December of the same year. (See Cooke, M.T., 1943, *Bird-Banding*, **14**: 72). On 27 September 1954 we trapped and banded an immature male Peregrine (546-12230) at Cedar Grove, and 2 March 1955 it was shot near Montevideo, Uruguay, less than 70 miles from the locality of the above return. The straight line distance between banding and recovery is about 5900 miles, and the approximate distance of a probable route (across the Caribbean via the Antilles and then along the Brazilian coast) is 9000 miles.—Helmut C. Mueller, Department of Zoology, University of Wisconsin, Madison, and Daniel D. Berger, Cedar Grove Ornithological Station, Rt. 1, Cedar Grove, Wisconsin.

Orange Crown Patches in Male Ruby-crowned Kinglets.—The following statistics are the result of Fall netting near Monkton, Maryland:

			Ruby-crowned Kinglets	
year	*number banded*	*females*	*males (red crown patches)*	*males (orange crown patches)*
1955	30	17	13	0
1956	76	31	44	1
1957	54	16	20	18

In 1957 the orange crown patches of four individuals were a lighter orange and one a darker orange than the average. Although Ruby-crowned Kinglets were banded from September 29, 1957 to October 23, 1957, the ones with orange crown patches were captured on October 22 and 23.

Bent (1949, *Life Histories of North American Thrushes, Kinglets and their Allies*, Smithsonian Inst., Washington, D. C.) reports that on occasion the young male will assume an orange or yellowish crown patch rather than the normal red one, but that this is a rather rare occurrence.—Stephen W. Simon, 402 Sharp St., Ashland, Ohio.

RECENT LITERATURE

BANDING

(See also Numbers 30, 33, 41, 61)

1. Recovery in Denmark 1900-1955 of Birds Ringed Abroad. (Genfangster i Danmark 1900-1955 af fugle ringmaerkede i udlandet). Ella Adelholt. 1958. *Dansk Ornithologisk Forenings Tidsskrift*, **52** (3-4): 153-280. (With explanatory summary in English). This long list gives the raw data for almost all the birds banded abroad and recovered in Denmark over a 55-year period. Most of the records are from the literature (each is referred to its source in the bibliography), but a few are hitherto unpublished. Lists of this sort, despite the labor of compiling and the cost of publishing them, are exceedingly useful, and one wishes that similar ones could be done for other areas. Students of African faunistics, for instance, would welcome a compilation of the African recoveries of birds banded in Europe, but locating those that have been published, most of them in minor journals of limited circulation, is an almost impossible task, even in the largest and most complete libraries. How ornithology would benefit if the wealth of information scattered in the many small banding schemes throughout the world were deposited in some central repository for all to use! We welcome the publication of lists such as this one where they are economically feasible.

Here in the United States our banding data have long been so voluminous that publishing them *in toto* is financially impossible. While they are all available on IBM cards at the Patuxent Research Refuge in Laurel, Maryland, just processing and maintaining these records consumes a major portion of the Fish and Wildlife Service's limited appropriations, and leaves little or none for disseminating them further. The staff of the Banding Office is always glad to help any qualified researcher who can hie himself to Patuxent to dig the information he needs out of the files, and many ornithologists are now availing themselves of the opportunity. Far too many, however, are either unaware of this invaluable mine of information, or are unable to get to Patuxent to prospect in it. Something should be done to make fuller use of our rapidly mounting banding data, particularly for non-game species. But what?—O. L. Austin, Jr.

2. Report on Bird Ringing for 1957. Robert Spencer. 1958. *British Birds*, **51** (Supplement): 449-487. The total figure reached 186,346 birds of which 49,286 were nestlings or chicks, 137,060 juveniles to adults. Recoveries during 1957 came to 5,497. All the species ringed are listed—both those in 1957 and the grand total since 1909. The bulk of the paper is concerned with listing the more important recoveries of birds found at a distance. Two Manx Shearwaters *(Procellaria puffinus)* were taken in Brazil. Interestingly enough, Kestrels *(Falco tinnunculus)* ringed as nestlings in 1957 showed contrasting migratory behavior. Of two ringed near Moniaive in June one was found dead in November 7 miles east, the other was shot in France; of two ringed in Cumberland, one was found in December 85 miles south of its birthplace, the other was shot in France. Of 2 birds from the same brood ringed on the Isle of Man, one was shot in November 115 miles northwest, the other was reported dead in Spain; and of two others from the same brood ringed near Everly, one was shot in December 42 miles to the southeast, and the other in November in France. An adult Sanderling *(Crocethia alba)* was ringed Sept. 9, 1957 and shot one month later in Poti, Georgia, U.S.S.R. "This remarkable recovery is the first for the species. Poti is *ca.* 2,200 miles southeast of Holy Island, the most direct course lying mainly overland." An adult Wryneck *(Jynx torquilla)*, ringed in Yorkshire Sept. 4, 1956 was taken in Sweden May 27, 1957. "This is the first foreign recovery of a Wryneck and is of considerable interest. The recovery locality is near the northern limit of the species. The bird was ringed at the time of one of the greatest drift arrivals of northern species in recent years and may well have been involved in that movement."

This whole report is admirably organized and full of valuable information on the movements of British birds.—M. M. Nice.

3. British Recoveries of Birds Ringed Abroad. E. P. Leach. 1958. *British Birds*, **51** (Supplement): 487-496. This selective list omits some species and gives only significant records of others. Golden Plover *(Charadrius apricarius)* came from Iceland and Holland, Lapwings *(Vanellus vanellus)* from Finland, Germany, Czechoslovakia, and "one ringed in Norway was in its thirteenth year when killed in Ireland. . . . The heavy infiltration of young Great Black-backed Gulls is a factor to be taken into account in bird protection, and Herring Gulls are now shown to come in from the north of that country on a significant scale."—M. M. Nice.

4. Modifications of Ruffed Grouse Traps. Robert E. Chambers and P. F. English. 1958. *Journal of Wildlife Management*, **22**(2): 200-202.—The basic design of the mirror trap is maintained in a collapsible, portable version with no change in efficiency. The effectiveness of the cloverleaf trap is increased by addition of end cages.—Andrew A. Arata.

5. The Use of Mist Nets for Capturing Nesting Mourning Doves. Stanley W. Harris and Marius A. Morse. 1958. *Journal of Wildlife Management*, **22**(3): 306-309. The authors describe several variations of a basic technique of setting a net near a nesting *Zenaidura carolinensis* and "panicking" (the verb is theirs) the brooding bird into it. Working with nesting birds, even just observing a nest closely, always involves a certain amount of jeopardy to nesting success. Most students of nesting phenomena do their best to disturb their subjects as little as possible, both to ensure observations unaffected by their presence and to avoid unintentional mortality. While the methods recommended here are doubtless efficient for catching nesting doves, and probably the only ways certain ones can be caught, the disturbance they entail cannot help being harmful to nest, eggs, and young. Having had considerable experience both with mist nets and with nesting doves, though I have never combined the two, I am a bit suspicious of the author's claim that their "operations had little or no effect on over-all nesting success" and of the data they present to substantiate it.

Being somewhat responsible for introducing mist nets to occidental ornithology, I am perhaps overly sensitive to their potential misuse. They are not without their hazards to the birds they catch, though careful setting and tending reduce these to an inconsequential minimum. Nor do they lack their critics among the more rabid ornithophiles. I regret the publication of this paper because its implied callousness to the welfare of the birds being studied could provoke

further criticism of netting and, though the fault here is not with the net but with the way it is used, further threaten the use of this most efficient and, properly handled, safe and humane method of catching birds for banding.—O. L. Austin, Jr.

MIGRATION

(See also Numbers 33, 43)

6. Fall Migration of the Dragon-fly Anax junius. Aaron M. Bagg. 1958. *Maine Field Naturalist,* **14**(1): 2-13. The movements of insects, particularly of the large ones, have a twofold bearing on studies of bird migration: (1) to the extent that these movements resemble migration, they perhaps provide clues for a better understanding of that phenomenon; (2) insects in the upper air probably introduce a certain amount of contamination into radar data concerning migrating birds and to somewhat lesser extent into lunar data as well. The present paper should prove valuable to migration students not only for these reasons but also because the author, well-known for his skill in correlating large-scale weather processes with migration developments in spring, here applies his insights to the meteorological situations of fall.

Drawing upon references in the entomological literature, communications from observers, and his own experience, Bagg produces evidence that the emigrations of large dragonflies are directed movements, essentially of a north-south character, bearing a remarkable resemblance to the southward passage of diurnally migrating birds. Dragonflies, butterflies, and birds seem to travel at the same season, to follow similar routes, and to react to many external factors in a similar way. Simplified weather charts are used to show that the big autumn flights commonly take place during an eastward or southeastward flow of polar air following the passage of a cold front. In such weather the insects even respond to the "guiding lines" or "containing lines" in concert with the birds and pass in dense processions along sea coasts.

