individuals show the differences to be significant at above the 1 percent level in each sex.

| | Same individuals | | | | Whole series | | |
|---|---|---|---|---|---|---|---|
| | No. | Mean Juv. | Mean 1st Winter | Mean of Diffs. | No. | Mean Juv. | No. | Mean Adult |
| Male | 6 | 88.0 | 92.7 | 4.3 | 18 | 87.8 | 108 | 92.4 |
| Female | 7 | 84.3 | 88.7 | 4.4 | 26 | 85.6 | 142 | 89.9 |

There is no evidence yet as to further growth after the postjuvenal molt.—Charles H. Blake, Museum of Comparative Zoology, Cambridge, Mass.

**Migrant Kirtland's Warbler Mist-Netted.** — On May 10, 1959 a Kirtland's Warbler *(Dendroica kirtlandii)* was taken in a Japanese mist-net at Point Pelee National Park, Essex County, Ontario. On examination it proved to be a first-year male having new bluish feathers on the crown and sides of the head and worn grayish feathers on the nape and back and faint speckling on the breast. It was banded with U. S. Fish and Wildlife band number 26-88093. According to Harold Mayfield this is probably the first time a Kirtland's Warbler has ever been caught and banded during migration.

Measurements and weight are: flattened wing—68 mm; bill from feathers—12 mm; tarsus—22 mm; tail—57 mm; weight—15.6 grams and fat condition —medium (Wolfson, *Auk* **71**: 413-434, 1954). The tarsus was also measured with a 'Blake gauge' (Blake, *Bird-Banding* **25**: 11-16, 1954). The average greater diameter was 2.0 mm and the average lesser diameter was 0.9 mm. Recommended band size is number 0.

The bird was first seen perched near the ground in a scrub willow, in an open, sandy area bordering a cattail marsh. It was watched for several minutes by several members of the Ontario Bird Banding Association and the Federation of Ontario Naturalists. It sang briefly and occasionally flew out from its perch as if 'fly-catching'. There are two other records of the Kirtland's Warbler at Point Pelee. One, a young male was collected by W. E. Saunders October 2, 1915 and is now in the Royal Ontario Museum. The other, also a male, was seen May 10, 1953 by D. Sutton and Frank Cook (Baillie, *Aud. Field Notes* **7**: 271). J. Woodford, c/o Royal Ontario Museum, Toronto 5, Ontario.

## RECENT LITERATURE

### BANDING

**(See also Numbers 19, 21, 22, 23, 24, 28, 44, 62, 66.)**

**1. Bird Banding in Norway, 1957, Report Number Eight.** (Ringmerkingsoversikt 1957.) Holger Holgersen. 1958. *Sterna*, **3**(4): 145-177. (From the English summary.) The Norwegian banding reports are among the best summaries being published today, and several other banding schemes could profitably adopt their format. They summarize new bandings by species for the year and cumulatively, give each cooperator's totals, and present a selected list of significant recoveries with appropriate comments for each species, omitting repeats, short-term returns, and recoveries of little importance. The use of scientific names and of the internationally accepted symbols and abbreviations make the data perfectly intelligible and useful even to those who do not understand Norwegian.

In 1957 the Norwegian total bandings were 32,153, bringing their grand total to 294,007. Among the recoveries of interest are a *Rissa tridactyla* banded as a nestling in June in Norway and recovered in Newfoundland in November. A *Sturnus vulgaris* banded as an adult female in May 1954 and reported from the Barents Sea in March 1957 "apparently lost its head and course when returning from the supposed British winter-quarters."—O. L. Austin, Jr.

**2. Banding Results from the Revtangen Station for 1957.** (Ringmerkings-resultater fra Revtangen på Jaeren i 1957.) A. Bernhoft-Osa. 1958. *Sterna*, **3**(4):178-184. (From the English summary.) This is a separate report of the banding activities of the Stavanger Museum's observatory and banding station at Revtangen. The totals are included, however, in those for the previous report (No. 1). The report is outstanding for the large number of waders handled, though the fall banding "was very much handicapped by poor weather." So

far the station has banded 14,198 Dunlins *(Erolea alpina)* alone, 1,118 of them in 1957, with most gratifying results recoverywise. Listed here are one Dunlin 8 years of age and a second one banded at the Swedish Bird Observatory at Ottenby and retrapped at Revtangen 2 days later.—O. L. Austin, Jr.

**3. Bird-banding in Finland in 1957.** (Vogelberingung in Finnland im Jahre 1957.) Göran Nordström. 1959. *Memoranda Societatis pro Fauna et Flora Fennica,* **34** (1957-1958): 1-48. Banding activities in Finland continue to increase. The 38,628 birds of 168 species banded in 1957 bring the Finnish total to 259,367 individuals of 215 species. Among the long list of recoveries reported are two for *Larus fuscus* 26 years old.—O. L. Austin, Jr.

**4. Bird Banding in 1956.** (Prstnovanje ptica godine.) Renta Kroneisl-Rucner. 1959. *Larus,* **11** (1957): 5-22. (With English summary.) Yugoslavian banders had their best year to date in 1956, when 71 cooperators banded 14,836 birds of 117 species, roughly half of them as nestlings. The list of 76 "recoveries" from their bandings contains a high proportion of returns and repeats. Also given are raw data for 76 Yugoslavian recoveries of birds banded abroad in Poland, Russia, Esthonia, Lithuania, Czechoslovakia, Hungary, Germany, Holland, France, England, Italy, and Sweden.—O. L. Austin, Jr.

**5. Fourth Annual Report of the Australian Bird-Banding Scheme, July 1957-June 1958.** W. B. Hitchcock and R. Carrick. 1958 *C.S.I.R.O. Wildlife Research,* **3** (2): 151-141. During this period the Australians banded 35,618 birds of 154 species, almost equaling the totals for the preceding 4 years combined. Their figure of 8,735 "recoveries" of 85 species resulting from the banding (almost 25 percent!) is unreal, for it includes a large number of repeats and returns, categories which the Australians unfortunately do not recognize. Totals banded and "recovered" are listed in tabular form for each species, and the report concludes with full data for 110 selected "recoveries" with terse comments on their significance under each species.—O. L. Austin, Jr.

**6. Eighth Preliminary List of Recoveries of Birds Ringed in Greenland.** (Oftenda foreløbige liste over genfundue grønlandske ringfugle.) Finn Salomonsen. 1959. *Dansk Ornithologisk Forenings Tidsskrift,* **53** (1): 31-39. (From the English summary.) Gives the raw data for 47 recoveries among 9 species banded in Greenland and recovered elsewhere, with comments on the significance of the more interesting ones. Outstanding is the recovery of a Snow Bunting banded in northeast Greenland and recovered in northeastern Russia. "This second Russian recovery removes the doubt which is attached to the first one whether the northeast Greenland population regularly moves so far to the east. It must be regarded as quite certain now that the northeast Greenland Snow Buntings move due east in autumn, across the Polar Sea, north of Scandinavia, to north Russia where they continue to the south, and spend the winter in the steppes and open forest land of central and southern Russia. This is a most peculiar and quite unexpected migration route, and it shows that the different populations of Snow Buntings are strictly allohiemic."—O. L. Austin, Jr.

**7. France and the Passage of Danish Migrants.** (La France et la passage des migrateurs Danois.) P. Skovgaard. 1958. *Alauda,* **26** (2): 105-118. At the author's banding station in Denmark some 200,000 birds were banded up to 1949, from which about 12,000 recoveries have been reported. To emphasis the importance (and perhaps the danger) of France to the Danish migrants, he totals here the 540 recoveries of 49 species received from that country alone. As the recoveries are summarized sketchily for each species without complete data, they are of use only in showing the most general of trends. Outstanding, as in all European banding schemes, is the high rate of recoveries reported. While this reflects the hunting pressure birds experience in western Europe, especially in the various passerines which yield anywhere from 1 to 4 percent recovery, it likewise signifies better reporting than on this side of the Atlantic of those bands that come to human notice.—O. L. Austin, Jr.

**8. Florida Waterfowl Band Recoveries 1920-1957.** Robert K. Hyde. 1958. Game and Fresh Water Fish Commission, Tallahassee, Florida. Photo-offset. pp. 1-23 + 34 maps. This report was designed "to acquaint the sportsmen of Florida with the banding program" and, incidentally "to stimulate the curiosity

of the hunter enough that when a band is recovered it will be reported immediately and not be put away 'til later' and never thought of again, as many bands are." It summarizes sketchily the recoveries for 19 species of ducks and geese either banded in Florida and recovered there or elsewhere, or banded elsewhere and recovered in Florida, and shows the more dramatic and significant of them on a series of maps. The data are understandably incomplete, and no attempt is made to analyze them, but if the pamphlet improves the rate of reporting of bands by hunters, it will perform a most worthwhile service.—O. L. Austin, Jr.

