(2) the "postage" entries for the first three years listed include U. S. customs (not applicable to shipments received starting in October, 1962).

(3) "Losses" include replacement of damaged or defective nets, loss of shipments in the mail, and credit losses.

(4) "Cash on hand" is a balance between the previous year's final figure, payments received in cash, and sums drawn toward expenses (on the one hand) and postage and other expenses paid in cash rather than by check. The negative amounts involves times when the assistant treasurer in charge of net sales had paid out more in cash than he had yet been reimbursed for.

(5) "Nets on hand" are shown at cost to date, not retail value.

(6) "Nets on order" must be paid for in advance, and are shown at cost to date.

(7) "Nets paid in advance" involve short-term situations where some net type is temporarily out of stock, and longer-term situations where NEBBA is holding a small credit against a purchaser's account (particularly for overseas purchasers).

(8) Three fiscal years involved a reserve for shipments in transit against customs duties payable when the shipments arrived.

E. A. Bergstrom,
Assistant Treasurer

RECENT LITERATURE

BANDING

(See also 6, 14, 19)

1. Rapid Band Wear on Australian Ravens. Ian Rowley. 1966. *The Australian Bird Bander*, **4**(3): 47-49. In a study of the Australian Raven (*Corvus coronoides*) the author reports on handing operations utilizing monel clip-bands and subsequent damage by abrasion and corrosion to the bands. Clearly, bands that were too loose slipped freely up and down the legs, the result being obvious wear of the band at the same point, on the upper side, opposite to the clip. Furthermore, by weighing bands after 100-1200 days' use, Rowley noted an average annual weight loss of 7.2 per cent. Weight losses of similar magnitude (though different kinds of bands were used) have been reported from sea birds—*Puffinus puffinus* (10.5%) and *Rissa tridactyla* (9.3%). Banders working with large and long-lived species should be apprised of this situation.—David W. Johnston.

MIGRATION

2. An Approach to the Analysis of Visible Migration and a Comparison with Radar Observations. P. R. Evans. 1966. *Ardea*, **54**(1/2): 14-44. This paper attempts to calculate the relation between the actual density of diurnal migrants (birds/mile^2) and the observed rate of passage (birds/hr) along a "leading-line." Its basic assumption is that all low-flying birds that reach the leading-line turn along it and do not leave it: this is reasonable for the case studied by the author, but will not apply generally. The graphs in the paper also apply only to one geographical case, but the mathematical expressions can be applied to others.

A striking feature of the results is the importance of the wind, which can augment the concentration of birds along a leading-line by a factor of 10, or reduce it to zero. Lateral drift by the wind is a critical factor in the augmentation, and there is still doubt whether it occurs. (Surprisingly, Evans does not mention his own important argument in another paper (see review no. **3**), which shows that the effects of drift take place even if the birds compensate for drift.) An important conclusion is that the rate of passage along the line increases steadily during the day until the birds begin to settle: the density of migration can be estimated only if the rate of increase is observed; *the maximum rate of passage along the line is a measure only of the duration of migration and not of its density.*

The last section of the paper compares estimates of migration density obtained by this means with radar estimates of the density of high-flying birds, probably of the same species. Briefly, each method detects about the same number of birds, and neither alone gives an unbiased measure of density.—I. C. T. Nisbet.

3. Migration and Orientation of Passerine Night Migrants in Northeast England. P. R. Evans. 1966 *J. Zool.*, **150**(2): 319-370. This long paper discusses a variety of topics, but is primarily concerned with long-distance migrants (especially warblers—Sylviidae) leaving northern England and Scotland in autumn. Most warblers leave this area with little or no fat, although some of the species lay down large quantities of fat in southern England, and others do so in southern Europe. Evans points out that fat deposition in these species is facilitated by their autumn change in diet from insects to fruit; since soft fruit ripens earlier in southern Europe it is advantageous to migrate south early in autumn. However, suitable feeding areas in southern Europe are limited, and finding them might require precise navigation.

Using radar, Evans found that the tracks of the birds were more consistent than their headings, and that on some nights the tracks remained constant in spite of changes in wind; hence the birds correct for drift and maintain the same tracks on each night. The usual track is SSE., but some of the species are later found in Portugal (band recoveries) and hence must change to SW when they reach France. Evans interprets this 'dog-leg' migration as an adaptation to the prevailing upper-air westerlies in high latitudes, and shows convincingly that birds attempting to fly directly from Scotland to Portugal would, more often than not, encounter impossibly strong headwinds. Migration tended to be denser with light or tail-winds, with falling temperature, and with clear skies, but none of these correlations was very pronounced.—I. C. T. Nisbet.

4. Autumn Movements, Moult and Measurements of the Lesser Redpoll *Carduelis flammea cabaret*. P. R. Evans. 1966. *Ibis*, **108**(2): 183-216. Lesser Redpolls breed in northern Britain and winter either in southern England or in continental Europe. Most band recoveries on the Continent occurred in years in which the birch seed crop was poor (which happens in alternate years). The molt of the species was studied in a traditional molting area to which individuals returned in successive years, although most did not breed there. The progress of molt in different feather tracts is described in detail with the help of quantitative diagrams. Complete molt in both sexes usually began just after the last brood of young reached independence, and southward migration followed immediately after the molt was completed. Weights of adults (but not first-year birds) decrease at the start but increase toward the end of molt; apparently there was no premigratory fat deposition, migration taking place in short stages by day. Food supplies in the breeding area remained adequate throughout the winter, but the time available for feeding in the short winter days was limited: Evans suggests that day-length, not food, is the main reason for migration in this subspecies.—I. C. T. Nisbet.

5. Inertial Navigation in Relation to Animal Navigation. John S. Barlow. 1966. *J. Inst. Navigation*, **19**(3): 302-316. This is a concise summary of Barlow's 1964 paper on inertial navigation (see review in *Bird-Banding*, **35**: 269, 1964), but contains little new material.—I. C. T. Nisbet.

6. The Movements of Pied Wagtails as shown by Ringing. Peter Davis. 1966. *Bird Study*, **13**(2): 147-162. This well-marked subspecies, whose breeding range is virtually confined to the British Isles, has yielded 388 distant recoveries. Movements of less than 50 miles are in random directions: longer movements represent migration, SSE through Britain to France, then SSW to Iberia and Morocco. Southern birds tend to migrate to the southern part of the winter range, but only a proportion of them (mainly juveniles) migrates at all. Long-distance recoveries of first-winter birds are clustered in years following warm summers, and hence perhaps reflect high population-levels.—I. C. T. Nisbet.

7. The Great Immigration of early September 1965. Peter Davis. 1966. *Brit. Birds*, **59**(9): 353-376. The largest "fall" of migrants in 60 years of record descended on the English east coast on 3 September 1965. At one place half a million birds were seen in 24 miles of coast (which probably would not be exceptional on the American east coast). "Evidently most of the birds were part of the SSW-oriented stream from Scandinavia to Iberia, disorientated, concentrated and forced down by a belt of overcast and heavy rain." Some facts are pointed out which do not fit into this simple interpretation: Davis tentatively suggests that both the "random dispersal" and "reversed migration" hypotheses may be necessary to explain them.—I. C. T. Nisbet.

8. The Movements of the Kittiwake. J. C. Coulson. 1966. *Bird Study*, **13**(2): 107-115. Kittiwakes banded in Britain show a restricted dispersal of young birds during July-September, followed by a more extensive dispersal in October and November. The most extensive movements are in the third autumn of life, when many reach North America or Greenland. Two groups of birds can be distinguished, one which remains in European waters and another which disperses across the Atlantic. It is tentatively suggested that these groups are composed of different sexes.—I. C. T. Nisbet.

9. Passerine Night Migrants on Skokholm. David Lack and Peter Lack. 1966. *Brit. Birds*, **59**(4): 129-141. This paper summarizes numbers and migration periods of the smaller long-distance migrants, using 19 years' records at this small island off South Wales. "Most species are commoner in spring than in autumn, probably because they are British summer residents, which, when they pass over Skokholm, are much nearer to the start of their migratory flight in autumn than in spring. Hence the birds are less likely to meet adverse weather over Skokholm in autumn than in spring, and may also be less likely to be forced down if they meet it." –I. C. T. Nisbet.