The paper alludes to the possible "triggering" action of polar air as a stimulus to emigration, but it may be significant that *all* the spectacular dragonfly flights were observed where either coasts or mountain ranges provided containing lines. Therefore, it is not improbable that appreciable, but more diffuse, dragonfly movements may be occurring with radically different meteorological situations but are not made manifest until most of the insects from a large area are compressed into a dense stream along the containing line. If this be the case, it might explain why there has been only meager evidence of a return flight of dragonflies in spring.—R. J. Newman.

7. Watching Migrant Birds by Radar. David Lack. 1958. *Listener,* **60** (1544): 691 and 694. Illuminating though they are, the recent studies of migration by radar in Switzerland have been severely restricted in scope by their fixed vantage point at the interior of a continent. Now in a brief popular treatment, David Lack brings us news of results being obtained by more powerful radar installations on the coast of Britain, which are capable of detecting small birds at a range of 60 miles. By this means the reality of large flights of land birds over the sea has been directly confirmed. Indications are that the birds fly at speeds of 30 to 40 m.p.h., most commonly between 2000 and 4000 feet above sea level, too high to be detected by the naked eye. Under certain conditions, at least, large-scale invisible migrations may occur even over land in daylight, in regions where their passing has previously been unsuspected. Transmarine migrants apparently are able to navigate without landmarks but are unable to make allowance for drift. Hence, when there are crosswinds at sea, their course becomes the resultant between their constant heading and the direction and speed of the wind. When the birds are denied a view of the stars, they evidently mill about aimlessly until the air movement at length piles them up exhausted on the shore. A southward migration down the North Sea in April, revealed by radar, is interpreted as the redirected movement of continental migrants known to have drifted off course to Britain a week earlier. These findings, like those of the Swiss, dovetail well with conclusions derived from the lunar study of migration in the New World and give these conclusions new re-enforcement amid the welter of conflicting possibilities.—R. J. Newman.

8. Determinations of Flight Elevation with Optical Range-finding Apparatus. (Ermittlung von Flughöhen mit optischem Entfernungmessgerät.) H. Rittinghaus. 1958. *Die Vogelwarte*, **19**(2): 90-97. The data here assembled consist of 289 records of the flight elevations of migrating Hooded Crows, Rooks, Jackdaws, Lapwings, and Golden Plover. These were obtained over a period of years by the author and his associates chiefly by means of range-finding equipment of the sort used on anti-aircraft guns. The minimum elevation noted was 1 meter (for Lapwings) and the maximum 750 meters (for Rooks), but the paper makes no attempt to correlate the observed variations with meteorological conditions (which, however, are stated) nor to subject the records to statistical treatment even for simple descriptive purposes.

Since the observations were conducted on a low-lying island well removed from the mainland, irregularities in topography were not a complicating factor. Flight elevation above sea level and above the surface were virtually one and the same thing. By the same token, the results cannot be used to gain a reliable idea of the typical altitudes of flight in nonmarine situations. In fact, the work with radar discussed in the preceding review has rather definitely shown that migrants mount higher into the sky as they fly out over the sea.

It is not clear whether the technique employed produces an unbiased sample—that is, whether the apparatus provides an equal opportunity to make measurements at all elevations. American students of bird migration who may be wondering whether optical range-finders might be useful in helping to solve some of their own most obstinate problems will have to read between the lines to decide. It is perhaps significant that the subjects of the present study are all fairly large, whereas the birds that are our most critical concern are all fairly small. One thing is certain: the equipment described by Rittinghaus, with a magnification of only 12 diameters, is not sufficiently powerful even to detect certain of the large diurnal flights of passerines that have been observed high aloft in spring passing inland over the northern shores of the Gulf of Mexico.—R. J. Newman.

9. Repetition of an Experiment on Bird Orientation. Klaus Hoffman. 1958. *Nature*, **181**: 1435-1437. The ingenious but controversial sun-arc hypothesis of Matthews holds that displaced birds discover whether they are north or south of their home latitude by extrapolating the path of the sun to the noon position. The main evidence for this kind of navigation was provided by two "sun-occlusion" experiments. By denying homing pigeons a view of the sun during a period of drastic change in its declination, Matthews was apparently able to fool the birds, in accordance with the predictions of the theory, into thinking that south was north and into flying off upon release in a direction opposite to the home direction. Later, several attempts in Germany to repeat the experiment failed utterly to reproduce the original result.

Now, in an effort to duplicate the conditions of Matthews' experiment more exactly, the German investigators have transferred their base of operations to the vicinity of the original tests in England and have worked with English pigeons purchased from the dealer who supplied Matthews. And again the sun-occluded birds have homed as well as the controls, lending no support whatever to the sun-arc hypothesis. The circumstances surrounding any outdoor experiment are, of course, so subtle and so complex that they can never be recreated with complete fidelity. In addition, there are apparently slight differences in the way Hoffman and Matthews trained their birds and perhaps in the way they released them. And if the conflict in testimony seems mystifying even so, it at least has ample precedent in the checkered history of homing experiments. —R. J. Newman.

10. Visible Migration in the East Baltic Area. Erik Kumari. 1958. *Ibis*, **100**(4): 503-514. More than half this very general account of results obtained by the growing network of daytime observation posts in Estonia, Latvia, Lithuania, and North Germany is devoted to the movements of water birds and is mainly of regional interest. Ornithologists in this country may, however, find food for thought in the discussions of passerine migration. The latter phenomenon is envisioned as a complex of streamlike movements, which are much more spectacular along the coast than in the interior and which, depending on the features of the landscape, vary drastically from station to station both in

quantity of birds and species composition. As in the eastern United States, the crest of fall migration is supposed to occur in September and October, and the best autumnal concentration points are said to be either on islands or on peninsulas that trend in a southwesterly direction. The surprising magnitude of visible diurnal migration in Europe is illustrated by the observation of more than a million birds, 98 percent of them Passeres, on the east shore of Courland Bay during an autumn's flight. The fact that the main body of migrants there, as well as at other places, was made up of fringillids emphasizes the importance of daytime travel in the migrations of birds of that family. It should perhaps suggest to American investigators that our preoccupation with seed-eating birds in experimental work may be delaying a full understanding of the mechanics of nocturnal migration.—R. J. Newman.

11. Autumn Migration in Southwest Portugal, 1957. Jennifer Owen. 1958. *Ibis*, **100**(4): 515-532. Cape St. Vincent, Portugal, is situated at the tip of the southwesternmost jag on the continent of Europe, far west of the short crossing to Africa over the Straits of Gibraltar. Fall migrants leaving this strategic point must traverse more than 200 miles of open ocean before they again see land. From August 23 to September 25, 1957, a party of British ornithologists made observations of airborne diurnal migrants in the Cape area, conducted mist-netting operations, and kept counts of grounded birds. They found the visible migration of small passerines aloft to be spasmodic, consisting of solitary birds or flocks of 5 to 10 individuals and rarely totaling more than 50 birds in a day. Virtually all these migrants departed out to sea in a south or southeast direction. Mist-net catches indicated a marked movement of small passerine night migrants into and out of the area, but cold fronts to the north seemed to block this movement.

Particularly intriguing was the presence at the Cape of species whose breeding ranges lie east of that region—birds that must partially reverse course to reach their wintering grounds and that, in so doing, undertake a needlessly long water crossing. Ordinarily, one might ascribe this odd situation to displacement through migrational drift. But the prevailing winds of the period were from the northwest. They were not of a sort to produce such displacement. Indeed, we are told that such conditions favor concentrations of migrants at the Cape, whereas air flows with an easterly component, the kind that should favor drift, bring few birds!

The report makes no attempt to resolve this enigma, and the non-European reader who tries to draw his own conclusions is likely to be discouraged by seemingly contradictory statements regarding methods, results, and interpretations. For example, the author says, "we took a mist-net with us," apparently implying that the catches described were made with a single net, but later speaks of "using mist-nets" (plural). The text twice reiterates that "in all 176 birds were caught," yet a footnote giving a species-by-species breakdown lists 1776. At one point the following comment appears: "Presumably any bird reaching Cape St. Vincent . . . and faced with a sea-crossing would be more likely to continue if the local weather was good. . . . Thus it is not certain whether the absence of birds indicates a lack of night migration." Yet otherwise the whole viewpoint of the analysis seems to be based on the unverifiable and explicitly stated opposite presumption: "We found that by using mist-nets we were able to get a reasonably accurate impression of the migration on the previous night." The observation period extended over a whole lunation and skies were "consistently clear." Under these circumstances, the reviewer finds it hard to understand why, after journeying all the way to Portugal expressly to study migration, the party made no effort to secure direct information on nocturnal bird movement by watching the moon—information without which the other data remain ambiguous.—R. J. Newman.

