preservation of the great Midway albatross colonies would help to build our reputation as a civilized nation.—E. Alexander Bergstrom.

40. Short-tailed Albatross on Torishima. (Torishima no ahodori.) Anon. 1959. *Asahi Shimbun*, Tokyo, Japan, 10 August 1959: p. 10. (In Japanese.) While articles in daily newspapers are not formal ornithological literature, it may be some time before Japanese scientific periodicals publish the welcome news in this press release from the Tokyo Metropolitan Government. The happy results of the strict protection the Japanese are affording the rare *Diomeda albatrus*, once feared extinct, are so welcome in contrast to the unfortunate plight of the albatrosses on Midway (see no. 39 above) that they deserve repeating here.

It will be remembered that in 1954 a scant score of these fine great seabirds reappeared almost miraculously out of the ocean wastes to nest once again on the lonely volcanic island, only 1½ miles in diameter, some 300 miles south of Tokyo, where they had last been seen in 1933. The staff of the small Torishima Meteorological Station, the only human inhabitants of the islet, have kept careful watch of the birds each breeding season, and have protected them from possible harm at the hands of occasional passing fishermen. They report that the small nucleus of birds has prospered steadily and that during the past season 18 chicks were hatched. "Including these chicks, there are now more than 50 *ahodori* on the island."

How fortunate it is that this unique colony, which contains all the Short-tailed Albatrosses in the world, is in appreciative hands, and that Torishima has no likely potential as a strategic military base.—O. L. Austin, Jr.

41. The Nesting Habitat of the Royal Albatross on Campbell Island. Kaj Westerskov. 1959. *Proc. New Zealand Ecological Soc.*, **6**(1959): 16-20. Campbell Island is a treeless, shrubby, wind-swept bit of land 42 square miles in area, about 10 by 10 miles in extent, approximately 450 miles south of New Zealand. Lying directly in the path of the antarctic west wind belt, it is an ideal nesting ground for the Royal Albatross, *Diomedea epomophora*. Albatrosses need wind to maneuver and are often grounded when velocities drop below 5 mph. This happens less than 1 percent of the time on Campbell Island, where the average annual wind velocity is 30.9 mph, and 60 mph gales often rage for days. The island has been uninhabited since 1927, when the few hardy sheep ranchers that lived there moved away, unfortunately leaving a few of their sheep behind.

The albatrosses' only natural enemy on Campbell is the Skua *(Catharactes)*, but so closely do the albatrosses incubate and brood during their individual 1- to 2-week stints on the nest that the eggs and chicks are never left unguarded unless some human or a wandering sheep forces the parents away, which happens very seldom. Nor is the population of introduced rats able to do them any harm, though apparently the rats eat quite a few eggs of the local Rockhopper Penguins.

The albatrosses build their nests in the clumps of tussock grass that grows profusely in the islands peaty soil. Westerskov finds "the only danger at present threatening the welfare of Campbell Island's nesting albatrosses is the gradual deterioration of the vegetation and accompanying soil erosion, as a result of the grazing of a large population of wild, unexploited sheep. A recommendation for the removal of these sheep is now being considered by the government departments concerned."—O. L. Austin, Jr.

WILDLIFE MANAGEMENT

(See also numbers 39, 40)

42. Nesting Studies of Canada Geese on the Hanford Reservation, 1953-56. W. C. Hanson and R. L. Browning. 1959. *Journal of Wildlife Management*, **23**(2): 129-137. The authors studied 1,032 nests of the Canada Goose *(Branta canadensis moffitti)* on 18 islands in the Columbia River in southwestern Washington. The nest density varied from 0.003 to 4.0 per acre and showed no relationship to cover type.

In the 71 percent of the nests which were successful, 92 percent of the eggs hatched, 6 percent contained dead embryos, and 2 percent were infertile. Of the 29 percent of the nests which failed to hatch, 13 percent were destroyed by predators, 11 percent were deserted, and 3 percent were flooded. The nesting season covered a span of 10 to 12 weeks, commencing during the 3rd and 4th weeks in

March. A breeding population of about 300 pairs produced from 810-980 young per season.—F. C. Bellrose.

