RECENT LITERATURE

BANDING

(See also Numbers 12, 14, 15, 39, 40, and 42.)

1. Further Results from Banded Norwegian Migratory Birds. XVII. (Fortsatte resultater (XVII) fra den internasjonale ringmerkning vedrørende norske trekkfugler.) H. Tho. L. Schaanning. 1948. *Stavanger Museum Årbok*, 1947: 12-25. During 1947 recoveries were reported for 148 birds banded in Norway; 45 of the records were from foreign countries. Sixty-seven of the recoveries were of Hooded Crows, *Corvus cornix* Linnaeus. Winter recoveries of Lapwings, *Vanellus vanellus* (Linnaeus), are recorded from England, Ireland, Spain, France, and the Netherlands. There are records also of 13 birds banded in other countries and recovered in Norway. During 1947, 2810 birds (76 species) were banded. Most frequently banded were the Starling, *Sturnus vulgaris* Linnaeus 250; Fieldfare, *Turdus pilaris* Linnaeus 347; Pied Flycatcher, *Muscicapa hypoleuca* (Pallas) 281; and Dunlin, *Calidris alpina* (Linnaeus) 292.—D. S. Farner.

2. Further Results from the Banding of Norwegian Migratory Birds. XVIII. (Fortsatte resultater (XVIII) fra den internasjonale ringmerking vedrørende norske trekkfugler.) H. Tho. L. Schaanning. 1949. *Stavanger Museum Årbok*, 1948: 72-92. During 1948 records were received for 204 recoveries of banded Norwegian migrants; 24 had been banded in foreign countries. Most frequently recovered were Hooded Crows, *Corvus cornix* Linnaeus, 33. There were 12 recoveries of Herons, *Ardea cinerea* Linnaeus, banded at Helleland, Rogaland 1944-6; 10 were winter or spring recoveries in the British Isles. There are 28 records of Knots, *Calidris canutus* Linnaeus, banded at Jaeren and recovered in fall and winter in France, Denmark, southern Norway, England, and the Netherlands. During 1948, 4258 birds were banded.—D. S. Farner.

3. Bird Banding Activities of the Stavanger Museum for 1949. (Stavanger Museums Ringmerkingsarbeid 1949.) Holger Holgersen. 1950. *Stavanger Museums Årbok*, 1949: 102-113. During 1949, 5596 birds of 92 species were banded. Most frequently banded were the Starling, *Sturnus vulgaris* Linnaeus 448; Knot, *Calidris canutus* (Linnaeus) 761; Dunlin, *Calidris alpina* (Linnaeus) 657; and *Crocethia alba* (Pallas) 299. A summary shows that from 1914 through 1948 the Museum has sponsored the banding of 40,084 birds of 167 species; 1768 recoveries have been recorded. During 1949 there were 184 recoveries. Recovered in greatest numbers were the Hooded Crow, *Corvus cornix* Linnaeus 17; Knot, 30; and Starling, 9. A Fieldfare, *Turdus pilaris* Linnaeus, banded as a juvenal 6 July 1949 at Evje, Setesdal, was recovered near Spilimbergo, Udine Province, Italy, 10 November 1949.—D. S. Farner.

4. Results from Bird-Banding by the Ornithological Station at Revtangen, Jaeren, Norway. (Resultatet av ringmerkingen ved Ornitologisk stasjon på Revtangen, Jaeren, i 1949.) A. Bernhoft-Osa. 1950. *Stavanger Museum Årbok*, 1949: 114-119. During 1949, 2647 birds in 36 species were banded. Species banded most frequently were Starling, *Sturnus vulgaris* Linnaeus 180; Twite, *Carduelis flavirostris* (Linnaeus) 129; Ringed Plover, *Charadrius hiaticula* Linnaeus 149; Knots, *Calidris canutus* (Linnaeus) 761; Dunlin, *Calidris alpina* (Linnaeus) 654; Sanderling, *Crocethia alba* (Linnaeus) 299; and Bar-tailed Godwit, *Limosa lapponica* (Linnaeus) 138. Sixty-eight recoveries, mostly for shore birds are recorded.—D. S. Farner.

5. Bird-banding in Finland in 1939. (Die Vogelberingung in Finnland im Jahre 1939.) Ilmari Välikangas and Lauri Siivonen. 1949. *Memoranda Societatis pro Fauna et Flora Fennica*, 24: 212-233. The data contained in this report were in preparation for publication at the outbreak of war. With other materials from the Zoological Museum they were placed in safekeeping and did not become available again until 1945. During 1939 bands were placed on 7675 birds of 125 species. Most frequently banded were Black-headed Gulls, *Larus*

ridibundus Linnaeus 1110; Fieldfare, *Turdus pilaris* Linnaeus 896; Common Tern, *Sterna hirundo* Linnaeus 488; Swallow, *Hirundo rustica* Linnaeus 410; Willow Warbler, *Phylloscopus trochilus* (Linneaus) 378; Redwing, *Turdus musicus* Linnaeus 352; and Spotted Flycatcher, *Muscicapa striata* (Pallas) 323. A résumé is given of the recoveries of birds banded in 1939 and recovered up to 1 July 1940; included are 173 records for 39 species. Two White Wagtails, *Motacilla alba* Linnaeus, were recoverd in Egypt. A Fieldfare was recovered in Scotland in February; two were recovered in winter in Italy. A Redwing was recovered in January in Portugal and another in the Netherlands in February. There is a record of an Eagle Owl, *Bubo bubo* (Linnaeus), banded in June 1925 and recovered 125 kilometers northeastward in 1939. A female Tufted Duck, *Nyroca fuligula* (Linnaeus), was banded in June 1938 and recovered in Norway 10 February 1940. A female Golden-eye, *Bucephala clangula* (Linnaeus) banded in June 1936 was recovered in Rumania on the Black Sea in December 1939. Finnish-banded Black-headed Gulls were recovered in Germany, Denmark, Kattegat, British Isles, the east Baltic countries, France, Switzerland, Hungary, Italy, Jugoslavia, and Greece.—D. S. Farner.

6. Bird-banding in Finland, 1940-1947. (Die Vogelberingung in Finnland in den Jahren 1940-47.) Ilmari Välikangas and Jukka Koskimies. 1950. *Memoranda Societatis pro Fauna et Flora Fennica*, 25: 136-155. During this period banding was generally sporadic; 2850 individuals in 78 species were banded. Most frequently banded were the Pied Flycatcher, *Musicapa hypoleuca* (Pallas) 1291; Starling, *Sturnus vulgaris* (Linnaeus) 101; Great Tit, *Parus major* Linnaeus 117; Common Tern, *Sterna hirundo* Linnaeus 109; and Black-headed Gull, *Larus ridibundus* Linnaeus 206. There are reports of 183 recoveries in 35 species. A Fieldfare, *Turdus pilaris* Linnaeus, banded in east-central Finland 17 June 1938 was recovered in southern Norway 28 October 1941, indicating westward fall migration by a portion of the Finnish population. A Tawny Owl, *Strix aluco* Linnaeus, was banded 13 June 1936 and killed 24 February 1947. Recoveries of Black-headed Gulls (57) are similar to those of the previous report with the addition of a record from Spain. There are 22 recoveries of Common Gulls, *Larus canus* Linnaeus, and 28 Herring Gulls, *Larus argentatus* Pontoppidan.—D. S. Farner.

7. The Activities of the Ottenby Ornithological Station during 1949. (Verksamheten vid Ottenby fågelstation 1949.) Gunnar Svärdson. 1950. *Vår Fågelvärld*, 9(1): 11-31. Of particular interest is the report of banding activities, 14,059 birds in 110 species having been marked. Most frequently banded were the White Wagtail, *Motacilla alba* Linnaeus 1348; Redstart, *Phoenicurus phoenicurus* (Linnaeus) 446; Dunlin, *Calidris alpina* (Linnaeus) 3552; Robin, *Erithacus rubecula* (Linnaeus) 865; Willow Warbler, *Phylloscopus trochilus* (Linnaeus) 835; and Water Pipit, *Anthus spinoletta* Linnaeus 527. There is a brief analysis of the 324 recoveries. Among these are the records of 99 (46 banded as adults, 53 as juvenals) House Martins, *Delichon urbica* (Linnaeus), banded at Ottenby in 1948 and which returned during the summer of 1949; one was recovered in Rhodesia in January. Of considerable interest are the 31 recoveries and returns of Dunlins; 14 are from Ottenby (six banded as adults, eight as juvenals); the remaining recoveries came from France, Denmark, Italy, and Britain. Perhaps the most remarkable recovery is that of a Robin banded 14 October 1948 and recovered in western Georgia, U.S.S.R., 5 February 1949. This indicates a movement quite different than the normal southwest migration of the species.—D. S. Farner.

8. Results of Bird-banding Activities under the Auspices of the Rijksmuseum van Natuurlijke Historie te Leiden, XXXV. (Resultaten van het ringonderzoek betreffende de vogeltrek, ingesteld door het Rijksmuseum van Natuurlijke Historie te Leiden, XXXV (1948).) G. C. A. Junge. 1950. *Limosa*, 23(3/4): 315-337. Species banded in greatest numbers during 1948 were the Lapwing, *Vanellus vanellus* (Linnaeus) 845; Black-headed Gull, *Larus ridibundus* Linnaeus 519; Great Tit, *Parus major* Linnaeus 903; Starling, *Sturnus vulgaris* Linnaeus 11,354; Chaffinch, *Fringilla coelebs* Linnaeus 3202; Siskin, *Carduelis*

spinus (Linnaeus) 926; Linnet, *Carduelis cannabina* (Linnaeus) 717; Tree Sparrow, *Passer montanus* (Linnaeus) 670; and Greenfinch, *Chloris chloris* (Linnaeus) 822. The banding of a total 27,867 individuals of 142 species is reported. Species for which the greatest numbers of recoveries are reported include the Teal, *Anas crecca* Linnaeus 168; Lapwing 34; Starling 64; and Chaffinch 32. There are reports of the recoveries in 1948 of four Oyster-catchers, *Haematopus ostralegus* Linnaeus; one was banded in 1935, one in 1938, and two during 1948. Among the 26 recoveries (1948) of Herring Gulls, *Larus argentatus* Pontoppidan, are several of interest in terms of age—one banded in 1921, one in 1924, two in 1932, one in 1933, two in 1934, one in 1936.—D. S. Farner.