12. Observations on the Autumn Migration of 1957 in Southern Spain. J. F. W. Bruhn. *Ibis*, **100**(4): 532-533. This short note concerns observations on the Mediterranean side of the Iberian Peninsula made at the time of the studies in Portugal described in the preceding review. It shows markedly inferior evidences of small-bird migration, except in the case of swallows, and supports the existing belief that in September and early October the narrow sea-crossing at the Straits of Gibraltar is of little importance except to large soaring birds.—R. J. Newman.

13. Autumn Immigration of Redwings *Turdus musicus* into Fair Isle. Kenneth Williamson. 1958. *Ibis*, **100**(4): 582-604. This represents another of a series of investigations into migrational phenomena based upon attempted correlations between the geographical forms of birds arriving at Fair Isle Bird Observatory, Scotland, and analyses of meteorological conditions preceding and coinciding with their appearances.

Williamson's correlation in this paper of sporadic immigrations of Continental *(Turdus m. musicus)* and Icelandic *(T. m. coburni)* forms of the Redwing to Fair Isle with the passage of large-scale pressure systems depends upon two basic premises he advanced in earlier papers: (1) that the principal stimulus to migration is lack of wind plus clear skies, conditions most frequently associated with anticyclonic or high-pressure systems and, (2) that in the absence of navigational aids flying birds are subject to down-wind drift in the direction of wind-flow, rather than a resultant of wind velocity in one direction and flight speed in another, positively oriented, direction. Down-wind drift is frequently associated with cyclonic or low-pressure systems which carry unfavorable weather.

The arrival of the Continental Redwings at Fair Isle is usually associated with easterly or southeasterly winds. The largest influxes are associated with easterly winds flowing along the southern edges of anticyclones centered over Scandinavia to the east and northeast. Smaller influxes are associated with easterly winds resulting from frontal conditions preceding the arrival of cyclonic systems.

It is claimed that these thrushes are displaced by wind-drift from their north-south over-water crossing between Norway and Denmark (the Skaggerrak) and are blown in a northwesterly direction to northern Britain. Only during periods of calm air between the passage of wind systems do Redwings arrive at Fair Isle by direct southwesterly flight from the western Norwegian coast.

Conversely, most of the Icelandic Redwings arriving at Fair Isle do so in conjunction with cyclonic westerly winds. As pointed out by Williamson, to assume down-wind drift from Iceland would violate both of the above basic premises: birds would have to leave Iceland under cyclonic influence, and direct down-wind drift should deposit them on the shores of central Norway. To circumvent these difficulties, Williamson suggests that the birds must move west across the Denmark Straits to Greenland (which is under the influence of a prevailing anticyclone), south along the Greenland coast, thence east by down-wind drift to Britain.—Stuart Warter.

14. Attraction of Nocturnal Migrants by the Lights on a Television Tower. W. W. Cochran and R. R. Graber. 1959. Wilson Bulletin, **70**(4): 378-380. This excellent little paper, based mainly upon investigations made during the dark hours of two spring mornings, is packed with interesting conclusions: (1) migrants are attracted by red lights on television towers; (2) they are not evenly distributed in the sky to begin with; (3) they accumulate around the tower much as they have been shown to do in ceilometer beams; (4) only a small proportion of the birds drawn to the lights are actually killed; (5) migrants are little affected by TV towers when the cloud ceiling is high.

Data supporting these conclusions were obtained by watching the migrants in the beam of a spotlight, by comparing the numbers of flight calls heard at the tower versus the numbers heard away from the tower, and by comparing the numbers heard at the tower with the lights on versus the numbers heard with the lights off. These methods, of course, are not absolutely trustworthy. The use of a searchlight beam can certainly be expected to influence the behavior of the birds, and we cannot be sure that even the red lights do not have a stimulatory effect on the frequency with which migrants utter call notes. It would seem that the first conclusion is convincingly demonstrated, that the second hinges on one's definition of evenness, and that the last has already been thoroughly refuted by the massive mortality reported under lofty overcasts at several towers in the fall of 1958. The other two conclusions would seem to require further study before they can be accepted as valid generalizations.—R. J. Newman.

15. An Analysis of Migrating Birds Killed at a Television Tower in East-Central Illinois, September 1955-May 1957. Richard Brewer and J. A. Ellis. 1958. *Auk*, **75**(4): 400-414. At the scene of the studies described in the

preceding review, 486 dead or injured migrants of 51 species were retrieved on seven dates extending over four migration seasons. This total is a modest one compared with casualties that have occurred elsewhere, and it was not the product of the sort of organized day-to-day search that lends such data maximum significance. Nevertheless, the authors have followed the example of Tordoff and Mengel *(Univ. Kansas Pub. Nat. Hist.,* 10: 1-44) in making the most of the material collected. They have determined the relative numbers of each sex and age group recorded the fat condition of each specimen. Surprisingly, they report that adults predominated among the birds killed and that migrants tended to become fatter as the season progressed. By means of a novel *index of similarity,* they have compared the species composition of their kills with the composition in 24 other nocturnal disasters. On this basis, their TV-tower samples are more similar to the results recorded at ceilometers than to the results obtained at other television towers.

In the concluding section of the paper, the number of birds killed is used to compute the total number of migrants passing the tower on a given night in a space a mile wide. It would appear, however, that the authors themselves do not consider this method of estimate a very dependable one. They say it may be of little value if birds aggregate in migration or are attracted to the tower and then express the belief that aggregation may be pronounced. It is instructive to note that, if the same mathematical procedure were applied to the estimate of 20,000 birds killed at a television tower in Wisconsin one night in 1957, the computed number of passing migrants per mile of front would exceed the utterly fantastic figure of 38 million!

Two pieces of circumstantial evidence bearing on attraction and aggregation are mentioned. Maintenance personnel at another tower in the area found fewer dead birds lodged in the structure at the level of the lights than at other levels, as though the migrants had tended to avoid the lights. And on one of the dates the odd distribution of the dead birds on the ground—all on the east side of the tower, as though they had been killed by striking a single guy wire—suggested that migration had been moving in a concentrated stream.—R. J. Newman.

16. The autumn migration at Falsterbo in 1954. Report No. 12 of the Falsterbo Bird Station. (Fågelsträcket vid Falsterbo år 1954.) Ingvar Lennerstedt. 1958. Vår Fågelvärld, **17:** 303-331. (English summary.) The experience gained in the course of the years by the field observers at the Swedish bird stations of Falsterbo and Ottenby is beginning to tell in a remarkable way. Not only is this evident in the revelations of significant facts through the statistical analyses, but in the uncovering of important phases of behavior, which considerably improves our knowledge why and how birds move. Thus, of interest as it is that nearly 300,000 Chaffinches *(Fringilla coelebs)* flew over Falsterbo during the fall migration 1954 and that the Brambling *(Fringilla montifringilla),* the Ortolan Bunting *(Emberiza hortulana),* and the Wheatear *(Oenathe oenanthe)* reached all-record peaks in the same fall, the account of a single day of migration, 15 Oct. 1954, with its detailed observations of behavior and the analysis of relative factors, particularly the weather, enables the author to speak with assertion about why birds move when they do. Report No. 12 contains also other instances of revealing behavior, as that of the Red-breasted Mergansers *(Mergus serratus)* which during this fall accumulated in great numbers off Falsterbo. Apparently in a kind of premigratory preparation, a small flock would suddenly lift from the water. The sight of them drew raft upon raft of their fellows into the air until, like an avalanche of snow gathers on a mountain side, the whole mass of ducks was aloft to fly, perhaps, a few hundred yards or even a kilometer or two before settling on the water once more. This happened over and over again. Finally, only a few at a time flying away in their "standard" SW direction, the assembly of ducks thinned out and disappeared. The Wheatear is a night migrant but appears also regularly in diurnal migration. All of a sudden, it starts off in a bouncing flight towards the shore, hugging the ground. Some of them alight at the water's edge for a minute or two before taking off again with apparent determination out over the tops of the waves. Astonishingly few show any hesitation and return. Thus the author finds an answer to almost every question. All are concerned with environmental conditions, particularly

the weather. Once the birds are on the move, he concludes, there is no need looking to the manifestations of their internal rhythm and motivation for explanation of the variations they show in movement and behavior.—Louise de K. Lawrence.