43. Some Population Mechanics of the American Coot. John H. Burton II. 1959. *Journal of Wildlife Management*, **23**(2): 203-210. A report on the annual mortality rate, age composition, and migration of the American Coot *(Fulica americana)* in the northern Mississippi Flyway. Recoveries from bandings made during the period 1923-47 indicate an average annual survival rate of 43 percent. The predicted composition of hunters' bags with an assumed stable coot population is 79 percent young, 12 percent yearlings, and 9 percent older birds. Band recoveries suggest that coots wintering in the Southeast migrate largely through the [so-called-Ed.] northern Mississippi Flyway.

The color of the tarsus in coots appears to be a valid age character, for it shows a good correlation to the length of the bursa. The percentage of green and yellow-green legged birds among 296 coots collected in Wisconsin in October 1957 suggested that juveniles composed 90-94 percent of the sample. The length of the tarsus and middle toe with claw was found to be a good means of determining sex in the coot.—F. C. Bellrose.

44. Annual and Shooting Mortality Estimates for the Canvasback. Aelred D. Geis. 1959. *Journal of Wildlife Management*, **23**(3): 253-261. Band recovery data were used to compute yearly mortality rates as well as the role played by shooting as an agent of mortality in the Canvasback *(Aythya valisineria)*. Juveniles suffered an astounding 77 percent mortality rate during their first year of life, while adult mortality ranged from 35 to 50 percent in any one year. Hens suffered higher mortality rates than drakes.

Hunting losses were greatest for juvenile and adult hens early in the hunting season. Over half the mortality in Canvasbacks of flying age was attributed to hunting. Band recovery rates declined in those years in which either the season was shortened or bag limits reduced, indicating the practicality of these measures in regulating the kill of this species.—F. C. Bellrose.

45. Growth and Plumage Development of Wild-Trapped Juvenile Canvasback *(Aythya valisineria)*. Alex Dzubin. 1959. *Journal of Wildlife Management*, **23**(3): 279-290. Canvasback ducklings were colored by injecting a green or red dye solution in eggs 1 day prior to hatching or at pipping. Later 122 young were retrapped at varying ages to provide information on the weight and plumage changes up to the flying stage.

At hatching Canvasback ducklings weighed 44 gm., and, after 56-68 days, the time required to reach the flight stage, they weighed nearly 1,000 gm. The length of the culmen appears to be the best method of determining the age of ducklings in the hand, but the length of primary, secondary, scapular, and rectricial feathers aids in determining age more precisely. Plumage color of males can be used to separate them from females as early as the 30th day, when gray vermiculations appear on the scapulars. After the 45th day, males tend to have a darker cinnamon head color than females.—F. C. Bellrose.

46. A 4-Year Study of Wood Ducks on a Pennsylvania Marsh. Eugene Decker. 1959. *Journal of Wildlife Management*, **23**(3): 310-315. The nesting and the hunting of the Wood Duck *(Aix sponsa)* were investigated on the Conneaut Marsh in northwestern Pennsylvania. During the period 1953-56, the use of nesting houses declined from 57 to 16 percent. Raccoons destroyed 46 percent of the Wood Duck nests in 1953 and 1954, but their depredations were almost eliminated in 1955 and in 1956 by means of tunnel guards and elliptical-shaped openings.

In 1953 weather conditions favored a high kill of Wood Ducks by hunters during the first 2 days of the season. Bag checks on the first day revealed that 37 percent of the duck kill on the entire marsh consisted of Wood Ducks. As a result of unfavorable weather conditions, the Wood Duck kill was much reduced in 1954, but in 1955 and 1956 they again formed an important part of the duck kill. The large kill of Wood Ducks was considered responsible for the steady decline in the breeding population on the area during the period of investigation. —F. C. Bellrose.

47. Lead Poisoning as a Mortality Factor in Waterfowl Populations. Frank C. Bellrose. 1959. *Illinois Natural History Survey Bulletin*, **27**(3): 235-288. Price $0.50. Mortality from lead poisoning in wild waterfowl has been of concern to conservationists for many years, but its importance was unknown. This bulletin evaluates the importance of lead poisoning on the basis of (1) the incidence and magnitude of waterfowl die-offs attributable to this disease, (2) the incidence of ingested lead shot as obtained from the examination of gizzards, and (3) the extent of waterfowl losses resulting frou the ingestion of various quantities of lead shot.

Outbreaks of lead poisoning have occurred more commonly in the Mississippi Flyway than in other flyways, and more commonly with Mallards than with other species of ducks. The annual rate of loss of Mallards in outbreaks of this malady in the Mississippi Flyway was estimated to be 1 percent. In addition, day-to-day losses that pass unnoticed were estimated to be on the order of 3 percent for the Mallard. For all species of waterfowl in North \America, the annual loss attributable to lead poisoning was estimated at 2 to 3 percent.