10. Blackpoll Warbler Migration in Michigan. Bertram G. Murray, Jr. 1966. *Jack-Pine Warbler*, **44**(1): 23-29. Forty-four Blackpoll Warblers taken in Michigan in autumn show a pattern of weights and dates very similar to that reported for Massachusetts. Murray concludes that birds from both areas continue their migration along the same route (in his view, via the Middle Atlantic States to Florida, a devious route for the Michigan birds).—I. C. T. Nisbet.

11. The Migration of Raptors at Falsterbo. Report No. 34 from Falsterbo Bird Station. (Rovfågelsträcket vid Falsterbo.) Leif Rosén. 1966. *Vår Fågelvärld*, **25:** 315-326. (English summary.) This paper is based on records covering 1942-1944, 1949 and 1950, and 1952-1960. Analysis of the data deals with the following problems: 1) when does the peak occur and which is the mean period of migration of each species? 2) does a late or an early migration in one year prolong or shorten the mean migration period? 3) do many or all species, respectively, tend to be late or early in the same year? 4) is there a general tendency in any one species to advance or delay their migration? 5) does the total mumber of migrants tend to increase or decrease in any of the species? Apart from the text, the findings are presented in three tables and 14 diagrams.—Louise de K. Lawrence.

POPULATION DYNAMICS

(See also 7, 12, 34)

12. Eruptions of Bearded Tits during 1959-65. H. E. Axell. 1966. *Brit. Birds*, **59**(12): 513-543. The British population of this species was reduced to less than 4 pairs in 1947, but had increased to some 200 pairs by 1959. Since then dramatic "eruptions" have occurred each autumn. The eruptive behavior is described in detail, and is illustrated in a remarkable photograph by Eric Hosking. Because the history of the entire population is known in detail, the discussion of the causes of the eruption is especially valuable. High population density appeared to be a major proximate factor, but not the only one.—I. C. T. Nisbet.

NIDIFICATION AND REPRODUCTION

(See also 4, 19)

13. On the Occurrence and Biology of the Marsh Harrier in Finland. (Ueber Vorkommen und Biologie der Rohrweihe, *Circus aeruginosus* (L.), in Finnland.) Olavi Hildén and Pertti Kalinainen. 1966. *Orn. Fenn.*, **43**(3-4); 85-124. A joint study based on reports from 83 observers. The earliest record of the Marsh Harrier in Finland was of a specimen shot in 1886. Now it nests more or less commonly in marshes near the coast of Finland. The authors suggest that this extension of range may be partly due to the amelioration of climate in the region during this century, as well as to the disappearance of many central and southern European wetlands through drainage.

The female harrier builds the nest, lays four or five eggs and incubates them. These hatch in 31-34 days; for the first two to three weeks the male brings all the food for mate and chicks. First flights are made at about six weeks. In the 51 nests observed throughout their course, 233 eggs were laid and 117 young fledged—a success of 50 per cent. The food of these harriers consists of small rodents and young birds. Their stay in Finland lasts from early April to August or September. —Margaret M. Nice.

14. Summer Observations of the Least Flycatcher in Michigan. Lawrence H. Walkinshaw. 1966. *Jack-Pine Warbler*, **44**(4): 151-168. The author has found 104 nests of *Empidonax minimus* throughout Michigan; he tabulates his records on migration dates, nest site, territory size, measurements of eggs, weight and growth of the young. The female builds the nest and incubates the eggs. Both parents feed the young. Incubation takes 13 to 15 days, fledging 13 to 16 days. "Of 54 nests where the outcome was known, eggs hatched in 33 and young fledged from 28 (51.9%). Out of 193 eggs, 123 (63.72%)hatched and 103 (53.6%) fledged." Only five of the 54 nests were parasitised by Brown-headed Cowbirds (*Molothrus ater*), and of these only one cowbird was fledged. Of the four pairs of adults banded, two pairs and the other two males returned the following year to their former territories. Of 46 banded nestlings not one was found in later years. This is a careful study full of detailed information. The four photographs by the author of Least Flycatchers and their beautiful nests are excellent.—Margaret M. Nice.

15. Behaviour of the Young Gannet. J. B. Nelson. 1966. *Brit. Birds*, **59**(10): 393-419. Another chapter in the author's intensive study of *Sula bassana* on Bass Rock, Scotland (see review in *Bird-Banding*, **37**: 136, 1966). In contrast to the "slow and violently fluctuating development of boobies *Sulas pp.* due to their erratic food supply," the chick of the Northern Gannet with an excellent food supply sits quietly upon its nest and in 90 days increases in weight from 60 to 4,500 g, 150 per cent of the adult's weight. Then of its own accord, with *no starvation period*, the young bird leaves for the sea, and its parents pay no further attention to it. The adult male Gannet has developed territorial aggression to a high degree. The strict sedentariness of the chick is an adaptation partly to the dangers of a cliff-nesting site and also to the severe attacks by the adults to any chicks seen wandering about. Eleven figures and 12 photographs graphically illustrate this valuable study.—Margaret M. Nice.

16. The Breeding Biology and Management of the Northern Eider (*Somateria mollissima borealis*) in the Cape Dorset Area, Northwest Territories. F. G. Cooch. 1965. *Can. Wildl. Ser., Wildl. Mgt. Bull.*, Ser. 2, No. 10, 68 pp. The economic motivation for this study was the desire to establish a viable eider down industry in the Canadian Arctic. A preliminary aerial survey in 1954 indicated a large eider population on southwestern Baffin Island, and in 1955 and 1956 the study was carried out on four small islands. Nests were located, eggs numbered, females banded, ducklings dyed by egg injection, and observations were made both before and following the nesting season. In both years the weather was warm and dry in June and early July. The first migrant eiders, males, arrived in early May; females increased in numbers later, and by early June the sex ratio was equalized and courtship frequent. With thawing of lake ice, nest

prospecting began in mid-June. Old nest sites were most frequently chosen, partly because of high site tenacity; 90 per cent of these sites were sheltered by rocks. Nesting density on well-drained, south-facing rocky ridges was high, in one case about 13 nests / acre. Mean clutch size was 3.57 and 3.83 in the two summers, the maximum clutch size being 7. During egg-laying, down was gradually shed (not plucked) from the female's body and used, together with other nest material, to cover the clutch during the inattentive period. Females pluck body down and feathers if the shed down has been collected. Egg losses to predators (ravens, herring gulls, and parasitic jaegers) and other causes were 14.5-23.4 percent, but eiders are among the few species of Arctic waterfowl capable of renesting, so these losses were somewhat offset. The linear decline in clutch size, from about 6 at the start of nesting, to 3 after two weeks had elapsed, resulted in lower clutch sizes in second nests.

The author presents extensive analyses of the reproductive data, which this review only summarizes. After hatching, some ducklings spent a few days on shallow freshwater lakes, but there was a major migration of broods to coastal tide pools within a week. Many hens appeared to abandon broods, which then joined other broods as the female: duckling ratio increased in August, and numerous adult females without young appeared. Post-hatch migration and combining of broods made estimates of post-hatch mortality impossible.

The author concludes that at least four potential eider down "farms" exist in the Cape Dorset area, and that all are presently underpopulated, largely due to Eskimo exploitation. He is, however, commendably cautious in discussing the problems involved in starting such an industry among the Eskimos, whose nomadic way of life is not immediately adapted to the sedentary requirements of the industry.—Robert S. Hoffmann.

17. Whooping Crane Population Dynamics on the Nesting Grounds, Wood Buffalo National Park, Northwest Territories, Canada. N. S. Novakowski. 1966. *Can. Wildl. Serv., Report Ser.*, No. 1. 20 pp. The first publication in this new series, which replaces the Bulletins and Occasional Papers, is fittingly devoted to one of Canada's rarest breeding birds. Following discovery of its nesting grounds in the Sass River region in 1954, aerial surveys have been conducted annually to determine numbers, breeding success, and mortality. The cranes nest on shallow pot holes whose waters are somewhat more alkaline than average (pH 7.6-8.3); they avoid pot holes too deep to allow feeding by wading. The resident population has ranged from a low of 3 in 1962, when no nesting occurred, to a high of 14; the mean is 8.6 birds, of which 6.2 were nesting, and 2.4 non-breeding. At least 6 well-defined nesting areas, presumably occupied by the same adult pairs, exist, and have accounted for production of all chicks in the Sass River region. Pairs lay two eggs, but frequently only one chick is reared, the other egg apparently being destroyed after the first egg hatches. Cold, wet weather in May-June correlates with years of poorest breeding success. Of 72 eggs estimated to have been laid (1954-65), 40 are known to have hatched, and 32 chicks survived until fall migration. This production rate, compared with the number of juveniles arriving on the wintering grounds at Aransas, plus the appearance in Sept.-Oct. at Sass River of Whooping Cranes from other unknown areas, indicates that more than one-half of the continental population breeds farther north. Yearlings migrating north do not return to their natal areas, and these and non-breeding adults seem to suffer the greatest mortality.