## MIGRATION

**(See also Numbers 6, 7, 24, 53, 56.)**

**9. Celestial Navigation by Birds.** E. G. F. Sauer. 1958. *Scientific American,* **199** (2): 42-47. This attractively illustrated popular article brings within easy reach of Americans a firsthand description of the sensational experiments in a German planetarium that revealed the ability of night-migrating Old World warblers to orient by the stars (for an abstract of the original report, outlining the main features of the present one, see *Bird-Banding,* **29** (1): 49-50).

The experimental results fall into such beautifully consistent patterns, so free of untidy loose ends, that they carry almost irresistible conviction; and many people tend to assume that a majority of nocturnally migrating land birds behave in nature as the three test species did in the controlled artificial environment. But several difficulties must be overcome and some contrary evidence explained before such a conclusion can be fully accepted, for example:

(1). Warblers hatched and reared in completely closed, soundproof chambers indicated by their reactions in the planetarium that the ability to interpret the map of the stars is inborn. Yet through the phenomenon known as precession, the navigational meaning of the star pattern on a given date has been constantly changing through the course of evolutionary time. It is, therefore, almost impossible to visualize how such an adaptation can have arisen through natural selection.

(2). Sauer's birds acted as if positively phototactic to the moon. Yet this seemingly disastrous distraction is one with which birds in nature must contend on more than half the nights they migrate.

(3). In the planetarium, inexperienced warblers suddenly confronted with star patterns of longitudes to the east of their home longitude almost immediately adjusted their directions to point back toward the usual migration starting point in Germany. Yet in mass outdoor tests with banded birds of other kinds, young migrants that have never visited the winter range of the species have repeatedly revealed a lack of the adult's capacity to compensate for eastward or westward displacement.

(4). The indoor experiments provided evidence that "with no cue except the stars, the birds are able to locate themselves in time and space." Yet, if this were generally true of night migrants, the process of migrational drift, which has been directly observed again and again under the real stars, could hardly occur.

These seeming contradictions make a fascinating discovery all the more fascinating and add increased suspense to the future studies in the laboratory and in the field through which they will some day be explained.—R. J. Newman.

**10. Orientation of Migrants over Sea in Fog.** J. M. B. King. 1959. *British Birds,* **52** (4): 125-126. On March 26, 1958, Mr. King and a companion were aboard ship 10 miles off Plymouth, Devon, near the fabled Eddystone light during a period of fog in which visibility from the ship varied from 100 yards to one mile. They catalogued the passage of 1600 migratory birds in 4¼ hours and observed the direction of flight from the vicinity of the ship once the birds had reoriented themselves after being deflected off course by sighting the ship.

The writer's observations led him to the conclusion that the migrants were able to orient quite well where no land or sky was visible, except that they became lost when "the fog closed right down." He sees these observations as evidence of "visual orientation by migrants over the sea when the sky is obscured" —orientation by the direction of the waves previously determined by the birds in relation to their "course."—Stuart L. Warter.

**11. Correlation between the Homing Abilities of Pigeons and Temperature.** (Korrelation zwischen Heimfindevermögen von Brieftauben und Temperatur.) Hans G. Wallraff. 1957. *Die Naturwissenschaften*, **21**: 568-569. Over a number of years the late Gustav Kramer and his associates carried out a series of carefully planned field tests designed to make order out of the tangle of claims and counter-claims that has arisen during the long history of homing experiments with domestic pigeons. Several products of this work not previously summarized in *Bird-Banding* are reviewed in this issue.

It had been noticed that homing performances at short distances were considerably worse in winter than in summer, but on some cold days they were better than on warmer ones. In this briefest of the several contributions, Wallraff furnishes a graph comparing "relative homing performance" with temperature in monthly tests extending from August 1956 to August 1957. The performance curve is based on the percentage of pigeons that returned on the day of release, the portion homing at 20 km. per hour or better being given full value and the portion homing more slowly being counted at half value. This procedure (the exact logic of which is not explained here) yields a marked correspondence with the temperature curve—a fit far more striking than the straight totals for first-day returns would produce. A scatter diagram is included to show that improvement in homing performance levels off sharply at 10°C. The means by which low temperature influences the results remains unknown except that there is reason to believe it does so by impairing the homing ability itself, rather than by merely curbing the birds' desire to return.—R. J. Newman.

**12. Directional Differences in Pigeon Homing.** G. Kramer, J. G. Pratt, and Ursula von St. Paul. 1956. *Science*, **123** (3191): 329-330. Far more elaborately investigated than the influence of temperature on homing has been the so-called "directional effect." Here, Kramer, Pratt, and St. Paul report on 675 flights in the vicinity of Durham, N. C., made from a "cross release pattern" in which pigeons were turned loose singly at 10-minute intervals at points approximately due north, south, east, and west of the home loft and approximately equidistant therefrom. The distances used in the different trials were both short (16 and 17¼ miles) and long (53 to 60 miles). At either range the largest number of returns were from the south, the smallest number from the north.—R. J. Newman.

**13. Testing for an ESP Factor in Pigeon Homing: Requirements, Efforts, and Difficulties.** J. G. Pratt, 1956. *Ciba Foundation Symposium on Extrasensory Perception* (Little, Brown, Boston): 165-179. The failure of any sensory hypothesis of bird navigation to gain universal acceptance has excited the interest of parapsychologists and inspired them to undertake some ornithologically rewarding experiments. One especially ingenious example is the "rectangle" release dealt with in this paper. Imagine a four-sided figure with these dimensions in miles: top 75, bottom 81, left side 94, right side 101. At the northeast (upper right hand) corner lies Richmond, Va.; at the opposite corner, Durham, N. C.; at the remaining two corners are the chosen release points A and B, at each of which pigeons from both cities are turned loose. Sixteen days later the test is repeated, but the birds first released at A are now taken to B and vice versa.

In both trials, initial orientation was better from the north and south than either the east or west, with Durham and Richmond stock performing about equally well. The over-all homing scores were best from the west and almost as good from the south (Richmond birds in both cases); they were markedly inferior from the east and north (Durham birds). Thus, all in all, the data did not strongly corroborate the results of the cross release (see No. 12). In general, both observed orientation and homing success improved considerably in the second "rectangle" test, but good initial orientation and good homing were not very closely correlated.

Such an experiment as this, as Pratt recognizes, is incapable of producing evidence of extrasensory perception, but he regards it as a prelude to a more expensive undertaking theoretically capable of doing so—one in which both the pigeons and the home situation are displaced.—R. J. Newman.

**14. Two-Direction Experiments with Homing Pigeons and Their Bearing on the Problem of Goal Orientation.** G. Kramer, J. G. Pratt, and Ursula v. St. Paul. 1957. *American Naturalist*, **91** (856): 37-48. The authors review some of the experiments mentioned above and discuss three additional ones apparently not previously described in print.

At a castle in Germany directly south of Wilhelmshaven, directly north of Freiburg, and situated midway between, pigeons from the two cities were released alternately. Wilhelmshaven birds performed better than those from Freiburg in terms both of initial orientation and homing success. Thus the results demonstrated in a new way that in the region concerned pigeons home best from the south.

At a point 90 miles roughly southwest of Durham, N. C., and 117 miles roughly northeast of Mountville, S. C., a test of similar design was carried out. Vanishing points of the pigeons from both cities were scattered among the directions north of the east-west line, with no appreciable difference between the two groups. All except one of the Durham birds homed; all the Mountville birds were lost.

Another such release was made near Asheboro, N. C., with pigeons from Durham, 54 miles to the northeast, and Greenville, S. C., 158 miles to the southwest. The Greenville birds showed indications of homing orientation, while nearly all the Durham birds, which should have flown east-northeast, headed south toward the city of Asheboro. Homing success, though poor in both cases, was less so in the case of the initially disoriented Durham birds.

From the accumulating data, the paper draws the following tentative conclusions: that, even under similar weather conditions, homing pigeons in the eastern United States can orient themselves much better on some days than others; that on the whole, however, their departure patterns are less accurate than those of birds in England and northern Germany; and that their inferior performance, while possibly due to differences between the stock here and that used abroad, is more likely the result of regional differences in the physical substrate that provides orientation clues.—R. J. Newman.