An effort to find a lead alloy shot pellet that was nontoxic to ducks was unsuccessful. Iron was the only metal found that proved to be both nontoxic and still potentially suitable for shotshell pellets. The principal disadvantage of iron pellets for shotshells is their loss in velocity at maximum ranges.—T. G. Scott.

48. Food Habits of Migratory Ducks in Illinois. Harry G. Anderson. 1959. *Illinois Natural History Survey Bulletin*, **27**(4): 289-344. Price $0.50. A total of 4,977 gizzards of 17 duck species were collected during the autumns of 1938, 1939, and 1940. Analysis of the food contained in the gizzards showed that most species of ducks in Illinois feed largely upon vegetable matter, seeds making up the bulk of the plant parts consumed. Dabbling ducks feed largely upon emergent and moist soil plants, whereas diving ducks feed to a greater extent upon submerged plants. Corn made up nearly half the organic contents found in the gizzards of Mallards *(Anas platyrhynchos)*. Animal foods proved more important to diving ducks than to dabbling ducks, and the Lesser Scaup *(Aythya affinis)* was the only species which fed predominantly on animal life.

Among the total of 95 wild and 4 domestic plants found in the food contents of Illinois ducks, only 19 can be considered important. These are corn, rice cutgrass, marsh smartweed, coontail, wild millet, longleaf pondweed, red-rooted nut-grass, water hemp, nodding smartweed, buttonbush, large-seeded smartweed, nut-grass, chufa, Walter's millet, sago pondweed, duck potato, river bulrush, teal grass, and giant bur-reed.—F. C. Bellrose.

49. Food Habits of the Canada Goose at Lake Mattamuskeet, North Carolina. Carl S. Yelverton and Thomas L. Quay. 1959. North Carolina Wildlife Resources Commission, Raleigh, North Carolina. 44 pp. From the examination of 263 gizzards and 31 crops of the Canada Goose *(Branta canadensis)*, the authors determined the winter food habits of this species at the Lake Mattamuskeet National Wildlife Refuge in coastal North Carolina. Sedges constituted 63 percent and grasses 33 percent of the total food volume. The most important plants and the parts consumed were: The roots and culms of dwarf spike-rushes, the roots and culms of the three-square bulrush, anl the seeds of corn.

The aquatic and marsh plant ecology of the area and its effect upon duck and goose populations are discussed. Several years ago carp were virtually eliminated from the lake by means of rotenone, and, with the subsequent increase in beds of musk-grass, duck populations greatly increased. Geese did not, however, make much use of muskgrass or other aquatic plants as food.—F. C. Bellrose.

PARASITES AND DISEASES

(See also numbers 27, 67)

50. Observations on Egyptian Hyalomma Ticks (Ixodoidea, Ixodidae). 2. Parasitism of migrating birds by immature *H. rufipes* Koch. Harry Hoogstraal and Makram N. Kaiser. 1958. *Annals of the Entomological Society of America*, **51**(1): 12-16. Emphasizes the importance of migratory birds in spreading their parasites far beyond these insects' normal ranges. Large numbers of ticks taken from 10 species of spring migrant passerines in Egypt

support the authors' conclusions that the populations of certain ticks native to the Ethiopian faunal region and now found in North Africa and southern Eurasia were established there by migratory birds. As these various ticks are the known vectors of several virus and rickettsial diseases which affect domestic animals, poultry, and man as well, the implications of the birds' importance to epidemiology are plain. The possible end results and eventualities are not pleasant for those of us who love birds to contemplate.—O. L. Austin, Jr.

51. Starlings Affected by Smog. W. M. Peet. 1959. *British Birds*, **52**(7): 238. "Fog persisted nearly all day at Sleaford, Linconshire, on 9th February 1959, but at dusk it became a dense blanket with its base more or less level with the top of the church spire. There was almost a complete lack of breeze." Next morning from 250 to 300 dead *Sturnus vulgaris* littered the main thoroughfares for half a mile. A sample of 7 Starlings was sent to the Department of Animal Pathology at Cambridge; the report stated "that deaths were largely due to asphyxia resulting from severe smog." It is suggested that flocks of Starlings on their regular route to their roost were overcome by the smog and descended to the roads. "Here, being unable to fly, they were probably killed by heavy traffic. No birds were found in gardens or on traffic-free roads."—M. M. Nice.