9. The Recovery in Netherlands of Birds Banded in Other Countries. (Terugvondsten van in het buitenland geringde vogels, 23.) C. G. B. Ten Kate. 1950. *Limosa*, 23(3/4): 364-369. Most of the 88 records concern birds banded in Scandinavia, Germany, Belgium, France, and Britain. A Mallard, *Anas platyrhynchos* Linnaeus, was banded 4 July 1948 in Moscow, U.S.S.R., and was shot in Ilmenmeer on 9 September 1948. A Pintail, *Anas acuta* Linnaeus, banded on a wildlife reservation in Astrakhan, U.S.S.R., 29 July 1947, was shot in mid-November 1948 on Kampereiland. Another Pintail banded at Moscow on 10 September 1946 was shot at Rilland-Bath 28 December 1948. A Shoveller, *Spatula clypeata* (Linnaeus), banded on the Oka River (ca 55°N, 41°E), U.S.S.R., 22 July 1948, was shot at Den Ilp 12 November 1948. There are several records of Swedish-banded Black-headed Gulls, *Larus ridibundus* Linnaeus, recovered in the Netherlands as well as similar recoveries of this species from birds banded in Czechoslovakia.—D. S. Farner.

10. Results from the Banding of Herring Gulls in Norway. (Ringmerkningsresultater av Saeing—*Larus argentatus*—Pont.) B. Wilmann. *Stavanger Museum Årbok*, 1947: 40-46. From 1926 through 1947, 1536 Herring Gulls have been marked with bands of the Stavanger Museum; there have been 189 recoveries, 23 outside of Norway. Ninety-eight have been recovered within 200 kilometers of the banding locality; 86 of these were recovered at the banding site. The greatest age attained was 9½ years. Norwegian Herring Gulls have been recovered in Sweden (1), Denmark (16), England (4), and France (2). Recovered in Norway have been Herring Gulls banded in U. S. S. R. (8), Finland (22), Sweden (34), Denmark (2), Netherlands (1), and England (1).—D. S. Farner.

11. Results from Banding Great Black-backed Gulls in Norway. (Ringmerkingsresultater for Svartbak *(Larus marinus* L.).) B. Wilmann. 1949. *Stavanger Museum Årbok*, 1948: 123-128. Of 727 banded Black-backed Gulls, 74 have been recovered. Forty-nine were recovered at less than one year of age; 63 were less than three years of age at recovery. The oldest recovery was eight years, 10 months after banding. The average age after banding was 16.5 months. Southward migration begins in August, the bulk occurring in September and October; it progresses slowly along the coast to Denmark, northwestern Germany, Netherlands, Belgium, Great Britain, and France. Several Black-backed Gulls banded at Murmansk and Petsamo have been recovered along the coast of Norway.—D. S. Farner.

MIGRATION

(See also Numbers 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 39, 40, and 42.)

12. The Migration and Winter Area of the Fieldfare. (Bjerktrostens *(Turdus pilaris)* trekk og vinterkvarter.) H. Tho. L. Schaanning. 1949. *Stavanger Museum Årbok*, 1948: 135-146. The Fieldfare is among the most common Norwegian species breeding throughout practically the entire country from sea level to 1000-1200 meters above sea level. As a breeding species it shows irregularities in numbers and distribution; there are also irregular winter movements. An analysis of banding data indicate that Scandinavian and East Baltic Fieldfares migrate southwestward to the southwest coast of Norway, thence to the British

Islands and thereafter to France, the low countries, Spain, and Portugal. There is no evidence of a more direct migration via Denmark.—D. S. Farner.

13. Migratory Physiology in Thrushes—Blood Sugar, Body Temperature and the Action of Adrenalin. (Zur Zugphysiologie der Drosseln *(Turdus pilaris* L., *T. merula* L., and *T. musicus* L.). Über Blutzuckerspiegel, Körpertemperatur und Einwirkung von Adrenalin.) Göran Bergman. 1950. *Societatis Scientiarum Fennica Commentationes Biologicae,* 10(16): 1-20. Experimental material included seven Fieldfares, four European Blackbirds, and two Song Thrushes. The initiation of *Zugunruhe* can be associated neither with the blood-sugar picture nor stimulation. Blood sugar reaches a daily maximum at sundown or shortly thereafter. Blood-sugar level is somewhat lower for birds in *Zugunruhe* than in resting birds. The normal diurnal curve in body temperature is generally unaffected by *Zugunruhe* although active *Zugunruhe* may elevate body temperature a mean 0.5°C. The birds with highest blood-sugar levels had the highest body temperature.—D. S. Farner.

14. British-Bred Swallow Summering in Norway. E. P. Leach. 1951. *British Birds,* 44(3): 100. A Barn Swallow, *Hirundo rustica* Linnaeus, ringed as a nestling on the Isle of Man, Aug. 11, 1949, was killed through colliding with electric wires June 20, 1950, at Driva, Norway, some 700 miles northwest. The ring was returned and the bird described. In extensive studies on seven species from one-half to three-quarters of the young found in subsequent breeding seasons were taken in the vicinity of the birthplace. A few individuals were recovered at considerable distances: a British-bred Barn Swallow at 160 miles; a Purple Martin, *Progne subis* (Linnaeus) at 210 miles; and an American Robin, *Turdus migratorius* Linnaeus, at 425 miles.—M. M. Nice.

LONGEVITY AND MORTALITY
(See also Numbers 8, 9, 10, 11, and 40.)

15. Population Losses in the Mallard, Black Duck, and Blue-Winged Teal. Frank C. Bellrose and Elizabeth Brown Chase. 1950. *Illinois Natural History Survey Biological Notes* No. 22, 27 pp. This paper is a significant study on the population dynamics of ducks. The basic data are from ducks taken by hunters at Lake Chautauqua and McGinnis Slough in Illinois; a correction is applied in order to obtain a true value for the loss in birds of the year by shooting. From the tabulated data it is possible to calculate weighted mortality rates according to the method of Lack *(Ibis,* 90: 266. 1948) or Farner *(Wilson Bulletin,* 57: 62-3. 1945) which are probably somewhat better for comparative purposes than are unweighted averages of the authors. The following summary indicates the significance of the study (annual mortality rates are weighted rates calculated by the reviewer): (1) Mallards, *Anas platyrhynchos* Linnaeus. Juvenile males, Lake Chautauqua, 2361 recoveries, 50 percent annual mortality rate (55 percent for first year); adult Mallards (ages not known at banding) Lake Chautauqua, 3245 recoveries, 39 percent annual mortality rate (36 percent for first year); females, Lake Chautauqua, 1609 recoveries, 47 percent annual mortality rate (46 percent during first year); all Mallards, McGinnis Slough, 2257 recoveries, 50 percent annual mortality rate (47 percent during first year). (2) Black Duck, *Anas rubripes* Brewster, McGinnis Slough, 939 specimens, 50 percent annual mortality rate (48 percent during first year). (3) Blue-winged Teal, *Anas discors* Linnaeus, McGinnis Slough, 307 specimens, 53 percent annual mortality rate (50 percent during the first year). An analysis of the data on the Mallards indicate, on the basis of these samples obtained in shooting, that annual mortality rate does not change with age. The data for all of the species are for the period 1940-1945. It should be emphasized that these data are from recoveries by shooting. It will be of great interest to compare such data with non-shooting recoveries when sufficient numbers become available.—D. S. Farner.

16. Nestling Mortality amongst Tits on Tentsmuir, 1949 and 1950. J. M. D. Mackenzie. 1950. *British Birds,* 43(2): 393-398. Some 500 nest boxes

were erected in 20 sites around Perth up to 20 and 40 miles distance. Nestling mortality was markedly higher at Tentsmuir than elsewhere; Tentsmuir is a region of pure sand planted to Scots pine, *Pinus sylvestris*. In 1949 the "success of Great, Blue and Coal-Tits *(Parus major, caeruleus* and *ater)*" in Tentsmuir was compared with that of "normal sites, both conifers and hardwoods growing in good soil. Of 93 eggs in 12 nests in the first group only 50 young were fledged—54 percent. Of 481 eggs in 61 nests in normal conifers 407 young were fledged—85 percent, and of 268 eggs in 33 nests in normal hardwoods 249 young were fledged—93 percent. The average clutch size was about the same in both regions. At Tentsmuir dead nestlings were found aged 5, 8 and 10 days as well as some that were fully fledged. The author suggests that this mortality might have been "due either to the poverty of the soil and so of the vegetation growing on it, which may be short of some essential, possibly a trace element, which would also be short in larvae feeding on the vegetation; or to some food item in the fauna of such an area being always so scarce that a small deficiency is enough to produce a shortage." (p. 396.) The weather was very good in 1949, but in 1950 sharp frosts in late April seem "to have killed off most of the defoliator larvae on which nestling tits are fed." (p. 397.) Predators were more active in 1950 than in 1949. Of 143 eggs in 19 nests in Tentsmuir 81 young were fledged—57 percent. It may be "that the rearing of quite considerable numbers of tits for three years, 1946 to 1948, in a habitat not of the best has caused a definite scarcity of those species most favoured as nestling food. That is, at first the tits controlled the larvae but now the larvae control the tits." A very interesting article.—M. M. Nice.

FOOD HABITS

(See Numbers 17, 19, 40, and 42.)