The very slow increase in Whooping Crane numbers, and the critically high mortality of second eggs and of yearlings suggest means for artificially increasing survival. Plans have been formulated for removing second eggs from nests for artificial incubation in wet years, when twinning is least successful. Trapping of young of the year at Aransas is suggested, both to establish captive flocks, and to see whether birds held until they are sexually mature before returning north might experience lower mortality rates.—Robert S. Hoffmann.

18. Ecological Observations at the Pointe Geologie Emperor Penguin Colony (Adelie Land) in 1964. (Observations ecologiques a la colonie de Manchots empereurs de Pointe Geologie (Terre Adelie) en 1964). Jean-Louis Mougin. 1966. *L'Oiseau et R. F. O.*, **36** (3-4): 167-226. (In French with English summary.) Since 1952 French investigators have published six articles on the

Emperor Penguin in this journal, and a number of papers have appeared in other journals cited in the bibliography of this paper. Apparently the chief purpose of the present study was to investigate this particular colony of breeding Emperor Penguins and to compare data amassed in 1964 with those reported from earlier years.

Subjects covered in this paper include the following: arrival at the colony, incubation, raising the young, mortality of adults and young, weights and dimensions of eggs, weights of adults, studies of rectal (*sic*) temperatures, movements of birds, and recognition mechanisms between birds. In general, the results of these observations in 1964 were similar to those in past years.—David W. Johnston.

LIFE HISTORY

19. The Black Vulture (Aegypius monachus) in Iberia. (El Buitre Negro (*Aegypius monachus*) en Iberia.) Francisco Bernis. 1966. *Ardeola*, **12**(1): 45-99. (In Spanish with English summary.) Because of constant dangers to Black Vultures, Lammergeyers, Imperial Eagles, and other birds, a new Spanish law, enacted in 1966, has extended protection to all birds of prey in that country. Despite this protection conservation-minded individuals have initiated a vigilance system that results in reporting of damage to rare birds. Detailed life histories, one of which is the subject here, are also deemed necessary for proposing desirable conservation measures.

Currently only about 200 pairs of the Black or Cinerous Vulture are found in Spain, even though the species is widespread in Central Asia. The present article summarizes annual cycle of adults, nest construction (by both sexes), copulation, incubation, growth, brooding, and feeding of the pulli. The rather restricted nesting habitats are described for Spain and illustrated in photographs. About 50 occupied nests were visited, 40 pulli studied in detail, and 35 of these banded. Pulli must be shaded from the hot sun. When very young, the pulli are beshadowed by the adult's body or fully spread wings. At a later age, pulli maintain a drooping position so that the head falls under the shadow of the trunk. This self-shadowing has obvious advantages when the growing young must remain in the nest for long intervals, and is presumably a mechanism freeing the parents from so much protection at the nest.

Two other articles in this issue of *Ardeola* deal with ecological, ethological, and distributional features of the Black Vulture.—David W. Johnston.

BEHAVIOR

(See also 15)

20. The Influence of the Weather on the Display Activities of the Black Grouse (Lyrurus tetrix). (Vädrets inflytande på orrens spelaktivitet.) Ingemar Hjort. 1966. *Vår Fågelvärld*, **25:** 289-314. (English summary.) This investigation recognizes environmental variables as an important source of stimuli to which animals are highly sensitive. It seeks to evaluate with a degree of accuracy the impact of weather and other conditions on the oscillating intensities of the lek activities of the Black Grouse. The study was conducted during practically every month of the years 1962 and 1963 and during the first months of 1964. The data are presented in comprehensive day-to-day charts showing the birds' activity values as related to atmospheric pressure, temperature, cloudiness, wind velocity, precipitation, and the condition of the ground.

The behavior of the cock is coordinated into a series of chain reactions, starting with his emergence from the roost and ending with the cessation of the display. Each new phase springs from the current situation that, in turn, is created by and depends upon the preceding one. Listed are 11 chronological links of the action chain. They include the weather on awakening, the bird's physical condition, the intensity of its previous activity, the position and the behavior of the other cocks, the number of hens present and their behavior, and outside disturbances. Motivation depends partly on the hormonal "pressure," which is a

slowly changing variable, and partly on the environmental stimulations which are in a state of continuous change. The tendency that impels the cock to fly to the display arena is often not enough to activate the display but requires additional stimulus. Values of positive and negative reactions were established by means of carefully conducted tests. Displays always took place when a combination of conditions elicited overwhelmingly positive responses. A stimulating and well conducted study.—Louise de K. Lawrence.

21. Onset of Echo-location Clicking in Collocalia Swiftlets. Tom Harrisson. 1966. *Nature,* **212** (5061). As part of continued research on echo-location in swiftlets of the Malaysian region, the author had occasion to raise young swiftlets that had fallen from nests. "After these had reached the stage where feather sheaths persisted only on the bases of the three outermost primaries the characteristic echo-location clicks were suddenly heard. . . ." Although some of the young swiftlets were being tested for their capacity to survive without food, the onset of clicking occurred despite loss of weight and deprivation of food.

Additional characteristics of echo-location in swiftlets are noted: (1) it is not learned, (2) it occurs only when the wings are fluttering, (3) it can be used "in daylight sweeping over water, in courtship and "play" flights, and when traffic is dense in the cave mouth at any time of day."—David W. Johnston.

22. Foot-paddling in Four American Gulls, with Comments on its Possible Function and Stimulation. P. A. Buckley. 1966. *Z. Tierpsychol.* **23**(4): 395-402. (Summary in German.) This is largely a theoretical presentation of the subject, discussing its possible function in food-getting and whether it is "Learned or non-learned?" The author concludes: "Paddling appears to be an excellent case of IRME or Innate Releasing Mechanism modified by Experience." —Margaret M. Nice.

23. Montagu Harrier Retrieves its Young. (Wiesenweihe (*Circus pygargus*) trägt Junge ein). Otto von Frisch. 1966. *Z. Tierpsychol.,* **23**(5): 581-583. While watching a nest of Montagu's Harrier the author saw a three-day-old chick crawl out of the sunshine on the edge of the nest into shade outside the nest. From here it struggled in vain to return. Upon noticing the situation the mother arose, took two steps, picked the chick up by its crown and returned it to the nest. The next day in the absence of the adult the author put a chick some 70 cm distant from the nest. Upon her return she brooded and fed the nestling; after 15 minutes she became aware of the outsider, walked to it, took it gently in her bill by its head feathers and brought it back to the nest. One picture from the first day and four from the second illustrate the behavior.

Dr. von Frisch cites three articles in which parent birds have been reported as transporting their young. The European Woodcock (*Scolopax rusticola*) is most often cited; its methods vary between carrying the chicks in the bill, in the claws, and between the legs and the breast. In *Development of Behavior in Precocial Birds* (1962, p. 129) I reported that three species of *Rallus —aquaticus, limicola, longirostris,* as well as a *Gallinula chloropus* have been seen carrying young in the bill.—Margaret M. Nice.

24. Social Behavior of the Ruff, Philomachus pugnax (L.). A. J. Hogan-Warburg. 1966. *Ardea,* **54**(3-4): 99-022.1 The observation period of this study included approximately 200 days in the spring months from 1960 through 1963, much of the observer's time being spent in a blind where cameras, binoculars, and a tape recorder were the only tools employed.

Courtship and mating in this species include a communal display ground or lek. Social organization of the lek community and the behavior patterns serving mutual communication among the birds are the central theme of these observations. Considerable discussion is devoted to males of the lek community: independent males (including resident and marginal birds) and satellite males (including central and peripheral birds). Interactions among these various male types are described in detail, as are behavior patterns among females and between males and females.

Finally, the evolution of both behavioral and morphological polymorphism is discussed. "It is suggested that the marked plumage diversity among independ-

ent males serves to facilitate individual recognition by both females and other males; the less marked plumage diversity among satellite males serves primarily to identify satellite males as such to both females and other males."