52. Blowflies of Birds. (Vogelblutfliegen) Erwin Lindner. 1957. *Die Vogelwarte*, **19**(2): 84-90. Lindner has worked up the Blowfly *(Protocalliphora)* material from three sources: recent collections, the Stuttgart Museum, and the collection of E. O. Engel. Host species are listed. He gives a key to four *Protocalliphora* and includes two confusingly similar *Phornia* species. The latter are not bloodsucking. The commonest European form is *Protocalliphora a. azurea* with 11 host species listed. *P. a. chrysorrhoea* specializes on the Sand Martin *(R. riparia)*; *P. falcozi* has been found in nests of Tits *(Parus major* and *P.* spp.); *Protocalliphora hirundo* was found subcutaneously in the Skylark *(Alauda arvensis)*.—Frances Hamerstrom.

53. The Flea population in artificial nest boxes in the Frankfurt City Forest. (Der Flohbesatz in den künstlichen Nisthöhlen des Frankfurter Stadtwaldes.) R. Langer and W. Tilgner. 1957. *Die Vogelwelt*, **78**(6): 176-181. Fleas were gathered from 579 pressed-wood nest boxes. They were more common in boxes in wet hardwood than in dry conifer sites, absent in unlined nests such as woodpeckers'; and commonest in nests of species having many young or much moist nest lining. Of 2,685 fleas gathered 98.6% were *Ceratophyllus gallinae*, 3% *C. fringillae* and 1.1% *Monopsyllus sciurorum*. The authors believe that the last, a mammal flea, is also parasitizing birds. Fleas were found in the nest boxes of the following species: *Parus major, P. caeruleus, P. palustris, Ficedula hypoleuca, Phoenicurus phoenicurus, Sitta europaea, Sturnus vulgaris, Passer montanus and "Certhia spec."*—Frances Hamerstrom.

54. Lousefly infestation kills Swallow brood. (Lausfliegenbefall vernichtet Rauschwalbenbrut.) Friedrich Kühlhorn. 1958. *Die Vogelwelt*, **79** (2): 58. The author has usually collected *Stenopteryx hirundinis* L. from Swallows *(Hirundo rustica)*; on 28 June, 1956, he noticed hordes of louseflies which turned out to be *Ornithomyia fringillina* Curtis leaving a recently occupied nest and crawling up the barn wall. The weak, still heavily parasitized young in the nest had obviously just died.—Frances Hamerstrom.

PHYSIOLOGY AND PSYCHOLOGY

(See also numbers 65, 66)

55. Song Learning in the Domestic Canary. Holger Poulsen. 1959. *Zeitschrift für Tierpsychologie*, **16**(2): 173-178. "The vocabulary of the Canary *(Serinus canarius)* consists of 12 sounds including 1 social call, 1 injury call, 2 aggressive calls, 2 alarm calls, song, begging call of the female and soliciting call of female, begging call of nestlings, begging call of fledglings, and injury call of fledglings. All these calls are inborn as they develop eventually in the young bird reared in isolation from other canaries." Young Canaries begin to sing when about 1 month old, and their song is developed at 6 months of age. The song is inborn, but during the period of development, as well as in subsequent

autumns when the bird sings his subsong, he is capable of incorporating imitations of other birds into his specific song. The soft and low song of Rollers is genetically fixed, yet they "are able to imitate and thereby change the finer touches of their song." An interesting study.—M. M. Nice.

PLUMAGES AND MOLTS
(See number 45)

ZOOGEOGRAPHY
(See also numbers 40, 41, 65)

56. Narrative of a Visit to the Newly Discovered Emperor Penguin Rookery at Coulman Island, Ross Sea, Antarctica. H. J. Harrington. 1959. *Notornis*, **8**(5): 127-132. Describes the discovery of the tenth known Emperor Penguin colony, and apparently one of the largest, for it contains about 33,000 pairs of birds. The breeding Emperors were found on the open sea ice about 2 miles westward of the northern end of Coulman Island. An open lead in the ice about 10 miles away made a convenient place for the birds to feed. The penguins were not distributed haphazardly, but stood on the ice "in a series of fairly distinct arcs or irregular loops." It being 6 December, the chicks must have been fairly well grown. Some 200 were banded on the flipper. The numbers of birds were estimated from photographs taken from a helicopter, supplemented by theodolite surverys of parts of the rookery on the ice, and by counts of the birds in the creches. The population of chicks in the whole rookery was estimated at 50,000 which does not agree too well with "the snap estimate of 33,000 breeding pairs."—O. L. Austin, Jr.