PHYSIOLOGY

(See Number 13.)

LIFE HISTORY

(See also Numbers 16, 40, and 42.)

17. Daily Routine of the Great Tit, *Parus m. major* L. H. N. Kluijver. 1950. *Ardea*, 38(3/4): 99-135. A valuable study based on intensive observation and mechanical recording at four localities in Holland. As with many other birds the female rises later and retires earlier than the male. During winter the male begins his day about 26 minutes before sunrise, the female about two minutes later (civil twilight starts about 15 minutes before sunrise at this season). In April and May he starts singing at about civil twilight, when the sun is six degrees below the horizon. "In August the birds go to roost an hour before sunset, in winter ± at sunset." (p. 133.) In the far north (67°N) the Great Tit is active for about five hours of the day during December, from two hours before sunrise to two hours after sunset. Since the sun is then about seven degrees below the horizon, the Great Tit starts his activity in midwinter at 67°N at about the same light value as in spring in the Netherlands.

The temperature of the eggs was found to fluctuate between 32.3°C and 33.5°C when the female was off the eggs and between 36.2°C and 39.3°C when she was on. (Gibb's, 1950, maximum egg temperatures in a Great Tit's nest near Oxford ranged between 33.9°C and 36.7°C.) Although the female spends each night in the nest during the period of egg laying, incubation does not start with the first brood until the clutch is almost complete, the lack of incubation earlier probably being due to the incomplete development of the brood-patch. In second broods hatching is apt to extend over several days. With the female at Bennekom periods off the nest varied between 12 and 29 a day. With the first brood periods on the nest averaged 27.6 minutes and off the nest 7.9 minutes; with the second brood they averaged 26.2 and 10.9 minutes. Close correspondence was found between air temperature and amount of time spent on the nest. With the Bennekom pair an increase of one degree Centigrade in the average air temperature caused a de-

crease of eight minutes in the brooding time per day with the first brood and 15 minutes per day with the second. At two other nests the decrease was 15 and 10 minutes per degree Centigrade. Figures 1 and 5 show the relationship between temperature and time spent on and off the nest. Table 6 gives number of feeding visits per day at eight nests from 0 to 21 days, five complete records, the others lacking a few days. All increase in the course of nestling life, most reaching a maximum at about 9-15 days. The greatest number of trips was 937 to a brood of ten 15-day young. The number of trips was not correlated with number of young but with size of the prey. Samples of prey organisms were collected by means of a collar around the neck of a nestling; the average weight for the first brood at the Bennekom nest was 45-50 mg., for the second brood 240 mg.

At one nest 10 young hatched May 9; the male helped care for them until the 23rd when he stopped feeding them and courted the female. "The female regularly fed the young 50-60 times per hour, on 24th May 73 times in the hour, and on 25th May as much as 83 times during one hour's watch." (p. 130.) Some 60 percent of the food consisted of peanuts from a feeding shelf. Five young were fledged May 31, the others having died. On June 3 the female started building a new nest and on the 5th laid the first of a set of 9 eggs. The male fed this brood normally. As to daily rhythm in feeding activity, with six pairs the afternoon activity was about 60 percent that of the morning. The author agrees with Palmgren (1944) that this is largely due to the bird's autonomic rhythm.—M. M. Nice.

18. Notes on the Breeding Habits of the Swift. A. S. Cutcliffe. 1951. *British Birds*, 44(2): 47-56. Some 250 visits were made during 1944-1949 to a church tower in Devon to study *Apus apus* (Linnaeus). The Swifts nest in holes 80 feet above the ground, ejecting whatever House Sparrows, *Passer domesticus* Linnaeus, may have installed themselves. "Coition was witnessed on a few occasions at the nesting site, the female clinging vertically to a beam. . . . Simulated coition has been observed many times while the birds were in flight in late July by which time most nests contain young birds. Possibly non-breeding birds were involved. . . . Each year a number of non-breeding birds is present in the tower. In 1949 six non-breeders helped to make up the colony of 20 adult birds. The non-breeders arrive in early May and nightly occupy a nest throughout the breeding-season, usually in pairs. One such couple, ringed in 1948, returned in 1949 and bred, using the nest in which they had been ringed." The history of eight nests, occupied from one to five years, is given. We are not told whether the same adults returned to nest. There were 29 nestings, 58 eggs were laid, of which 36 (62 percent) hatched and 29 young (50 percent) were fledged. Seventeen eggs were ejected by the parents in inclement weather; in only two cases did the birds attempt a second brood. Five chicks succumbed to bad weather. The young fledged at 37 to 54 days, averaging 42 days; some of them returned to the nest for a few nights before migrating. DDT applied to nests and birds destroyed the mites and blood-sucking flies, which had been attacking the Swifts. —M. M. Nice.

19. The Development of Starlings Raised by Hand from the Egg. (Die Entwicklung von Staren *(Sturnus vulgaris* L.) bei künstlicher Aufzucht vom Ei ab.) Lore Mittelstaedt. 1950. *Ornithologische Berichte*, 3(2): 113-119. So far very few passerines have been raised from the egg. The author succeeded in this task with Starlings both in 1947 and 1949. During the first four days they were fed fresh ant pupae, finely ground, and small silkworm larvae; during the next six days freshly molted mealworm larvae, grasshoppers, earthworms, and house snails without the shells; from the eleventh day on egg yolk, finely cut lettuce leaves, white bread, veal, mulberries and calcium. Up to five days of age they were fed every 27 minutes, till 11 days every 32 minutes and afterwards every 50 minutes throughout the 14-hour day. A graph of weight increase closely matches the results of Kluijver (1933) with wild Starlings. A summary of feather development is given as well as changes in the bill. The young left the nest at 20 days and fed themselves four days later.—M. M. Nice.

BEHAVIOR

(See also Numbers 17, 18, 40, and 42.)

20. Sex Recognition and Pair Formation with the Yellowhammer. (Erkennen des Geschlechts und Paarbildung bei der Goldhammer *(Emberiza c. citrinella* L.).) Gerd Diesselhorst. 1950. *Ornithologische Berichte,* 3(2): 69-112. For four years the author has made an intensive study of a population of color-banded Yellowhammers in Bavaria, observing the wild birds and experimenting with decoys in cages. These buntings recognize each other's sex immediately by plumage characters. Whenever decoy birds were brought on to a territory, the owners reacted appropriately to their respective sexes. Once a caged male courted an immature bird with plumage like a female, but wing measurement of a male. The Yellowhammer is a typically territorial bird, the males confined to their territories, the females wandering about seeking mates and after a time settling down. In February and early March the pair formation ceremony consists in the male flying to the ground and the female following him; here both pick up and drop pebbles and bits of vegetation. This symbolic picking may be carried out by a male with a succession of females, as well as many times with the bird that ultimately becomes his mate. Pair formation seems to be a gradual process dependent on the birds becoming used to each other. Later in the season pair formation is effected differently. The male goes through two different courtship ceremonies—one a dance around the female with hanging wings, head held up and tail raised and red-brown rump conspicuous; the other a picking up and holding of grass stems. (p. 99.) The author found evidence that in the wild pair formation would not necessarily take place between any male and any female; possibly psychological factors play a small role. Some females seemed influenced in their choice of partners by the character of the territories. Polygamy was observed only twice, but could easily become common in case of a surplus of females. A warning is given against considering behavior of captive birds, even of those that breed, as wholly representative of conditions in freedom. A fine paper, based on thorough observation and much thought.—M. M. Nice.

21. The Building of a Rookery. C. M. Ogilvie. 1951. *British Birds,* 44(1): 1-5. Observations on nest building of *Corvus frugilegus* Linnaeus from March 8 to 19, 1948, during which time the rookery grew from 3 to 14 nests. Thieving of sticks occurred regularly when a nest was left unguarded; occasionally epidemics of thievery broke out. "In contrast to the silent stealth of the lone thief, there were the direct and destructive tactics of the smash-and-grab raid with much falling-out among thieves. A single Rook pilfering an unguarded nest would be joined by an unruly and impatient queue of four or five birds each awaiting a turn at the sticks. These Rooks bickered among themselves with much cawing and flapping of wings and those who approached the sticks were repelled by the thief in occupation or fought with him on the nest." The thieves might be near neighbors or from a colony 300 yards distant. "Infective behaviour in colonial birds, although valuable in many aspects of their life, may thus intensify and extend an activity that is unfavourable to the colony. For not only may structural damage be done to the nest, especially during the 'epidemics', but there is often significant loss of nesting material." One nest in nine hours received 72 sticks (10 from other nests) and lost 19. The female often begs from her mate while she is laying, but he seldom feeds her until incubation is under way.—M. M. Nice.

22. "Force-of-Habit" Behaviour of House Sparrows. K. G. Spencer. 1951. *British Birds,* 44(3): 92. A bandstand under whose roof a flock of *Passer domesticus* Linnaeus had been roosting was completely removed on March 14. "Towards dusk the incoming sparrows began to alight on bushes nearby," and individuals and little parties repeatedly sallied "out to the spot in mid-air where their roosting place used to be." They finally settled down to sleep in the shrubs and no more searching for the old locality was seen.—M. M. Nice.

23. Notes on Behaviour of a Blackbird. V. J. MacNair. 1951. *British Birds*, 44(3): 99-100. A pair of *Turdus merula* Linnaeus were constantly together in the author's garden for at least five years. In October and November the female was often heard singing "a sub-song similar to that of a male or juvenile bird." A young male, raised by hand and given his liberty started singing a weak sub-song on October 23 when 15 weeks old; he first gave adult song March 10.—M. M. Nice.

ECOLOGY

(See also Numbers 17, 27, 29, 34, 35, 38, 40, and 42.)