**15. New Studies of the Directional Effect.** (Neue Untersuchungen über den "Richtungseffekt.") G. Kramer, J. G. Pratt, U. v. St. Paul. 1958. *Journal für Ornithologie*, **99**(2): 178-191. This most recent study by Kramer and his collaborators does not discuss—and indeed does not even cite—the directionally ambiguous results summarized in the preceding two reviews. Abandoning entirely the criterion "take-off" directions, which have proved so unstable in our country, the present investigation goes back to the cross release pattern (see No. 12) and employs its basic principle in a series of two-directional simplifications. Homing ratios and homing speeds become the sole measure of the directional effect, but these are evaluated by a revised scheme that permits chi-square tests of significance.

In new trials comparing releases from north and south of lofts in Virginia and the Carolinas, pigeons were flown on 19 different dates from as close to home as 8 km. and as distant as 200 km. In every case, in conformity with the expected directional effect, homing was better from the south. In the several of these tests made under overcast skies when the birds could not orient by the sun, those returning from the north were only slightly affected. On the other hand, far fewer birds from the south than usual were in the top category of speed (24 km. per hour or faster) and far more in the middle category (back on the day of release at less than 24 km. per hour); but because so few of them fell into the worst bracket (later on the release day), the arrivals from the south still managed to maintain a statistically significant edge. In addition, several actual four-directional tests were run with birds from a different loft just outside Durham, N. C. In the flights at 8 and 66 km., the predicted distribution for the cross release (south best, north poorest, east and west intermediate) was reproduced, but at 16 and 27 km. the fliers from the east unexpectedly exceeded all the others. Still further work in Germany, with Wilhelmshaven pigeons, revealed that those flown from the east home better than those from the west but that when more than one release is made simultaneously at different points along the same route the birds from the different distances frequently do not return in the proportion of time anticipated.

The history of homing studies has been that no sooner is a hypothesis erected purporting to explain all the assembled evidence than new evidence is found to demolish it. Within the past decade we have seen a succession of events illustrating this pattern: the rise of the Yeagley idea of a grid of Coriolis and magnetic forces; its prompt discrediting by physical analysis and the substitution of an awesomely sophisticated mathematical model of topographic search; the demonstrations of ultra-long-distance homing that almost immediately forced even the originators of the modernized search theory to confess its inadequacy; and finally the well-known sun-arc hypothesis of the leading British investigator Matthews.

At the time of his death, Dr. Kramer seemed well on the way toward preserving tradition by establishing through experiment a conclusion to which others were already leaning on purely analytic grounds—that pigeons cannot navigate exclusively by the sun. The data reviewed in this issue make up an important part of the case. Though a consistent superiority on the part of birds homing from the south might conceivably be explainable in terms of Matthews' sun-arc speculations, the contrast between releases from the east and those from the west is very difficult to rationalize in such terms. The faster return of "south" birds compared with "north" birds even under complete overcasts seems to show that, while the sun is an important factor in the homing process, it is not the only important factor. Persistence of the directional effect even with release points only 8 km. from the home loft—release points from which the goal remains visible—indicates that the second important factor involves more than the sense of sight. Differences in homing performances in different regions and along different portions of a route suggest that the factor may be geophysical. However, not all the data supporting these arguments were obtained under circumstances that positively rule out, as complicating elements, genetic differences in pigeon strains and effects of the weather.—R. J. Newman.

**16. Periodic Wind Variations.** Alfred K. Blackader. 1959. *Mineral Industries*, **28** (4): 1-8. Although this is not essentially an ornithological paper, the information it contains should prove of more than passing interest to ornithologists. It discusses a meteorological phenomenon of recent discovery which, although of potentially great bearing on nocturnal bird movements, has apparently escaped the notice of many students of migration.

This particular phenomenon is a shallow, rapidly moving sheet of air that usually develops at night under certain conditions between 1000 and 3000 feet above the land surface, and is sandwiched between slower layers moving in the same direction above and below. Referred to as a "low-level jet" or "jet stream," under favorable conditions this air flow may reach nocturnal peak speeds 50 mph greater than those attained in daytime. The nocturnal formation of a low-level jet depends on the diurnal cycle of heating and cooling of the land surface. As sea surface temperatures vary little or not at all, this type of wind variation does not occur over the oceans. As a corollary, the farther away from the sea, the greater the temperature variation, and under proper conditions low-level jets may develop almost anywhere over the United States. The strongest and most frequent jets usually occur above the Great Plains.

"The requirements for a well-developed jet stream during the night are clear weather, rapid warming near the ground during the daytime, rapid cooling at night, and a moderate pressure gradient." Daytime heating of the land surface causes convective disturbances that interfere with the normal flow of the upper air; nighttime cooling removes these disturbances so that the combined influence of the earth's rotation (Coriolis force) and the horizontal pressure gradient may restore normal flow. The upper layer is "freed of its restraint" and speeds up, reaching its maximum between midnight and dawn, while the surface air slows down under the influence of the frictional drag of the ground. The amount of wind shear that develops beneath the low-level jet depends on the speed of the jet in relation to wind speed at the surface; if the wind speed in the jet is sufficiently great, dangerous wind shear may result, the flow beneath the jet stream may become unstable, and turbulence may result with brief periods of strong, gusty winds at the surface.

Low-level jet streams are intimately associated with nocturnal inversions (temperature increasing with altitude) in which the densest air is at or near ground level and the absence of convective rise of warm, less dense air from the surface lends stability to the air above. G. S. Raynor (*Auk*, **73** (2): 153-175) advanced

the hypothesis that nocturnal spring migration "normally takes place with favorable winds in stable air which may be caused either by ground or frontal inversions." In a short discussion of bird migration, Blackader speaks as if the Raynor hypothesis postulates that birds prefer to migrate on spring nights when an inversion is present *solely* because of "the absence of turbulence in such a temperature scheme," and proposes the tail-wind boost of the low-level jet stream as "a more plausible explanation." However, whether or not Raynor was aware of the existence of the low-level jet, he did recognize the importance of wind, but felt that stability played a greater role. Considering the available evidence, this still appears a moot point, but data now being processed at Louisiana State University may help to provide a solution. Blackader also states that fall migrants avoid flying on a night with an inversion present if an opposing jet stream exists, but here no original research is mentioned, and he fails to credit his source of information.

For a somewhat more technical, but perhaps more accessible, discussion of the low-level jet phenomenon see "Boundary Layer Wind Maxima and Their Significance for the Growth of Nocturnal Inversions" by the same author *(Bull. Am. Meteor. Soc.*, May, 1957, **38** (5): 283-290).—Stuart L. Warter.

**17. The British Contribution to the Study of Bird Migration.** A. Landsborough Thomson. 1959. *Ibis*, **101** (1): 82-89. As a part of the special issue of *The Ibis* to commemorate the centenary of the BOU, Sir Landsborough Thomson presents a summary of British contributions to ornithology in the field of migration. The main features of nearly 300 years of British ornithological occupation with migration, beginning with Francis Willughby in 1678, have been thoroughly condensed into 7½ pages of *The Ibis*. It is unfortunate for the non-British reader that bibliographic references to the cited contributions could not be given, for although "the sources are well known" or otherwise "ascertainable" to British readers, this is not necessarily so for others.—Stuart L. Warter.

**19. A visit to Fair Isle September 1957.** (Ett besök på Fair Isle september 1957.) Anders Edfelt. 1958. *Fauna och Flora*, **6**: 243-248. The Fair Isle Bird Observatory is run by a committee of the British Trust for Ornithology. The station occupies several well-built houses with room for 14 guests. The birds are caught in 12 Heligoland traps. Upon capture each bird is brought home to the well-equipped laboratory where it is banded, weighed, and measurements taken of the bill, tarsus, wings, tail, and also of the primaries in rare species. Birds driven off course during migration are objects for special study. "Lost" birds from the Asiatic as well as the American continents may touch down at this tiny treeless island halfway between the Orkney and Shetland Isles in the midst of the North Atlantic. In the fall, easterly and southeasterly winds bring the great migratory "waves." They occur when a low pressure develops over north and central Europe, south of which a flow of air from the east results, forcing the migrants in a westerly "drift."—Louise de K. Lawrence.