57. Birdlife of the Källskär-Vattungar archipelago. Variations in the breeding bird populations from the 1890 to the 1950 decade. (Fågellivet i Kållskären-Vattungarnas skårgard. Variationer i häckfågelbeståndet från 1890-talet till 1950-talet.) Bengt Jonsell. 1959. *Vår Fågelvärld*, **18**: 97-129. (English summary.) These 20 islets of the outer South-Södermanland skerries lie 5 nautical miles from the nearest land. All except the two or three largest ones are bald low rocks barely emerging from the sea. The author's 1957 census revealed 602 breeding pairs of 20 species inhabiting 15 of the islands. The Eider *(Somateria mollissima)* and the Velvet Scoter *(Melanitta fusca)* were the most common species. Records for the past 60 years show considerable fluctuations in the bird populations on the islands. Most remarkable was the spectacular increase immediately after wildlife protection was established, from the turn of the century well into the 1920s.—Louise de K. Lawrence.

58. Myrtle Warblers Crossing the Atlantic on Board Ship. Katharine Tousey. John M. R. Margeson. 1959. *British Birds*, **52**(7): 237-238. The first author reports the presence of a *Dendroica coronata* on shipboard in September 1954 from Canada to Ireland, and the second author reports another Myrtle Warbler on board ship from 24 to 30 May, 1955 from the Gulf of St. Lawrence to the coast of Ireland. This bird searched "crannies and corners" and "appeared very lively and strong on the wing."—M. M. Nice.

59. A Distributional Check-List Of The Birds Of Michigan. Dale A. Zimmerman and Josselyn Van Tyne. 1959. *Occ. Papers, Mus. Zool., Univ. of Michigan*, **608**: 1-63. The appearance of another of Dr. Van Tyne's "unfinished symphonies" is indeed welcome, and certainly this one appears to conform to his high standards in most respects. "Of the 326 species (356 forms) positively known to have occurred in Michigan, 215 are known to have bred at least once in the State."—a rather high proportion of breeders. Thirteen additional species for which no Michigan specimen has been preserved are listed in brackets in their proper Check-List order in the body of the list. Subspecies are treated under the species, and hybrids are mentioned in footnotes. This procedure is sound and conservative and yet includes data from well-substantiated sight records. The result is a list that will be easy to enlarge but difficult to reduce.

The paper contains 2½ pages of introduction and acknowledgements, a map of Michigan counties, and the species accounts. Season of occurrence is mentioned, but missing are migration dates, banding data, and a bibliography.—T. A. Imhof.

60. Observations at an Eleonora's Falcon eyrie. (Beobachtungen an einem Brutplatz des Eleonorenfalken). Wolfgang Makatsch. 1958. *Die Vogelwelt*, **79**(2): 40-47. The breeding population of Eleonora's Falcon *(Falco eleonorae)* on Theodorou Island off Crete apparently has dropped from at least 60 pairs in 1944 to at most 12 to 15 pairs. Falcon shoots for "game protection" used to be common; also, as recently as 1956 there was a report of 50 to 60 young Eleonora's Falcons taken from eyries to end up in frying pans. Notes on natural history and food habits are given.—Frances Hamerstrom.

SYSTEMATICS

(See also number 65)

61. Adaptive Variation in the Genus Vireo. Terrell H. Hamilton. 1958. *Wilson Bulletin*, **70**(4): 307-346. It is refreshing to see a paper with the word "variation" in the title and no description of a new subspecies. This study presents data on subgenera and species groups, winter and summer ranges, migration patterns, lengths of wing, wing tip, bill, and tail, and color. Geographic variation in color agrees with Gloger's rule, and migratory populations show a longer wing tip than those of resident segments. The obviously schematic map of the breeding and wintering ranges of *V. solitarius* fails to show that the nominate race winters commonly in the southeastern U. S. with the race *alticola* (cf. AOU Check-list, 1957, and many regional lists). This is important because the various races are therefore not entirely allohiemic as postulated.