This is an important contribution to the study of behavior patterns in shore birds as well as implications, ideas, and opinions on the significance of sexual dimorphism in birds. –David W. Johnston.

25. Some Observations on the Behavior of the Hawfinch During the Early Part of the Breeding Season. (Några observationer över stenknäckens (*Coccothraustes coccothraustes*) beteende under den tidigare delen av häckningssäsongen.) Lars Wallin. 1966. *Vår Fågelvärld*, **25:** 327-345. (English summary.) These observations both supplement and contradict some of the findings of Mountfort (*The Hawfinch*, 1957). Pair formation occurs during the successive dissolution of the winter flocks. The female becomes dominant and thereby overcomes the male's aggressiveness. The pair-bond is promoted by courtship feeding and other ritualized behavior. Territorialism is not highly developed, presumably because the tendency of the birds to nest in loose colonies precludes it, at least in part. When single nestings occur, territorial aggressiveness is more pronounced. The search for suitable nest sites was in two cases prolonged (14 days) and performed by the males who also initiated nest construction, in which eventually both sexes took part. Thus the behavior of the males serves to "attach the building activities of the females to a certain site." Courtship posturings of the males include stretching the head toward the females, erection of the crown feathers, wings partly opened and vibrating and the tail depressed and widely spread, all of these actions suggesting motivations of mixed aggressiveness and appeasement.—Louise de K. Lawrence.

PARASITES AND DISEASES

26. High Residue of Mercury in Finnish White-tailed Eagles. Kurt Henriksson, Eeva Karppanen, and Matti Helminen. 1966. *Ornis Fennica*, **43**(2): 38-45. The numbers of *Haliaëtus albicilla* have been decreasing in the coastal areas of Finland during this century—gradually at first, very rapidly of late. Nesting success has dropped to zero in Åland and eight fully grown birds were found dead there in the summer of 1966; autopsies on five of these specimens showed the cause of death to have been intoxication by mercury and chlorinated hydrocarbons. The authors cite similar situations from pesticides in birds of prey in other parts of the world.— Margaret M. Nice.

CONSERVATION

(See also, 17, 42)

27. Bionomics of the Sandhill Crane. W. J. Douglas Stephen. 1967. *Can. Wildl. Serv., Report Ser.*, No 2. 48 pp. $0.75. As implied by the title, the chief objectives of this report were to estimate damage by cranes to grain crops, to study crane populations, to estimate food and space requirements, and to consider the economics and control of crane damage to crops. Field studies resulting in this publication were conducted largely at Last Mountain Lake, Saskatchewan from 1961 to 1963.

Much of the damage to grain fields by Sandhill Cranes occurs during atumnal migration when their numbers reached 18,000 birds in the study area. The greatest number of cranes foraging in grain fields was 4,365/100 acres, the mean distance between feeding cranes being approximately six feet.

The gullets of 93 per cent of 190 birds contained grain, and from studies on captive birds it was estimated that one bushel of wheat would supply food for 200 cranes for one day. (At best this is a very crude estimate and might not be even a close approximation to the true food or energy requirements of feral birds.) The use of automatic acetylene exploders resulted in a diminution of cranes on given grain fields and at roosts.

From 303 specimens taken in the area morphometric data are presented—

weight and measurements of total length, bill, tarsus, and mid-toe. Comparisons are made between these data from the Last Mountain Lake birds and those given by Walkinshaw (*Can. Field-Nat.*, **19:** 181-184, 1965) for three subspecies of this crane (*canadensis, rowani,* and *tabida*). As I understand Stephen's conclusions on this matter, most of the Last Mountain Lake birds possessed characteristics indistinguishable at the subspecific level because (1) ". . . the inconsistency of shaft colour on individual birds suggest that primary shaft colour is not a reliable taxonomic characteristic," and (2) measurements of the Saskatchewan migrants generally include a large proportion of measurements known for the three subspecies mentioned above. Chiefly on the basis of his measurements, Stephen notes that "at least 75 per cent of the Last Mountain Lake sandhill crane specimens could not be assigned to one sub-species."—David W. Johnston.

PHYSIOLOGY

28. The Thermoregulation Features of Polypnoea in Some Anatids under High Environmental Temperature. I. V. Andrievskii and V. K. Yakubanis. 1965. *Novosti Ornitologii,* 12-13. Herein the authors were interested in the acclimatization of several species of geese, the avowed aim being" . . . to determine the extent of adaptability of . . . bird species to critical conditions of life found in their localities of acclimatization." Evidently geese were placed in heat chambers where oxygen consumption, respiratory rate, and body temperature could be measured at different environmental (chamber) temperatures (generally between 20° and 38°C). In some species a rise in body temperature resulted in marked polypnoea, and at higher chamber temperatures increased oxygen consumption was evident.

"The results of the experiments would draw Snow and Gray Geese under one ecological type, readily adapting to life in high environmental temperature. Mountain Geese are less adaptable to life in a hot climate. For the Ogar and Nile Geese a high temperature is inherent."—David J. Johnston.

29. Gamma Irradiation of Birds Eggs and the Radiosensitivity of Birds. David K. Wetherbee. 1966. *Mass. Agric. Exp. Sta., Bull.* **561:** 1-103. Part 1 of this bulletin is entitled "The LD-50 (to hatching) radiation and effects upon fertility of wild bird eggs exposed at embryonated stages." Among the conclusions drawn from this study are the following: (1) gamma irradiation applied during the first nine days of incubation in *Coturnix* has the most noticeable lethal effects, the greatest effects being seen at 900r; (2) an LD-50 sensitivity higher than 1400-1800r was reported for "very fresh" eggs in this bird.

Part 2 is a "Review of recent literature on radiosensitivity of birds." It deals largely with effects of radiation on chickens, but some discussion is devoted to effects on turkeys, pheasants, weaver finches, parakeets, pigeons, and a few other species. Particularly helpful are the several pages of literature cited.—David W. Johnston.

PLUMAGES AND MOLTS

(See also 4)

30. Early Cretaceous Feathers from Victoria. John A. Talent, Peter M. Duncan, and Peter L. Handby. 1966. *Emu,* **64**(2): 81-86. Remarkable was the discovery of two fossil feathers from the Lower Cretaceous (Valanginian-Aptian) claystones in Koonwarra, Victoria, Australia. The feathers represent the oldest (110-125 million years) bird remains yet known from the southern hemisphere, and are antedated among birds only by the toothed *Archaeopteryx* from the late Jurassic of Bavaria.

One of the feathers is a well-preserved contour type, 20 mm. long and possessing a well developed shaft. Barbs and barbules are evident, but details of hooklets, cilia, and teeth are not discernible. An aftershaft is absent. The second feather is not as well preserved but does show a shaft and barbs, many of the latter being twisted across the lower one-third of the specimen.

Happily, the authors have been cautious in their interpretation of the fossil feathers. At one point they remark: "It is nevertheless possible, though not yet provable, that the Koonwarra feathers, being fairly close in time to *Archaeopteryx*, were derived from a toothed bird or birds." I, for one, am pleased that these authors did not attempt to relegate the feathers to any avian taxa such as a genus or species. —David W. Johnston.

31. The Structure of the Contour Plumage of Birds in Relation to Their Flight. T. L. Borodulina. 1964. *Zool. Zhurn.*, **43**(12): 1826-1836. (In Russian.) The smoothness of the flow of air currents over birds in flight depends to a considerable extent on the structural features of the trunk feathers. Not only the form and size of the individual feathers but also their microstructure is of significance. Since the barbules are attached to the barbs slantwise, at an acute angle to the bird's direction of flight, it is believed that during flight a penetration of air into the outer layer of the plumage occurs. In birds of greater flying capacity the area and density of the web or blade portion of the feather are greater. There is higher density of barbs and barbules per unit area, and the barbules are broader basally. Barbule structure is otherwise modified in relation to flight habits of bird species. In less aeronautical species the barbules are less differentiated and their pennules have no ventral denticles. In species habituated to frequent, rapid, and prolonged flights, the contour feather barbules have relatively broader bases, with thinner and more elongate pennules and more numerous denticles. Thus it is believed that barbules with more prominently developed pennules and ventral denticles provide smoother flow of air over the plumage for the bird in flight.—Leon Kelso.

