Wood Thrush. I have seen color-banded Wood Thrushes of both sexes give *eeee* notes like the Robin's predator alarms, from both the ground and perches. As stated above, I could never tell what evoked these notes, but one male frequently glanced upward while uttering them, and two incidents showed their alarm character: once a male Wood Thrush stopped singing while they were being given, and once an incubating female looked about alertly during a series of them. Whether they were being given by a Wood Thrush or a Robin on those occasions I do not know.

Tufted Titmouse. Once a color-banded female titmouse on my feeding shelf "froze" in a position looking a bit upward, and at irregular intervals gave clear, thin, moderately loud *see, see-see* and *see-see-see's.* Then, after something more than a minute, she dashed away without taking a seed. Along with that bird, a male titmouse, a pair of White-breated Nuthatches *(Sitta carolinonsis)* and two Blue Jays had been coming to the feeder on each other's heels for many minutes, but now the place was deserted for five minutes.—Hervey Brackbill, 2620 Poplar Drive, Baltimore 7, Maryland.

Drumming by Female Hairy Woodpeckers.—There are few published reports of drumming by female woodpeckers in this country. Brackbill (1953, *Bird-Banding* **24**: 18) states that female Downy Woodpeckers, *Dendrocopus pubescens,* drum as well as the males, thus settling the disagreement in Bent's *Life History* (1939. *Bull. U.S. Nat. Mus. 174:* 54, 61.) In the same note, Brackbill records drumming by female Flickers *(Colaptes auratus)* and Red-headed Woodpeckers *(Melanerpes erythrocephalus),* but does not mention the Hairy *(Dendrocopus villosus).* Likewise, in the separate accounts of thirteen *D. villosus* subspecies, Bent *(op. cit.:* 13-44) describes drumming many times without indication that female Hairys participate. Furthermore, in an examination of literature published since Bent, no reference to female drumming in the Hairy could be found.

During the spring of 1957, with the kind help of Dr. William H. Drury and Carl W. Helms, the author color-banded five Hairy Woodpeckers for preliminary behavior observations in the field, at the Hathaway School of Conservation Education at Lincoln, Massachusetts. During that spring one banded and one unbanded female Hairy were seen drumming, and drumming was also witnessed in female Downy Woodpeckers and Flickers, thus supporting Brackbill's observations. Dr. Lawrence Kilham, who is now conducting extensive research on the behavior of Eastern North American woodpeckers, tells me (pers. comm.) that his notes are full of observations of drumming by females of these and other species. Apparently drumming by the female of the species is a common but overlooked behavior trait in most, if not all, of our woodpeckers.—Jack P. Hailman, 4401 Gladwyne Drive, Bethesda, Maryland.

RECENT LITERATURE

BANDING

(See also numbers 12, 13, 14, 15, 71)

1. Bird-banding. (Ringmärkning.) Viking Olsson. 1958. *Vär Fågelvärld,* **17**: 103-109. With more and more people banding birds in Sweden, carelessness in handling birds is increasing correspondingly. This timely resumé of some do's and don't's for the field-bander might well prevent the loss of many valuable contributions to our knowledge of birds through mishandling and ineptitude. When banding in a sea-bird colony, climb to the highest point of the land so that the young birds can see you! Their first reaction will be to "freeze" against the ground thus preventing needless exposure and scattering. Do not lift the bird unnecessarily, but band it as it lies on the ground or in the nest! Cover or turn their heads away from the bander in order to minimize the possibility of awakening the nest-leaving reaction in nestlings! Only one of them needs to jump out for the nest-clinging reaction in all the others to be inhibited. Above all, never risk the life or the welfare of a bird for the sake of a record!—Louise de K. Lawrence.

2. The Czechoslovakian Ornithological Society's Bird-Banding Report for the years 1943 to 1946. (IX. Beringungsbericht der Tschechoslowakischen Ornithologischen Gesellschaft über die Jahre 1943 bis 1946.) O. Kadlec and D. Basova. 1957. Published by the Krajske Museum, Jihlava, Czechoslovakia,

pp. 1-72. (In Czechish, with German summary.) Fills the gap in the publication of banding data caused by the suspension of the usual medium, *Sylvia,* during the war years. During those difficult times some 200 Czechs managed to band 93,344 birds of 174 species. The 62 pages of raw data for recoveries, returns, and repeats contain a few salient comments on their significance.—O. L. Austin, Jr.

3. Annual Report of the Bird Migration Station for 1957. (Jaarverslag van het Vogeltrekstation over 1957.) A. C. Perdeck, J. Taapken, J. H. Mook, J. Rooth, and J. J. Zijlstra. 1958. *Limosa,* **31**(2): 93-106. (From the English summary.) "At the fowling yard near the Hague 9184 birds of 42 species were ringed. A Snow Bunting ringed here on 23 Nov. 1956 was recovered in Iceland on 6 May 1957. A short preliminary description is given of the pairing behavior of the Great Skua, which was studied in Shetland. At the isle of Vlieland methods for catching waders were tried. Among others, 120 Dunlins were ringed."—O. L. Austin, Jr.

4. Bird-banding in Norway 1956. (Report No. 7.) Holger Holgersen. 1957. Sterna, **2**(5): 137-184. As three-fourths of the Norwegian banding is of fledglings or downy young, bad weather and a poor breeding year reduced the 1956 totals (24,056) some 7,600 under those for 1955. The long list of *gjenfunn* received in 1956, wisely culled of short-distance recoveries, short-time returns, and repeats, is composed mostly of water birds, cormorants, geese, waders, and gulls predominating. Of special interest migratorily are a *Crocethia alba* from Greenland, a *Larus fuscus* from southern Russia, a *Motacilla alba* from the Black Sea, and several *Jynx torquilla* from continental Europe. For longevity are a 13½-year *Circus cyaneus,* a 12½-year *V. vanellus,* a 9½-year *Arenaria interpres,* and a 13-year *Larus canus.*—O. L. Austin, Jr.

5. Results of the ringing investigations instituted by the Royal Museum of Natural History, Leiden, 53 (1956), 1. *(Resultaten van het* ringonderzoek betreffende de vogeltrek, ingesteld door het Rijksmuseum van Natuurlijke Historie (voortgezet door het Vogeltrekstation) te Leiden, XLIII (1956), 1.) J. Taapken. 1958. *Limosa,* **31**(2): 156-187. Raw data for the recoveries received in 1956, from the loons through the hawks, by far the greater part of them for waterfowl—13 pages of *Anas crecca* recoveries, 8½ pages of *Anas platyrhynchos.*—O. L. Austin, Jr.

6. Bandings and Recaptures. (Baguements et Reprises.) L. Hoffmann. 1956. *Troisieme compte rendu d'activite et Recuil des travaux,* Station Biologique de la Tour du Valat, pp. 12-48. The Tour du Valat Station has been in operation since 1950, using Paris Museum bands. The totals for its first 6 years are 29,956 birds of 164 species banded, 24,919 as adults, the rest as nestlings or downy young. From these they have had 6,692 returns and repeats, 1,430 recoveries. Leading the list are 7,571 *Anas crecca,* which have yielded 819 recoveries. Presented here are the raw data for returns and recoveries received in 1956, with brief comments on their significance. Three maps show the distribution of the Teal recoveries.—O. L. Austin, Jr.

7. A five-year banding study of the Takahe *(Notornis mantelli* Owen). G. R. Williams and K. H. Miers. 1958. *Notornis,* **8**(1): 1-12. Summarizes the knowledge gained to date from the banding started in 1952 of this handsome New Zealand gallinule, formerly known from only three specimens and feared extinct, but miraculously rediscovered in 1949 still extant in the wild mountain fastnesses of South Island. The main, largest, and most concentrated colony seems static at about 50 adult birds, 30 of which have been marked with both aluminum and colored plastic bands. As the species shows no gross sexual dimorphism, birds of known pairs are sexed "provisionally" by a combination of culmen and weight measurements. Observations of the banded population have shown: "Pairs of takahe show year-round territorial behavior and extended attachment to the area they occupy—frequently lasting over a number of years. The size of this occupied area lies between 15 and 45 acres. . . . Usually takahe appear to pair for life and this bond persists throughout the year. . . . Both birds of a pair take part in incubation; the breeding age is one year in at least some birds; double brooding and renesting are known."—O. L. Austin, Jr.