POPULATION DYNAMICS

(See also Numbers 19, 21, 30, 33, 35, 61)

17. Winter mortality of the Tawny Owl in central Sweden. (Om dödligheten under vinterhalvåret hos kattugglor *(Strix a. aluco)* i Mellansverige.) Ragnar Edberg. 1958. *Vår Fågelvärld,* **17**: 273:280. (English summary.) An unusual number of Tawny Owls died during the late winter of 1955-1956 in the Province of Närke. This led to an investigation of, among other things, the mortality records of a taxidermist firm over a period of years. The analysis showed two peaks of mortality, one in the autumn and the other in late winter. The first appeared dependent on the hunting pressure plus other unknown factors, the second on the rigidity of the weather which presumably lowered the birds' resistance, and/or the depth of the snow cover which influenced the availability of food, i. e. small rodents. The late winter of 1956 was unusually harsh and the spring late; most of the owls that died during this period were starved. The following year the owl population of the region showed a drastic reduction due to this excessive mortality.—Louise de K. Lawrence.

NIDIFICATION AND REPRODUCTION

(See also Numbers 5, 25, 26, 27, 30, 34, 35, 40, 42, 46, 61)

18. Annual Mortality in a Banded Bobwhite Population. Halsey M. Marsden and Thomas S. Baskett. 1958. *Journal of Wildlife Management,* **22**(4): 414-419. This 7-year study is based on 1,546 banded Bobwhites *(Colinus virginianus)*. After October 1 of each year survival rates of both young and adults were the same. The 7-year average indicated annual populations composed of 82 percent young (average life expectancy of 8½ months). The oldest bird encountered in the study was shot in its 5th year. Annual mortality was as high in refuge areas as in hunted areas, indicating that hunting functions simply as an alternative cause of annual mortality.

Sex ratios, based on 961 birds captured from October to March to avoid bias of summer "cock-and-hen" trapping, showed an adult population composed of 63 percent males, a young population of 55 percent males. In both age groups this difference was statistically significant. No differential trap response was evident within either age or sex groups.

A regression analysis based on 1,124 recaptures gave an annual disappearance rate of 98.6 percent, of which 82 percent was attributed to mortality and 16.6 percent to egress.—Andrew A. Arata.

19. The Shiny Cowbird and its Hosts, Especially the Rufous-collared Sparrow. (Vom brasilianischen Kuhvogel, *Molothrus bonariensis,* und seinen Wirten, besonders dem Ammerfinken, *Zonotrichia capensis)*. Helmut Sick and Johann Ottow. 1958. *Bonner Zoologische Beiträge,* **1**(9): 40-62. During his internment as an alien in 1943-44 on tropical Ilha Grande 80 kilometers southwest of Rio de Janeiro, Dr. Sick utilized his time in zoological studies. With the help of three companions he studied for two seasons the relationships between the Shiny Cowbird and its preferred host, *Z. capensis.* Of 93 nests of the latter, 57 (61%) held from 1 to 6 eggs of the cowbird, but of 32 nests of 9 other species, known elsewhere as hosts, only one had been parasitized. The cowbird population appeared to be rather nomadic and the authors believe that no female laid more than one egg in a nest. Like our Brown-headed Cowbird *(M. ater)* these females watched their victims' nest building, punctured some of the hosts' eggs and carried others away. Incubation period of the cowbird was 11 to 12 days, of the sparrow 12 to 13; fledging period of the former 12 to 15 days, of the latter 12 to 13.

Of 83 sparrow nests 51 (61%) were parasitized by 94 cowbird eggs; 41 of these hatched (44%) and 24 young were fledged—26% of all the cowbird eggs laid. Of 152 sparrow eggs 62 (41%) hatched and 37 young were fledged (24%). These figures for success are low in comparison to those of open-nesting passerines in temperate zones. I found in Ohio 35% success for 906 Song Sparrow *(Melospiza melodia)* eggs and 32% success for 113 Cowbird eggs. Post-fledging mortality of the cowbirds is high due to their conspicuous and fearless habits. This is a valuable contribution—a nesting success study from the tropics.—M. M. Nice.

20. Buzzards "nest-decorating" around a nestling on the ground. (Ormvråkar *(Buteo buteo)* utförande "bosmyckning" kring en på marken sittande unge.) Arne Johansson. 1958. *Vår Fågelvärld,* **17**: 351. (English summary.) A Buzzard's nest was partially destroyed during a storm in May 1957 and all but one of the three nestlings that fell on the ground were killed. When found, the nestling was still alive and in good condition. It sat beneath the tree surrounded by newly killed prey as well as several fresh pine boughs. A week later, the nestling had moved and here again the parents had "adorned" its sittting place with pine boughs. Still another week later, the nestling sat on a rock some 20 meters from the original pace, also here surrounded by "nest decor." To say that birds decorate their *nests,* whether with snake skins or evergreen boughs, is perhaps a misapprehension. Observation from a blind divulged the reason for the young Buzzard's constant moving. It simply walked into the shade each time the sun shone upon it.—Louise de K. Lawrence.

21. Further Notes on the Tufted Duck in St. James's Park, London. E. H. Gilham. 1958. *British Birds,* **51** (11): 413-426. Notes on the breeding and post-breeding populations of *Aythya fuligula* from 1953-57. Some females stayed with their broods after they themselves became flightless; others deserted them when they were a few days old. "In cold or wet weather they died quickly, but if good weather predominated during their first 14 days of life the survival rate was high." "The average mortality of ducklings was about 50% of all those known to have reached water and over half the total casualties were ducklings up to 7 days of age."—M. M. Nice.

22. Courtship, Hostile Behavior, Nest-establishment and Egg Laying in the Eared Grebe *(Podiceps caspicus).* Nancy M. McAllister. 1958. *Auk,* **75** (3): 290-311. This detailed study of the breeding habits and behavior of the Eared Grebe is a welcome addition to the rather sparse literature on the subject. The author describes the species' courtship patterns, threat and escape attitudes, nest-building procedure, nesting behavior, and pays attention to its egg laying pattern (she has determined it to be an indeterminate layer). She notes a remarkable synchronization of the various stages of breeding within the colonial groups of nesting birds, particularly in the smaller colonies, and comments at length on its significance.—O. L. Austin, Jr.

23. Some Effects of X-irradiation on the Breeding Biology of Eastern Bluebirds. Robert A. Norris. 1958. *Auk,* **75** (4): 444-455. In the spring of 1956 the author exposed to X-irradiation some of the eggs and adult female and nestling *Sialia sialis* breeding in nest boxes on the Savannah River Plant area of South Carolina. Observations of the ensuing developments through the nesting season allowed him to conclude: "The breeding biology of irradiated and non-irradiated females was essentially the same in the following respects: size of sets of eggs, length of incubation, hatchability of eggs, nestling period, and general reproductive success. In both irradiated birds and controls there were records of second and third broods. Developing embryos were rather vulnerable to radiation. Among nine irradiated bluebird eggs (mean dosage about 420 r) the embryos died in three instances and the nestling produced died in three instances; the nestling hatching from the other three eggs succeeded in fledging. Four nestlings given 400 to 1200 r developed normally and fledged successfully. It is suspected that week-old songbirds might have greater radioresistance than laboratory chicks and ducklings of the same age." If this implies that perhaps wild birds may have a better chance than humans of surviving the next holocast, I don't begrudge it them one bit.—O. L. Austin, Jr.

24. The Gloss of Eggs. Nancy Wilson, Eric J. Preston, and F. W. Preston. 1958. *Auk*, **75**(4): 456-464. A specially devised gloss-meter shows a systematic tendency for the last egg of a clutch to be less glossy than the first egg in most species, but not in all. This parallels "previous findings that the last egg tends to differ in other respects, such as size, breadth, shape, and pigmentation." The authors do not comment on the possible biological causes or significance of these observed phenomena.—O. L. Austin, Jr.

BEHAVIOR

(See also Numbers 20, 22, 38, 46)

25. Behavior Studies on the Pied Flycatcher. Its Ethology and Ecology. (Verhaltensstudien am Trauerschnäpper. Beiträge zur Ethologie und Oekologie von *Muscicapa h. hypoleuca* Pallas.) Eberhard Curio. 1959. Beiheft 3 zur *Zeitschrift für Tierpsychologie)* 1-118. (With 4-page summary in English.) A remarkably thorough and well-documented contribution. A population was studied for 5 years near Berlin, most of the birds being color-banded—258 adults and 710 nestlings. Eight nestlings were reared by hand and a wild-caught pair kept in captivity. Artificial lengthening of daylight induced the reproductive mood in three of the young and in both adults.