24. Outline for an Ecological Life History of a Bird, Based upon the Song Tanager *Ramphocelus passerinii costaricensis*. Alexander F. Skutch. 1950. *Ecology*, 31(3): 464-469. The Pacific Scarlet-rumped Black Tanager is an abundant nester on Dr. Skutch's grounds in Costa Rica. It is a fine singer, but non-territorial, even in the nesting season remaining in loose flocks in which males outnumber females. No fighting was ever seen. Nests were usually well scattered, but occasionally two or three are found within a few yards of each other. The female builds the nest and incubates her two eggs that hatch in 12 days, the young leaving at 12 or 13 days. The male usually helps feed the young. A remarkable "Outline of Study" is given, covering the following main subjects: I, range and climatic requirements; II, habitat; III, food; IV, structure and plumage; V, social habits; VI, enemies and hazards; VII, diurnal rhythm; VIII, annual cycle; IX, reproductive activities; X, development and dispersal of juveniles; XI, population and vital statistics. Several hundred sub-headings constitute a full and illuminating set of suggestions. It is a great pity that such a valuable outline did not appear in an ornithological journal.—M. M. Nice.

25. The Breeding Birds of the Wieringermeer Polder during 1948 and 1949. (Broedvogels van de Wieringermeer in 1948 en 1949.) A. L. J. van Ijzendoorn. 1950. *Limosa*, 23(3/4): 338-357. This paper follows similar analyses for 1945-1946 and 1947. This series is of particular importance because it records the changes in avifauna since the flooding of the Polder in April 1945 and the consequent increase in reed-growths. There are notes concerning the status of 48 breeding species during 1948 and 1949. There has been an increase in the numbers of the "reed species" including the Reed Warbler, *Acrocephalus scirpaceus* Hermann; Reed Bunting, *Emberiza schoeniclus* (Linnaeus); and the Sedge Bunting, *Acrocephalus schoenobaenus* (Linnaeus). The Bearded Tit, *Parnurus biarmicus* (Linnaeus), was noted to breed in the taller reeds.—D. S. Farner.

26. Breeding Birds of the Northeast Polder, Breeding Season of 1949. Eighth Report. (Noordoostpolderbewoners, 8e bericht; broedseizoen 1949.) D. Bakker and A. Stam. 1950. *Limosa*, 23(3/4): 292-315. Since the drainage of this area in 1941 its avifauna has been the subject of careful observations. In 1949 all except 6500 of the 100,500 acres were under cultivation. The uncultivated area is largely reedland where the Reed-bunting, *Emberiza schoeniclus* Linnaeus, is the dominant species. There are notes and comments on 73 species. Decreases in the populations of the Kentish Plover, *Charadrius alexandrinus* Linnaeus; Ringed Plover, *Charadrius hiaticula* Linnaeus; Little Ringed Plover, *Charadrius dubius* Scopoli; Avocet, *Recurvirostra avosetta* Linnaeus; and the Herring Gull, *Larus argentatus* Pontoppidan, are thought to be the result of a decrease in the amount of slightly covered soil. However, the Black-headed Gull, *Larus ridibundus* Linnaeus, and the Common Tern, *Sterna hirundo* Linnaeus, have maintained their numbers. The pastures in the eastern part of the polder support an increasing population of Lapwings, *Vanellus vanellus* (Linnaeus); the Black-tailed Godwit, *Limosa limosa* (Linnaeus), also breeds in this habitat. The principal breeding species in the heavy-soil areas, which are used for small grain and alfalfa, are the Blue-headed Wagtail, *Motacilla flava* Linnaeus; Skylark, *Alauda arvensis* Linnaeus; and Meadow Pipit, *Anthus pratensis* (Linnaeus); some nesting by Lapwings is noted. The Ring-necked Pheasant, *Phasianus col-*

chicus Linnaeus, was first recorded as breeding in 1946 and has increased steadily thereafter. The increase in human habitations has been accompanied by increased numbers of the House Sparrow, *Passer domesticus* (Linnaeus), and House Martin, *Delichon urbica* (Linnaeus). This paper and the predecessors in the series constitute a most interesting contribution to avian ecology.—D. S. Farner.

AVIFAUNAL DYNAMICS

(See also Numbers 25 and 26.)

27. The Post-glacial Distribution of *Corvus monedula in Europe.* K. H. Voous. 1950. *Limosa,* 23(3/4): 281-291. The post-Pleistocene distribution of Jackdaws has been studied in terms of taxonomy and the distribution of geographic races. The present European races appear to have originated from Asiatic, Balkan, and southwest European stocks which were isolated during the last Pleistocene glaciation. Probably additional races in the Iberian Peninsula and North Africa were isolated before the last glaciation.—D. S. Farner.

28. The Eastern Ringed-Dove May Be Extirpated from Japan. Honpo San Shirakobato ni tsuite.) Tatsuo Udagawa. 1949. *Tori,* 12(59): 267-268. The Eastern Ring-Dove, *Streptopelia decaocto toliczkae* (Hume), was formerly abundant within Musashi province, Japan, but, owing to hunting pressure, is now almost extinct. A census at the end of February 1948 showed but 30 pairs in existence.—M. D. Arvey.

29. Bird Populations on Rott during the Summer 1948. (Fuglebestanden på Rott sommeren 1948.) Holger Holgersen. 1949. *Stavanger Museum Årbok,* 1948: 103-117. Rott lies 3-4 kilometers off the coast of Norway near Stavanger; it has an area of one square kilometer. Formerly it was known as the site of a great rookery. The Shags, *Phalacrocorax aristotelis* (Linnaeus), and alcid species, except *Uria grylle* (Linnaeus), have now completely disappeared. The population of Herring Gulls, *Larus argentatus* Pontoppidan, has decreased during the present century. Lesser Black-backed Gulls, *Larus fuscus* Linnaeus; Common Gull, *Larus canus* Linnaeus; Oyster Catcher, *Haematopus ostralegus* Linnaeus; Lapwing, *Vanellus vanellus* (Linnaeus); and Redshank, *Tringa totanus* (Linnaeus), are breeding species. Introduction of rats about 1920, illegal hunting and egg collecting, changes in land use, and increased visitor traffic are thought to be responsible for the decline in breeding populations. The avifauna has been protected since 1935.—D. S. Farner.

DISTRIBUTION AND ZOOGEOGRAPHY

(See also Numbers 27, 40, and 42.)

30. The First Specimen Record of *Branta bernicla nigricans* from Shikoku. (Kokugan Shikoku ni te Saishu saru.) Tatsuo Udagawa. 1949. *Tori,* 12(59): 273-274. A specimen of Black Brant, *Branta bernicla nigricans* (Lawrence), taken at Sukumo, Shikoku, is the first from that area; only two sight records are known from this island, and there are but 12 known records for all Japan.—M. D. Arvey.

31. Notes on the Birds of the Izu Islands. (Izu Shichi Shima no Tori-rui ni Tsuite.) O. L. Austin, Jr. 1949. *Tori,* 12(59): 262-264. Detailed notes on 17 species of birds are included in this paper; the author collected 200 specimens of 60 species and subspecies on the Seven Islands in May 1946 and in April 1949. These notes are selected as representing additions to the avifauna of the islands or changes in the status of certain species. The greater abundance of bird life on these islands as compared to the Japanese main islands is noted; apparently birds are abundant in areas of sparse human population only.—M. D. Arvey.

SYSTEMATICS

(See also Numbers 27, 37, and 38.)

32. Systematics of the Thrushes of the genus Turdus. (Considérations systématiques sur les Grives du genre *Turdus* L.) Jean Dorst. 1950. *L'Oiseau et la Revue Française d'Ornithologie,* 20(3): 212-248. It is always difficult to define the limits of very large genera of almost worldwide distribution and to sort out their numerous species and subspecies into natural groups and sequences. Dr. Dorst of the Paris Museum has endeavored to revise the thrushes, and he has succeeded in drawing a clearer picture of this great complex of closely allied birds. Like Hartert and many later authors, not excepting the writer of these lines, he has rejected several untenable genera based on vague and unsatisfactory characteristics and placed them all in the genus *Turdus.* He has even gone so far as to include the small North American wood thrushes which, in our opinion, are better separated as *Hylocichla* because of different proportions, aspects, and life habits. They seem to be more nearly related to the Central American *Catharus* and even to the Old World Nightingales *(Luscinia).* The genus *Geocichla* is maintained mostly on practical grounds, but the African species *litsipsirupa* (A. Smith) is placed in *Turdus,* as its patch on the underwing is of quite a different nature than in *Geocichla.* Dorst accepts two monotypic subgenera: *Psophocichla* for *litsipsirupa* and *Platycichla* for *flavipes* Vieillot. All the other species are included in the subgenus *Turdus* and twelve groups are recognized. Most of them are quite reasonable, but a few appear rather artificial and will not be generally accepted without discussion. The particularly difficult Central and South American Thrushes are well studied and sorted out.—Jean Delacour.

33. Oölogic Contributions to the Systematic Study of the Genus Turdus. (Contributions oölogiques à l'Etude Systématique du genre *Turdus.)* R. D. Etchécopar. 1950. *L'Oiseau et la Revue Française d'Ornithologie,* 20(3): 249-262. As a supplement to Dr. Dorst's revision of the thrushes, Mr. Etchécopar has undertaken a comparative study of their eggs. It corroborates our own opinions when they are not in full accord with those of Dorst. For instance, he finds that the eggs of the American wood thrushes are intermediates between those of *Turdus* and *Catharus.* The European Song Thrush, *Turdus philomelos* Brehm has eggs of a unique type. The eggs of the Redwing, *Turdus musicus* Linnaeus, recall those of *Hylocichla; viscivorus* Linnaeus and *cardis* Temminck resemble *chrysolaus* Temminck, *ruficollis* Pallas, etc.; *pilaris* Linnaeus resembles *musicus; eunomus* Temminck resembles *naumanni* Temminck and *merula* Linnaeus. We cannot go into further details, but Mr. Etchécopar's contribution is very instructive and shows that the pattern of eggs is well worth studying when general revisions are undertaken.—Jean Delacour.