**20. Fall migration at Kvarngärdet near Uppsala 1957 and the weather.** (Höststräcket och vädrets inverkan pa dess förlopp vid norra Kvarngärdet i Uppsala 1957.) Bengt-Olov Stolt. 1959. *Vår Fågelvärld*, **18**: 12-33. (English summary.) This study was conducted from 30 August to 20 October 1957. The greatest numbers of migrants appeared nearly always when falling temperatures were recorded to the north and northeast or in the region itself, with or without the passage of cold fronts. On one exceptional occasion a migratory "wave" appeared when a rising temperature dissolved mists and improved visibility. Diagrams show detailed data on the movements of *Alauda arvensis, Oenanthe oenanthe, Lucinia svecica*, as well as for some *Phylloscopus* species, considered most typical, in relation to the temperature.

This analysis would have been more convincing, in my opinion, had the behavior of the birds, i.e., whether they were in flight and moving across the surface of the land or resting, been brought out more clearly and consistently. Birds migrate, of course, by flying, and when resting they have stopped migrating. Thus, if the urge and inhibition to migrate coincided (which they appeared to do) at the same time or under similar conditions, either the temperature as a single factor released opposite reactions in groups of migrants, or other factors beside the temperature also affected the movements of the birds—Louise de K. Lawrence.

**21. On the Breeding and Wintering Grounds and Migration of the Slender-billed Gull.** (Sur les zones de reproduction et d'hivernage et les migrations du Goéland Railleur *Larus genei* Brême.) Christian Erard. 1958. *Alauda*, **26** (2): 86-104. (With English summary.) This paper is based largely on a Russian paper by S. M. Semenov and B. W. Sabinevskij entitled "Study of the Seasonal Movements and Migration of the Slender-billed Gull by the Banding Method" (*Trudy Byuro Koltzevanya*, Moscow, 1957, **9**: 86-133), which reports the details of 809 recoveries from 65,127 banded Slender-billed Gulls. On the basis of these data and other information culled from literature, the author delineates the species' breeding ground in southern Russia and traces three main migration routes, one south and east through the Gulf of Arabia to the Indian Ocean, the other two south and west, one through the Black Sea and the Dardanelles to the northern Mediterranean, the other across Turkey to the eastern Mediterranean. —O. L. Austin, Jr.

**22. Migration and Dispersal of New Zealand Gannets.** Kazimierz Wodzicki and Peter Stein. 1958. *Emu*, **58** (4): 289-312. This paper summarizes the results obtained to date from the banding studies initiated on two large New Zealand gannetries by the senior author in 1951 and continued through 1957. The 3,999 Gannet chicks banded have yielded 207 recoveries. "Full-fledged chicks leave the gannetry at the age of 15½ weeks. . . . At the age of 24 weeks all but sickly or late chicks cross the Tasman Sea with an average speed of up to 240 miles per day. . . . Sub-adult Gannets remain in Australian waters until they are two to three years old. . . . An analysis of live birds recovered at the gannetry shows that young Gannets begin to re-appear at their home-gannetry at the age of 3 years, first as 'roosting' or 'unemployed' birds; from the age of 4-5 years they commence to breed, but at the age of 6-7 years only about half of the birds are breeding."

The authors lump the genus *Morus* with *Sula* and regard the Northern Gannet, *S. bassana*, the African *S. capensis*, and the Australasian *S. serrator* as only subspecifically distinct. "In all three subspecies there is a similar strong urge in juvenile birds to migrate to warmer seas. Also a similar maximum distance of about 4,000 miles may be flown by the three subspecies, but whereas North Atlantic and Cape Gannets move equatorwards, New Zealand-bred Australasian Gannets migrate westwards."—O. L. Austin, Jr.

**23. Recovery of a Group of Ringed Gannets.** D. L. and V. N. Serventy. 1958. *Emu*, **58** (5): 391-392. Four of seven apparently storm-killed *Sula serrator* found together dead on a short stretch of beach in New South Wales wore bands Serventy placed on them as nestlings 3 years before at Cat Island, Tasmania. Strong group adherence evidence of this sort is not plentiful, but the authors believe the phenomenon "may well be general in colonial nesting birds." Most of the banded Gannets previously reported from Australia away from the breeding areas were ringed in the New Zealand gannetries, where much more banding has been done than in the Australian ones. "The general recovery records to date suggest that the Australian and New Zealand breeding populations intermingle throughout the southern Australian foraging range of the species." —O. L. Austin, Jr.

## POPULATION DYNAMICS

**(See also Numbers 32, 35, 36, 37, 52, 66.)**

**24. Dispersal Migration, Longevity and Death Causes of *Strix aluco*, *Buteo buteo*, *Ardea cinerea* and *Larus argentatus*.** Viking Olsson. 1958. *Acta Vertebratica*, **1** (2): 91-189. A fine statistical analysis of the recoveries obtained from the Tawny Owls, Common Buzzards, Common Herons, and Herring Gulls banded in Sweden, Norway, and Finland. The samples available for each species, ranging from 387 recoveries for the Tawny Owl to 1321 for the Herring Gulls, are indeed adequate and exhibit well-marked trends.

The author's analysis of band loss, a problem that has long vexed those of us working with marine birds, shows it to be of considerable moment in the Herring Gull, on which the Fenno-Scandian bands seem to last between 6 and 7 years.

In the Owl and the Buzzard, however, he finds band loss of no importance, and bands on Herons, "a species with both aquatic and arboreal habits, show a surprisingly low annual loss of weight, only about 1 percent."

Post-fledging dispersal in the four species falls into two different patterns. Both the Heron and the Tawny Owl exhibit what we term the "grenade effect," known generally abroad as "*Zwischenzug*" (interim wandering), and scatter widely immediately after leaving the nest. Buzzards exhibit the trait to a lesser extent, "and the Herring Gulls not at all. The releasing factor seems to be lack of food, and the variation of extensiveness between different species is probably due to the fact that the species characterizd as food-specialists are harder hit by such lack and consequently are more swiftly and more frequently driven away from their hatching places. . . . In species with extensive dispersal (here the Tawny Owl and the Heron), this [*Zwischenzug*] must be the most important factor for the colonization of new areas and for contact and an exchange between different populations. In the Herring Gull and the Buzzard with limited or no dispersal, prolonged migration and pairing in the wintering grounds will instead be most important."

Shooting is the commonest cause of death in the recoveries reported for the three diurnal species. In the nocturnal Tawny Owl man-made structures such as power lines, railways, buildings, and the like seem responsible for most of the mortality. Well-constructed life tables show interesting variations between the four species, in each of which "the calculated mortality is well balanced by the calculated annual production of young surviving until they become fully flegded." First-year mortality is far higher than subsequent mortality in all four, and the figures for Heron and Buzzard survival show "a surprisingly great successive increase of the expectation of further life in adults up to their 8th year of life."—O. L. Austin, Jr.

**25. The Sex-ratio and the Production of the Mallard, *Anas platyrhynchos* L.** J. A. Eygenraam. *Ardea*, **45** (3/4): 117-143. (With Dutch summary.) In the breeding population of Netherlands mallards the sex ratio varies considerably throughout the year. In January just before the breeding season it is approximately 106 males to 100 females. The excess of males over females in the young at hatching is apparently considerably higher, but is reduced by selective hunting and decoying in the autumn to 114:100 in November. The nesting population is estimated at 300,000 mallards of which 145,000 are females, each of which rears an average of 5 ducklings, giving an annual production of about 725,000.—O. L. Austin, Jr.

## NIDIFICATION AND REPRODUCTION

**(See also Numbers 22, 40, 41, 43, 46, 64, 66.)**

**26. Use of a Temperature Telemetering System in Incubating Eggs of Antarctic Birds.** C. R. Eklund and F. C. Charlton. 1959. *Trans. Am. Geophysical Union*, **40** (1): 41-42. Data on Skua *(Catharacta maccormicki)* and Adelie Penguin *(Pygoscelis adeliae)*. An egg of each was opened, a tiny transmitter placed inside, the egg closed and albumen injected, then the syringe-holes also closed. An experimental egg was added to the normal two-egg clutch of each species. From electromagnetic signals transmitted, it was determined that the skua egg had a temperature of 87°F-103.5°F (average 96.6°F). The egg temperature was 9.5°F less than the average body temperature. The penguin egg ranged 84.5°F-98.2°F (average 92.7°F). This is 11.1°F less than the average body temperature. In the skua, egg-temperature fluctuates greatly during the frequent changing-over by mates; the penguin may not be relieved by its mate for as long as two weeks.—R. S. Palmer.