8. On the attitude of adult birds toward their young banded in the nest. (Du comportement des oiseaux adultes vis-a-vis leurs jeunes bagues au nid.) R. Arnhem. 1957. *Le Gerfaut,* **47**(4): 237-240. Having watched a female Blackbird, *Turdus merula,* try vigorously to remove the shiny band just placed on one of her nestlings, the author speculates on the causes and possible consequences. He suggests that some parents, because of their instinct to keep the nest clean and free of nestlings' feces and other foreign objects, will try to remove the band. The instinct is so strong that if the band does not slide off the fledgling's leg and the fledgling is not too large, they may carry the fledgling away with it. He believes this to have been the fate of several small nestlings he banded that disappeared prematurely, and warns that young should not be banded until they are too large to carry away. However, he describes one case in which a *banded* female Blackbird apparently paid no attention to the bands on her young.—O. L. Austin, Jr.

MIGRATION

(See also numbers 56, 68, 71)

9. Bergmann's Rule and Obligatory Overseas Migration. Kenneth Williamson. 1958. *British Birds,* **51**(6): 209-232. Bergmann's Rule states "that in a polytypic species the body-size of a subspecies tends to increase with the decreasing mean temperature of its habitat." The author examines this rule in relation to length of migration overseas of land birds nesting in Greenland and Iceland, and finds it most strikingly born out in the Wheatear *(Oenanthe oenanthe).* "The migration-pattern at Fair Isle, and occurrences in the North Atlantic, show that trans-oceanic flights of 1,500-2,000 miles may be undertaken in cyclonic weather, resulting in a weight-loss considerably greater than the typical race could endure." Four tables present weights and measurements of Greenland, Iceland, and Continental Wheatears, and 10 maps show weather conditions at sea during migrations of Wheatears. "Among Icelandic birds the effect is most strongly marked in the Redwing, Merlin and Redshank, whose migratory flights into the British area may exceed 1,000 miles under cyclonic conditions." Other species show less of this "migration-influence"; some of them make a comparatively short migration to North America, while the Meadow Pipit and White Wagtail "may be comparatively recent and still expanding colonists in the northwest."—M. M. Nice.

10. The annual fluctuations in the migration of the Honey Buzzard over Falsterbo. Report from Falsterbo Bird Station No. 11. (De årliga fluktuationerna i bivråkens *(Pernis apivorus)* sträck över Falsterbo.) Staffan Ulfstrand. 1958. *Vår Fågelvärld,* **17:** 118-144. (English summary.) This paper is based on a study of the Falsterbo migration records of the Honey Buzzard for the past 10 years and the fall migration of 1953 and 1955 in particular. During these two fall periods, the Honey Buzzard appeared in more than double its average annual numbers. Moreover, while its migration period in 1953 occurred at the normal time, the one in 1955 was 3 weeks late. Neither population increases through either immigration or good nesting success, nor possible changes in the breeding range, nor the influence of the summer temperature on the timing of the migratory impulse can account for the deviations convincingly. The wind conditions, on the other hand, i.e., the relation between concentration-favoring and inhibiting winds, determined the numbers of these birds and the time when they soared across the skies over Falsterbo. The student of bird migration is warned to look deeply into the intricate relationship of the great variety of factors influencing the movements of a certain species, not the least important of which is the pattern of behavior. The entire study is comprehensibly reviewed in the English summary.—Louise de K. Lawrence.

11. Arrival dates of the Swift (Apus apus) in Germany 1953-1957. (Die Erstankunft des Mauerseglers in Deutschland 1953-1957.) Herbert Bruns. 1958. *Ornithologische Mitteilungen,* **10:** 61-65. This report supplements an earlier one *(Orn. Mitt.,* **5:** 61-70) covering the years 1948-1952 and, like it, is based on data obtained from many observers throughout Germany. The present report covers the 10 years from 1948 to 1957 for which 1019 first dates of arrival were available. Temperature, weather, and altitude are all shown to affect the arrival date, each as would be expected.—R. O. Bender.

12. The avifauna of Stora Karlsö in 1957. (Stora Karlsös fågelfauna under 1957.) B. Flach and R. von Schultz. 1958. *Fauna och Flora*, (1-2): 9-38. The comprehensive reviews furnished in recent years by the senior author on the birdlife of this strategic island in the midst of the migration routes across the Baltic Sea are important contributions, especially when considered in relation to the Ottenby and Falsterbo reports. During the unusually cold period March through May, many insectivorous birds succumbed to starvation. A warm air mass developing over southeastern Europe in the end of May drove a number of migrants northwesterly, resulting in an invasion of birds at Stora Karlsö. Many of these could be identified as young birds which, having not yet become imprinted upon a particular territory, were apparently stimulated by the warm air and the prevailing good visibility to prolonged migration. Other interesting observations were made on the deviating effect of the lighthouse beams upon the fall migrants flying southwest. The light attracted them out of course, but its rotating movement prevented any mass slaughter against the tower and the cliffs. Two nestling Guillemots *(Uria aalge intermedia)* banded 8 July 1957 were recovered, one on a salmon hook in Poland 2 December 1957, the other oil-killed at Bornholm 14 January 1958. Lack of space prevents quoting here many more data from this detailed report.—Louise de K. Lawrence.

13. A brief note on the pelagic migration of the Tubinares. Nagahisa Kuroda. 1957. *Misc. Rpts. of the Yamashina Institute for Ornithology and Zoology*. No. 11: 436-449. Kuroda shows on a world map how closely the migrations of oceanic birds follow the prevailing circulations of winds and currents in the major oceans. He suggests that while the seasonal regularity of their movements is controlled by the birds' "inherent physiological rhythms . . . the steady seasonal winds may act to orient their 'inherent impulse to migrate' to a fixed migratory direction." The paper lists the outstanding banding recoveries of Tubinares that indicate their postulated routes and is accompanied by a lengthy and comprehensive bibliography of source material.—O. L. Austin, Jr.

14. Notes on the Ringing and the Breeding Distribution of the Giant Petrel *Macronectes Giganteus*. Bernard Stonehouse. 1958. *Ibis*. **100**(2): 204-208. Reports 14 recoveries received (to October 1956) from 800 nestlings banded in the FIDS area (see *Bird-Banding*, **29**: 1) during the 1955-56 season and discusses their significance. Stonehouse agrees with Downes, Serventy, and others who have analyzed similar Giant Petrel recoveries from Australian bandings that the species' first-year movements are strongly influenced by the west wind drift, that they "tend to disperse eastward after fledging, and travel in a northeasterly direction across the west-wind zone." He also reviews sketchily from the literature the species' known breeding distribution and reports its first known nesting below the Antarctic Circle, on the Henkes Islets off the west coast of the Palmer Peninsula, which lie at 67°44′ South according to my maps (not 64°44′ as stated, which would put them more than 100 miles north of the circle instead of some 75 miles south of it).—O. L. Austin, Jr.

15. First Report of Banded Birds Migrating between Australia and Other Parts of the World. W. B. Hitchcock and R. Carrick. 1958. *C.S.I.R.O. Wildlife* Research, **3**(1): 54-70. A succinct analysis of avian migration within and to and from Australia is followed by a useful summary of the banding data connecting Australia with distant parts of the world. These now comprise 178 recoveries of 9 species. All but one species, a New Zealand freshwater duck, are sea birds and, except for Serventy's Shortailed Shearwaters (see *Bird-Banding*, **29**: 185), all were banded abroad and recovered in Australia. Most of the recoveries are for spectacular long distances, and they are shown graphically on three ingenious maps. Combining the data for several species on each makes the maps a bit cluttered and confusing, but they amply illustrate the authors' comments on the significance of the recoveries for each species.