EVOLUTION

(See Numbers 32, 34, 36, and 38.)

BOOKS

34. Evolution at the Population Level with Special Reference to Game Animals and Practical Game Management. Paavo Voipio. 1950. *Papers on Game Research* 5, 176 pp. Finnish Foundation for Game Preservation, Helsinki, P. Rautatiek. 13, Suomi-Finland. This paper is concerned with the genodynamics of wild bird and mammal populations. The first part presents a sound basis for the occurrence of genetic changes between populations; the second is devoted to the improvement of quality in game and furbearing animals. Among the forms of geographic variation discussed are: weight, body measurements, antler measurements, color, hair texture, seasonal changes in color, temperature tolerance, clutch size, litter size, choice of habitat, and tendency to migrate. Emphasis is given to physiological differences between local populations. It is established that variation among wild populations is caused by small to large mutations, that the majority of mutations present in nature are recessive in their

phenotypic effect, and that continued spreading of a mutation of unfavorable effect is inhibited by low viability and selection. Most mutations weaken viability, as they disrupt the hereditary structure resulting from complex and lengthy adaptation; but ultimately viability is based on the expression of the mutation under the influence of other genes included in the genotype in question, in some cases actually increasing viability. Above a certain population size selection is the dominant factor controlling the distribution of genes; below that size random gene loss prevails over selection. In small populations the stock rapidly becomes homozygous and undesirable genetic factors may become fixed, reducing the store of hereditary variation and elasticity to adaptation. Isolated oceanic islands are "evolutionary traps" that kill out species settling upon them. This idea is projected into continental populations. With increasing populations the distribution pressure is high in the central parts of the range and single individuals, mostly young, are fed into populations living at the edge of the distributional area, keeping these populations genetically vigorous. With decreasing populations the boundary of the continuous distributional zone retires, leaving scattered small populations that receive no reinforcements. The continuous distribution of ruffed grouse, wild turkey, sharptail grouse, and prairie chicken have been broken up in this manner, leaving isolated remnants. Random gene loss or fixation may cause rapid collapse under such conditions. Cyclic species must be genetically elastic to prevent local extinction, since cycles are accompanied by oscillations in selection, gene loss, gene fixation, and periodic alteration of the type of selection, the latter being the most significant in genodynamics. The improvement of game quality may be achieved by: (1) Promoting the quality and (2) protecting the quality. Improvement of quality through transferring animals with desirable characteristics is extremely limited. Introductions may upset gene-complexes of populations adapted to the habitat, desirable characteristics may be absorbed by the local race that is better adapted to its environment than the introduced animals, or during the process of adapting to the new environment the desirable characteristics may be lost. The objective of management should be to protect high-quality populations rather than replace one population with other animals of the same species. To preserve game quality, populations must be maintained at high levels to prevent formation of small, isolated islands and the accompanying effects of gene loss or fixation. The introduction of new blood is recommended to cancel out with hereditarily new types the disadvantageous effects of isolation resulting from inbreeding in small populations. This appears to be logical in theory, but Voipio fails to recognize that populations recover rapidly from cyclic or environmental lows without help from pen-reared stock, as pointed out in Canadian and American literature. Pen-reared stock may possess inferior qualities that would result in extirpation of a population. In an already established population, management should be directed toward maintaining a high effective (breeding) population-size to prevent the deleterious effects of isolation and gene loss or fixation. According to Voipio, this is accomplished by harvests of either sex, since harvesting males only reduces the effective population-size. Such does not appear to be true in American deer populations that have overpopulated ranges as a result, in part, of shooting only bucks. When introducing new stock into a low population, an unbalanced sex ratio should be used for polygamous species to keep the effective population-size as low as possible to permit the maximum rate of recovery. An illustration that excessive harvests may result in a population with less desirable qualities is provided by the samson (woolly) fox. Despite its low viability, the samson fox gained a foothold when natural populations were low and increased rapidly with the rise in the normal wild population. A subsequent decline followed after the termination of the growth period of the population and the elimination of the unfavorable gene through selection. A less fortunate situation is that of the spread of the cervina (rounded) type of moose antler that has been replacing the more beautiful palmated type since 1300-1400. The cervina type became established in southwestern Finland during a population low caused by poaching. Selection favors this type, possibly because it is superior for fighting between stags. Reducing populations in which the cervina type predominates and preserving the palmated type by selective shooting is recommended. Without doubt this paper will stand as one of the outstanding contributions to population genetics.—Helmut K. Buechner.

35. The Way to Game Abundance: An Explanation of Game Cycles. Wallace Byron Grange. 1949. Scribner's Sons, 597 Fifth Avenue, New York 17. xviii + 365 pp. $6.00. It is never a pleasure to be critical of a good book—and this is a good one—but the topic of cycles, being what it is in our present state of knowledge, is inevitably a fruitful ground for disagreement. If the title were modified to something like this:—*The Way to Game Abundance Through Controlled Environment*—it seems to the reviewer that it would have been more appropriate; he remains unconvinced that Grange has found an explanation of game cycles. Before debating this issue, however, let me say that the author's account of plant successions (which occupies the first third of the volume) is lucid and convincing, while his case for the direct dependence of animals on environment and habitat has probably never been better stated. His style, moreover, is easy and pleasant. *The Way to Game Abundance* is divided into four sections under the headings:—I. The Pattern of Life. II. Plant and Animal Successions. III. Population Cycles. IV. The Technology of Game Increase. Part I is introductory and thought-provoking. II, in which the author elaborates his thesis of plant and animal successions and environmental control appeals to me as the best section of the book. In Part IV, the author is very much at home. Although this section is more reminiscent of the standard textbook, its style is anything but that of a text. Occasional comments are particularly arresting, as for instance, "The nature of man's own habitat dilemma requires another volume: suffice it to say that he is indeed confronted with such a dilemma almost parallel to that of the Snowshoe Rabbit population in a jackpine thicket which has passed the optimum productive stage." (p. 350.) How appropriate an analogy!

Before considering Section III, a few general comments seem in order. Lack of documentation is, to my mind, a detracting feature of the entire book. One frequently gets the impression that the author is listing plants or animals on an arbitrary basis, or wonders whether this statement or that rests on established fact or is instead the author's personal opinion. The statement on p. 121, to take a concrete example, that low years of the ten year cycle have, for ten decades, ended in the numeral 7—1857, 67, 77, 87, 97, 1907, 17, 27, 37, 47—is, for instance, entirely valueless without corroborative evidence. The years 1867 and 1887 actually saw the greatest Canadian lynx peaks in recorded history (Elton and Nicholson, *Jr. An. Ecology*, Nov. 1942), together with rabbits and, no doubt, all species of grouse as well, unless the general pattern of the cycle has changed within recent decades. Likewise the statement—or inference, for one cannot decide which it may be from the way it is expressed—that lynx and bobcat prey on deer (p. 183), surely demands support. The average lynx, notoriously dependent on rabbits, weighs only about 25 pounds and a bobcat less, while a deer may run to over 300 pounds. Occasional judgments are open to question, as for instance, the inclusion of blue, snow and white-fronted geese among species needing special protection (p. 334). The first two species, on their spring resting grounds in Manitoba have been estimated in millions, while the writer has seen 30,000 white-fronts pass over his tent in a single day during the fall migration in Alberta. A few errors also occur, such as the statement (on the same page) that "there is no native breeding stock of musk oxen on the (American) continent itself." Not only does the Thelon sanctuary on the Canadian barrens have a substantial population but between it and Coppermine, herds of anything up to 50 animals are often enough reported by airmen.

Part III—*Population Cycles*—demands critical examination in view of the subtitle of the volume, *An Explanation of Game Cycles*. Part III attempts to provide the explanation. In view of the excellence of much of the book, it is regrettable that this section should lay itself open to rather drastic criticism, but such is the case. If I understand Grange correctly, he explains cycles on the basis of plant and animal successions. When an area has been burned, or logging has denuded a forest (the climax vegetation phase), a fresh start is made in the matter of plant growth. Beginning with grasses and small plants, a recognizable sequence varying with soil, latitude, climate, etc. is passed through, finally to terminate once again in forest, the climax phase which may require 150 years to attain. During that time, any given area has proved itself particularly suitable in successive years for successive species of birds and mammals: the plant cycle, in fact, induces an animal cycle. But there are cycles and cycles. There is no such

thing as *a* cycle of small game, but distinctions are not clearly drawn by the author. In the list of cyclic species, for instance (p. 118) in the paragraph beginning:—"*The* game cycle affects . . ." (italics mine), are included wolves, rabbits, grouse, arctic foxes and snowy owls, in addition to numerous other species. If wolves actually show a cycle, it is certainly a long term one, possibly of 35 years: rabbits and grouse, like lynx and many other fur-bearers, fall into the familiar ten-year pattern, while snowy owls and arctic foxes exhibit a four-year frequency, presumably dependent on the short-term cycle of about four years characteristic of mice, voles and lemmings. "*The* game cycle" of the author thus incorporates three entirely distinct concepts, each of which seems to require its own explanation. If all three depended upon a common denominator—plant successions—there would surely be but a single cycle and its duration would more appropriately appear to be around 150 years.

Although the author correlates the incidence of forest fires with sunspots in parts of the United States, the sunspot cycle coincides with none of the animal cycles yet recognized. And logging operations are certainly not cyclic. Taking the entire continent for our field, as we must in the case of at least the ten-year cycle, the author's argument seems inevitably to land him in the same jackpot as it did Stoddard in the matter of quail. Grange cites Stoddard on p. 188 as follows:—"It is also evident that the abundant summer rains that mean a big quail hatch in hill country flood flat low areas and cause a short quail crop. So, even a single large property of both hill lands and flat lands may have both *spot abundance* and *spot scarcity!* No wonder quail cycles are masked in the South!" Quite, no wonder! The question seems to me to be—do quail in the South cycle at all? And the question posed by Grange's hypothesis is precisely the same—would any kind of cycle be possible across the American continent if there were *spot abundance* and *spot scarcity* alternating over the entire territory, and coincident neither in time nor space? The answer is much more likely to be in the negative than in the affirmative. Such circumstances, which cancel each other out, might eliminate, but could surely not create, a cycle.