**27. Nest Attentivity of Lincoln's Sparrow Determined Using Thermistor Bridge.** J. Murray Speirs and R. Andoff. 1958. *Canadian Journal of Zoology*, **56**: 843-848. A new portable thermistor bridge recorder is described and illustrated with three figures. It was used at a nest of *Melospiza lincolnii* on the 5th day of incubation from 9:32 a.m. to 2:12 p.m. There were 10 attentive periods ranging from 17-40 minutes, averaging 20.4 minutes. Inattentive periods ranged from 2-15 minutes, averaging 6.9 minutes. On the 8th day, "an overcast, mild

day, attentive periods of 25 minutes, 54 minutes, and 18 minutes were broken by inattentive periods of 3 minutes and 1 minute." Incubation was entirely by the female and lasted 13 days.—M. M. Nice.

**28. The Breeding Biology of the Greater Snow Goose on Bylot Island, Northwest Territories.** Louis Lemieux. 1959. *Canadian Field Naturalist*, **73** (2): 117-128. Two colonies of 28 and 30 pairs of *Chen hyperborea atlantica* on Bylot Island in Baffin Bay were studied from 27 May to 26 August 1957. Incubation lasted from 23 to 25 days. The goslings "feed very actively almost twenty-four hours a day." They start to fly about 20 August when about 6 weeks old. Three goslings separated from their parents during a chase raised themselves. The adults molt from about 25 July 'till late in August. A total of 779 geese was herded into traps and banded; 47 of them have been recovered at Cap Tourments, Quebec.—M. M. Nice.

**29. Early Breeding in 1957.** M. J. Goodacre and David Lack. 1959. *British Birds*, **52** (3): 74-83. From December 1956 through March 1957 the weather in Great Britain was exceptionally mild; 7 resident passerines and one resident owl laid their eggs 6-12 days earlier than usual. "Temperature perhaps acts directly on the birds, rather than through its influence on the vegetation." M. M. Nice.

**30. The Breeding Biology of the Ivory Gull in Spitsbergen.** P. P. G. Bateson and R. C. Plowright. 1959. *British Birds*, **52** (4): 105-114.—Three weeks in July and August 1958 were spent at a colony of some 35 pairs of *Pagophila eburnea* nesting on a steep cliff. Two eggs were found in 22 nests, 1 egg in 10. A continuous watch for 24 hours on 3 nests showed that the pair shares incubation, each partner staying for a few minutes to over 11 hours. The incubation period for one egg was between 24¼ to 25¼ days. The most serious predator is the arctic fox. The "Ivory Gull seems to be tied to the pack ice in winter. For the most part the immature birds remain at the pack ice in summer as well and the breeding areas are never far removed from ice." A valuable contribution. —M. M. Nice.

**31. Survey of House Martin Colonies in East Lancashire.** L. E. Bouldin. 1959. *British Birds*, **52** (5): 141-149. A survey in 1958 by the East Lancashire Ornithologists' Club of the nesting-sites of *Delichon urbica*. "Breeding was found mainly in five distinct zones totalling approximately 50,000 acres and mostly in centres of heavy human population," largely in the suburbs. "419 of 483 nests were within four hundred yards of some major water supply." "Human interference was the chief cause of nest failure and only 12 nests were known to have been taken over by House Sparrows."—M. M. Nice.

**32. Supplementary Note on Laying and Incubation in the Emperor Penguin.** (Note complementaire sur la ponte et l'incubation chez la manchot empereur.) J. Prevost. 1958. *Alauda*, **26** (1): 26-30. M. Prevost's observations lead him to comment anthropomorphically that egg-laying must be "abnormally painful" for the female Emperor Penguin. He notes four cases in which females died of prolapse of the uterus during laying. He also determined that the female transfers the egg to her mate within 3 hours after laying, then departs on her "feeding journey" and remains away about 2 months. In commenting on the high mortality of eggs during incubation, he notes that 679 eggs were lost during the 1956 season against 265 in 1952, but gives no information on relative percentages.—O. L. Austin, Jr.

**33. Studies on the Social Behavior of *Bubalornis a. albirostris (Vieillot)*.** (Etudes sur la Comportment Social de *Bubalornis a. albirostris* (Vieillot).) John Hurrell Crook. 1958. *Alauda*, **26** (3): 161-198. (With English summary.) This is a detailed study of the ecology and breeding ethology of the colonial-nesting African Buffalo-Weaver, which the author discovered to be polygamous. Each males establishes his territory in one particular "lodge," establishes a harem of females in from 3 to 6 nest holes within it, and defends it against all other males and all strange females that approach it. Females also have their own nest territoriality and repulse the approach of other females of the same harem. Clutch

size averaged 2.7 young per nest, and when three or four young were present in the nest "at least one was sickly and unlikely to survive. Examination of 49 young from the nests gave a sex ratio of one male to 2.2 females." The author considers his behavioral and anatomical data justify removing the two genera *Bubalornis* and *Dinemellia* from the family Ploceidae and establishing them in a separate family Bubalornithidae.—O. L. Austin, Jr.

**34. The Nesting of the Australian Gannet.** John Warham. 1958. *Emu*, **58** (5): 339-369. A fine account of the breeding behavior of *Sula serrator* based on the author's study of a small colony on Cat Island, Bass Strait, where he acted as warden from November 1957 until April 1958. It contains good observations and comments on voice, display and posturing, unemployed birds, coition, incubation, rearing of the chick, attentiveness, enemies, comfort moments, individual recognition, and fledging of the young.—O. L. Austin, Jr.

**35. The Breeding of Wood Pigeon Populations.** R. K. Murton. 1958. *Bird Study*, **5** (4): 157-183. A statistical analysis of data obtained by a team of workers observing nests of *Columba palumbus* in varied habitats, a total of 702 nests in 1955 and 926 nests in 1957. Mean clutch size was 1.84, brood size 1.82, and neither was subject to variation throughout the breeding season which extended from March through October. The hatching success of eggs was 42 percent, with most of the failures due to predation. Nestling success was 73 percent, with some loss roughly constant throughout the year from predation, but with a secondary loss in May, June, and early July thought to result from food shortage. Breeding success varied during the year and was highest in August when cereal food was most plentiful. Total breeding success was 31 percent and varied in the different sites and habitats, but the number of young finally produced per pair seemed to be the same in each. No data are given on adult mortality, but the author suggests the population fledges enough young each year to provide a potential replacement of the adult losses.—O. L. Austin, Jr.

**36. The Breeding of the Meadow Pipit in Swedish Lapland.** S. J. J. F. Davies. 1958. *Bird Study*, **5** (4): 184-191. The author compares breeding data from 30 nests of *Anthus pratensis* obtained during a 5-week visit to Swedish Lapland with similar data from British birds. The breeding season in Lapland begins 2 months later, the clutch size is 1.2 eggs larger, and hatching success is 38 percent higher in Lapland than in Britain. The author considers the higher hatching success in Lapland to be the result of lower predation there. As his present data show no apparent differences in the nestling period, they do not support the proposed generality that young birds are reared more quickly in arctic than in temperate lands.—O. L. Austin, Jr.

**37. The Breeding Distribution of the Great Black-backed Gull in England and Wales in 1956.** T. A. W. Davis. 1958. *Bird Study*, **5** (4): 191-215. This paper analyzes the results of a B.T.O. cooperative census of the breeding population of *Larus marinus* in England, Wales, the Channel Islands, the Isle of Man, and Great Saltee Island during the summer of 1956. Total breeding population in 1956 was estimated at 1800 pairs, "the total adult population at about 4000, and not more than 5000 birds." Some island populations had increased almost three-fold since the last previous census in 1930, but the populations on the mainland coasts showed no appreciable change. Man and foxes are the only predators influencing the distribution of breeding sites. Most of the nests are in colonies or among those of other gulls; rarely does the species breed solitarily. "Scavenging is a principal source of food at all seasons, but, when breeding, Great Black-backed Gulls take many young of other sea birds and, where available, adult and young Manx Shearwaters in great numbers."—O. L. Austin, Jr.

**38. Mixed clutch of Oystercatcher (Haematopus ostralegus) and Ringed Plover (Charadrius hiaticula).** (Mischgelege von Austernfischer und Sandregenpfeifer.) Karl Greve. 1958. *Ornithologische Mitteilungen*, **10**: 215. This mixed clutch, which was found in July 1958 on the eastern border of Neuwerk, contained two eggs of each species and was brooded by the Plover. The nest was destroyed by a flood.—R. O. Bender.