The Giant Petrel, *Macronectes*, recoveries are strangely in inverse ratio to the numbers banded at each place, which the authors suggest is caused by "the position of the banding-centre in relation to potential recovery areas in which the probability of band-returns varies." Their tabular presentation of the monthly distribution of Giant Petrels banded as young and recovered at a distance, often on the opposite side of the world, is most revealing. The young birds seem to make a tremendous flight in leaving the nesting grounds, influenced and

helped by the strong westerlies as they move northward through them. They they tend to remain in a favorable locality in lower latitudes north of the westerly zone until they reach breeding age. "It does not seem necessary to postulate continuing circumnavigation of the globe, at least not by young birds." (See also No. 14.)—O. L. Austin, Jr.

16. Analysis of Mass Bird Mortality in October, 1954. David W. Johnston and T. P. Haines. 1957. *Auk*, **74**(4): 447-458. Conveniently summarizes all the usable data on the now famous bird kills at airport ceilometers, television and radio antennae, and tall buildings between 5 and 8 October 1954. Some of these are from the literature (six papers have been published on the event, most of them in minor journals), most of them are from a questionnaire sent to interested observers and from the authors' own investigation of the bird falls at Warner Robins A.F.B., Ga., which suffered the heaviest kill of all. They discuss the weather conditions that brought on the disaster and present data on weight, sex, age, fat deposition, and subspecific identity of many of the species involved.—O. L. Austin, Jr.

POPULATION DYNAMICS

(See also numbers 7, 24, 25, 26, 33, 45, 47, 50)

17. On the average age of the Blackbird. (Over de gemiddelde ouderdom van de merel *(Turdus merula* L.). R. Verheyen. 1958. *Le Gerfaut*, **48**(1): 5-14. (From the French summary.) Verheyen's analysis of 502 recoveries of Blackbirds banded as nestlings in Belgium shows that while the oldest bird reported lived slightly more than 7 years, the average life span (for whatever that vague concept tells us) is about 11 months. Of greater significance, the average annual mortality in the Belgian Blackbird population is about 67 percent, as against 42 percent shown by Lack for the same species in Great Britain. The age-compositions of the two breeding populations are also at variance; whereas the Belgian population comprises roughly 60 percent 1-year-old birds and 40 percent birds 2 years old and older, these figures are almost exactly reversed in the British population. This of course simply reflects their respective adult mortality rates.

Assuming that both the British and the continental Blackbird populations are maintaining themselves with approximately equal success, it follows that these demonstrated differences in mortality must be reflected by other aspects of their respective biologies, such as the slight difference in their average clutch sizes, 4.25 in Belgium, 3.9 in Britain. Verheyen thinks the Belgian birds compensate in part at least for their higher annual mortality by a first-year mortality no greater than that of subsequent years. Though his calculations seem to bear out this possible but improbable anomaly, I just cannot believe Belgian Blackbirds survive their first year any better in comparison to adult survival than young British Blackbirds or American Robins do. The fallacy probably lies in Verheyen's selection of his basic data, and he gives too little of and about these to permit reconstructing his tables in the standard format for recalculating by the standard methods adopted by Lack, Farner, Hickey, and others, none of which does he follow.

Of greater moment in the manifestly different population dynamics of the two populations, it seems to me, is their annual recruitment or replacement potentialities as shown not by average clutch size alone, but by the number of nestings each year and the fledging success in each population, which have yet to be investigated adequately.—O. L. Austin, Jr.

18. Sex ratios and mortality in nestling House Sparrows. (Geschlechterhältnis und Sterblichkeit der Nestlinge Haussperling.) Kurt Bösenberg. 1958. *Ornithologische Mitteilungen*, **10**: 86-88. Most sex ratios reported for adult *Passer domesticus* in the literature are close to 1:1. Over a 5-year period the author determined the sex of 397 nestling House Sparrows by dissection. The average male:female ratio for the entire period of 1.17:1.0 (ranging from 1.3:1.0 in 1953 to 1.0:1.06 in 1956) suggests that nestling mortality is higher in females, and it follows that fledgling mortality must be higher in males. Each pair fledged from 6 to 8 young per year. These studies are being continued.—R.O. Bender.

NIDIFICATION AND REPRODUCTION

(See also numbers 8, 18, 38, 46, 47, 50, 55, 67)

19. On the initiation of the incubation in the Blackbird. (Om ruvningens igångsättande hos koltrast *(Turdus merula).*) Anders Enemar. 1958. *Vår Fågelvärld,* **17:** 81-103. (English summary.) As all papers I have read by this author, this one distinguishes itself by the meticulous care and objectivity with which his observations are made and his conclusions drawn. In order to determine the actual start of incubation of the individual eggs, three aspects of the egg-laying process were investigated: 1) the contact between the bird and the egg during night-sitting, 2) the average heat of the eggs, 3) the reaction of the embryo. Often from the laying of the second egg the Blackbirds began sitting on the nest at night. True incubation usually started before the laying of the last egg. During the night-sitting and from the start of incubation, the birds sat deeply pressed down into the nest-cup at all times so that there was no question of "token" incubation among these Blackbirds. Furthermore, the warming of the eggs thus accomplished was sufficient to start embryonic development. By means of candling the eggs, the beginning of the heart-beat was determined to the hour, showing distinctly the succession in which the eggs were laid and incubation started even in clutches more or less completed when found. The English summary is descriptive and informative.—Louise de K. Lawrence.

20. Birds nesting in or on structures. (Vom Nisten verschiedener Vogelarten an und in Gebäuden.) Herbert Ringleben. 1958. *Vår Fågelvärld,* **17:** 109-118. (From the Swedish summary.) With most of the records coming from Germany, more than 30 species have been found nesting in or on buildings. Among these are jays, nuthatches, creepers, titmice, thrushes, swallows, ducks, doves, and gulls. The author points out the possibility of following the evolutionary process of this change in ecological requirement. Not all of these species are cliff-dwellers originally. In the cliff-dwelling species no ecological evolution has actually taken place. No "pressing circumstances" appear to have existed for eliciting such behavioral alterations.—Louise de K. Lawrence.

21. Egg-size variation in the Grey Starling, *Sturnus cineraceus* Temminck. Nagahisa Kuroda. 1958. *Tori,* 14 (70): 1-17. (In Japanese with English summary.) A statistical analysis of the measurements and weights of 100 eggs (87 in 17 first clutches, 13 in 3 second clutches) obtained from nest-boxes. Variations in shape, size, volume, and weight are correlated with size of clutch, sequence of laying, and time of laying. Weights were found to decrease slightly during incubation, but the rate of decrease varied considerably in individual eggs.—O. L. Austin, Jr.

22. Notes on the Breeding of the Iceland Gyr Falcon. Philip Wayre and G. F. Jolly. 1958. *British Birds,* **51**(8): 285-290. The authors visited six eyries of *Falco rusticolus islandus* and spent 40 hours in a hide 10 meters from one that contained 2 eyasses about a month old. All 6 kills brought were cock Ptarmigan, *Lagopus mutus.* Apparently the tiercel did most of the hunting and he also fed the chicks himself on four of the visits. He "was more gentle with the youngsters than the falcon was, and appeared to take far more trouble in tearing up the food."—M. M. Nice.