ZOOGEOGRAPHY

(See also 13, 30, 43, 45)

32. The Birds of Cocos Island [Costa Rica]. Paul Slud. 1967. *Bull. Amer. Mus. Nat. Hist.*, **134** (Article 4): 263-295. $2.00. Not to be confused with the Cocos Islands belonging to Australia and lying in the Indian Ocean, Cocos Island, the subject of this paper, is in the tropical eastern Pacific Ocean some 300 miles SW of Costa Rica. Because of its small size (10 sq. mi.) and isolated position, this volcanic island and its avifauna present interesting problems to the zoogeographer. In a period of about two months in the spring of 1963, the author added 30 species to the known list of birds recorded from Cocos Island. Seventy-seven species are now known from the island, 65 of these being non-breeding forms.

Particular attention has been given in earlier investigations to the four native land birds — Cocos Island Cuckoo (*Coccyzus ferrugineus*), C. I. Flycatcher (*Nesotriccus ridgwayi*), Yellow Warbler (*Dendroica petechia aureola*), and C. I. Finch (*Pinaroloxias inornata*). Slud's observations on the finch add much to existing knowledge of this species' biology.—David W. Johnston.

SYSTEMATICS

(See also 27)

33. A Study of the Protein Fractions of the Blood Serum of Some Bird Species by Means of Paper Electrophoresis (for Taxonomic Purposes). N. N. Kartashev, I. A. Ghelfon and S. P. Gromakova. 1966. *Zool. Zhurn.*, **45**(12): 1843-1851. (In Russian). The intent is to evaluate blood serum electrophoresis as a criterion in systematics. An investigation of the blood serum of *Columba livia* by paper electrophoresis revealed that the total protein content and ratio of protein fractions is subject to ample fluctuations depending on age, sex, season, nature of food, degree of hunger, and ration preceding starvation. The albumin to globulin ratio varied 2-5 fold or more, the change of globulin indices being of the same magnitude. Blood fibrinogen content fluctuated from season to season and declined during starvation. The total protein content and ratio of protein fractions of blood sera of the marine species (*Fulmarus glacialis, Rissa tridactyla, R. brevirostris, Larus marinus, Uria aalge, U. lomvia, Alca torda, Cepphus grylle,*

Cyclorhynchus psittacula, Fratercula arctica, F. corniculata, Lunda cirrhata) showed individual variations within ample ranges. Differences between species, genera, and orders were obscure or not at all perceptible. It is concluded that the use of blood serum electrophoresis in avian systematics requires great caution, and those individual variations controlled by various easily altered factors (such as food composition) should be taken into account.—Leon Kelso.

FOOD

(See also 13, 27)

34. The Effect of Beech Crops on Great Tit Populations and Movements. C. M. Perrins. 1966. *Brit. Birds*, **59**(10): 419-432. It has been observed in Great Britain and on the Continent that when the beech (*Fagus sylvatica*) fruits heavily, it becomes the chief food of *Parus major*; when the crop fails the Great Tits migrate. The author examines and correlates the records and suggests that Great Tits may "show eruptive movement not because of high population density but because of food shortage."—Margaret M. Nice.

35. The Means of Rediscovery of Stored Seeds by the European Jay and Nutcracker. (Über das Wiederauffinden von im Boden versteckten Samen durch Tannen - und Eichalhäher). F. J. Turcek. 1966. *Waldhygiene*, **6**(7/8): 215-217. (In German with English summary.) Seeds of oak, beech, mountain-pine, and hazel were gathered and buried in soil by European Jays (*Garrulus glandarius*) and Nutcrackers (*Nucifraga caryocatactes*) in the autumn. During the late autumn and winter the seeds were rediscovered chiefly by trial and error.

In the late spring and summer the buried seeds had begun to germinate, so that their young shoots could be detected by the birds. Evidently seeds that had been buried for one or more years were still edible and of nutritional value to the birds, even though the seeds might be dehydrated and chemically altered from their original condition.

Only a part of the buried seeds and even of those found by the birds was utilized. Obviously, many seedlings and saplings originated from the seeds buried by these birds, other birds, and other animals.—David W. Johnston.

36. Winter Food Habits of Capercaille in North-east Scotland. Fred C. Zwickel. 1966. *Brit. Birds*, **59**(8): 325-336. An analysis based on 99 crops collected between 22 Oct. and 27 Jan. from hunter-killed *Tetrao urogallus*, was supplemented by field observations. *Pinus sylvestris* needles, twigs, buds, and cones comprised 90 per cent, both by weight and frequency, of the crop contents. Birch and ericaceous shrubs were represented sporadically, totalling 17 per cent by frequency, though only a trace by weight. Many pine twigs, with needles and buds attached, were taken, but few twigs or buds alone, and the author concluded that Capercaille feeding was directed primarily to the needles. Field observations suggested a shift from ground to tree dwelling between November and December, coinciding with arrival of snow. Moreover, significantly more Capercaille were found in larch trees before needle drop than after, when the birds shifted to pine. The dependence of this species on pine in winter is thus very marked.—Robert S. Hoffmann.

SONG

(See 39)

BOOKS AND MONOGRAPHS

37. Guide to the Birds of New Caledonia and its Dependencies. (Guide des Oiseaux de la Nouvelle-Calédonie et de ses Dépendances). Jean Delacour. 1966. Delechaux et Nistlé, 32 rue de Grenelle, Paris VIIe. 172 pp. 30 francs ($6.00).

New Caledonia and the Loyalty Islands, lying some 750 miles east of Australia, are of great interest ornithologically because of their large number of endemic birds. These represent four genera, 20 species, and more than 40 subspecies. The climate of these mountainous islands is tropical, yet healthful and pleasant, while the flora is remarkable with tree ferns, palms, screw pines, and kauries.

In this book 116 species are briefly described and discussed. Lloyd Sandford has illustrated 54 of them in black and white and 18 in color. A five-page bibliography cites references in chronological order.

The most striking of the endemic birds are: the brilliant green and yellow Silky Parrot (*Drepanoptila holosericea*); the handsome fruit-eating Notou (*Ducula goliath*), largest arboreal pigeon in the world; and the splendid great Crested Parrot (*Eunymphicus cornutus*). The most famous of the endemic birds is the Kagu (*Rhynochetes jubatus*), a large, flightless bird with wings useful only in display. It lives in the forests and has fallen prey to cats, dogs, pigs, and rats introduced by the white settlers. Dr. Delacour writes: "The Kagu should be protected by all possible means. The responsibility of saving to the world this extraordinary and magnificent bird is one of the most important duties of the inhabitants of New Caledonia."

Dr. Delacour points out endangered species; he mentions rarities to be looked for and problems to be undertaken. He has written this excellent guide in hopes of informing the New Caledonians of the riches of the wild life on their islands and to awaken interest in and respect and love for these rare and beautiful birds. All success to him in this noble effort.—Margaret M. Nice.

38. The Living Air. The Memoirs of an Ornithologist. Jean Delacour. 1966. Country Life Limited, London. 6" x 9 1/2", 173pp. 34pp of black-and-white photographs. 45s. Obtainable for $6.90 from Jeremy North, Box LM Duke Station, Durham, North Carolina 27706. This is the story of a born naturalist whose earliest memory dates from the age of three, when he and a baby domestic chick became imprinted on one another. Wealthy, privileged, abounding with life and passionately devoted to living things, as a boy he watched for hours at a time his birds in the aviary. He "knew every individual, its history, its peculiarities, its temper and its personal record. My head was burdened with bird problems."

By the age of 15 he had established at his family's home in Villers in Picardy one of the largest collections of birds then in existence. This was destroyed in World War I. He then moved to Clères in Normandy and again established a great collection. This I was privileged to visit with the Ninth International Ornithological Congress; in 1938 it was a real "earthly paradise" with some 3,000 birds of 500 species. Then came disasters: a fire in the chateau destroyed all of Dr. Delacour's books, journals, notes, and art treasures, while the next year all the birds and other animals fell victims to World War II. The intrepid ornithologist and the devoted manager of the park, Frank Fooks, rebuilt the collection so that now it is almost restored to its past glory, "the finest private zoo in the world," as Peter Scott writes in his foreword to this book.