**39. Another case of bigamy with the Pied Flycatcher *(Ficedula hypoleuca).*** (Weiterer Fall von Bigamie des Trauerschnäppers.) Erich Thimme. 1958. *Ornithologische Mitteilungen,* **10**: 232. In the area of Iburg, the author found a nest of this species containing nine young attended by two females and one male. Five of the young were estimated to be two days older than the other four. One female was banded as well as the young. Other similar cases are known. —R. O. Bender.

## BEHAVIOR

**(See also Numbers 23, 37, 33, 34, 46, 51, 64, 66.)**

**40. Notes on the Display, Nesting and Moult of the Mute Swan.** Henry Boase. 1959. *British Birds,* **52** (4): 114-123.—Observations on *Cygnus olor* in the Tay estuary, in east Scotland. Display attitudes are illustrated with 15 graphic sketches.—M. M. Nice.

**41. Observations on Arctic Terns in Spitsbergen.** P. J. K. Burton and M. H. Thurston. 1959. *British Birds,* **52** (5): 149-161. Observations on some 600 pairs of *Sterna paradisaea* during the first half of August 1957. In the continuous daylight "the existence of a rest period was obvious from the silence which fell over the area about midnight." Glaucus Gulls *(Larus hypoboreus)* were the chief predators; they were violently mobbed by the terns as, indeed, were two harmless species—Fulmars *(Fulmarus glacialis)* and Kittiwakes *(Rissa tridactyla).* Eiders *(Somateria mollissima),* Long-tailed Ducks *(Clangula hyemalis),* and phalaropes of two species nested in association with the terns.

Experiments with mounted Glaucous Gulls elicited a great deal of mobbing; this was also true with a mounted head of an adult on a stick 16 inches from the ground and with a "two-dimensional paper model of a gull's head, twice life size. . . . but when the red spot on the bill was missing there was no response in the three tests made."—M. M. Nice.

**42. Notes on the Behavior and Plumage of Colour-ringed Blue Wrens.** Eileen and Joan Bradley. 1958. *Emu,* **58** (4): 313-326. Reports the results of a 12-month study of a population of *Malurus cyaneus* in a Sydney suburb. The authors color-banded 25 individuals, members of 3 groups, which they were able to keep under fairly close observation. There are cogent notes on family relationships, territory, display and song, and on the development of plumages.—O. L. Austin, Jr.

## WILDLIFE MANAGEMENT

**(See also Numbers 25, 63.)**

**43. Biology and Management of the Hawaiian Goose.** William H. Elder. 1958. *Transactions of the Twenty-third North American Wildlife Conference*: 198-215.—A year's intensive study of the exceedingly rare Nene *(Branta sandwichensis)* produced very interesting results. A breeding ground of a few square miles was discovered on the east slope of Mauna Loa at 6500 feet elevation. Strangely enough, the Nene breeds on a declining day length; the mid-winter hatching means short days for feeding and growth is slow. The 10 to 12 weeks required for the young to reach the flying stage are nearly twice the time needed by young Canada Geese *(Branta canadensis).* The maximum number of wild Nenes seen was 35. "This may well be all the Nenes remaining in the wild." The chief predators are feral cats, dogs, pigs, and mongooses; these should be poisoned. Nenes are being bred in captivity in Hawaii and in England, but at least half of the eggs are infertile or fail to hatch. Dr. Elder makes many excellent suggestions as to how the people of Hawaii can "protect their new official bird." —M. M. Nice.

## CONSERVATION

**(See also Numbers 58, 60.)**

**44. A Preliminary Investigation of Bird-catching.** (Inchiesta preliminare sulla uccellagione.) Ettore Bassini. 1958. *Ricerche di Zoologia applicata alla accia*, **29**: 1-125. (With English, French, and German summaries.) This report of an inquiry by the University of Bologna's "Laboratory of Zoology Applied to the Hunt" describes the various kinds of bird-catching installations in Italy, their distribution throughout the country, and their slow but general increase (except in one district) over the past two decades since the last such inquiry was made. No significant changes are apparent in the annual harvest of birds reported by the Italian netters, probably because of inadequate data, and the report makes no comments or recommendations.—O. L. Austin, Jr.

## PHYSIOLOGY AND PSYCHOLOGY

**(See also Numbers 26, 63.)**

**45. Molt in Birds and its Endocrine Determinants.** (La mue des oiseaux et son determinisme endocrinien.) Ivan Assenmacher. 1958. *Alauda*, **26** (4): 241-289. This is a useful, comprehensive, and up-to-date discussion of a subject on which physiologists have done a great deal of research in the last decade, and which the author treats under six main headings: thyroid, gonads, gonad-thyroid interrelationships, hypophysis, diverse endocrine factors, and light. He reviews the literature (bibliography of more than 200 titles), describes his own experimental work, and discusses the effects on molt of removal of various glands and of injections of thyroid extracts, androgens, estrongens, esterones, and other hormones. He shows in conclusion that "natural molt is conditioned by a complex of the bird's endocrine rhythms . . . [which], when the animal is in its natural surroundings, are affected by the periodicity of cycles of daylight and, at a last resort, confer to the phenomenon of molt its characteristic seasonality."—O. L. Austin, Jr.

**46. Social Life and Thermoregulation in the Emperor Penguin.** (Vie sociale et thermoregulation chez le manchot empereur *Aptenodytes forsteri*.) Jean Prevost and Francois Bourliere. 1957. *Alauda*, **25** (3): 167-173. (With English summary.) The authors comment on a series of 80 cloacal temperatures taken of incubating male Emperors in Adelie Land in 1952-53. Solitary fasting and incubating males have a cloacal temperature of 37.9 C. (about 100 F.) whereas those huddled together for protection against the cold and wind have temperatures about 2° C. lower. A series of weights taken on these birds showed the weight loss of those birds that huddled together was half the amount per day of that of birds kept alone. "The adaptive value of such a behavior pattern—which enables the fasting penguin to reduce its heat loss and . . . prevent a too rapid loss of weight—is obvious."—O. L. Austin, Jr.

## MORPHOLOGY AND ANATOMY

**47. On the Angle of the Cerebral Axis in the American Woodcock.** Stanley Cobb. 1959. *Auk*, **76** (1): 55-59. The "almost upside down" position of the brain in the skull case of *Philohela minor* led the author to compare its relative position with those of four other Charadriiformes. The differences are most easily expressed in terms of the angle between the axis of the bill and the axis of the brain, which he finds varies from 34 percent in the Herring Gull to 60 percent in the Semipalmated Sandpiper, 78 percent in the Dowitcher, 85 percent in the Semipalmated Plover, and a maximum of 117° in the Woodcock. He speculates interestingly on the probable sequence of phylogenetic development that led to this situation and the factors probably responsible for it. "Since the evolutionary change is evidently related to such an important function as food intake, it is reasonable to look upon it as caused by natural selection."—O. L. Austin, Jr.

## PLUMAGES AND MOLTS

**(See also Numbers 28, 40, 42, 45, 50, 51.)**

**48. An Approach to the Study of Molts and Plumages.** Philip S. Humphrey and Kenneth C. Parkes. 1959. *Auk*, **76** (1): 1-31. The authors feel that the terminology for describing the sequences and patterns of feather replacement in birds has not kept pace with recent advances in knowledge of these phenomena. Lack of concise definition and loose usage of even the basic words "plumage" and "molt" to cover a wide range of meanings have rendered them subject to misinterpretation, incapable of expressing observed particulars accurately enough for modern concepts, and especially inadequate for indicating homologies between different bird groups. Therefore, Humphrey and Parkes bravely propose, complete with definitions, a revised and almost totally new terminology for plumages and molts. Their recommendations are obviously the result of long thought and careful study on their part, and were acknowledgely reviewed and criticised by several colleagues both here and abroad whose advice and suggestions, I assume, they followed.

I have nothing but praise for their efforts, and I particularly admire their conservative approach to the semantic aspects of the problem, whereby they have resisted the temptation to coin new words and have tried to use the simplest possible English terms, redefined for their needs. As far as I can see their proposed terminology is sound and capable of indicating without confusion all known types and patterns of feather successions. Some of their suggestions fill obvious needs and should meet a ready acceptance. Before I had finished reading the article for the first time I found I had mentally assimilated their proposed "basic" and "alternate" for the somewhat misleading "non-nuptial" and "nuptial" I have used for those "plumages" all my life, and was unconsciously testing them as replacements.