Sixteen types of utterances are described as well as *Mischlaute* which are intermediate between two otherwise well defined types; apparently the bird utters these two notes simultaneously. "Motor pattern, causation, function and presumed evolution" of 6 social behavior elements are discussed and illustrated with line drawings and charts. "To a potential mate, the ♂ demonstrates its hole by rushing into it, uttering enticing calls." "In order to induce nest building activity in his newly acquired partner, the ♂ stimulates her by ritualized attacks, intention movements of hole-demonstration and by real hole-demonstrations themselves." During the egg stage the male feeds his mate 2.7 times an hour on the average, supplying her with about half her needed food. Pied Flycatchers in western Europe are single-brooded; those in Moscow double-brooded.

The female alone incubates. "The total time spent on the nest amounts to 71.1% (at 14.3 C) of the day. The ♀ leaves the eggs 55 times a day for periods of 5.0 min. after sitting for 12.1 min. (table 13). If the temperature falls, the ♀ increases the number of the daily periods on and off the nest and shortens the periods off more substantially than the periods on, so that a higher incubation time percentage results (fig. 38): 1° Celsius change in temperature results in a change of the total incubation time of 2.6%." "Berlin ♂ ♂ collect 41.5% of the nestlings food, but Finnish ♂ ♂ nearly 50% (table 17). ♂ ♂ eager in courtship feeding are more industrious too in feeding their brood (table 18). The feeding rate remains constant (at least) from the 8th day onwards up to the fledging stage (fig. 43). Berlin nestlings get 5.47 feedings per hour, whereas Finnish ones get only 4.82 feedings per hour (table 20). As the parents of the latter feed for 19 hours per day and those of the former only for 17.5 (table 21, fig. 45), nestlings of both the populations concerned receive nearly the same number of food parcels per day (table 20)."

These quotations give an idea of the wealth of material in this monograph. There is an extraordinarily wide coverage of the literature, much of it cited with the page reference, a most helpful and all too often neglected practice. The work closes with an index to authors and another to subjects and species. This study will prove a mine of information and inspiration to students of bird biology and behavior.—M. M. Nice.

26. Anticipatory Food-Bringing in the Prairie Warbler. Val Nolan, Jr. 1958. *Auk*, **75**(3): 263-278. This behavioral study of the food-carrying habits of the male *Dendroica discolor* to its incubating or brooding mate is followed by a theoretical discussion of the significance and probable origin of the habit. "Observations at five nests on the hatching day tend to prove that the male is unaware of hatching until he makes a food-bringing visit and that the behavior therefore functions to bring about the discovery and prompt feeding of the young by the male . . . his early assistance in feeding permits the female to

adjust her brooding schedule to weather conditions without sacrificing the nourishment of the nestlings. In favorable weather the advantage takes the form of a more rapid feeding rate, which should be conducive to the raising of larger broods. . . . A review of the 20 other species of wood warblers in which the male is reported to carry food or to feed the female before there are nestlings leads to the view that incubation feeding in his family has evolved from anticipatory food-bringing and that courtship feeding in three or four Parulids is but a later stage in evolutionary development."—O. L. Austin, Jr.

27. Pair Formation, Mutual Tapping and Nest Hole Selection of Redbellied Woodpeckers. Lawrence Kilham. 1958. *Aug,* **75**(3): 318-329. Describes pair formation, nest hole selection, and the early breeding cycle of *Centurus carolinus* from observations near Seneca, Maryland, beginning in early January and continuing until nesting starts in April. A novel behavior feature hitherto unnoticed in the woodpeckers is what the author calls "mutual tapping." In this "ceremony which may strengthen the pair bound and register agreement on the site of a nest hole, both members of a pair give slow, rhythmic taps . . . with the male inside his roost hole and the female outside, at dawn, and with both birds on bark outside of a hole about to be or being excavated."—O. L. Austin, Jr.

28. Tracking Birds on Tidal Flats and Beaches. C. Swennen and Miss G. van der Baan. 1959. *British Birds,* **52**(1): 15-18. Observations, illustrated with 12 photographs, of feeding behavior of shorebirds, gulls, and ducks on tidal flats, with notes on the prey animals. There is a marked difference between the efficient working methods of adults and the "stupid" behavior of young birds. Fledged Oystercatchers *(Haematopus ostralegus)* accompanied their parents and were fed by them.—M. M. Nice.

ECOLOGY

29. The influence of ecology on variation in the Mistletoe-bird *(Dicaeum hirundinaceum).* Allen Keast. 1958. *Emu,* **58**(3): 195-206. The Mistletoe-bird occurs widely in all types of Australian forest associations, apparently in response to the ubiquitous distribution of its chief food, the berries of the parasitic mistletoe (Loranthaceae). Keast suggests "its virtual lack of geographic variation results from a well-developed food-nomadism and continuity of distribution. *Dicaeum* is the chief agent for disseminating the mistletoe plants, transporting them in its alimentary canal and shedding them with vitality unimpaired on branches where they can grow. Its mobility has apparently not, however, materially reduced the potential of the plants for developing geographic variation and undergoing speciation for the seeds can only be transported for distances of 30, and perhaps 60, miles at a time. This is insufficient to get most species across tracts of country from which the requisite host species or habitat is lacking. It also explains the absence of mistletoes from Tasmania."—O. L. Austin, Jr.

30. Ecology of the Clapper Rail in Southeastern North Carolina. David A. Adams and Thomas L. Quay. 1958. *Journal of Wildlife Management,* **22**(2): 149-156. This study of the Clapper Rail *(Rallus longirostris)* was conducted during 1955-56 in a salt water marsh at Southport, N. C. Of 30 nests, 23 were found in saltmarsh cord-grass *(Spartina alterniflora).* Nesting continued from 1 April until 2 June, the largest number initiated between 15 and 28 April. Nesting success was 42 percent, and 10.5 eggs per nest yielded 9 chicks per successful nest. Parental care of young lasted 5 to 6 weeks and the young started flying at 9 to 10 weeks. Banding recoveries (4 percent) suggest that part of the local population is nonmigratory. A 5:1 ratio of juveniles to adults was obtained with both trapped (summer) and fall (shot) birds.—Andrew A. Arata.

WILDLIFE MANAGEMENT

(See also Numbers 5, 18, 30, 36, 44, 54, 55, 56)

31. Analysis of Variation Among Participants in Pheasant Cock-Crowing Censuses. Samuel M. Carney and George A. Petrides. 1957. *Journal of Wildlife Management,* **21**(4): 392-397. As would be expected, cock-crowing counts made by groups of people selected with no regard for previous experience showed very poor agreement. Two experienced counters produced results that were higher and more frequently in agreement than did four inexperienced people. Groups making counts on a single species obtained greater uniformity, regardless of species, than did a group counting the calls of Bobwhites *(Colinus virginianus)*, Mourning Doves *(Zenaidura macroura)*, and Pheasant *(Phasianus colchicus)* simultaneously.—Andrew A. Arata.

32. Evaluation of Ruffed Grouse Drumming Counts. Robert S. Dorney, Donald R. Thompson, James B. Hale and Robert F. Wendt. 1958. *Journal of Wildlife Management,* **22**(1): 35-40. A definite correlation of drumming transects with winter flush counts of Ruffed Grouse *(Bonasa umbellus)* was obtained on study areas in Wisconsin. Various aspects of the efficiency of drumming counts are discussed. The authors conclude that this method of obtaining indices of breeding populations of males is satisfactory.—Andrew A. Arata.

33. Distributions of Populations and Hunting Kill of the Canvasback. Robert E. Stewart, Aelred D. Geis, and Charles D. Evans. 1958. *Journal of Wildlife Management,* **22**(4): 333-370. This comprehensive report analyzes the banding returns of Canvasbacks *(Aythya valisineria)* available from all sources through 1956, and some returns from the 1957-58 hunting season. It presents numerous figures and tables of data on breeding and wintering populations, distribution of kill (total, sex and age, breeding ground derivation), migratory routes, and 10 maps showing the distribution of 381 recoveries of Canvasbacks landed in different areas.

Counts of wintering birds (1952-1956) varied from 384,000-669,000, averaged 508,000. About 80 percent of the population wintered in eastern United States and parts of Ontario. Wintering counts indicated occasional shifts in population between such regions as the Mississippi Valley and the mid-Atlantic region. Approximately 60 percent of the breeding population nests in the aspen parklands of Alberta, Saskatchwan, and Manitoba.

The kill was distributed as follows: United States (75%), Canada (24%), Mexico (1%); distributed primarily along the major migratory routes.—Andrew A. Arata.