Between wars, Dr. Delacour has worked busily at Clères; during that period he wrote over 500 articles and "several books" besides founding and editing the French ornithological magazine, *L'Oiseau*. Winters he customarily spent in the tropics, especially in Indo-China where he led seven expeditions, returning with great numbers of specimens as well as live birds. Five chapters tell of rewarding experiences in these regions. It is good to read that the inhabitants of Laos were "pleasant, gay people who do not love work and consider leisure the object of life."

In China "one man out of three carried a round cage covered with a blue cloth, or a stick on which perched a pet bird. Nowhere else in the world was love for individual birds so great and widespread." In India the author's experiences were fantastic from Sir David Ezra's estate "jammed with animals and birds, mostly monkeys, ducks and pheasants . . . Noah's Ark could not have been more crowded!" to the lavish hospitality of Maharajahs. In Calcutta the author and his friends attended bird fights, never the cruel cock fights, but the harmless contests of Grey Francolins and bulbuls. The partridges, hand-reared and tame, were kept in pairs in small double cages. The males were put in the arena where they rushed at each other, striking with wings and bill, encouraged by calls from

their mates. Soon one would run back to his master to be petted and rested. The chapters on the travels in the Far East give vivid pictures of past ways of life now gone forever.

In 1940 Dr. Delacour came to America where he was warmly welcomed. He became a technical advisor of the New York Zoological Society and a Research Associate of the American Museum of Natural History. Later he became Director of the Los Angeles County Museum. Here in Southern California in a delightful house and a garden with a natural brook in it he created a small aviary in a semi-tropical garden. In 1960 he retired and now divides his time for the most part between Clères and the U. S. A., as well as traveling to distant parts of the earth.

It seems incredible that any one man could have accomplished the prodigious amount of work that Dr. Delacour has. Besides innumerable articles he has written many books. Some of these are: *Les Oiseaux de l'Indochine Francaise, The Birds of Malaya, Guide des Oiseaux de la Nouvelle-Calédonie, Pheasants of the World, and Waterfowl of the World.*

The present book, illustrated with photographs of people, places, birds and beasts, makes fascinating reading. Jean Delacour, full of charm to high and low among mankind and full of unquenchable enthusiams, is a key figure in conservation problems throughout the world.—Margaret M. Nice.

39. Singing Behavior and its Development in the Song Sparrow Melospiza melodia. James A. Mulligan. 1966. *Univ. Calif. Publ. Zool.*, **81**: 1-76. $2.00. The first paper of Dr. Mulligan from his notable study of Song Sparrow song, carried out on four races that are permanent residents in the San Francisco Bay region, was concerned with an analysis of adult song. (See review in *Bird-Banding*, **35**: 281, 1964.) About 1800 songs were recorded on tape; many of these are reproduced in this monograph in the form of sonograms and oscillograms.

The present paper deals with the development of the song in both wild and experimental birds of this species. The Song Sparrows in California showed the same five stages in the course of development of their repertoires of songs as had mine in Ohio (Nice, 1943). Eleven young males were used in his experiments.

Two of these, "deprived from the time of the egg stage of opportunity to hear adult Song Sparrow song" (yet hearing each other) were able to produce an approximately normal song. . . . The repertoires are smaller than in the wild, but nevertheless, number about ten basically normal songs." Other males taken from the nest at six and seven days of age heard three "training songs" recorded from wild Song Sparrows. Both birds trained at 5-10 weeks adopted two of these songs into their adult repertoires and one of two trained at 14-16 weeks did likewise. Training sessions from 23-28 weeks and from 32-49 weeks had no effect. Thus the sensitive learning period occurred "in the period from four to ten or twelve weeks of age." The training took place five to six months before the pupil started to sing.

One hand-raised bird was bilaterally deafened at the age of 12 weeks. He used the call note and his warbling in State I was nearly normal, but beyond this the development was quite abnormal. Four of his "songs" are reproduced; "they have an appropriate duration but lack the syllable structure and temporal pattern of normal song." His singing stopped about May 1, although he remained in excellent health.

The repertoires of the intact experimental birds ranged from 7 to 11 songs (averaging 9.1), but those of 13 wild birds ranged from 10 to 23 and averaged 15.8. This exceeds the repertoire size recorded in the eastern United States. Thirteen Connecticut and New York state Song Sparrows had repertoires of 6-24 songs, averaging 13.4 (Saunders, 1951); seven Maine birds had 11-24 songs, averaging 12.3 (Borror, 1965), while 38 birds in Ohio had from 6-17 songs, averaging about 9 (Nice, 1943).

In California two wild Song Sparrows with repertoires of 22 songs both showed favoritism in the use of their songs. In 3,486 songs of a banded bird "six accounted for half of the songs, and ten for 75 percent." The favorite type was heard 399 times, the lowest in the scale 3 times—11.4 per cent for the top song, 0.1 for the bottom one. The other bird sang 731 songs in four hours; 12.3 per cent of the output was for each of two favored songs, 0.3 for the least favored. With my birds there was little evidence of favoritism. The frequency of 1M's six songs in 181 hours that totalled 5,930 songs ranged from a high of 19 per cent to a low of 12.6 per cent. The frequency of 4M's nine songs in 80 hours that totaled 8,903 songs varied from 14 to 8 per cent.

The author ascribes the large repertoires of his wild populations to the mild winter weather and the long period in which the young Song Sparrow has to develop a rich and varied set of songs. Perhaps we might conclude that six to nine songs make an adequate number of songs for a Song Sparrow and that these sizable repertoires in California might be an *over-development* due to the exceptional features of the climate. This monograph is an impressive contribution, based on years of faithful work and keen insight into problems. Dr. Mulligan is to be congratulated!—Margaret M. Nice.

40. Frank M. Chapman in Florida. His Journals and Letters. Compiled and edited by Elizabeth S. Austin. 1967. University of Florida Press, Gainesville. 228pp. $7.95. A delightful and authoritative book giving a vivid picture of Dr. Chapman as he studied birds in his beloved Florida at intervals from eager youth to sage maturity. In 1886, when Chapman was 22 his mother established a winter home in Gainesville and here for three seasons he observed nature, and collected specimens for Joel Asaph Allen, Curator of Birds and Mammals at the American Museum of Natural History. The journals of "FMC" and his letters to Dr. Allen are full of keen observations and great rejoicing over the abundant wild life. In March 1889 he met a flock of 50 Carolina Parakeets (*Conuropsis carolinensis*) near the headwaters of the Sebastian River. The following year he organized a spring trip to the lower Suwannee River with William Brewster, the famed Massachusetts ornithologist. As no journal or letters of Chapman of this trip have survived, Mrs. Austin uses Brewster's journal for the narrative. Many birds were seen and many collected, among them an Ivory-billed Woodpecker (*Campephilus principalis*) and a large number of Bachman's Warblers (*Vermivora bachmanii*).

Mrs. Austin continues to follow Chapman's career from his journals of 1891 to 1892 in Florida, Texas and Cuba; she tells of his studies on Brown Pelicans (*Pelecanus occidentalis*) and of his persuading his friend Theodore Roosevelt to declare their nesting island the first "Federal Bird Reservation." With the publication in 1895 of his *Handbook of Birds of Eastern North America* and in 1899 his founding of the magazine *Bird-Lore*, Dr. Chapman became the key figure in bird study and conservation in the country. As Mrs. Austin truly says, "Frank Michler Chapman, scientist, explorer, author, editor, photographer, lecturer and museum curator, was one of the most influential naturalists and greatest ornithologists of his era." The bibliography of his published writings extending over 58 years (exclusive of book reviews, notes and editorials in *Bird-Lore*) covers 11 pages; it lists 19 books and more than 300 articles, scientific and popular.

An important feature of the present book is the final chapter on "Birds of the Gainesville Region, Then and Now" by Oliver L. Austin, Jr. Chapman's first major scientific paper appeared in the *Auk* in July 1888; it gave notes on the occurrence of 149 species recorded from November 1886 to May 1887. At that time there were no game laws in Florida; song birds were shot indiscriminately and plume-hunters had raided most of the heronries. Since then workers have added 93 more species to the Alachua County list, 67 of these being of rare occurrence. "Undoubtedly the most gratifying change in the Florida bird life that Chapman lived to see was the return, with the protection he worked so successfully to obtain for them, of the species that had borne the brunt of the persecution for their plumes—the egrets, herons, gulls and terns."