Hamilton notes that variations in wing, relative tail, and relative bill lengths appear to be in conflict with Bergmann's and Allen's rules. This points up the possible fallacy of a long-standing concept that length of wing is closely correlated with body size, which has been questioned by Amadon (1943: 164-177), Mayr and Vaurie (1948: 238-265), and Van Tyne and Berger (1959: 360). As Hamilton himself acknowledges, "One criticism of this study . . . is the absence of a more adequate measure or index for body size. . . . Until adequate series of weights (or bone measurements) are available, such comments as these must be considered tentative."—T. A. Imhof.

FOOD

(See also numbers 37, 48, 49, 65)

62. House Sparrows Soaking Hard Bread to Soften It. G. L. Purser. 1959. *British Birds*, **52**(6): 199-200. In May 1957, 1958, and 1959 a cock *Passer domesticus* brought hard bread from a neighbor's yard and soaked it in the author's bird bath. The editors point out a similar report in *Country Life* in 1949 and add: "Both observations are most interesting and it is to be presumed that the habit arose from the accidental discovery that water would soften bread, in the same way that tits *(Parus* spp.) learned to open milk-bottles."—M. M. Nice.

63. Flightless Woodpigeon Fed by Another. M. J. Dawson, 1959. *British Birds*, **52**(7): 236. When the author approached an ivy-covered tree on 1 October, 1955, a *Columba palumbus* flew out while another sat very still. It was shot and proved to be an adult with no primaries except one in each wing; the others were newly growing out. It was fat and its crop was half filled with barley which could not have come from less than half a mile away. The author concluded it could not have flown for at least 10 days and that the other pigeon had been feeding it.—M. M. Nice.

64. Stomach Contents of a North Island Kiwi *(Apteryx australis mantelli)* from the Raetihi District. T. C. Bull. 1959. *Notornis*, **8**(5): 143-144. Very little accurate information seems to be available on the feeding habits of this primitive nocturnal ratite. A detailed analysis of the stomach contents of an adult female killed by dogs and sent to the Dominion Museum adds a number of new items to the species' known diet. The Kiwi "eats a wide range of animal and plant material, some of it, berries for instance, being obtained from the surface of the ground rather than from under it. This probability should be taken into account by anyone planning to use poisoned baits for the control of noxious animals in areas where kiwis occur."—O. L. Austin, Jr.

SONG
(See numbers 31, 55, 65)

BOOKS AND MONOGRAPHS

65. Fundamentals of Ornithology. Josselyn Van Tyne and Andrew J. Berger. 1959 John Wiley & Sons, New York, pp. xi+624. Price $11.75. (Student's edition $9.75.) Dr. Berger is to be congratulated for completing Dr. Van Tyne's last major work in a manner that the senior author would certainly have approved. I consider the book among the best for teaching college ornithology that has yet been produced. While this is perhaps faint praise, it is by no means meant to be damning.

Ornithology has become so complex in the last half century, its scope so vast, and its literature so voluminous that it is manifestly impossible to cover it adequately in a single volume. This one does a workmanlike job of presenting most of the basic biological fundamentals that the serious student of birds should know, much of which may be found a little too technical for the use of the average undergraduate "bird" course. At the same time specialists are certain to carp about the inadequacy of the treatment given a number of the subjects covered, each of which, as the authors were well aware, "might easily be expanded to book length." My chief regret is the absence of a chapter on population dynamics, and certainly the growing group of behaviorists will rue the authors' failure to do justice to their new techniques and jargon, not a word of which has found its way into the text.

Perhaps the most valuable part of the book for reference is the 168 pages devoted to 1-page synopses of the generally recognized bird families. These present nicely abridged summaries of pertinent data on characteristics, ranges, habits, foods, and breeding, together with salient references to the literature for each family. The systematics are conservative, and essentially follow Wetmore and Peters livened with a few overtones of Stresemann and Mayr. The few inaccuracies I have noted in these accounts are the sort that are almost bound to creep into a work of this one's magnitude, and in no way detract from its worth. Some of them stem from the difficulty of inserting all recently published information into long-completed sections before going to press—such as the fact that in the Emperor Penguin incubation is by the male alone, an exception to the rule that both sexes incubate in the penguin family.

The skillful line drawings of a typical representative of each family by George M. Sutton lend attractiveness to these pages and doubtless give the student a better idea of what each family looks like than could words in the same amount of space. I don't imagine the artist is at all happy about the reproducing of several of his sketches, particularly those of the Trumpeter and the Sheathbill which are tipped so the birds are off balance, back on their heels. I looked in vain for the diagnostic "very long, sharp claw" on the 2nd toe of the Cassowary on page 388.