The point I am trying to make is this: from what we now know of the ten-year cycle, it has three outstanding features—(a) remarkable regularity of interval (on the average, something short of ten years); (b) circumpolar synchronization; (c) the simultaneous involvement of various species. Taken district by district, the maxima and minima do not necessarily fall into precisely the same years: There may be a lag of a year or two here, and an advance of a year or two there, quite possibly reflecting local conditions such as fires, logging operations and plant successions, but the fact remains that in the over-all perspective of the whole of Canada, and into Scandinavia and Finland, the cyclic interval has remained at close to ten years for as far back as the records go. The northern United States are no exception. Grange's graph on p. 91 of the rabbit-grouse cycle in Wisconsin fits precisely into the ten-year pattern and involves four species. Yet the legend reads—"Basic habitat changes and cyclic weather conditions combine to cause the small game cycle." The "cyclic weather conditions" are not defined: a random reference to sunspots is truly included, but sunspots have long since been discarded as irrelevant to the ten-year cycle. The "Basic habitat changes" are local and show no synchronization: how can they logically be held to account for the synchronous nature of a circumpolar cycle?

The cycle, moreover, appears to be more than circumpolar. Wodzicki's newly published book, *Mammals Introduced Into New Zealand,* indicates a ten-year cycle of the European rabbit *(Oryctolagus cuniculus)* almost as precipitate as our Snowshoe's and equally regular over the past 30 years. Since I am not reviewing my own opinions, and this new information lends remarkable corroboration to a viewpoint expressed elsewhere (See Rowan, W., (a) *The Ten Year Cycle,* Department of Extension, University of Alberta, 1948: (b) *New Biology* (Penguin Books), Oct. 1950, "Canada's Premier Problem of Animal Conservation".), suffice it to state that the length and breadth of the ten-year cycle, its striking periodicity, and its simultaneous effect on many species, suggest a controlling factor of far greater magnitude and potency than local and fortuitous vegetative sequences. What the factor (or factors) may eventually prove to be, remains a matter of conjecture, but that the author's contention (p. 160) that "Fire (and wind locally)

is the important denuding factor in the Snowshoe Rabbit cycle" (and with it grouse) remains, as far as I can see, without any reasonable justification. Across the breadth of Canada and into Finland and Scandinavia, a wave of death affecting numerous species of birds and mammals, and millions of individuals, sweeps the northern hemisphere at ten year intervals. Apparently, it happens also in New Zealand. It seems to the reviewer that this periodicity alone is so striking as to eliminate the last chance that local and random plant successions can possibly account for the phenomenon.

Grange has brought together many interesting facts. That plant and animal successions are correlated I imagine nobody will question, but that these can account for the ten-year cycle or any other large-scale cycle, I, personally, find it impossible to believe. That game abundance can be enhanced by manipulating the local plant environment seems equally beyond doubt, and if such control could be applied simultaneously on a continental scale, I would certainly entertain a hope that the ten-year cycle might some day be harnessed by management. In the meantime, I am afraid I shall remain a skeptical—and possibly an obnoxious —reviewer of Grange's *Explanation of Game Cycles.*—Wm. Rowan.

36. Evolution Emerging. William King Gregory. 1951. The MacMillan Company, 60 Fifth Avenue, New York 11, New York. Volume I (text) xxvi + 736 pp. and Volume II (illustrations) vii + 1013 pp. $20. set. This extensive treatise combines an interesting presentation of selected evidences for the current concepts of the stages and pathways of the evolution of animals with numerous philosophic suggestions and theories concerning the dynamics of evolution. As one would expect from the author's numerous important researches, the core of the treatise is paleontologic; however, the author has by no means dwelt alone on prosaic descriptions and comparisons of fossils but has extensively interwoven innumerable inferences concerning the biology of fossil groups as well as evidences and ideas from comparative anatomy, comparative embryology, ecology, and, to a considerably lesser extent, comparative physiology, comparative psychology, and genetics. The basic philosophy of the treatise is best expressed in the words of the author. "In the present work we shall not be concerned primarily with the classic problems whether the course of organic evolution has been guided by natural selection or by some other natural system. Even the hereditary and statistical mechanisms through which evolution works will be taken for granted here because they are being dealt with (as in the growing volumes on evolution) by many who are more competent to do so. Still less we are interested in *proving* evolution. . . . Our postulates . . . are as follows: (1) Evolution, the natural history of the universe and its parts, deals with the processes and results of the transformation of energy and matter, viewed against the background of time and space. (2) Our sense organs and measuring instruments give only partial information of the complexities of the subject matter; our mental pictures, written records, symbols and measurements of evolution, having been made by fallible human beings, are often anthropomorphic or at best approximate. Nevertheless, since scientists are always subjecting their colleagues' results to the test of experience, there is in the long run a rapidly growing residue of increasing approximation to the facts of evolution." (p. 7.)

Volume I contains the text (with references to pertinent figures in Volume II), a classified bibliography of 143 pages and several thousand references, an index of authors, and a general index. Volume II contains only illustrations with a minimum of explanatory material. The total number of individual illustrations must exceed five thousand. Although the majority are concerned with the morphology of fossils, many depict restorations, morphology and anatomy of living species, and phylogenetic relationships. This valuable collection of illustrations will prove invaluable to zoologists in general, regardless of the field of specific interest. The text has an unusual, but effective, organization and order of presentation. Part One consists of an introduction and chapters concerning respectively (I) "the first living things" (bacteria, Protophyta, and Protozoa through Amelida), (II) the Mollusca, and (III) the Arthropoda. Part Two, "Emergence of the Vertebrates . . .," consists of chapters on (IV) "coelomate foodsifters of diverse types" (Brachiopoda, Polyzoa, and Echinodermata), (V) the prochordates and the origin of vertebrates, (VI) the jaw-less vertebrates, (VII) placoderms, (VIII)

elasmobranchs, and (IX) bony fish. Part Three is concerned with the air-breathing fish, amphibians, reptiles, and birds; it contains chapters on (X) lung fishes, (XI) amphibians, (XII) origin of reptiles, (XIII) invasion of aquatic habitats by reptiles, (XIV) archosaurians, and (XV) pterosaurs and birds. Part Four, chapters XVI-XXIV, is concerned with the evolution of mammals. Part Six, "Evolution Emerging: Retrospect and Prospect," consists of a single chapter dealing with certain philosophic aspects of evolution. The text maintains reader-interest well. It is interestingly jolting, however, to pass from such headings as "The impetuous swordfish and the leaping marlin," "Leaping on all fours," and "The sharp-eyed blennies and their slithery relatives" to the relatively technical terminology of the texts beneath them.

The author repeatedly cautions against anthropocentrism in the development of theory of evolution and assails (p. 455) those who fail to place man in his rightful place in the scheme of animal evolution. Further (p. 231) he vigorously assails the contention of Broom that progressive evolution has come to an end and that man is after all the main objective and climax of evolutionary advance. The reviewer is prompted to observe, nevertheless, that "Evolution Emerging" could unwittingly contribute to this very type of anthropocentrism, particularly in the case of the more casual and non-critical reader. Of the 560 pages of text, 411 concern the Vertebrata, the sub-phylum to which man belongs. The arrangement is one which pyramids to the evolution of the human species, including "Part Five. The Devious Paths to Man" and Chapter XXIV, "Man's Debt to the Past." The latter traces evolution from the origin of life to the development of the human species.

Birds are discussed in Chapter XV (pp. 312-322) together with the pterosaurs. In general the treatment is that of the classical paleontology with little reference to material in publications since 1935. The latest citation to Wetmore is 1933 and the latest to Howard is 1932. One finds no reference to the paleontologic investigations of Loye Miller nor to the comparative myologic studies of Hudson. The reviewer finds it somewhat difficult to consider feathers as "excretions" and scales as adaptations of feathers. The swallows are referred to the Alaudidae in the text (p. 320) and are omitted from the phylogenetic diagram (Plate 15. I, Volume II). The author aptly states the principle which must be observed at all times by students of avian physiology and avian behavior. "Both birds and mammals are warm blooded animals and have been derived from cold blooded lizard-like reptiles; so that there has been considerable parallelism in end results, which have been achieved by similar means. However, the older heritage and derivation of birds and mammals are widely different." (p. 326.)

Throughout the text (pp. 228, 310, 549, for example) one encounters reference to and discussion of isomeres, anisomeres, polyisomeres, and polyanisomeres. Polyisomeres are groups of repetitive units (structures, organs, events, etc.); anisomeres are specialized isomeres. "But each polyisomere has its own individuality, for even if they look exactly alike they will have different histories in space and time, as in the case of different leaves on a tree or different ones of the paired appendages of Crustacea, or different generations. . . . In so far as different polyisomeres show difference in sizes or in emphasis of any given character, they are termed *anisomeres* (unequal parts). Polyisomeres (implying repetition, units, serial numbers) and anisomeres (implying either positive or negative emphasis, degrees) form an associative or correlative pair of categories of wide application in nature and even in the special worlds of man. After we have once learned to know them, we are forced to wonder why others, especially students of natural and social science have not commonly recognized them as such. The answer is that the differences between polyisomeres and polyanisomeres of different kinds and origins are so conspicuous that each kind has received its own name . . . Daisies, flies, sand grains, chocolate bars, votes, vertebrae and mosquitoes, we know separately . . . [but] we may fail completely to recognize the utility of lumping them all together under a single class." (p. 549.) Granting the eloquence of the discussion and the large number of apparently pertinent cases, there still remains to be developed the true basic meaning in terms of genetics, ontogeny, physiology, and natural selection.