An amazing item in the list concerns a recent arrival, the Cattle Egret (*Bubulcus ibis*). First recorded in Florida in 1952, seven birds bred in Alachua County in 1954, and ten years later their heronry had reached an estimated 2,000 pairs! It "is now unquestionably the most plentiful heron in Florida." One factor in the phenomenal increase of this species is the fact that it is the only heron able to breed in its first year (see Kolar, 1666, as reviewed in *Bird-Banding*, **38**: 157).

Dr. and Mrs. Austin are to be congratulated on this carefully and imaginatively prepared contribution to the history of ornithology in this country.—Margaret M. Nice.

41. Enjoying Birds around New York City. Robert S. Arbib, Jr., Olin Sewall Pettingill, Jr., and Sally Hoyt Spofford. 1966. Houghton Mifflin Company, Boston. 171 pp., illustrated. $4.50. This is an excellent guide for bird-watchers, for beginners as well as for the more seasoned ones. It tells where in

and around this great city to look for birds, with detailed descriptions of parks, beaches, mountains, and piers where birds might be seen, what species are likely to be encountered, and how to get there. Some of these places are illustrated by maps. Good tips on the identification of the birds, advice on aids (binoculars and song recordings) are of assistance to the beginner. Eighty of the more common birds are illustrated by William C. Dilger's delicate pen-drawings. Among many other useful features are a bird-watcher's calendar and information on localities and dates where and when he may look for the arrival of migrating birds.

It is amazing to find that areas so radically changed by man contain so great a variety of wildlife. The book may therefore well serve as a good model for similar guides to cover the birdlife of other metropolitan centers.—Louise de K. Lawrence.

42. A Sand County Almanac with Other Essays on Conservation from Round River. Aldo Leopold. Illustrated by Charles W. Schwartz. 1966. Oxford University Press, New York, 269 pp. $6.50. The book that Dr. Donald S. Farner reviewed so favorably in *Bird-Banding* **21**: 78-79, 1950 has been reprinted in what the editors call an "Enlarged Edition," but nothing has been added that warrants enlarging Dr. Farner's review, although one of his comments might be changed. He wrote, "Every thinking open-minded citizen should read this" and probably thought the book would thus advance the course of conservation. In the nearly 20 years since this book was first published great "progress" has been made in the destruction and pollution of natural resources. It is therefore my wish that the book be read by the many citizens whose closed minds need prying open.—Elizabeth S. Austin.

43. The Birds of Canada. W. Earl Godfrey. 1966. Bull. No. 203 National Mus. of Canada, Biol. Series No. 73, Queen's Printer, Ottawa, 69 color plates by John A. Crosby, 71 line drawings by S. D. MacDonald, 428 pp. $12.50. Thirty years ago P. A. Taverner published the first complete *Birds of Canada* (Musson) containing both eastern and western species. Today the present book is in a sense complementary to Travener's work, in that it contains additional and up-to-date data of a science that in the intervening years has developed in a spectacular way in methods of research, accuracy, and amassed knowledge as well as in popularity.

A total of 518 species are described, all represented by a Canadian specimen, with the exception of the Snew (*Mergellus albellus*) for which adequate color photographs exist. Species whose occurrence are based on sight records alone are treated as hypothetical. A few diversions from the rulings of the American Ornithologists' Union's *Check-list of North American Birds* (Fifth Edition, 1957) are adopted. These include the treatment of *Branta nigricans* as conspecific with *B. bernicla, Chen hyperborea* with *C. caerulescens,* and *Buteo harlani* with *B. jamaicensis. Larus argentatus thayeri,* however, is treated as a separate species, *L. thayeri.*

The descriptions of each species contain plumages, measurements (except length), field marks, habitats, nesting, egg measurements, general range and breeding distribution in Canada, the latter illustrated by 377 excellent maps. Available data on incubation periods are always given with source of reference. In the case of the Slate-colored Junco (*Junco hyemalis*) on page 390, I question, however, from my own experience F. L. Burns' findings that both sexes share in the incubation. Food and economic status are not regularly included in the descriptions but often touched upon in the author's remarks. These sections, which follow the descriptions of many species, are interesting, apt, and characteristically permeated with the author's keen concern about conservation. On the Gannet (*Morus bassanus*) he departs slightly from his well-disciplined scientific style to let his admiration for these birds discreetly break through his choice of words, only in the last sentence to withdraw again behind a practical piece of information, that the Gannets of Bonaventure bring to the village of Percé no less than $100,000 annually in tourist trade.

The meticulous care in checking and verifying all data runs through the work as an unassailable distinction. Obviously, the author set as his goal an authentic presentation beyond anything previously produced on the subject, to which end no effort was spared and no amount of patient research was neglected. So is, for instance, the alleged occurrence of the Red-faced Cormorant (*Phalacrocorax urile*),

included in Taverner's list, convincingly repudiated (p. 34) by means of careful examination of a single puzzling specimen, thus eliminating the continuation for great lengths of time of an easily made mistake, the bane of compilations of this kind.

Crosby's colored illustrations are eminently successful. His birds are posed freely in natural and pleasing surroundings, showing in flight or in repose often two or three plumage phases of usually, very good coloring. Particularly helpful is the placing of the autumn warblers together with birds in spring plumage and in groups of very similar species, thus giving the reader excellent opportunities of intra- as well as interspecific comparisons. Plate 60, for instance, shows remarkably well detailed plumages of the Connecticut (*Oporornis agilis*) and the Mourning warblers (*O. philadelphia*).

The work is astonishingly clear of typographical errors. An inadvertent anthropomorphism appears on page 230, where it is stated that the male Ruby-throated Hummingbird (*Archilochus colubris*) does not take part in the "drudgery" of incubation and raising of the young. In the descriptions of colors the habit of adding the qualifying ending "ish" (yellowish, whitish) is perhaps unnecessarily prevalent, and the presence and absence of hyphens (mixedwoods, mid-day, under parts) have me slightly puzzled. But the excellence of the work would scarcely be duly appreciated without negligible irregularities. Significantly, the book was consistently on the Canadian non-fiction best-seller list for at least three weeks after publication and still appears on it intermittently, testimonial enough not only of its popular appeal but of its value as an attractive and scholarly work on the avifauna of Canada.—Louise de K. Lawrence.

44. A Life Time with the Birds. An Ornithological Logbook. Earle R. Greene. 1966. Edwards Bros., Inc., 2500 S. State St., Ann Arbor, Mich. 404 pp. $6. Earle Greene is a cordial, very friendly man who greatly enjoys birds and bird people. He has written a chatty, informal record of a life time largely concerned with these two subjects. Professionally he was Refuge Manager for the U. S. Biological Survey at Lake Mattamuskeet National Wildlife Refuge in North Carolina, at Okefenokee National Wildlife Refuge in Georgia, and at the Great White Heron and Key West Refuges in Florida.

His bibliography, mainly concerned with birds of the southeastern states, runs to eight pages. His "Life List" of over 600 species seen in North America north of the Mexican border fills 28 pages; with each species are listed the states or provinces in which the birds were seen. There are 110 photographs in the book, some excellent, others rather indistinct. The volume closes with an index of the names of birds and persons.

It is interesting to read of the nesting of exotics, originally escapees from aviaries, two species in California, six in Florida. In "Parakeet Village" on Treasure Island, not far from St. Petersburg, hundreds of Budgerigars (*Melopsittacus undulatus*) have nested in freedom during the last five years. In a rookery of White Ibis (*Eudocimus albus*) Mr. Carter Bundy of Miami introduced a number of eggs of the Scarlet Ibis (*E. ruber*) from Venezuela with the consequence that some of these gorgeous birds are now nesting in the rookery.

After "retirement" in 1956 Mr. Greene is an enthusiastic as ever, driving over the country, avid to visit his many friends and to see new birds for his life list.

Let me quote: "When the *average* person reaches three score and ten years of age, he decides to take it easy, enjoy the rocking chair on the front porch or sit in his patio, read or look at television, or perhaps sleep the time away. Not so with the student of birds or one who has a serious passion on some subject vital to him. This person keeps on until he is called to the Happy Hunting Ground."

May this good fate be the author's!—Margaret M. Nice.