34. A Study of Renesting in Canada Geese in Montana. Melvin G. Atwater. 1959. *Journal of Wildlife Management,* **23**(1): 91-97. Twelve geese were trapped on nests using a manually operated spring-type trap constructed from a Hancock beaver trap. Only the two trapped during the egg-laying stage renested. One of these renested twice, the first time at 0.3 mile and the second time at 0.1 mile from the first nest. About 2 weeks lapsed between the first and second nest and 1 week between the second and third nest. The second bird was trapped on a nest containing six eggs. The second nest was constructed on another reservoir 24 miles from the site of the first nest about 17 days after the initial nest was destroyed. Unsuccessful nesting pairs usually moved away from the original nest sites and remained by themselves, exhibiting restlessness and wandering. The data indicate that in the present study only a small percentage of the geese renested, but they suggest that nest destruction during the egg-laying stage may result in considerable renesting. More data are required to prove the latter point.—Helmut K. Buechner.

35. Significance of Ground Nesting by Mourning Doves in Northwestern Okahoma. Robert L. Downing. 1959. *Journal of Wildlife Management,* **23**(1): 117-118. In an area where trees occupy less than ½ percent of the total area, approximately 70 percent of the Mourning Dove *(Zenaidura macroura)* population nested on the ground and produced 59 percent of the juveniles in 1956.—Helmut K. Buechner.

PARASITES AND DISEASE

(See also Number 23)

36. An Epizootic among Eider Ducks Involving an Acanthocephalid Worm. Gordon M. Clark, David O'Meara and James W. Van Weelder. 1958. *Journal of Wildlife Management*, **22**(2): 204-205. A number of dead Eiders *(Somateria mollisima dresseri)* picked up along the Massachusetts and Maine coasts were found to be heavily infected with an acanthocephalid worm, *Polymorpha botula.* One Eider yielded 610 worms. Examination indicated freedom from bacterial pathogens, and the incidence of other parasites was low. The deaths were attributed to the presence of *Polymorpha.*—Andrew A. Arata.

PHYSIOLOGY AND PSYCHOLOGY

(See also Numbers 23, 42, 45, 46, 56)

37. The Effectiveness of Aesthetic Factors with Vertebrates. (Die Wirksamkeit ästhetischer Faktoren bei Wirbeltieren.) Bernhard Rensch. 1958. *Zeitschrift für Tierpsychologie*, **15**(4): 447-461. A Jackdaw *(Corvus coleus)* and Carrion Crow *(C. corone)* preferred squares of paper with the "more regular, more symmetrical or rhythmical patterns. In most cases the percentage of preference was statistically significant." The same preference was shown by two species of monkeys. Fishes, however, always preferred the irregular patterns. "When choosing between two colours the jackdaw and the crow preferred gray and black, i.e. the colours of their own plumage. On the other hand, they preferred patterns with two or four different colours to simpler patterns of one colour or two colours respectively." The painting of apes and monkeys and songs of birds are discussed. The author concludes that optical and acoustic aesthetic factors are effective not only with man but also with other mammals and with birds, but not with fishes.—M. M. Nice.

38. Intelligence Tests with Tits. M. Brooks-King and H. G. Hurrell. 1958. *British Birds*, **51**(12): 514-524. Descriptions and illustrations are given of various ingenious contrivances by which peanuts could be procured by the solving of a problem. Blue *(Parus caeruleus)* and Coal Tits *(P. ater)* were very successful but Great *(P. major)* and Marsh Tits *(P. palustris)* and Nuthatches *(Sitta europaea)* never tried to pull out the pegs of the "perspex" apparatus. The last 2 showed no interest in the test situation but the Great Tits constantly watched the successful Blue and Coal Tits and at times robbed them of the booty.—M. M. Nice.

39. The Function of the Salt Gland in the Brown Pelican. Knut Schmidt-Nielsen and Ragnar Fange. 1958. *Auk*, **75**(3): 282-289. This is another in the series of intriguing papers by Schmidt-Nielsen and his collaborators on the importance of the nasal glands in sea birds as eliminators of salt from the water they drink. "The salt gland (nasal gland) of the Brown Pelican can excrete a highly concentrated solution of sodium chloride. The excretory capacity of the salt gland permits the bird to tolerate ingestion of sea water, and to profit from it because the salt is excreted in a concentration higher than in sea water. Quantitatively, the role of the salt gland in the elimination of sodium chloride is greater than that of the kidney."—O. L. Austin, Jr.

40. Incubation and body temperatures in the yellow-eyed penguin. Donald S. Farner. 1958. *Auk*, **75**(3): 249-262. This paper is a significant addition to the growing literature on body and incubation temperatures. The penguins' long periods of uninterrupted incubation and post-nuptual molts during which they go without food or water make their temperature phenomena of additional interest. Farner's measurements in *Megadyptes antipodes* show that incubation temperatures increased gradually "from 20-25° C. (68-70° F.) during the first two days to a maximum of about 38° C. (100.4° F.) at 15 days; this maximum was maintained throughout the remainder of the incubation period. The period of increasing incubation temperature coincides with the period of increased vascularization of the incubation strip." The maximum incubation temperature, reached at and maintained after the 15th day, does not differ significantly from

the body temperature of the incubating birds. He also found the body temperature of molting birds to be significantly higher, 38.6° C., than the 37.8° C. of non-incubating, non-molting birds. It would be instructive to have comparative data on the molting and incubation temperatures in such species as the Adelie and Emperor penguins, whose uninterrupted incubation periods are much longer (the full 64 days by the male Emperor) and whose molt periods are undergone under much more rigorous climatic conditions. Body heat loss on the shore ice during strong gales and sub-zero temperatures must be considerable during molt, and one suspects these birds' body temperatures must rise considerably to compensate for it. Much still remains to be done to determine the physiological mechanisms that regulate these temperature adjustments.—O. L. Austin, Jr.

41. On Regional Movements and Body Weight of Black-capped Chickadees in Winter. Louise de Kiriline Lawrence. 1958. *Auk*, **75**(4): 415-443. From the fall of 1948 to the spring of 1954 Mrs. Lawrence made 1279 weight records of 340 individual *Parus atricapillus* that she captured, marked, and released at her feeding station in central Ontario. Analysis of repeats and returns showed the presence of two populations, one transient, the other resident birds, between which no significant weight differences were apparent. "The factor most consistently influencing the variations in weight and fat deposition in the chickadees was the seasonal rise and fall of the mean temperature of the air. The influence of temporary cold or warm spells was much less consistent and often counteracted by other factors, such as migration, reproduction, and the food supply. The accumulation of fat in the greatest number of chickadees occurred in December and their highest weights were recorded in February. Increases in weight and fat were brought about chiefly by accelerated feeding. . . . The intimate interplay between the different factors influencing the changes in weight and fat of the chickadees is shown in this study. Any factor, even the most important, seldom maintained its modifying influence undisturbed for any length of time before another began exercising its counteracting pressure." This is an outstanding example of the sort of worthwhile study that can be made at a banding station with a limited population of birds.—O. L. Austin, Jr.

MORPHOLOGY AND ANATOMY

(See also Number 39)

42. The "Hatching Muscle" in the Chick. Harvey I. Fisher. 1958. *Auk*, **75**(4): 391-399. Recent workers have questioned the functionability of the "hatching muscle," M. complexus, which appears between the vertebral column and the dorsal surface of the head in the domestic chick at 7 days of incubation and supposedly motivates the egg-tooth, on whose widely accepted egg-pipping function they also have cast doubt. The muscle's development parallels that of the egg-tooth; it reaches its maximum size at 20 or 21 days of incubation and then gradually disappears. Fisher produces here experimental evidence, both anatomical and histological, that allows him to postulate "although the evidence is far from conclusive, my present belief is that the egg-tooth ruptures the shell at hatching and that M. complexus provides the power."—O. L. Austin, Jr.

43. Size differences between early and late autumn migrants of Dunlins at Ottenby. (Storleksskillnad hos genomsträckande kärrsnäppor *(Calidris alpina)* vid Ottenby.) Per Martin-Löf. 1958. *Vår Fågelvärld*, **17**: 287-301. (English summary.) The measurements used in this paper were obtained from 1,112 Dunlins, of which only a little over one percent were old birds. Methods and calculations are described in detail. Although no conclusions can be drawn with assurance and more clarifying work is planned in the near future, indications so far reveal that two populations may be involved among the Dunlins that pass over Ottenby during the fall migration.—Louise de K. Lawrence.

44. Sexing Live-Trapped Juvenile Ruffed Grouse. Walter L. Palmer. 1959. *Journal of Wildlife Management*, **23**(1): 111-112. Color of the bare skin on the upper eyelid was used in determination of sex with only 4 percent error. The error was further reduced by using other criteria of sex in combination with pigmentation of the eye-patch.—Helmut K. Buechner.