23. The Feeding of Nestling St. Kilda Wrens. T. B. Bagenal. 1958. *Bird Study,* **5**(2): 83-87. Counts for 11 and 14 hours on two nests shows the young were fed between 20 and 30 times per hour, instead of 10 to 13 times per hour as previously reported for this insular subspecies. As this approximates the feeding rate in the continental race *(T.t.troglodytes),* "it cannot be said that the St. Kilda Wren lives in such a bleak habitat that food shortage significantly increases the time necessary for foraging. . . . The role of the two sexes in feeding the young was approximately equal except for the early morning and late evening when the female did the greater share. The St. Kilda Wren, like other insular races, is believed to be less polygamous than the European Wren, and this would appear to be reflected in the large amount of feeding done by the male."—O. L. Austin, Jr.

24. Observations on the Breeding of the Kittiwake. J. C. Coulson and E. White. 1958. *Bird Study*, **5**(2): 74-83. Excellent statistical data on the nesting phenomena of *Rissa tridactyla*, based on counts and observations in one colony (see No. 25) through four breeding seasons. Incubation periods in 119 successful nests varied from 23 to 32 days, with a mean of 27.3 ± 1.3 days. The fledging period for 116 chicks averaged 42.7 ± 4.4 days, with a minimum of about 36 days. The fledging periods of single and paired chicks did not differ significantly. The mean size of 149 clutches was 2.01 eggs; brood size at hatching averaged 1.82 chicks. "The breeding success of the colony was 56% between egg-laying and fledging of young, 1.14 young being fledged per breeding pair. The average daily increase in weight of chicks between 100-300 g. was 16 g. There was no difference between the growth rates of broods of one and two chicks, and no difference between the growth rates of older and younger birds in broods of two chicks." In view of the apparent recent increase in the Kittiwake population on the east coast of Great Britain, it would be interesting to compare these figures on reproductive success and potential recruitment with figures on later mortality, particularly in the breeding population.—O. L. Austin, Jr.

25. The Effect of Age on the Breeding Biology of the Kittiwake *Rissa tridactyla*. J. C. Coulson and E. White. 1958. *Ibis*, **100**(1): 40-51. Another fine paper in the series these authors are producing on their Kittiwake studies. This one is based on a small population of birds the authors were able to trap and color band at their nests on the window ledges of a riverside warehouse in Northumberland from 1954 through 1956. Their observations on these aged and sexed birds confirm their earlier postulate that older Kittiwakes react "to the breeding stimulus earlier, more intensively and with greater success than younger breeding birds. Birds with previous breeding experience returned to the colony before birds breeding for the first time and these before non-breeders." They found Kittiwakes show both colony tenacity and nest-site tenacity strongly and, as we found with the terns years ago, the trait becomes stronger with age. Surprising, to me at least, is their discovery that while slightly more than half the birds retained the same mates in subsequent years, the remainder changed mates each year. The authors analyze all their data statistically and show them to be of extremely high mathematical significance.—O. L. Austin, Jr.

26. The Breeding of the Blackbird *Turdus merula* at Oxford. D. W. Snow. 1958. *Ibis*, **100**(1): 1-30. The results of a detailed 4-year study of two populations of Blackbirds, one nesting in the Oxford Botanic Garden, the other in the broad-leaved woodland of a neighboring estate. "Old females averaged 3.1 broods per year, yearling females 2.3. Breeding begins later in woodlands than in gardens." Clutches averaged slightly smaller in the garden population, and yearling females laid smaller clutches than older ones. Hatching success was 90 percent in the garden population, 92-95 percent in the woodland, but reproductive success was much lower in the woodland birds because of heavy predation to the nestlings. "The garden population has produced an average of 4.1 young per pair per year, and 66% of them have survived to independence. . . . It is probable that at least 62% of the young that reach independence survive to the next breeding season." The paper also contains many useful data on incubation, feeding and rate of growth of the young, and dispersal of the young after they leave the nest, and discusses these aspects of breeding biology in relation to weather conditions.—O. L. Austin, Jr.

27. The Significance of the Colour of Turdine Eggs. David Lack. 1958. *Ibis*, **100**(2): 145-166. Analysis of egg color in the Holarctic and Indian species of Turdinae shows this character to be of no taxonomic significance. "Instead, certain colours of eggs tend to be associated with certain types of nesting site; species nesting in deep holes tend to have immaculate white eggs; those in shallower holes and niches speckled white, immuculate blue or speckled blue eggs; those on the ground, amid herbage or on ledges obscured brown, grey or olive eggs; those in forks in bushes or trees blotched eggs, often with shadow-marks, on a bluish or white ground; those building domed nests immaculate or speckled, white or blue, eggs." Lack considers these colors adaptive. "The immaculate white eggs of hole-nesters perhaps result merely from the absence of selection by predators, but more probably are adapted to increase the visibility of the eggs to the parents in a dim light. Obscured brownish or

olive eggs are adapted for concealment on the ground or amid herbage." He gives considerable space to refuting Cott's theories (see *Bird-Banding*, **24**: 76) on the significance of palatability in passerine eggs and gives strong evidence showing that "palatability is not correlated either with colour of eggs or with nesting sites as such, and hence that the species most vulnerable to predation have not evolved especially distasteful eggs, and that the eggs of small passerine species are not warningly coloured."—O. L. Austin, Jr.

28. Notes on Breeding Colonies of the Red-billed Quelea in S. W. Tanganyika. Desmond Foster Vesey-FitzGerald. 1958. *Ibis*, **100**(2): 167-174. Notes on incubation, clutch size, hatching, feeding of young, and daily activity of parent birds in *Q. quelea* made in nesting colonies in the Rukwa Valley. The size of these colonies—the largest one studied "covered about 93 acres and contained about 2½ million nests"—affords some idea of the magnitude of the economic problem posed by these grain eaters in agricultural Africa.—O. L. Austin, Jr.

29. Nest-site Selection, Pair Formation and Territory in the House —Sparrow *Passer domesticus*. D. Summers-Smith. 1958. *Ibis*, **100**(2): 190-203. Observations of color-banded birds from 1951 to 1957 in two study areas, one rural the other suburban, lead the author to conclude "that once House-sparrows have bred they remain faithful to their mates and nest-sites for life. Exceptions to this faithfulness to nest-site may occur in areas where suitable sites are plentiful, when the pair may hold two sites and use these indiscriminately for breeding. . . . Pair formation most frequently occurs by replacement when one bird of an established pair dies. . . . Bigamy appears to be uncommon. The House-sparrow is a colonial nester and territorial behavior is limited to defence of the nest-site. The factors of importance in these aspects of the life of the House-sparrow are: sexual dimorphism, sedentary behavior and use of fixed sites for nesting. Colonial nesting is considered to have arisen from the bird's feeding habits and sedentary behavior; it is maintained by the method of pair formation."—O. L. Austin, Jr.

30. Life History of the White-whiskered Soft-wing *Malacoptila panamensis*. Alexander F. Skutch. 1958. *Ibis*, 100(2): 209-231. Detailed first-hand observations on this little known and seldom studied Central American species, presented in the author's simple direct prose, which to me is always a pleasure to read. Most of this paper deals with the species' nesting habits, but it also contains excellent notes on its appearance, voice, and general behavior. —O. L. Austin, Jr.

31. The incubation rhythm of the female Pied Flycatcher *(Ficedula hypoleuca)* in the presence and absence of the male. Lars von Haartman. 1958. *Ornis Fennica*, **35**(2/3): 71-76. Incubation in this species is entirely by the female. She is fed frequently on the nest by the male, but she also leaves the nest at short intervals to forage for herself. When the male of a pair was removed experimentally at the start of incubation, the female's periods on and off the nest were greatly extended, especially the off-periods. "The total amount of incubation decreased from about 79% to 58%. The weight of the female decreased from 16.0 to 14.2 gm. These findings confirm that the food given by the male is of real importance in the nutrition of the female during the incubation period."—O. L. Austin, Jr.