Viewed in light of its objectives and postulates, and as a portrayal of the evolution of certain groups as indicated primarily by the fossil record with support-

ing evidence from other sources, "Evolution Emerging" is a treatise which should prove itself to be of noteworthy usefulness to biologists and laymen not extensively versed in animal paleontology. Its interesting text and wealth of illustrations make it an important exposition of this aspect of our knowledge of evolution.—D. S. Farner.

37. Check-List of Birds of the World Volume VII. James L. Peters. 1951. Museum of Comparative Zoölogy, Cambridge 38, Massachusetts. x + 318 pp. $6.00. Volume VII of this invaluable reference is the first concerned with the Passeriformes. Included is the suborder Eurylaimi (broadbills) as well as the Dendrocolaptidae (wood-hewers), Funariidae (ovenbirds), Conopophagidae (ant-pipits), and Rhinocryptidae (tapaculos) of the superfamily Furnarioidea, suborder Tyranni. In general the plan of the previous volumes is followed although in the case of the Furnarioidea only the synonymy since Hellmayr, rather than since Sharpe, is given. With respect to the Furnarioidea it is of interest to note that Volume VII admits approximately 300 forms more than Hellmayr's revision of a quarter century ago. It is always an extreme pleasure to note further progress towards the completion of this monumental series and to anticipate the consequently greater ease in the use of proper nomenclature.—D. S. Farner.

38. Species formation in the Red-eyed Towhees of Mexico. Charles G. Sibley. 1950. *University of California Publications in Zoology*, 50(2): 109-194, plates 11-16, 18 figs. in text. There doubtless still are a few zoologists who decry taxonomy as a field of little modern-day importance—one in which there remains scant opportunity for yielding contributions of broad biological significance. To the contrary, systematics is just now coming into its own. The taxonomist is no longer a closet naturalist who deals only with dried, stuffed, or otherwise preserved specimens in the museum. He is just as much concerned with the biology of living populations of the groups with which he is working. The techniques employed by the author of the present paper typify the trend in modern systematics. Having already measured and critically studied no less than 1,156 museum specimens of a kind of bird in which there were supposedly several "good" species, he then went several times into the field to southern Mexico, to ascertain how these alleged species responded to their environment and to each other. His results are classic, and biologists are now nearer than they were before to understanding fully the process of speciation in birds as well as in all higher groups. Specifically the paper deals with the perplexing relationships of the Red-eyed Towhees of Mexico, especially with the *ocai-maculatus* problem. These two radically unlike Towhees occur in one place (Oaxaca) side by side without interbreeding; in another place (Mount Orizaba), the two exist side by side but produce only occasional hybrids; finally, in a third place (Cerro Viejo, Jalisco), the two "species" hybridize so promiscuously that a sample of 77 specimens of the population there yielded no two that are alike. Areas such as this, demonstrating degrees of breakdown of reproductive isolation between two species, shed much light on the mechanics of species formation in higher vertebrates. They are to the zoologist the proving ground that the laboratory is to the chemist. Of special interest to ornithologists of the United States is the fact that Sibley advocates reducing the Spotted Towhees, *Pipilo maculatus* Swainson, of the West, to a subspecies of the Eastern Towhee, *Pipilo erythrophthalmus* (Linnaeus). The latter name has priority and hence would become the specific name of the group. In support of this action, Sibley's arguments are both logical and convincing. The paper is deserving of the attention of all serious students of ornithology.—George H. Lowery, Jr.

39. Migration of Birds. Frederick C. Lincoln. 1950. Fish and Wildlife Service, U. S. Department of the Interior, Circular 16. 102 pp. U. S. Government Printing Office, Washington. $0.30. This interesting well-illustrated bulletin discusses many of the aspects of migration with an abundance of examples drawn from the author's long and varied experience. Emphasis is on American species and investigations performed in America. Concerning the origin of migration, the author discusses the "northern ancestral home theory," the "southern ancestral

home theory," "theory of photoperiodism," and the "theory of continental drift." Deficiencies in the first three are presented; the last is rejected on the basis of temporal incompatibility. It seems desirable that the extreme probability of a *multiple* and even *repeated origin* of migration in different groups at different times should have been indicated. A series of maps show the rate of spring migration of the Black and White Warbler, *Mniotilta varia* (Linnaeus); Cliff Swallow, *Petrochelidon pyrrhonota* (Vieillot); Canada Goose, *Branta canadensis* (Linnaeus); Gray-cheeked Thrush, *Hylocichla minima* (Lafresnaye); and Black-poll Warbler, *Dendroica striata* (Forster). Generalizations on the altitude at which birds migrate are difficult to frame. The author rightfully points out that much of it must be lower than 3,000 feet although migrating cranes have been seen as high as 15,000 feet. There is a brief discussion of some of the fragmentary information bearing on the problem of orientation during migration. Perhaps the least adequate part of the treatise is that concerned with the influence of weather. The initial statement that "the state of the weather at any point has little if anything to do with the time of arrival of migratory birds" (p. 80) although containing certain basically correct elements is certainly dangerous and misleading as a generalization. There is an interesting discussion of migration of races within a species indicating that frequently the race with the northernmost breeding range migrates furthest south in winter. There is a map (p. 19) showing the southward migrations of the Arctic Tern, *Sterna paradisea* Pontoppidan, as an example of "long-distance migration." There is a relatively extensive discussion (pp. 46-69) of the Fish and Wildlife Service "flyways" which, with some exceptions, constitute a rather arbitrary classification of routes, however admittedly of basic importance in waterfowl management. The "Evolution of Migration Routes" is in many respects the most interesting in the entire treatise and is concerned primarily with the development of routes by extension of range. Mr. Lincoln's treatise obviously is not, nor is it intended to be, a detailed or complete treatment of the field. As a well-conceived introduction to many of the interesting aspects of migration it is admirably adequate.—D. S. Farner.

40. Canada Geese of the Mississippi Flyway with Special Reference to an Illinois Flock. Harold A. Hanson and Robert H. Smith. 1950. *Illinois Natural History Survey Bulletin*, 25(3): 67-210. This study is based on data from three primary sources: Horseshoe Lake, Alexandria County, Illinois (3,700 acres); surveys of populations elsewhere in the Mississippi flyway; banding records of Jack Miner Bird Sanctuary, Kingsville, Ontario, which were made available to Geese investigators. A total of 5,747 geese were trapped at Horseshoe Lake from 1940 to 1947, and 16,232 geese were banded at the Jack Miner Bird Sanctuary from 1927 to 1944. Forty questionnaires were distributed to fur trade posts in the Canadian Eastern Arctic in 1947, to obtain additional information on breeding ranges, kill, band returns, etc. The following are discussed: The flyway concept; eastern populations (North Atlantic and Hudson-James Bay); Hudson-James Bay breeding range (limits, west coast muskeg type, west coast production center, nest sites); migration (autumn and spring routes, time and rates); winter concentrations (Jack Miner Bird Sanctuary, Illinois, Michigan, Wisconsin, Ohio, Indiana, Arkansas, lower Mississippi River, and coastal marshes); goose behavior and hunting losses (wariness, family groupings, sociability); history of goose hunting in Illinois; annual bag (on breeding grounds, southern Canada and United States, total annual bag, Canada vs. U. S. kill); differential hunting losses; crippling loss; miscellaneous mortality factors (lead poisoning, starvation, bound crop, predators, diseases, parasites); productivity (breeding potential, actual productivity, data from Horseshoe Lake, theoretical vs. actual productivity, flock sizes); population survival (mortality, longevity); discussion (status and management); present situation. Appendix A and B concern southeast populations and classification. The flyway concept is well presented. Note is made of the chief deviations from flyway consciousness among young birds that have not nested. Young Canada Geese when raised in or transported to a new area are similar to the migratory behavior of the geese native to that area. Present data indicate that the population of Canada Geese breeding inland from both coasts of James and Hudson bays is a heterogeneous one and is composed of

four segments or subpopulations (South Atlantic, Southeast, Mississippi Valley, and the Eastern Prairie). Each has its own breeding range, migration routes, and wintering areas. This discussion is well organized and presented interestingly.

The Horseshoe Lake Wildlife Refuge, located at the southern tip of Illinois, was created in 1927. Increased numbers of Canada Geese began using this refuge soon after it was formed thus drawing geese away from their traditional wintering ranges on the Mississippi River. Recently the refuge has attracted about 50 percent of this population of the Mississippi Valley. Annual kill of geese has increased tremendously near the refuge, due in part to a loss of wariness. The suggested cause is the psychologically pacifying effect of large numbers of geese at rest on a relatively small area. In 1939, 17,300 geese were killed in this area, a kill greatly exceeding what the flock could sustain according to the authors. From 1939 through 1945, about 9,800 geese have been killed per season in this area. Bag inspections showed that a preponderance of juvenile geese were taken. Crippling losses in recent years in this area are estimated to be equivalent to approximately 30 percent of the annual bag. Indians have harvested approximately 25 percent of the total Mississippi Valley Canada Geese bagged in recent years. Inspection of trapped and bagged geese at Horseshoe Lake over a seven-year period revealed that the age ratios varied from 47 to 204 juveniles per 100 older geese. Average flock size of birds in the fall and winter is suggested as a quick means of appraising breeding success for the previous spring. Increased protection of the Mississippi Valley Canada Geese in 1946 and 1947 plus certain other management practices resulted in an appreciable gain in the population by 1948-49 according to the authors.