PLUMAGES AND MOLTS

(See also Number 40)

45. What makes the plumages of birds water-repellent? (Vad gör fåglarnas kroppsbeklädnad vattenavvisande?) Eric Fabricius. 1956. *Zoologisk Revy*, **18:** 71-83. (English summary.) Upsetting the author's *(Ornis Fenn.*, **22:** 33-45) earlier assumption that diet influenced the water-repellent properties of the plumages in young waterfowl, experiments with downy young Tufted Ducks *(Aythya fuligula)* showed that what they ate did not matter, provided their feathers were not soiled or disarranged by the feeding and/or the food.

Thence Dr. Fabricius goes on to establish the following facts: 1) the uropygial gland is functional from the moment of hatching in young Tufted Ducks but the existence of the secretion can, without injury to the birds, only be shown at death, when the powerful sphincter muscles which control it are completely relaxed; 3) the downy feathers of newly hatched ducklings are water-repellent in themselves, with out any oiling having to be effected either by the mother or some "innate agency"; 3) preening, the movements of which he analyses in minutest detail, is the chief agent preserving the waterproof quality of the plumage, less through the anointment with oil gland secretion, than by maintaining the fine structural organization of the barbules of the feathers. The most important preening movement is the chewing of each feather from base to tip. In an unsoiled and well-groomed plumage the constant distances between the barbules are thereby kept so small that water with normal surface tension cannot penetrate the webs. As soon as these distances are disturbed, however, for instance by handling the bird, the water is sucked in through the resulting apertures, replacing the air contained in the plumage, with as dire a consequence as if the bird had been ducked in oil. Oil, as known, has a much lower surface tension than water. Unfortunately, a weather catastrophe interrupted Dr. Fabricius' experiments, causing the death of all his test birds. Hence, despite this notable effort to clear up a baffling problem, he was unable seriously to challenge Dr. Elder's *(Wils. Bull.* ***66:*** 6-31) well-argued contention that ducks in the wild, deprived of their uropygial glands, eventually succumb.—Louise de K. Lawrence.

46. Growth and Development of the King Rail. Brook Meanley and Anna Gilkeson Meanley. 1958. *Auk*, **75**(4): 381-386. Describes the growth and development of *Rallus elegans* from hatching to first flight as observed in five birds reared in captivity. A table gives weights and measurements from hatching at irregular intervals up to 3 months, and pterylosis is described in some detail. The young start to fly apparently "with the completion of juvenal plumage development. Three of four captive rails flew at nine weeks, the fourth at eleven weeks." The authors describe four different calls in month-old rails: one "indicates general satisfaction and particularly, acknowledges the presence of others and notifies them of its presence," a second shows "relaxed comfort and sleepiness," a third "lonely dissatisfaction," and the fourth "expresses protest."—O. L. Austin, Jr.

ZOOGEOGRAPHY

(See also Numbers 29, 60, 61)

47. Our Harriers. (Våra kärrhökar.) Erik Rosenberg. 1958. *Vår Fågelvärld*, **17:** 302-303. This short article graphically gives the diagnostic field-marks of Sweden's four Harriers, *Circus cyaneus*, *C. macrourus*, *C. aeruginosus*, and *C. pygargus*. In text and with photographs, Sweden's keenest veteran bird watcher succeeds so well in his task that even the inexperienced ornithological sight-seer in Europe has no difficulty knowing the Hen Harrier from the Pallid Harrier by the black-edged wings in one and the wedge-like black patch at the tip of the wing in the other, nor the Marsh Harrier from Montagu's Harrier by the lifted pose of the wings in the first and the falcon-like form and beat of the wings in the last. When, added thereto, you read Rosenberg's vivid descriptions of movements and behavior, you get a record of high fidelity impressed upon your mind. —Louise de K. Lawrence.

48. Pallas's Warbler found in western Sweden. (Kungsfågelsångaren *(Phylloscopus proregulus)* anträffad i Bohuslän.) Ingemar Ahlin. 1958. *Vår Fågelvärld, 17:* 331-334. (English summary.) The range of this small warbler extends over the southern parts of Sibiria south into the Tibet mountains. Only the nominate race *proregulus* migrates to southern China and Indochina. On 22 Oct. 1957 at least three of this species were observed in a garden in the Province of Bohuslän on the Swedish west coast. An adult male was collected. The kinglet-like appearance with the distinctive yellow rump and the characteristic habit of hovering in the air while catching insects led to the birds' certain identification. A first record of the species for Sweden.—Louise de K. Lawrence.

49. The Crossbill Invasion of 1956 and the Subsequent Breeding in 1957. F. R. Smith. 1959. *British Birds,* **52**(1): 1-9. A poor crop of spruce cones in Sweden in the spring of 1956 was followed by an invasion of *Loxia curvirostra* into Great Britain in the summer of 1956. Some of these remained and nested in 1957, but very few were seen after June.—M. M. Nice.

SYSTEMATICS

50. Remarks on the Taxonomy of Some American Doves. Derek Goodwin. 1958. *Auk,* **75**(3): 330-334. While acknowledging that "generic limits are largely a matter of opinion," the author recommends merging the genera *Zenaidura, Melopelia* and *Nesopelia* in the single genus *Zenaida* and presents logical grounds for this "lumping."—O. L. Austin, Jr.

51. Intraspecific variation in the Australian finches. Allen Keast. 1958. *Emu,* **58**(3): 219-246. A thorough taxonomic study and revision of the 18 species of Australian Estreldinae. Keast comments cogently on "Forms with the 'Potential' for Developing into New Species," "Geographic Barriers of Importance in Speciation," "Non-Evolutionary Variation—Clines," and "Species That Do Not Vary Geographically."—O. L. Austin, Jr.

52. Seasonal movements and geographic variations in the Australian wood-swallows (Artamidae). Allen Keast. 1958. Emu, **58**(3): 207-218. "The Australian wood-swallows provide a clear-cut demonstration of the significance of the different kinds of seasonal movements in the development of geographic races. Attention is drawn, in *A. leucorhynchus,* to the contrast between the negligible geographic variation occurring under continental conditions and the effects of insular isolation on the genotype, a wide range of strikingly different populations occurring in the islands beyond Australia."—O. L. Austin, Jr.

FOOD

(See also Numbers 28, 41)

53. Concealment and Recovery of Food by Birds, with Some Relevant Observations on Squirrels. T. J. Richards. 1958. *British Birds,* **51**(12): 497-508. An important paper based on observations on Coal and Marsh Tits *(Parus ater, P. palustris),* the Nuthatch *(Sitta europaea)* and the Rook *(Corvus frugilevus),* as well as on discussion of the relevant literature. The Grey Squirrel *(Sciurus carolinsis)* recovers its hidden nuts largely through smell. The tits and Nuthatch probably find most of theirs by foraging in the same localities where they stored their extra food. The remarkable efficiency by which the Thick-billed Nutcracker *(Nucifraga c. carycatactes)* retrieves its hidden stores is difficult to understand. The author emphasizes the important role played by birds in the reproduction and dispersal of forest trees.—M. M. Nice.

54. Gulf Coast Marsh Vegetation as Food of Wintering Waterfowl. J. L. Chamberlain, 1959. *Journal of Wildlife Management,* **23**(1): 97-102. Seeds were the most important food of 17 species of waterfowl examined except Blue Geese and mergansers. Analysis of seeds eaten, based on 1,251 gizzards, showed that *Cladium jamaicense, Eleocharis* spp., *Scirpus validus* and *Distichlis spicata* were the common foods. This study is valuable as background material for base manipulation of vegetation in the management of waterfowl.—Helmut K. Buechner.

55. Food Habits of the Mourning Dove in Missouri. Leroy J. Korschgen. 1958. *Journal of Wildlife Management*, **22**(1): 9-16. The crops of 2,000 Mourning Doves *(Zenaidura macroura)* collected in Missouri were examined. Seeds made up 99.2 percent of the total volume. The 10 most important foods (90.5 percent total volume) were included in 4 plant families: Gramineae, Euphorbiaceae, Leguminosae, and Compositae. Principal foods (May to September) are listed, and annual changes in diet noted.—Andrew A. Arata.

56. Food Requirements of the Golden Eagle. H. R. Fevold and John J. Craighead. 1958. *Auk*, **75**(3): 312-317. The authors fed three Golden Eagles *(Aquila chrysaëtos)* and one Goshawk *(Accipiter gentilis)* for a year experimentally to determine the amount of food necessary to keep the birds at a constant weight under various conditions of exercise and external temperature. From their data, presented in tabular form, they show that the weight of food the Eagle consumes (expressed in percentage of body weight) varies inversely with respect to both body weight of the bird and the environmental temperature, which is not entirely unexpected. While they were unable to determine the effect of exercise, they assume it would increase food consumption slightly. They show how these data "when related to other vital statistics of diet, raptor days, and average prey weights, can be used to estimate the number of prey animals of various species required to maintain these raptors in their environments."—O. L. Austin, Jr.