32. Observations on the Incubation Behavior of a Common Nighthawk. Milton W. Weller. 1958. *Auk*, **75**(1): 48-59. A female *Chordeiles minor* nesting on an exposed roof, oriented her body on clear days "along the axis of the sun's rays with her head away from the sun. On cloudy days, or when artificially shaded, she did not orient. Her head was more sensitive to the sun than her body." In temperatures that ranged up to 61° C. (142° F.) she cooled herself by "panting, facing away from the sun, and fluffing the feathers." As has been noticed in the terns and other species that nest in exposed places, incubation is of more importance in keeping the eggs from cooking on hot sunny days than in warming them during cool weather. This bird cooled her eggs as much as 15° C. at midday and warmed them some 5° to 6° at night. She moved displaced eggs with her bill, feet, and breast feathers; the young were able to move themselves in response to her call the first day after hatching.

The male was not seen to incubate, but helped feed the young from the day they hatched until after fledging, and apparently "assumed responsibility for feeding the young of the first brood while the female incubated the second clutch." —O. L. Austin, Jr.

33. Relation of "Clutch-size" to Number of Ova Ovulated by Starlings. David E. Davis. 1958. *Auk*, **75**(1): 60-65. By serial sectioning their ovaries the author determined the number of eggs 32 female *Sturnus vulgaris* ovulated. Comparison with the number of eggs in the nest box of each bird showed more ovulations in 16 cases, fewer in 9, the same in only 7. Loss of eggs is easy to account for; excesses may result from two females laying in the same box. As Davis points out, "the fact that clutch size is not necessarily an indication of number of eggs ovulated means that interpretations of the biological implications of changes or differences in clutch-sizes need to be examined carefully." But while number of ovulations is unquestionably a sounder measure of reproductive potential than clutch size, it is a far more difficult figure to obtain, and what counts demographically is not the number of young a species is capable of producing, but the number it produces that mature to breed in turn.—O. L. Austin, Jr.

34. Notes on the Breeding Habits of *Panyptila cayennensis*. F. Haverschmidt. 1958. *Auk*, **75**(2): 121-130. Describes the nesting of a pair of Scissor-tailed Swifts against the stone wall of a house in Paramaribo, Surinam. This paper, with No. 35, provides detailed information on the roosting and breeding habits, particularly on nest construction in this interesting species.—J. C. Dickinson, Jr.

35. Distribution and Nest of *Panyptila cayennensis* in Brazil. Helmut Sick. 1958. *Auk*, **75**(2): 217-220. See comment on No. 34.—J. C. Dickinson, Jr.

BEHAVIOR

(See also numbers 7, 8, 23, 30, 39, 46, 63, 65, 66, 67, 68, 69)

36. The Display of the Manakin *M. manacus*. Iris Darnton. 1958. *Ibis*, **100**(1): 52-58. To find as delightful a paper as this one in staid old *Ibis*, of all places, renews one's faith in the future of the British Commonwealth. Its contents aren't earth-shaking; they probably won't cause the slightest tremor even in the little world of behavioristic ornithology. Its main contributions are the observations that these manakins make individual dancing grounds in close proximity to one another on the forest floor in which each pair goes through a dance ritual early every morning, and that the series of unbirdlike sounds, one like a twig snapping, another like a nail drawn over a comb, are made by *both* sexes during the dance. How the birds produce the sounds has yet to be explained satisfactorily, though evidence suggests they doubtless make some of them with their wings, not the syrinx.

The paper's outstanding features are its freshness, simplicity, and clarity. To describe what she saw during a month in Trinidad spent most profitably watching the manakins go through their antics, the author uses refreshing Anglo-Saxon one- and two-syllable words, a minimum of technical terms (most of those quoted), and no behaviorist jargon whatever. Her opening sentence sets the tone for the entire piece: "The Black and White Manakin *Manacus manacus* is a cobby little bird about four inches long, common in the forests of Trinidad." As she develops her narrative and argument from that perfect start, you don't have to be a behaviorist nor even an ornithologist to understand and to enjoy every word of it. This to me is scientific writing at its best.—O. L. Austin, Jr.

37. Further Notes on Pairing and Submissive Behavior of the Red-legged Partridge *Alectoris rufa*. Derek Goodwin. 1958. *Ibis*, **100**(1): 59-66. "1. The submissive display is described. It is sometimes given when the bird appears to be simultaneously frightened and attracted by a fellow member of the species. 2. The pairing behavior of some individual captive birds is described. Some degree of mutual fear and hostility seems to be a necessary correlate of sexual attraction in this species. Birds that know and are at ease with one another do not pair. 3. A young male showed (in autumn) behavior similar to that of a female ready to pair when introduced to an old and aggressive male. A possible biological function of such behavior is suggested." No comment.—O. L. Austin, Jr.

38. Territorial and Other Behavior of the Woodpigeon. S. Cramp. 1958. *Bird Study*, **5**(2): 55-66. The author studied *Columba palumbus* for some 8 years, mainly in the parks of central London, where this usually wary and wild species is "both surprisingly tame and numerous." He describes pair formation and nuptial display in detail. Birds establish territories in early winter and maintain them through the breeding season; they proclaim ownership "by song and display flight to some extent, but mainly by the male's continued presence for long periods and by his driving off all trespassers." The function of territory "appears to be to provide a safe place where the pair-strengthening displays and coition can take place without interference. It also helps to ensure sufficient nesting sites for a species which often makes many repeat attempts in one season." —O. L. Austin, Jr.

39. An Investigation on the Courtship of the Red-crested Pochard. (Eine Untersuching über das Balzverhalten der Kolbenente *(Netta rufina* Pallas).) With English summary. Hans Lind. 1958. *Zeitschrift für Tierpsychologie*, **15**(1): 99-111. Observations on 4 males and 1 female in the Copenhagen Zoo. Courtship consists of 4 distinct phases; these are described and illustrated. "It is shown that there is probably no special courtship drive, but that the courtship activities are 'still' dependent on the original drive combination (attack, fleeing and sexual drive). This combination is ritualized so that only a variation in strength of the three drives within definite 'limits' results in courtship. Besides, every courtship activity corresponds to a relative strength of the three drives which is also ascertained by the ritualization. Finally, some remarks are made on the ritualization of the displacements."—M. M. Nice.

40. Behavior of the European Nuthatch. (Das Verhalten des Kleibers *(Sitta europaea caesia* Wolf). (With English summary.) Hans Löhrl. 1958. *Zeitschrift für Tierpsychologie*, **15**(2): 191-252. This excellent study covers the same field as the more popular account by the same author previously reviewed in *Bird-Banding* (**29**(3): 207), to which review the reader is referred. The present paper treats the same material with more detail and discussion and with citations to a long bibliography. The color-ringed Nuthatch population of 36 acres was watched for 5 years and the behavior of the birds carefully investigated. Fifteen calls of different significance are described. "The male's red flank-feathers are spread conspicuously when it is sexually excited but are generally hidden during threat display. In low-intensity fighting, males tear off pieces of bark and pull leaves to shreds. This displacement activity may develop into real feeding. The females join actively in the fighting and even attack males."

Three observations of 12 to 15 hours on 2 incubating females showed that Female F's average period on the eggs was 21.2 minutes and off the eggs 8.8; Female S's periods averaged 33.5 minutes on and 22 minutes off. Female F, incubating 70 percent of the daylight hours, hatched her eggs in 15 days, while S, spending 64 percent of the time on the eggs, hatched hers in 18.5 days. The young are brooded for 15 to 20 days; they leave the nest at 24 days, well able to fly. Eight to 10 days later they are independent. A notable contribution.—M. M. Nice.