45. The Birds of Tikal. Frank B. Smithe. 1966. The Natural History Press, Garden City, N. Y. 350 pp. $7.50. I have been asked to review this excellent new field book chiefly because my husband and I spent six months in 1965-66 exploring and observing birds through central British Honduras and Peten, Guatemala. We made no collections but did some mistnetting. Later we joined C. Russell Mason, Mrs. Margeret Hundley and Sr. Jorge Ibarra (an outstanding naturalist in the country) for four days of intensive birding at Tikal, followed by four days of observations mostly by dugout canoe along the Rio de la Pasion in southwest Peten. Still later, in 1967, at Santa Elena on the shore of Lake Peten,

I have recently spent four more days at Tikal, this time using Smithe's book.

Descriptions in the book are accurate, detailed, and include the color of the eyes, legs, feet and other fleshy parts, facts too often missing in previous reports. In almost every species, songs and calls are well described; in those few cases where the author has not himself heard the voice, he has combed the literature for the information.

The book is well organized, giving a maximim amount of information on each of the 280-odd species covered and yet condensing it all into a small field-size book. Under each species name is listed the common English name (after Eisenmann), the common Spanish name used in this area, the local Mayan dialect name (much of this material is from St. Jorge Ibarra), range, status here, length, and weight. A paragraph deals with abundance, habitat, and typical actions that aid in identification. The description of the species follows, with notes on food, voice, nest, and eggs. Lastly a short list of the most useful references for the species is given. This is far more information than one usually finds in a field book.

The color illustrations by H. Wayne Trimm, 170 originals covering 107 species, are well chosen for content, both to afford comparisons of easily confused species and to provide illustrations for many of the species not previously depicted elsewhere. Plates 3-9 on falconiform birds are practically worth the price of the entire book. The Plumbeous Kite should have been included here, for it has been observed at Tikal and nearby.

Plates 13 and 14 on the hummingbirds, Plate 22 on the Furnariidae and the Formicariidae, Plate 23 on the becards, Plates 25, 26 and 27 which cut across family lines in order to make comparisons among confusing, small, greenish birds, Plates 28 and 29 covering all the resident orioles and including the similarly marked Black-throated Shrike-Tanager, and Plate 31 differentiating among the four species of blue grosbeaks and buntings—these plates are all exceptionally helpful to birders new to this area. The color on some species is poor: too much red on the male Red-throated Ant-Tanager; too much rufous on wing of the Gray-headed Dove; too red a brown on back and crown of the Buff-throated Foliage-gleaner; and the tail on the Scaly-throated Leafscraper should be black or blackish The Mealy Parrot in particular has poor head-body proportions. I question the advisability of emphasizing the white throat as a key field mark of the White-crowned Parrot, in this area at least. This is an exceedingly variable character, for two birds seen at a distance of 25 feet showed no white on the throat at all and only a trace on the chin proper, and I have never seen one in this area which shows the amount of white appearing on Plate 11.

Several other criticisms seem in order. The bibliography is carelessly constructed. *The Birds of El Salvador* by D. R. Dickey and A. J. van Rossem is listed only under "F" for Field Museum. A basic book for this area, *A Fish and Wildlife Survey of Guatemala* by George B. Saunders, Ancil D. Holloway, and Charles O. Handley, Jr., is listed only under "W" for Wildlife. Some items are listed under the author's name, but many authors are simply consigned to limbo.

Collecting sites mentioned in the text and appendices are carefully pinpointed on the end-cover maps, a great help in an area where place names are often old lumber or chicle camps now long forgotten. But Melchor de Mencos, one of the largest towns in Peten, is not shown at all. Ceibal, the site of the Harvard diggings and a favorite tourist attraction, is not shown. And excellent birding areas like Lago San Juan Acul and Lago Petex-batun in southwest Peten are omitted. One of the oil company's maps, easily available from any filling station in Guatemala City, should be used as a supplement.

The Birds of Tikal is exactly what Mr. Smithe's title says it is, describing in detail each species known from the 15-mile-square Tikal National Park, which is probably one of the best and most convenient birding spots in northern Central America. The park is limited ecologically—a quasi-rain-forest (Lundell's apt name) with no aquatic habitat except for a few small muddy ponds that are nearly dry in the dry season, and with no open areas except for the relatively recent clearings for the small airstrip. However, the jacket description reads, ". . . it is a complete handbook of the birds of the Peten. . . . Indeed, in the absence of other books on the region, it will serve as a handbook to the birds of the lowlands of Central America." This last statement is patently absurd. Even if the list for Peten were complete (it is not), this guide does not encompass the large number of species found along the Caribbean coast, in the dry lowland areas such as the

Motogua Valley, in the Pacific lowlands of northern Central America which have an almost totally different avifauna, nor in southern Central America.

As to the Peten itself, the bird list of Tikal Park does not include all the species found in the extensive lake system in central Peten, in the large savanna areas south of La Libertad and towards Poptun, in the pinelands of southeast Peten, in the western foothills of the Mayan Mts., in the true rain-forest of southern Peten, or the many miles of riparian forest along the Rio de la Pasion, the Rio Usumacinta, the Rio de San Pedro, and the headwaters of the Rio Mopan and the Rio Sarstun.

The appendices are most interesting. Temperature and rainfall records over a four-year period, while unusual in a field guide of this sort, add materially to the records Dr. Lundell lists from Paso Caballos and the official government records from Flores. Appendix D, drawings of the various types of pensile flycatcher nests, was obviously a labor of love and is fascinating.

Appendix B gives the lists of species recorded by previous investigators. Mr. Smithe says these "bring the records of the Peten very close to completion," but this is not necessarily true because not enough collecting has been done and many areas of Peten have not yet been visited by professional ornithologists. Many species simply listed in Appendix B and not described in the text are common birds elsewhere in the Peten—the Mangrove Swallow, Plain-breasted Ground Dove, Blue-gray Tanager, Grey-crowned Yellowthroat, Vermilion Flycatcher, Fork-tailed Flycatcher, Common Tody-Flycatcher, Grayish Saltator, Acorn Woodpecker, Lesser Yellowlegs, Purple Gallinule, American Coot, and Muscovy Duck. We ourselves have also seen, and these species are not listed anywhere on any list in this book, Black-bellied Tree Duck, White-tailed Kite (a common bird throughout Central Peten in February and March), Least Bittern, American Bittern, Bonaparte Gull, Common Gallinule, Common Ground Dove, and Scarlet-rumped Tanager. The Jabiru Stork is well-known to the Indians and archeologists along the Rio de la Pasion. A number of additional species are common in British Honduras close to the Peten border, and since no one has collected anywhere in eastern Peten as yet, they may well be found to occur there. These species include Buff-throated Saltator, Striped Cuckoo, Yellow-headed Parrot, and, in the mountain edges, Black Phoebe and Horned Guan.

As it stands this book is a "must" for any birder going to Tikal, and surely more people will discover what a superb spot it is. But for the birder going anywhere else in the Peten or in Izabal, or to the adjoining areas of Mexico or British Honduras, Blake's *Birds of Mexico* and Eisenmann's *The Species of Middle American Birds* are still essential. Mr. Smithe has done such an excellent job of describing the birds he deals with that I personally hope he will now prepare a companion volume covering the rest of the birds of Peten.—Dora Weyer.

NOTES AND NEWS

Philip and Paul Robillard would be grateful for further data on the Eastern Phoebe (*Sayornis phoebe*), such as nest record cards, other nest studies, albinism, and in fact any life history aspect (address: 125 Burnett Road, Granby, Mass. 01033).

Papers intended for presentation at NEBBA's 1967 annual meeting (Drunlin Farm, Lincoln, Mass., October 28) should be discussed with James Baird prior to September 1 (address: Mass. Audubon Society, So. Great Road, Lincoln, Mass. 01773).

The 1968 spring field meeting of NEBBA is scheduled for June 8 at the Wellfleet Bay Wildlife Sanctuary on Cape Cod. Present plans are for a beach-buggy trip down Nauset Beach on the 8th, and tentatively a longer beach-buggy trip on Sunday the 9th, down Monomoy. Some migrant shorebirds should still be present.

While mist nets sales have been very heavy this spring, NEBBA can still offer immediate shipment on all ten types, including "tethered" 30mm mesh (12 meters long). For details, write Mr. E. A. Bergstrom, 37 Old Brook Road, West Hartford, Conn. 06117.

Errata: (a) in the January, 1967 issue, under "Postjuvenal Molt and Determination of Age of the Cardinal", on p. 39, line 6 of text, for "260" read "360"; on p. 50, line 1 of the Summary, for "234" read "334".