I am sure, however, that their idea of restricting the word "plumage" to mean "a single generation of feathers," manifestly useful and practical though it be, will encounter stubborn resistance even among specialists in feather succession. Witness the difficulty of establishing in banding terminology concise meanings for "recovery" and "return" which, even after three decades, many banders (and almost all other ornithologists) still confuse and insist on using interchangeably. The word "aspect" proposed to indicate "the total *appearance* [italics theirs] of a bird at any given time" strikes me as serviceable and a happy choice, but I fear "feather coat" to "describe the aggregate of feathers worn by a bird regardless of the relative time of assumption of the components of that aggregate" holds less promise of success. The difference between "aspect" and "feather coat" is not entirely clear in the author's definitions and, if a term for the second concept be necessary, "feathering" so restricted might suffice with less vulnerability to satirical trifling.

Reforms and reformers are traditional targets for ridicule and always fair game for critics. Therefore I anticipate these proposals will come in for their share of disapprobation from the diehard Old Guard, and I will be greatly surprised if the authors are not prominently lampooned in the next "AUKLET" which, of course, will make them famous and completely successful. This middle-aged critic refuses to enter the lists, except to opine that the ultimate accolade, regardless of possible usage in the forthcoming "Hand-Book," will be the appearance of new editions of the Peterson and the Audubon field guides revised to describe the winter and summer aspects of each bird's feather coat.—O. L. Austin, Jr.

**49. The Bill Color of Summering Immature Common Terns.** F. Haverschmidt. 1957. *Ardea*, **45** (3/4): 176-178. On 22 July 1953 the author collected three *Sterna hirundo* in Surinam, one of which was a bird we had banded 28 June 1951 as a fledging at Plymouth Beach, Massachusetts. These three birds and two more immatures collected the following June and July in Surinam "have wholly black bills." As we have never observed such individuals breeding in the northern colonies, apparently the typical red and black bill of the nesting adults develops only with sexual maturity, seldom reached before the third or fourth year. Examination of the state of the gonads in such individuals would be conclusive.—O. L. Austin, Jr.

## ZOOGEOGRAPHY

**(See also Numbers 30, 37.)**

**50. Birds of the Northeastland of Spitsbergen.** (Fåglar på Nordostlandet, Spetsbergen.) Christman Ehrström. 1958. *Fauna och Flora*, **6**: 256-271. (German summary.) During the Geophysical Year a Swedish glaciological expedition was stationed at Murchison Bay from 15 July to 28 August 1957. Except for a coastal zone 20 km. wide where lichens and flowers grow sparsely, the Northeastland is covered with ice up to 700 metres thick. The contrast between the life and clamor of "millions of birds" in the western part of Spitsbergen and the silent sterility of the Northeastland is striking. Birdlife is concentrated at the coasts; a few Eiders *(Somateria mollissima)*, Kittiwakes *(Rissa tridactyla)*, Glaucous Gulls *(Larus hyperboreus)*, occasional Brünnich's and Black Guillemots *(Uria lomvia* and *U. grylle)* nest here. Farther inland Arctic Terns *(Sterna paradisaea)* may be encountered. Yearling terns, still in their winter plumages, were observed regularly and two halfgrown young were banded. An Eider that started nesting before the expedition arrived remained where she was in the midst of the camp, her eggs hatching 2 August. The ice plateau is lifeless; only the skeleton of an Ivory Gull *(Pagophila eburnea)* was found here. The Iceland Gull *(Larus glaucoides)* was not present on Spitsbergen; the skuas (Stercorariidae) were of the light-phase variety, one of their young was banded. The warming of the climate is progressing and birds of southern climes ranging northwards. The Great Black-backed and Herring Gulls *(Larus marinus* and *L. argentatus)* are new arrivals, Redwings *(Turdus musicus)* have been observed of late, and four swallows *(Hirundo rustica)* were seen flying over the sea just south of the islands.—Louise de K. Lawrence.

**51. The vertebrate fauna of the Sarek and Padjelanta alpine regions in Swedish Lapland.** (Vertebratfaunan i Sareks och Padjelantas fjällområden. Del. II.) Kai Curry-Lindahl. 1958. *Fauna och Flora*, **3-4**: 97-149. (English summary.) The annotated list includes 96 species of birds, many of which are discussed at some length. For instance, the song and nesting behavior of an Arctic Warbler *(Phylloscopus borealis borealis)* are described. The coloration of the Wheatear *(Oenanthe oenanthe)*, which differs in birds living in the arctic and alpine regions from that of those living in lowlands, is attributed to the variation of light and the degree of wear to which the birds are exposed in these habitats. The English summary deals with the author's ornithological observations in great detail.—Louise de K. Lawrence.

**52. Mute Swans in Scania, Sweden, 1957.** (Knölsvanen *(Cygnus olor)* i Skåne år 1957.) Anders Winge. 1959. *Vår Fågelvärld*, **18**: 1-11. (English summary.) By car, boat, airplane, and from observation posts in treetops, a group of ornithologists took a census of Mute Swans in the southwestern part of the province, visiting about a hundred lakes. They arrived at a count of 139 breeding pairs and estimated about 650 non-breeding birds present in the area. Due chiefly to the low number of cygnets hatched in the 20 nests along the seashore, they obtained a mean of only 4.4 young per nest.—Louise de K. Lawrence.

**53. Observations of Red-breasted Flycatcher and Scarlet Grosbeak.** (Iakttagelser av liten flugsnappare *(Muscicapa parva)* och rosenfink *(Carpodacus erythrinus).)* Gunnar Otterlind. 1959. *Vår Fågelvärld*, **18**: 49-63. (English summary.) This is a compilation of data on two species that recently emigrated into Sweden from the southeast. Neither the grosbeak nor the flycatcher males acquire fully mature plumages until their second or third year, and it is significant that so far the males in immature plumages of both species predominate. The grosbeak is proving more successful than the flycatcher in establishing itself, apparently because it is a day and a flock migrant. The night-migrating flycatchers, on the other hand, easily become separated while flying over the seas and consequently have greater difficulty in locating mates when they penetrate into new territory during prolonged migration. The grosbeak's concentration in the region around Dalälven in central Sweden is a good example of the effect of faithfulness to territory (imprinting) in combination with an advantageous kind of daily rhythm and a habit of migrating in flock.

Further observations will be of importance. This is a rare opportunity for ornithologists to follow at first hand the extension of ranges into a new territory of such special geographic character as the Scandinavian Peninsula by two species differing in habits and behavior.—Louise de K. Lawrence.

**54. The eighth Winter census (1957-58) of water birds in French Switzerland.** (Le huitiéme recensement hivernal (1957-58) des oiseaux d'eau en Suisse romande.) Paul Géroudet. 1958. *Nos Oiseaux*, **24**: 311-320. This census, which was conducted from 22 Dec. 1957 to 5 Jan. 1958, yielded a minimum of 72,177 birds of 37 species. Allowing for errors, the author estimates the actual population to have been between 78-80,000 birds, a few less than found on preceding census. More than half of these were of three species: 21,000 Black-headed Gulls, 18,000 Coots and 10,000 Great-crested Grebes.—R. O. Bender.

**55. Population Changes, Especially Geographical Changes, in the Norwegian Avifauna During the Last 100 Years.** (Populasjonsendringer, Spesielt Geografiske, Forskyvninger, i den Norske Avifauna de Siste 100 Ar.) Svein Haftorn. 1958. *Sterna*, **3** (3): 105-137. (From the English summary.) An interesting and highly significant analysis of the changes in numbers and distribution of the Norwegian avifauna during the past century. Man is shown to be directly responsible for most of the shrinking ranges and for the diminution in numbers of many species "either directly through hunting and unconscious destruction of nests . . . or indirectly through ruining breeding places. [Also] the climate is believed to be a fundamental cause and factor of many of the described changes in the bird fauna. Similarly to the general development of the climate in north-western Europe, the autumn, winter and spring temperatures have, on the average, increased in Norway since the middle of the previous century though the summer has, on the contrary, become cooler. This change has urged southern elements of the avifauna to expand northward and northern elements to retire in the same direction."—O. L. Austin, Jr.

**56. The Arctic Tern in Australia.** K. A. Hindwood. 1958. *Emu*, **58** (4): 259-263. The author briefly reviews the recent literature on the subject and hypothesizes on the possible origin of the seven specimens of *Sterna paradisaea* recorded so far from Australia, for which he gives complete data, descriptions and measurements. He considers it "not likely that there is a definite migration of the Arctic Tern in the Indian Ocean, an ocean which has no natural seaway with northern waters." He suggests a possible movement of the species down the western Pacific but admits that all the birds may be stragglers "blown off course by adverse winds." (See also *Bird-Banding* **29**: 247)—O. L. Austin, Jr.