41. Mixed Bird Flocks in Mexico, in Particular the Behavior of Northern Migrants. (Gemischte Vogelverbände in Mexiko, insbesondere das Verhalten nordischer Zugvögel.) Helmut O. Wagner. 1958. *Zeitschrift für Tierpsychologie*, **15**(2): 178-190. Local birds usually stay in families within the winter flocks. The migrants benefit from the sedentary birds' knowledge of good places for sleeping, eating, and refuge. "Adverse environmental factors increase the flocking tendency." Some hummingbirds breed in Alaska and Mexico—in summer and winter quarters. In April 1939 300 Painted Buntings *(Passerine ciris)* were caught in the state of Veracruz and 10 to 15 percent of the young birds had thick, bright bill swellings, evidently having recently left the nest. No further details are given.—M. M. Nice.

42. On the social behavior of Pheasants. (Zum sozialen Verhalten des Jagdfasans.) Kaj Westerskov. 1958. *Ornithologische Mitteilungen*, **10**: 84. The author comments briefly on the winter flocking behavior of the Pheasant *(Phasianus colchicus)* in New Zealand. Although unisexual winter flocks are common in the Northern hemisphere areas, in New Zealand three-fourths of all the Pheasants observed in the winter were alone, and one-fifth were seen in unisexual groups which averaged only 2 to 3 birds.—R. O. Bender.

43. Notes on the Courtship Behavior of the King Rail. Brooke Meanley. 1957. *Auk*, **74**(4): 433-440. The male *Rallus elegans* attracts a mate mainly by uttering the mating call and by exposing his white under tail coverts. During the nuptial phase of courtship the mated pair have a series of more subdued calls and utter the mating call less often. "The mating call and several other calls uttered by the King Rail . . . sounded identical to those given by the Louisiana Clapper Rail *(Rallus longirostris)*. . . . Further investigation of the habits of these two closely related species would possibly reveal many other identical behaviorisms."—O. L. Austin, Jr.

44. Notes on the Behavior of the Flying Steamer Duck. M. Moynihan. 1958. *Auk*, **75**(2): 183-202. Describes in behaviorist terms and some detail the "considerable variety of hostile and sexual behavior patterns" in *Tachyeres patachonicus*. Some of these patterns remind the author of those "of sheld-ducks and sheld-geese; but the other displays are peculiar enough to suggest that the relationship between the Steamer Ducks and the typical Tadornini is fairly remote. It may be better to put the Steamer Ducks in a separate tribe of their own, the Tachyerini."—O. L. Austin, Jr.

WILDLIFE MANAGEMENT

(See also numbers 28, 67)

45. On the population changes in birds during the hunting season. T. Udagawa. 1957. *Misc. Rpts. of the Yamashina Institute for Ornithology and Zoology*, No. 11: 458-460. (In Japanese with English summary.) The author made daily censuses of the birds observed near a Tokyo suburb for 2 weeks, starting 4 days before the hunting season opened. Small song birds such as sparrows, wagtails, titmice, and white-eyes showed no significant changes in numbers, but the populations of two species hunted commonly, the Jay *(Garrulus)* and the Bulbul *(Microscelis)*, declined markedly.—O. L. Austin, Jr.

46. Local Movements of Wood Ducks *(Aix sponsa)*. Paul A. Stewart. 1958. *Auk*, **75**(2): 157-168. Intensive field observations of female wood ducks and their broods in central Ohio, aided by color-marking and banding, showed that after leaving the nest the broods usually remain near the natal site for the first 2 weeks and then move to new habitats at varying distances up to 3.5 miles, often forming congregations of five and six broods. "When lost from the female, very young ducklings did not show their normal fear and followed various moving animals and objects. At such times they readily joined Wood Duck broods other than their own, and some mixing of broods thus occurred." When the young are about 6 weeks old, the females start gathering into small groups. When the young start to fly at 8 weeks, further population shifts occur, resulting in further congregating in late summer on ponds and lakes. "Birds at the congregation centers did not move but furnished the nuclei of the congregations." About the first of October, the birds move from the ponds "usually less than 15 miles" to rivers and creeks. The southward migration takes place in late October and early November.—O. L. Austin, Jr.

47. The Eider-Duck population of Vlieland. (Het aantal Eidereenden *(Somateria mollissima)* bij Vlieland. J. en C. Hoogerheide. 1958. *Limosa*, **31**(2): 151-155. (From the English summary.) The Eider population of this barrier island off the northeastern Netherlands coast was about 12,000 birds in 1957, the number of nests about 3,000. Counts at the start of the breeding season showed the sex ratio to be 1 to 1. The presence of 1,500 to 2.000 1-year-old birds attested the success of the 1956 breeding season.—O. L. Austin, Jr.

48. Seasonal, geographical and yearly trends in the weight of capercaillie *(Tetrao urogallus)* and blackgame *(Lyrurus tetrix)* in Finland. Jukka Koskimies. 1958. *Ornis Fennica*, **35**(1): 1-18. This scholarly analysis of 3,659 Capercaillie and 4,498 Blackgame weights shows the variations caused by sex, age, season, locality, and year. Males are heavier than females in both species; all sexes and age groups gain weight from September to a November peak and then start to lose gradually. "Blackgame show a consistent trend of increasing weight from south to north [Bergmann's rule]. . . . With capercaillie,

the southernmost populations are heaviest and the central ones lightest on the average. It is probable that the former are influenced by a large southern race *(Tetrao urogallus major)* and the latter by a smaller eastern one *(T. u. uralensis)*. The northern populations are intermediate in weight, probably representing the nominate race *T. u. urogallus*. There are year-to-year variations of about 5-10% in the average weight of the period October-December. The yearly weight level is in inverse relation to the average temperature of the same period."—O. L. Austin, Jr.

CONSERVATION

(See also number 16)

49. Notes on the Black Stork *Ciconia nigra* in Japan. Haruo Takashima. 1957. *Misc. Reports of the Yamashina Institute for Ornithology and Zoology*, No. 11: 431-435. (In Japanese with English summary.) This species has led a precarious existence since the turn of the century in both Japan and Korea. One or two wintered regularly with the cranes at the Arasaki sanctuary in Kyushu until the Korean war, during which its last known nesting site in Kyongsang Pukto was probably destroyed, for none has been reported since. It is all too likely that man has succeeded in extirpating the eastern Asiatic population of this fine bird.—O. L. Austin, Jr.

50. The Exploitation of Sea Birds in Seychelles. M. W. Ridley and Richard Percy. 1958. *Colonial Research Studies*, No. 25 (Her Majesty's Stationery Office, London): i-viii, 1-78. Price 12s. 6d. This timely report on the current status of the sea birds nesting on the group of islands north of Madagascar is based on an extensive field survey made in 1955. It gives a history of the century-old egg industry which, though declining rapidly, is still of considerable economic importance to the inhabitants of this British colony, and short accounts of the biology and ecology of the two species principally involved, the Sooty Tern, *Sterna fuscata*, and the Noddy, *Anous stolidus*. Its statistics show how greatly all species have declined, particularly the Sooty Tern which, though it has always borne the brunt of the egging, is still the most numerous species. In discussing the birds' many natural enemies it points out: "it would be a mistake to suppose that any factors other than man are responsible for their decline in numbers, or that the removal of all the birds' natural enemies would have more than a very small effect on the numbers of birds returning to breed each year."

During their survey the authors conducted a series of experiments on Desnoeufs Island, the largest ternery (1,210,000 Sooties, 18,300 Noddies), to learn something of the effects of egging on renesting. Their studies of dyed and color-banded adults showed: Not all Sooty Terns lay a second egg after removal of the first; a few renest on other islands; it takes the species an average of 14 days to re-lay after its egg is removed, and this period remains the same regardless of the stage of incubation and whether the egg is smashed or removed; the Sooty Tern will sometimes lay a third egg after the removal of the second; Noddies take much longer than Sooties to re-lay after losing their first eggs. The appendices contain useful notes on the reproductive system and the embryology of the Sooty Tern, pictures of eggs and embryos in various stages of incubation, and comments on the effects of storage on edibility.