57. Food Habits and Available Food of Ovenbirds in Relation to Territory Size. Judith Stenger. 1958. *The Auk*, **75**(3): 335-346. "From examination of stomach contents, the food of the Ovenbird was found to consist chiefly of invertebrates gathered from the forest floor. These invertebrates are not taken selectively but are eaten in the approximate proportions in which they are available. The weight of invertebrates per litter sample within the territory varied inversely with the size of the total territory established during the breeding season. This correlation held within habitats, as well as among habitats. The weight of invertebrate food on the forest floor increased during the breeding season to reach a peak during the first two weeks of July, which correspond with the nestling period of the Ovenbird chicks."—O. L. Austin, Jr.

SONG

(See also Number 46)

58. The Nature and Characteristics of Sub-song. W. H. Thorpe and P. M. Pilcher. 1958. *British Birds*, **51**(12): 509-514. To one who made an intensive study of the spectacular course of development of song in the Song Sparrow (Nice, 1943) the 19 sound spectrograms in this paper of sub-song and full song in British thrushes and several other birds are of great interest. The exuberance, variety and indefiniteness of sub-song are clearly shown. Seven characteristics are given for sub-song, which "in young birds at least sometimes appears to be a form of 'practice' for the production of the full song."—M. M. Nice.

BOOKS

59. The Folklore of Birds. Edward A. Armstrong. 1958. London: Collins. Pp. xvi+272, illus. Price 30 shillings. (Also 1959. Boston: Houghton Mifflin. Price $6.50.) The subtitle of this New Naturalist volume is "An Enquiry into the Origin and Distribution of some Magico-Religious Traditions." Its content involves mainly the wild birds in Britain important in folklore and the emphasis is on oral—not literary—lore. It is a very scholarly work, tracing concepts and ideas about such topics as the seasons, weather, harvest, fertility, death, and so on, from the present time far back into pre-history. Many concepts are discussed on at least a Holarctic basis. The following fragments, lifted out of context, give some idea of the scope of Armstrong's life-long interest in the subject:

"The increasingly rapid spread of industrialism and the standardisation of modes of thought due to modern means of communication are now eliminating ancient beliefs and practices over most of the world and consequently geographical distribution of folk tradition is becoming obscured." (p. xi)

"Folk thinking is associationist rather than logical. Like our dream thinking it is careless of contradictions. Probably both types of thinking are therapeutic because in them the highly buried, partly repudiated, past finds expression." (p. 84)

"A great mass of evidence ranging from Palaeolithic art to the aetiology of mythology suggests that animal or theriomorphic gods preceded anthromorphic gods; or to put it more accurately, that man thought of supernatural powers in terms of animal qualities before he pictured God in his own image." (p. 91)

"People are apprehensive of anything which appears to have human qualities without being human. Not only does the binocular vision of owls give them a resemblance to humanity but also the calls of some species are quasi-human." (p. 113.)

"It is possible for types of literary folklore to have a prolonged history in a country without influencing its oral folklore. Rather rarely literary folklore is accepted in oral folklore or the two cross-fertilise each other." (p. 118.)

". . . the eagle or anserine bird in early symbols nearly always represents sky powers, often the sun, but sometimes, especially in the case of the eagle, storm powers, thunder or lightning . . . , the fish and snake represent darkness, earth and water, the chthonic forces. Often the latter are sexual symbols Their ambivalence is thus explained, for sex involves attraction and repulsion. The elaborate courtship displays of birds are known to have evolved through the conflict of these drives. Human sexual and social activities have a similar foundation." (p. 139.)

". . . irrational notions sometimes serve a useful purpose, enabling people to live more integrated lives than they would be able to do without them." (p. 185).

"Poets have been glad to use bird images, as Shakespeare used the eagle and the owl, because they were already saturated with symbolical meaning, but they have seldom succeeded in endowing a bird or other animal with sufficient emotional significance for it to become a popular symbol." (p. 188.)

"Those who try to assess the signficance of what folklore has preserved are chary of assuming that previous generations were more foolish than their own. The continuity of tradition which we have found exemplified in this survey has provided a foundation enabling the bolder minds of successive generations to pioneer new ways of thought, and new modes of life without undermining the foundations of society. Conservatism is society's safeguard against revolution and disintegration. Many a neglected fable teaches that we despise the past at our peril. Wisdom is justified of all her children." (p. 237.)

Considering the author's self-imposed limits of coverage, the American reader —naturally—will find nothing on hummingbirds, or superstitions concerning the Gray Jay *(Perisoreus)*, and so on. But probably any reader will find that this book evokes memories of things taught or heard in childhood, or discussed in most serious fashion by fishermen or people in rural areas; this may cause some to wonder as to the extent of their misfortune in being conditioned against perpetuating the folklore they have received. Such as: it is bad luck to kill a Robin *(Erithacus,* transferred to our *Turdus)*; on hearing an owl, one should tie a knot in the corner of a sheet to forestall illness; that there is a deep-seated reason why some people nail a dead owl to the barn; the interest in the first swallow in spring; etc. Such are the surface phenomena; this book explains what lies underneath.—R. S. Palmer.

60. Bird Life throughout the Year. (Swiss Bird Life, Volume 1). (Das Vogelleben im Jahresverlauf. (Schweizer Vogelleben, Band 1).) Hans Noll. 1958. 2nd ed. 16 line drawings; 32 photographs. Basel. Wepf. 160 pp. A delightful and efficient guide to bird watching. The 6 chapters are as follows: Winter and winter guests from the bird world—December through February; Towards spring—February, March; Return of old acquaintances—March through May; High time in bird life—May, June; Quiet time, molt, and departure of our breeding birds—July, August; Migration, and return of winter guests—September through November. There are 3 appendices. Fifty-four of the regular and more common winter guests are each described and their distribution noted. Three pages are devoted to average arrival dates of the commoner breeding birds with notes on their habitats. Finally there is a most useful breeding-time calendar of the commoner and well-known species—75 in all. These are divided into

6 habitats and the following information given: dates when nests or young can be expected; position of nest, size of set; reliable incubation and fledging periods, and number of broods. The book concludes with a subject and a species index.

This volume is written with charm and clarity by an ornithologist of long and wide experience. It is well designed to prove a guide "to these lovely creatures that neither sow nor reap, but live their lives simply and gladly, as each day comes, without worries and without cares."—M. M. Nice.

61. The Bird Life of Great Salt Lake. William H. Behle. 1958. University of Utah Press, Salt Lake City. 203 pp., ill. Price $4.50. This is a semipopular dissertation, as the subtitle states, on the "Life History, Ecology, and Population Trends of the California Gulls, White Pelicans, Double-crested Cormorants and Great Blue Herons, together with an account of the Bear River Migratory Bird Refuge." It contains an excellent historical sketch of the lake's bird colonies and good accounts of the nesting behavior, food habits, and general biology of the four species principally involved. As a comprehensive study, however, the work strikes me as a bit haphazard. The omission from the 12-page bibliography, for instance, of references cited in the text (I looked in vain for the titles of Lockerbie's 1943 and 1946 papers mentioned on page 28 and the Akker and Wilson reference on page 174) suggests it is not as complete as it might have been. The factual information it presents seems a bit old, and the use made of the available banding data is far from exhaustive.

Delays between the completion of field work and the publication of results are inevitable, but this volume published in 1958, with papers cited in its bibliography up to 1956, gives banding "returns" only to 1953 and no population figures for the colonies later than 1949. The islands are obviously difficult to reach; they lie 20 to 70 miles from Salt Lake City (a scale of miles on the map would have been helpful), and transportation to them over the large, shallow, and excessively salty lake is, I understand, hard to obtain and always uncertain. Nevertheless one cannot help wondering what the current status of these fine bird colonies is, and what if any attention has been given them since the author last visited them, ostensibly 10 years ago.

In commenting on his banding results Behle does not differentiate between the terms recovery and return and uses the two indiscriminately for either category, which is at times quite confusing. Also perplexing in his discussions of population dynamics is his inattention to the statistical possibilities of the mass of banding data available to him. This is particularly manifest in the account of the California Gulls, for which up to 1953 he had at least 260 "returns" from birds banded as juveniles, the oldest of which had reached the age of 12 years, and whose worn band "which probably would not have lasted more than another year or two" leads him to comment "Hence there are limitations to ascertaining longevity by means of banded gulls." There are limitations indeed, but that is no reason for neglecting what the data can be made to show. Certainly a random sample of 260 birds of known age up to 12 years should be adequate for calculating the species' mortality and survival rates and potential life span.—O. L. Austin, Jr.