To me the book's weakest section is the glossary, which I more or less feared when I saw the publisher's blurb advertising it as "the most complete" since Newton's *Dictionary of Birds*, a boast that the senior author would never have countenanced. Not that the glossary isn't good, for it is, and handy and useful to boot, but it is not as comprehensive as it could be, nor is it always consistent, and the definitions could be improved greatly by a skilled lexicographer.

The book is not without minor typographical and other errors that more alert proofing might have caught—the glaring switch in the caption for the skeletons illustrated on page 13, for example. But absolute perfection in a work as broad and comprehensive as this one is entirely beyond human capability. These small lapses only emphasise the "straight A" I would rate the book. The earnest student will find herein everything he needs to start him on his way, and he couldn't begin to digest it all in a 1-year course.—O. L. Austin, Jr.

66. Comparative Endocrinology. Aubry Gorbman, editor. 1959. John Riley and Sons, Inc., 440 Fourth Avenue, New York 16. xx + 746 pp. $15.

This volume is a record of the proceedings of the Columbia University Symposium on Comparative Endocrinology held at Cold Spring Harbor, New York, 25-29 May 1958. It contains 43 papers together with the discussions which fol-

lowed their presentation. As in all large symposia of this kind, the nature of the papers represents a spectrum from relatively technical reports of specific research projects to reviews of research progress and concepts in rather broad areas. Of the latter type are those of B. A. Houssay on the endocrine function of the pancreas, Ernst Scharrer and Berta Scharrer on neuroendocrine interrelationships, and J. H. Welsh on neurohumors. The proceedings of this congress indicate clearly that comparative endocrinology, long a struggling empirical discipline of unintegrated and largely unintegratable data, is now entering a more mature state with the emergence of a satisfying comparative philosophy.

The volume contains a large number of papers of very substantial interest to ornithologists. Among these is "Ecologic and physiologic factors in the regulation of spring migration and reproductive cycles in birds" by Albert Wolfson (pp. 38-70). This consists of a brief general review of the field followed by a more detailed presentation of his ingenious and interesting investigations, primarily with *Zonotrichia albicollis* and *Junco hyemalis*, and includes much previously unpublished material. Considerable attention, with additional experimental evidence, is given to the difficult problem of the relative roles of darkness and light in the stimulation of gonadal development and the migratory state; but he reaches the conclusion that a definite decision concerning the matter of the stimulatory effect of light vs. the elimination of a possibly inhibitory effect of darkness is not as yet possible. Many interesting data concerning the elimination of the refractory state by short days are presented. It is suggested, with good logic, that the term, "preparatory phase," replace the older term "refractory period." Emphasis in this paper is on the photoperiodic control of cycles. This is certainly the best known timing system and the only one we understand in any detail whatsoever. But in my opinion one must take the emphatic position that this is by no means a universal type of timing in birds. Many readers may find difficulty in following Dr. Wolfson's argument that day length could be a regulator of migratory breeding cycles in the tropics. Unquestionably there are some semantic difficulties here, but one can only rest on the conclusion that speculation is not really fruitful until there are many more experimental investigations on tropical species.

Another paper of interest to ornithologists is the "Endocrine basis of reproductive adaptations in birds" by Emil Witschi (pp. 515-523). Although this paper dwells admirably well on fundamental endocrine controls, the rather extensive breadth of the field covered (control of gonadal cycles, control of gonaducts, control of nuptial plumages, and "the riddle of migration") has restricted its depth considerably. It seems slightly unrealistic to state that "[migration] does not seem to call for any hormonal mediation at all" in view of recent developments concerning the extent and nature of metabolic alterations associated with migration.