Most important are the authors' studied analysis of the conservation problem and the strong measures they deem mandatory to protect the valuable natural resources of the Seychelles to maintain their yield. They recommend protecting all birds and their eggs except the two terns, prohibiting the export of wild bird plumage, and making certain islands inviolate sanctuaries. They advise reducing the tern egg harvest drastically and discuss ways of accomplishing it, such as by cropping only half the occupied territory each year alternately, varying the closed season dates, or by allotting quotas. They also recommend limiting the harvest to fresh eggs for use within the colony, prohibiting the export of egg yolks, eliminating the appalling wastage of smashing eggs to ensure fresh ones later, and the keeping of adequate statistics on the egging trade and on the bird populations that make it possible.

Enforcing conservation laws on remote islands is always difficult and poaching is notoriously hard to control when its profits are high, but the examples of Laysan, the Priblofs, and of the American coastal bird islands show conservation is not

only possible, but practical and profitable. It is earnestly to be hoped that the implementing action so necessary in the Seychelles will shortly follow the publication of this fine report, before it is too late for the Wideawakes and the other species that are so rapidly disappearing there.—O. L. Austin, Jr.

PARASITES AND DISEASES

51. Treatment of Sick and Wounded Birds. F. B. Lake. 1958. *Bird Study*, **5**(2): 66-74. This is a most helpful discussion of a problem that, as the author points out, often embarrasses almost everyone known to be interested in birds—what to do with the sick, wounded, exhausted, or otherwise helpless live birds that people bring you. It describes the common ailments encountered, tells which illnesses and injuries are curable and how to cure them, which ones are hopeless and how best to put the suffering bird out of its misery. It gives common sense advice on how to cage and feed different kinds of birds and describes their varying reactions to confinement. The advice on what to do with nestlings, "perhaps the commonest thing one has to deal with," is particularly apt: return the bird to its parent if at all possible, if not "hand rearing may be undertaken." I'm sure I for one will often have occasion to refer to this useful paper.—O. L. Austin, Jr.

PHYSIOLOGY AND PSYCHOLOGY

(See also numbers 32, 33, 48, 68)

52. Body Temperatures in California and Gambel's Quail. George A. Bartholomew and William R. Dawson. 1958. *Auk*, **75**(2): 150-156. Data gathered on captive *Lophortyx californicus* and *L. gambelii* show a "conspicuous diurnal cycle of body temperature that is correlated with level of activity. . . . These quail resemble birds of other groups in their storage of heat at high ambient temperatures. Their demonstrated tolerance of body temperatures as much as 4°C. (7.2°F.) in excess of normal levels appears to be of primary importance in their survival in hot environments."—O. L. Austin, Jr.

MORPHOLOGY AND ANATOMY

(See also number 59)

53. The Beard of the Wild Turkey. A. W. Schorger. 1957. *Auk*, **74**(4): 441-446. The author discusses the results of detailed gross and microscopic examination of the beards of 5 races of *Meleagris gallapavo*. The original purpose of this study, separation of domestic and wild specimens, provided negative results. The Schorger investigation presents data (somewhat meagre in terms of numbers of specimens involved) which indicate that there is no noticeable geographic variation in the number, length, or cross-sectional shape of the bristles of this species. The conclusion that "the beard is a poor sex character," based on the presence of beards in 8.9 percent of 120 domestic turkey females and in 7.4 percent of 230 pen-reared females of wild stock, seems unwarranted on the basis of data presented for wild-killed birds, for which Schorger quotes McDowell's (1954 Ph.D. Thesis, Va. Poly. Inst.) figure of 4 out of 557 females with beards.—J. C. Dickinson, Jr.

54. Comments on the Phylogeny and Skull of the Passeriformes. M. Jollie. 1958. *Auk*, **75**(1): 26-33. The relative development of the prefrontal bone in various oscines indicates to the author that "the large species of this suborder, as represented by the crows, are the more primitive while the small species are the more specialized. Other features of the skull suggest that the passerines may not be the most advanced of birds." His introductory comment that "at this time . . . we need to know how to interpret information . . . as much as we need new information" seems particularly apt.—O. L. Austin, Jr.

ZOOGEOGRAPHY

(See also numbers 7, 13, 14, 15, 41, 49, 67, 70, 71)

55. Name List of the Netherlands Birds. (Naamlijst van de Nederlandse Vogelsoorten.) First report of the Commissie voor de Nederlandse Avifauna (Netherlands Chick-List Committee). 1958. *Limosa*, **31**(2): 107-119. (From

the English summary.) A list of the scientific and approved Dutch vernacular names for the 350 species the committee recognizes as occurring in the Netherlands. Subspecies are not mentioned. Also indicated are the 184 of these for which the Committee considers sufficient proof exists of breeding in the Netherlands since 1900.—O. L. Austin, Jr.

56. Occurrence of the Red-flanked Bluetail *(Tarsiger cyanurus)* in Finland and some remarks concerning its expansion to the west. Matti Helminen. 1958. *Ornis Fennica*, **35**(2/3): 51-64. During the past decade this central and eastern palearctic species has extended its range across the Ural barrier into northeastern Finland. "There is some evidence that warm springs have stimulated the spring migration of the species and caused its prolongation."—O. L. Austin, Jr.

57. Remains of Rare and Extinct Birds from Illinois Indian Sites. Paul W. Parmalee. 1958. Auk, **75**(2): 169-176. A very rewarding study of avian remains from Indian sites dating back to the A.D. 1550-8000 B.C. periods. New and interesting records of a variety of forms are presented.—J. C. Dickinson, Jr.

58. Photographic Studies of Some Less Familiar Birds. LXXXIX. Goshawk. I. C. T. Nisbet. 1958. *British Birds*, **51**(6): 233-237. *Accipiter gentilis* breeds both in the Old and New Worlds, but is little more than a vagrant in Britain. It has long been used for hawking. They "were regularly used in Persia and India for hunting such large game as cranes *(Grus* sp.), Great and Houbara Bustards *(Otis tarda* and *Chlamydotis undulata)* and Gazelles *(Gazella subgutterosa)*." Studies on its prey under natural conditions are summarized. "The species has only one serious enemy—Man, in his rôles of falconer, game-preserver, chicken farmer and 'sportsman'." There are 6 fine photographs of adults and young in Sweden taken by Kurt Ellstrom and Jonas Svensk.—M. M. Nice.

SYSTEMATICS

(See also numbers 48, 54, 55)

59. Convergence or paramorphogenesis. Systematics and phylogeny of the Penguins. (Convergence ou paramorphogenèse. Systématique et phylogénie des manchots (Sphenisciformes).) R. Verheyen. 1958. *Le Gerfaut*, **48**(1): 43-69.

Since in the view of the author a satisfactory solution to the problem of the evolution of the orders of birds may not be reached by the traditional methods of taxonomy, he proposes a new means to determine whether similarities be due to convergence or separate phyletic lines or to paramorphogenesis, the parallel development of structures inherited from a common ancestor among its related descendants. If the amount of similarity is very low, resemblances are said to be due to convergence. If the similarities are numerous, the forms are thought to have retained from a common ancestor an identical structural basis.

A review, from the literature, of the morphological and physiological characters of the penguins occupies 18 pages and is accompanied by a useful bibliography. Original factual material includes a table of skeletal ratios of 11 forms based on a total of 20 specimens. Unfortunately raw measurements are omitted. Osteological diagnoses of the six genera are given. The number of species recognized is 13, although apparently the author did not study some of the forms reduced to synonymy.

The penguins are said to agree with the Procellariiformes in 52 percent of 208 taxonomic characters and with the auks in 54 percent of these characters. We are not told just what these points of agreement are. Furthermore the skeletons of the diving petrel *(Pelecanoides urinatrix)* and the dovekie *(Plautus alle)* are identical in 65 percent of 105 unenumerated particulars.