**57. Food, Habit Selection, and Decline of the Population of the White Stork in the Netherlands.** (Over het Voedsel, de Terreinkeus en de Achteruitgang van de Ooievaar, *Ciconia ciconia* L., in Nederland.) J. Rooth. 1957. *Ardea*, **45** (3/4): 93-116. (From the English summary.) This study of the food and habitat preferences of the White Stork was made as part of an investigation of the recent decline of the species in the Netherlands. The breeding population there now averages 1 to 2 breeding pairs per 1000 km², as against 60 or more breeding pairs per 100 km² in parts of eastern Europe. Much of the paper is given over to an analysis of the food eaten, both from the literature and from observations made on two pairs observed throughout the breeding season in the Netherlands. Factors responsible for the stork's decline are "shooting (mostly on migration), lack of food, nest fights, parasitism, struggle in migration flocks, mechanical death, and diminution of the favorable habitat (in the Netherlands dimunition of extensively cultivated grasslands). . . . None of the various factors discussed play a particularly important part, perhaps with the exception of the shooting. However, they all work toward the same end, forming together the cause of the decline in question, which probably cannot be stopped."—O. L. Austin, Jr.

**58. Roosting Places of the Crane in the Netherlands.** (Pleisterplaatsen van Kraanvogels, *Grus grus*, in Nederland.) S. Braaksma. 1957. *Ardea*, **45** (3/4): 143-167. (From the English summary.) Recent reclamation of wild moor

and heath areas for cultivation is steadily reducing the places available in the Netherlands for migrating cranes to roost and feed during their passage between their breeding and wintering grounds. As the reclamation of formerly wild lands threatens to continue indefinitely, the author recommends the "founding of protected areas of undisturbed 'crane-reserves,' large enough to insure the necessary rest and enough food," as probably the "only way to preserve not only for the Netherlands but for Western-Europe as a whole the population of maybe some thousands of cranes which pass through this country."—O. L. Austin, Jr.

**59. Notes on the Cattle Egret in Surinam.** F. Haverschmidt. 1957. *Ardea*, **45** (3/4): 168-176.) (With Dutch Summary.) Reports the first definite breeding record of *Bubulcus ibis* in Surinam in 1957, showing that this expanding species is increasing its range to the southward as well as to the north. In reviewing the history of the Cattle Egrets' invasion of the New World, Haverschmidt casts doubt on the recent evidence published by Vaughn (1956) that the species was observed in Surinam between 1877 and 1882.—O. L. Austin, Jr.

**60. The Impact of Deforestation on Birds of Cebu, Philippines, with New Records for that Island.** D. S. Rabor. 1959. *Auk*, **76** (1): 37-43. In 1947 Dr. Rabor and his students started collecting on Cebu, one of the 10 largest islands in the Philippine Archipelago, which had not been collected seriously since 1906, when the island's original forest cover had already largely disappeared. The new forests planted by the government during the 20th century were destroyed during World War II. Dr. Rabor's studies reveal 10 forms, 6 of them resident, not previously recorded from Cebu, but his survey shows that all but 1 of the 10 known endemic forms as well "as several other forest species, may have disappeared." —O. L. Austin, Jr.

## FOOD

**(See also Numbers 37, 57.)**

**61. On a winter food cache of the Little Owl.** (Au garde-manger hivernal de la Chevêche.) Teddy Blanc. 1958. *Nos Oiseaux*, **24**: 321. The author found 12 meadow mice, 1 field mouse and 2 Tree Sparrows *(Passer montanus)* stored in a dark corner of a cavity occupied by a Little Owl *(Athene noctua)* on 4 Jan. 1958. On 19 Jan. there were 22 meadow mice and 1 Tree Sparrow.—R. O. Bender.

**62. Little Owls and Tree Sparrows.** (Chevêches et Friquets.) Jean Steffen. 1958. *Nos Oiseaux*, **24**: 321. A cavity in an old Cedar, which had contained a nesting cavity of a Little Owl *(Athene noctua)* for the preceding three years, when examined yielded two bands which had been applied to Tree Sparrows *(Passer montanus)*.—R. O. Bender.

**63. On the acceptance of colored grain by wild birds.** (Zur Annahme von gefärbtem Getreide durch Wildvögel.) Günther Bodenstein. 1959. *Ornithologische Mitteilungen*, **11**: 2-3. Variously colored grains were offered to Pheasants, Turtle Doves, Mallards, House and Field Sparrows, and Wood Doves. The objective was to determine whether a color could be found which would repel the birds. None was found. The use of chemical repellents was also unsuccessful.—R. O. Bender.

## SONG

**(See Number 51.)**

## PHOTOGRAPHY

**(See Number 66.)**

## BOOKS AND MONOGRAPHS

**64. The Breeding Life of Passerine Birds.** (Gnezdovaya zhiznj pevchikh ptic.) A. S. Maljchevskij. 1959. Izdat. Leningrad. Univ. Leningrad. 281pp. This work is based on the author's own investigations carried out mainly around Leningrad and other areas of the European part of the USSR. Each chapter contains a critical review of the literature compared with the author's own results and views. Chapter I deals with mating. Song, in the author's opinion, does not serve in the defense of territory, but rather in the bringing together of the sexes. Chapter II, discussing breeding of woodland passerines, includes data on 1730 nests. Selection and evolution favor plasticity rather than conservatism in nesting habits. Chapter III is on the subject of clutches; these range in size from 3-4 eggs with the Golden Oriole *(Oriolus oriolus)* to 15-17 with the Great Tit *(Parus major)*. The main cause of variation in clutch size, in the author's view and experience, is predation. Losses of eggs and nestlings from predation were three times as high as all other factors together. Crows were the chief enemies. In Chapter IV hatching and nestlings are discussed, in Chapter V the food. A total of 11,000 food items was obtained by means of neck rings from 892 nestlings of 39 species. Chapter VI is on the post-embryonic development of passerines.

Part II is devoted to detailed accounts of the nesting biology of 47 species. There are 313 titles in the bibliography, 101 of them foreign.

This book is a good piece of work and adds much to our knowledge of the breeding biology of the most common passerines. Of special value is the enormous material, mostly original, collected over some years of field investigation and rearing birds in captivity. The importance of the study of behavior is fully demonstrated in this excellent work, edited by Prof. G. A. Novikov, the famous ecologist. The illustrations are fine photographs by the author and good drawings.—F. J. Turček.

**65. A Bibliography of Birds.** ***With Special Reference to Anatomy, Behavior, Biochemistry, Embryology, Pathology, Physiology, Genetics, Ecology, Aviculture, Economic Ornithology, Poultry Culture, Evolution and Related Subjects. Part 4. Finding Index.*** 1959. Reuben Myron Strong. *Zoological Series*, Field Museum of Natural History, Volume 25, Part 4: 1-186. Serious students of ornithology will welcome the completion of Dr. Strong's monumental "Bibliography of Birds." Parts 1 and 2—the Author Catalogue—appeared in 1939 (see *Bird-Banding* **11**: 75), and Part 3—the Subject Index—in 1946 (see *Bird-Banding* **18**: 75). The Subject Index, 528 pages long, is concerned with 120 main topics, such as banding, behavior, digestion, distribution, molt, mortality, paleontology, etc., with a multitude of sub-topics, references being to author and year as cited in the first two parts. The much shorter Finding Index presents "one continuous alphabetically arranged list" with references to the Subject Index. An astonishing amount of valuable material is thus made easy of access. I feel I cannot do better than to quote from my review of Part 3: "Ornithologists and other zoologists owe a great debt to Dr. Strong for his tireless zeal, his scholarship and endless patience in carrying through a task of such incredible magnitude."—M. M. Nice.

**66. The Pygoscelid Penguins.** William J. L. Sladen, 1958. *Falkland Islands Dependencies Survey, Scientific Reports*, Number 17, pages 1-97, plates I-XII. This most important contribution to the studies of the life history, biology, and behavior of the penguins, particularly *Pygoscelus adeliae*, is based primarily on the author's work in the South Orkneys and in the Palmer Peninsula from 1948 to 1951, in which banding played a prominent part. It is exceedingly thorough and detailed, adequately bolstered with tables, graphs, and charts, and illustrated by the author's superb photographs. Unusual but highly valuable additions are Sladen's supplemental notes on skinning and preserving penguin specimens in the field and on the special techniques needed for successful photography in the Antarctic.—O. L. Austin, Jr.