Of particular interest to those interested in population dynamics as revealed by banding is the section on "Population Survival" (pp. 172-188). Two sets of data are employed. The first are those obtained from retrapping geese originally banded at Horseshoe Lake. The studies extend only through seven years; in order to obtain mean values for survival for each year of life it has been necessary, in effect, to assume, by use of percentages, that the sample banded each year was of the same size. Further for a calculation of survival of each successive year not only is there the natural reduction in the sample because of natural mortality but also for each successive year the number of age classes contributing to the sample is reduced by one. Hence the calculations can be regarded only as indicative of the order of survival. The "survival index" *(unweighted mean for survival rates for the first three years)* for geese banded as juvenals at Horseshoe is 43 percent (p. 174); for geese regardless of age banded at Horseshoe Lake, 48 percent. Of greater significance are the data based on the recoveries of geese banded at Kingsville and recovered in the Mississippi Valley. The following "survival indices" are tabulated for Kingsville-banded geese (all ages); 1925-1932, 61 percent; 1925-1929, 48 percent; 1930-1934, 59.5 percent; 1935-1939, 63 percent. Although these "indices" will doubtless prove useful as indicators of survival rate it would seem that it would have been more useful, especially for comparative purposes, to have calculated mortality and survival rates according to the procedure of Lack *(Ibis*, 90: 266. 1948) using, if feasible, the correction employed by Paynter *(Ecology*, 30: 162. 1949). Nevertheless the value of the "survival indices" must not be discounted particularly as an aid in ascertaining trends in population size and composition. Of very considerable interest is the survival curve presented on page 186. It indicates the usually relatively high juvenal mortality rate followed by five years of fairly uniform annual survival (58-72 percent) with an indication of some increase in survival rate in the 6-8th years. However, as the authors indicate the data are not conclusive because of the smallness of the samples for these years. These data on population dynamics are an important contribution to a very significant monograph.—C. F. Yocom and D. S. Farner.

41. Birds of the Cleveland Region. Arthur B. Williams, editor. 1950. *Scientific Publications of the Cleveland Museum of Natural History, Volume X*, and *Bulletin 2 of the Kirtland Society*. 215 pp. The Cleveland Museum of Natural History, 2717 Euclid Avenue, Cleveland, Ohio. For purposes of this list, the Cleveland region is defined as the territory lying within 30 miles of the Cleveland

Public Square. The body of the treatise (pp. 13-177) is the annotated list of species and subspecies. For most of the forms listed there is information, where applicable, on status, migration dates, habitat and distribution in the Cleveland region, critical specimens, and nesting records. Since accurate records for the area date back to Kirtland's observations, there has been ample opportunity to note changes in abundance and status of certain species. This annotated list will be an important source of information for avifaunal investigations for many years to come. In addition there is a bibliography of seven pages, a very interesting history of ornithology for the region (pp. 185-192), an annotated list of locality names, a list of 106 species seen on Christmas bird counts (1910-1948), and a list of 115 species included in breeding bird population studies. The publishers, the editor and the contributors are to be commended for an important contribution to American ornithology.—D. S. Farner.

42. The Life of the White Stork. (La Vie des Cigognes.) G. Bouet. [1950?] Les Éditions Braun & Cie, 18, Rue Louis-le-Grand, Paris (2e). 108 pp. This charming little book, with 35 excellent photographs and five maps, presents interestingly many facets of the life history of the White Stork, *Ciconia ciconia* (Linnaeus). Chapter I (pp. 8-61) is concerned primarily with reproduction. Chapter II (pp. 62-70) discusses the geographic distribution of the species. In 1934 there were 53,944 recorded nests in Europe; in 1935 the estimated number of breeding pairs in North Africa was about 30,000 pairs. With a few rare exceptions there are no breeding storks in France except in Alsace (185 nests in Haut-Rhin and Bas-Rhin in 1947). The general absence of breeding storks in France is attributed to the fact that French culture does not favor the existence of storks in the way that it is favored by the cultures of the "nordic or anglo-saxon peoples" and of the Mohammedan peoples. There has been a failure to enforce protective laws effectively in France. Chapter III (pp. 71-108) discusses migration. The account of the migration of the breeding storks of Europe is in essential agreement with that of Rüppell *(Der Vogelzug,* 13: 35-38, 1942). Most interesting is the account of the migration of the breeding population of North Africa; much of the information is from the author's own research. Fall migration (mid-August to September) southward across the Sahara occurs during the dry season and is massive, rapid, and probably nocturnal. Spring migration (January to March) is leisurely as the season, with the emergence of molluscs, insects, reptiles, and amphibians, advances northward. There is an interesting discussion of the wanderings of young storks.—D. S. Farner.

43. Where to Find Birds in Minnesota. Kenneth D. Morrison and Josephine Daneman Herz, editors. 1950. The Webb Publishing Company, 55 East Tenth Street, St. Paul 2, Minnesota. xiii + 122 pp. $1.50. This little book is a well-edited compilation of the contributions of 48 Minnesota ornithologists concerning the birds to be seen at 62 selected Minnesota localities. For each locality there are travel directions, brief description of the terrain, vantage points, ecologic groups to be seen, list of species, hazards, general remarks, and references. As a device to stimulate the study of ornithology, this little book will prove to be an interesting experiment. The reviewer predicts that it will be successful. The book is a must for teachers of biology, club leaders, scout leaders, and others who introduce youth to nature and natural history.—D. S. Farner.

44. The Doves, Galliform Birds, Swifts, Goatsuckers, Bee-eaters, Rollers, Kingfishers, and Hoopoes of Belgium. (Les Colombidés et les Gallinacés ainsi que les Martinets, l'Engoulevent, le Martin-Pêcheur, le Guêpier, le Rollier et la Huppe de Belgique.) R. Verheyen. 1950. Institute Royal des Sciences Naturelles de Belgique, Rue Vautier, 31, Bruxelles. 152 pp. This interesting volume is the eighth in a series of compilations devoted to the general biology of Belgian birds. Previous volumes have concerned ducks and geese (1943), woodpecker and cuckoos (1943, 1946), birds of prey (1943), song birds (two parts, 1946, 1947), and shore birds (1948). The initial section (pp. 1-24) is a general discussion of the swifts, rollers, bee-eaters, goatsuckers, and hoopoes with respect to systematics, plumage, feet, buccal organs including salivary glands,

and reproduction. A second section (pp. 25-42) treats galliform and columbiform species in a similar manner. Of particular note is the discussion of the utilization of cellulose by means of symbiotic micro-organisms. This discussion is a compilation of information from a number of sources. Unfortunately, here as elsewhere in the volume, specific bibliographic references are lacking. The bulk of the volume (pp. 46-146) consists of discussions of the 21 species of the above-cited groups which occur, or have occurred, in Belgium. For each there are sections on synonymy, description, distribution (general and in Belgium), migration and other movements, habitat, food habits, nesting, eggs, incubation, and young and their development.—D. S. Farner.

NOTES AND NEWS

In the course of a very pleasant field meeting of the Northeastern Bird-Banding Association (at the banding station of Mr. and Mrs. James F. Nields, Jr., Hardwick, Mass.), an informal discussion took place on color standards available to banders, with which to record details of plumage and the soft parts of birds. It seemed that the ideal standard would be: (1) compact enough to be carried in the field; (2) reduced to a reasonably small number of colors to avoid the need of a great many sub-divisions in studying, for example, plumage changes in Purple Finches; (3) tied in to the great mass of existing data based on Ridgway's standards; (4) and yet more objective and simpler in application; (5) while remaining moderate in price. It seemed possible that such a standard would be useful in other branches of natural history, although the range of colors needed would vary with the branch to some extent. Mr. C. H. Blake, President of the N.E.B.B.A., appointed a special committee to look into the subject: Mr. B. M. Shaub (Chairman), Mr. Parker Reed and Mr. E. A. Bergstrom. The committee would welcome any comments or suggestions, to be sent to Mr. Shaub at 159 Elm St., Northampton, Mass.

During the same field meeting, a question was raised by Mr. E. A. Bergstrom as to whether it would not be profitable to experiment with trapping methods for use under the following specialized situations: (1) spring or fall landbird migrants on barren islands or peninsulas, to get more information on whether water-drip traps would not prove effective, and if not, whether any other type of automatic trap could be used. Most of the banding done under such circumstances seems to have been done in Europe, relying heavily on driving birds into the big Heligoland traps; (2) methods other than nets to take species such as blackbirds in the vicinity of roosts where considerable numbers gather, at certain seasons; and (3) species such as marsh wrens or sharp-tailed sparrows in large marshes, as adults, without disturbing the immediate vicinity of the nests, and at a considerable distance from solid ground. From the discussion which followed, it did not appear that any great amount of work had been done on these problems, and their inherent difficulty challenges our ingenuity. The editor would welcome comments on solutions which any readers may have found.

Erratum: on page 40 of the January, 1951, issue, the second line of the review of *The Pre-egg Stage in the Albatross Family* should read in part: "*Biological Monographs,* No. 3."

As a service to banders, the Massachusetts Audubon Society has in stock a large assortment of traps (see circular enclosed), assembled by Mr. C. R. Mason, its executive Director. He is a bander of long experience, and a member of the Council of the Northeastern Bird-Banding Association. One excellent trap was obtained too late for inclusion in the circular: the Mason trap (designed by Mr. Edwin A. Mason of Arcadia Wildlife Sanctuary), which is among those discussed by Mr. Blake in his paper entitled "A Method of Comparing Traps" in this issue. It is a large (37 x 18 inches) automatic trap, at $12.00.

Because of the greater space devoted to original papers in recent issues, the backlog of papers awaiting publication is low. We know of several being prepared with a view to publication in *Bird-Banding,* such as a summary of information on traps and baits for the Mourning Dove, being prepared by biologists of the U. S. Fish and Wildlife Service. Nevertheless, the editor could use additional good papers on subjects of particular interest to bird banders, in early issues. Most general notes accepted for publication in recent months have appeared in the first