There are two important papers for ornithologists by A. V. Nalbandov. The first, "Neuroendocrine reflex mechanisms: bird ovulation," wrestles with the knotty problem of the control of egg-laying frequency and pattern, primarily in the domestic fowl. Dr. Nalbandov assumes that the avian (at least domestic fowl) pituitary probably produces only a single gonadotropic hormone with both follicle-stimulating-hormone and luteinizing-hormone properties. He assumes further that the anterior pituitary tends to secrete this single hormone at a steady rate *except* when inhibited neurogenically by the presence of the ovum in a particular part of the oviduct. "The nerve-transmitted signal, which originates in the oviduct, reaches the pituitary gland via the hypothalamus. It is possible that this signal calls for the re-initiation of release of the gonadotropic complex after its secretion has been inhibited. . . . Clutch length may depend on two factors: the amount of gonadotrophic complex that the pituitary gland is stimulated by light to secrete; and the rapidity with which the pituitary gland can regain its ability to secrete the complex in quantities sufficiently high to induce ovulation." In Dr. Nalbandov's second paper, "Role of sex hormones in the secretory function of the avian oviduct" (pp. 524-532), he concludes that the morphologic development of the oviduct can be caused by estrogen alone, but that its normal function requires the combined function of either estrogen and progesterone or estrogen and androgen.

Finally specific attention should be drawn to the very scholarly "Comparative function of the avian pancreas" by the eminent authority, B. A. Houssay (pp.

639-667.) This is of particular importance in avian biology for it appears that the role of the avian pancreas may be quite distinctive. It has been known, for example, for more than half a century, that total or near-total pancreatectomy in birds causes hypoglycemia whereas the corresponding operation in mammals causes hyperglycemia. To me this observation, and other observations and experiments, point to a dual endocrine function, the production of both insulin and glucagon, the latter being physiologically dominant in birds. Dr. Houssay prefers to review the experimental data carefully without a special generalization with respect to birds.

Many other papers in this volume have a direct or indirect bearing on the role of endocrine glands in birds. Among these special note should be made of "The roles of endocrine and behavioral factors in the growth of mammalian populations," by John J. Christian (pp. 71-91), which may indicate the way toward understanding the internal mechanisms involved in the control of population size through at least some of the so-called density dependent factors. —D. S. Farner.

67. Check-List and Bibliography on the Occurrence of Insects in Birds' Nests. Ellis A. Hicks. 1959. Iowa State College Press, Ames, Iowa. 681 pp. Price $8.50. This is such a curious and puzzling compilation that it is difficult to understand just what purpose its author had in mind for it. Its organization, its peculiar mixture of wilful judgment and lack of judgment, and its failure to provide any textual discussion or recognition of obligate, facultative, or accidental association of insects with birds' nests, make it a rather aimless and difficult catalog of insects, birds, and literature.

The alphabetical arrangement of both insects and birds in orders, families, genera, species, and subspecies is a nuisance. Anyone interested in, say, birds' nests as environments for related insect forms, or perhaps the tendencies within one group of birds to harbor more or different insects in their nests than does another, must reassemble the catalogs into proper systematic groupings. Having done so, he will find that a mere record of occurrence cannot be distinguished from regular breeding activity in the nest, and that he must check all references for content at first hand because Hicks does not resumé their findings.

For example, Barber showed in 1914 that *Dermestes elongatus* Lec. breeds in Black-crowned Night-heron nests. *D. elongatus* is of course listed, as is Barber's article, with host nests given as "black-crowned night heron, pigeon," but with no indication that a breeding site is involved. Though Hicks catalogs this beetle and Barber's paper under the Latin binomial of the heron in the alphabetical bird list, he includes no index to common names. Therefore in this instance (and many others) the entomologist must look up the taxonomic assignment of the bird elsewhere and, having done so and turned to *Nycticorax nycticorax* (L.), he finds at last that both *Dermestes elongatus* and *D. nidum* Arrow, along with some other insects, have been found in this heron's nests (but not necessarily so, because listings are not always based on firm records of occurrence e.g., see p. 165 concerning the records for hippoboscid flies. However, only by chasing down all the references can he decide whether either, both, or neither of the *Dermestes* are common denizens of these herons' nests, or whether they are known to breed there.

Finally, suppose for some reason we wish to know what contributions Olt and Ströse (1914), or anyone else for that matter, has made to this subject. Either every entry in one or the other catalog must be searched, or the original publication must be sought. Somewhere, in the 633 pages of Olt's and Ströse's "Die Wildkrankheiten and ihre Bekämpfung," we can find what we want, and probably more easily and profitably than by searching this catalog for naked records of association.

Catalogs of this kind, to be truly useful, must be accurate, scrupulously consistent, adequately cross-referenced, and arrayed in good systematic order. The labor that must have gone into this publication is appalling to contemplate, but so also is that which must still be expended if any considerable use of it is to be made.—K. W. Cooper.