From the application of this new method in the study of evolution the preposterous conclusions reached by the author are: 1) the penguins are as closely allied to the auks as they are to the petrels. 2) The diving petrels should be removed from the Procellariiformes and placed in the order Alciformes. 3) The

penguins, auks, and petrels had a common origin from semiaquatic coelurosaurian reptiles, distinct from the line leading to other birds. From this common ancestor one branch led to the penguins, which never passed through a volant stage, and a twin branch gave rise to the auks and petrels. 4) The fossil penguins may have had a different ancestor than had the living ones.

Let us hope that the author's lament that recent anatomical research has had no influence on systematics will prove true in the case of the theory of paramorphogenesis.—Pierce Brodkorb.

60. Field Observations Pertaining to the Systematic Status of the Great White Heron in the Florida Keys. Andrew J. Meyerriecks. 1957. *Auk* **74**(4): 469-478. Ever since 1858 when Spencer Baird gave the name "*Ardea wurdemannii*" to the hybrid produced by *A. occidentalis* and *A. herodias* the battle has raged. Meyerriecks joins forces with Mayr *(Auk,* **73**: 71-77) in presenting evidence that *occidentalis* and *herodias* are conspecific. Observations of behavior, variability, white : blue ratios, randomness of mating, and breeding season all lend additional weight in favor of this conclusion.—J. C. Dickinson, Jr.

61. Variation in the Great Horned Owls of Middle America. J. Dan Webster and Robert Orr. 1958. *Auk,* **75**(2): 134-142. The authors comment that *Bubo virginianus* is a difficult but interesting one for the taxonomist. They state the "complicating factors are: (1) the availability of relatively few specimens; (2) the existence of two and even three color phases in some areas; (3) considerable indifference to ecological conditions by the species as a whole, yet ecological constraint exhibited by local populations; (4) a network pattern of distribution of morphological characters, with some localized populations distinct, but surrounded by much larger areas where the populations are intermediate or different." It does seem that it might have been best to delay arrival at conclusions until the first (and only) removable objection had been removed. The value of conclusions on subspecific validity and relationships based on 4 *(B.v.mayensis)* and 11 *(B.v.mesembrinus)* specimens is certainly questionable. The third Middle American race these authors recognize is *B.v.pallescens.*—J. C. Dickinson, Jr.

62. Variation in South American Great Horned Owls. Melvin A. Traylor. 1958. *Auk,* **75**(2): 143-149. Traylor, as were Webster and Orr (see No. 61), was hampered in arriving at conclusions on the subspecies of *Bubo virginianus* in South America, but he had the advantage of a more equitable distribution of his specimens, and of course he studied variation over a much larger geographical area. Thus the diagnostic differences cited are much more marked than those outlined by Webster and Orr for their Middle American forms. Traylor concludes that *B.v.magellanicus, B.v.nacrutu,* and *B.v.nigrescens* are worthy of certain recognition. The status of *B.v.deserti,* of which only one specimen was available for study, is "tentative."—J. C. Dickinson, Jr.

EVOLUTION

(See numbers 27, 54, 59, 68)

FOOD

(See also numbers 22, 23, 26, 68)

63. Food and Feeding Habits of the Scaups in Connecticut Waters. John M. Cronan, Jr. 1957. *Auk,* **74**(4): 459-468. Analysis of the stomach contents of 119 *Aythya marila* and 10 *Aythya affinis* showed the former to eat 93.4 percent animal food, the latter only 61.7 percent. In both species molluscs are "unquestionably the favorite scaup food, but the particular molluscan species taken appeared to depend upon availability." The most important plant food is sea lettuce *(Ulva).* Timing the dives of feeding scaup showed them to range from 9 to 33 seconds, with an average of 20.4 seconds. The birds usually feed in 5 feet or less of water; the greatest depth in which they were seen to feed was 23 feet.—O. L. Austin, Jr.

64. Studies of the bird population of a fruit orchard. (Untersuchung über die Vogelpopulation eines Obstgartens.) Johann Korodi Gal. 1958. *Ornithologische Mitteilungen,* **10:** 66-69. Late May censuses for two seasons in a mixed fruit orchard in Roumania showed 26 species nesting in the 8.5 hectare area, 12 of them migratory, 10 non-migratory, and 4 "temporarily present" (what the latter designation signifies is not clear). Data are presented on the food habits of young Great Tits *(Parus major)* obtained by the neck-band method.—R. O. Bender.

SONG

(See also numbers 30, 51)

65. Late Season Singing of the Yellowhammer. Noble Rollin. 1958. *British Birds,* **51**(8): 290-303. Three *Emberiza citrinella* in Britain (lat. ca. 55° N.) sang the following number of songs in one day: 1 August, 2,279; 5 August, 2,686; 5 August, 3,482. This last bird spent 12 hours, 11 minutes singing. A table and chart give the number of songs per hour for each bird, and another chart shows the times of beginning song from March to August; early singing occurred throughout June, July, and early August.

In Norway (between latitudes 63° and 69° N.) from 23 June on, Yellowhammers were singing much less than in Britain. "A bird in full song in the Arctic sang 488 songs in one day." Song ceased in July. "Factors thought to be connected with the lesser amount of song in higher latitudes were the continuous light, the lack of night sleep and the lesser amount of song competition." —M. M. Nice.

66. The Calls of the Chaffinch *(Fringilla coelebs L.)* in Denmark. H. Poulsen. 1958. *Dansk Ornithologisk Forenings Tidsskrift,* **52**(2): 89-105. Analysis of sound spectrographs or "sonograms" shows the calls of the British race are very similar to those of the continental race in Denmark except for minor variations in song and in one of the male alarm calls. The author divides the Chaffinch repertoire into 13 calls, each with a different meaning and "communicatory function."—O. L. Austin, Jr.

BOOKS

67. The Ring-necked Duck in the Northeast. Howard L. Mendall. 1958. *University of Maine Studies, Second Series,* No. 73, 320 pp. $2.50.—Since 1930 *Aythya collaris* has extended its range from the west and northwest to much of the northeast, being "especially numerous in Maine, New Brunswick, eastern Ontario and parts of Quebec." The present excellent volume is the report on one of the major research projects of the Maine Wildlife Cooperative Research Unit from 1943 through 1955. A thorough coverage of the distribution, migration, life history, food, hunting, and management is presented in 14 chapters, each with its summary, as well as in 10 appendices, a 14-page bibliography, 48 photographs, and a subject index. Not only is the Ring-neck fully discussed, but comparisons are freely made with other studies on ducks, chiefly North American.

Pair attachment and parental care are more pronounced in Ring-necks than in many other ducks. The drake stays by his mate practically to the end of incubation, while the hen "is one of the most devoted of duck mothers." "The feigning performance is the most intense and persistent that I have observed among any waterfowl in the northeast. The process may last as long as 10 or 15 minutes and take the female a half mile from her brood." In contrast to the majority of diving ducks, the Ring-neck customarily keeps her young with her until they have reached the flying age at 7 weeks.

Red-winged Blackbirds *(Agelaius phoeniceus),* through their zeal in driving crows and ravens from the nesting marshes, are a definite help in saving eggs of Ring-necks and Black Ducks *(Anas rubripes).* The average clutch size of 423 first nests of Ring-necks was 9, of 48 re-nests 7. The incubation period ranged from 25-29 days, averaging 26. Of 473 first nests 70 percent hatched, of 49 re-nests 61 percent. Brood counts averaged 8.4 at hatching and 5.2 when the ducklings were nearly grown. Thus nesting success and brood survival both reflect exceptional parental care.

As to management, the following measures are recommended: continuance of the regulations against hunting before October; habitat management on refuges, particularly control of water levels and exclusion of human visitors during the nesting season; predator control only under special conditions.

"This study began 21 years ago." The report is the product of the labors of many people as is shown by the acknowledgments that fill more than 6 pages. All in all, an admirable book, a storehouse of information about a fine species that is increasing and pioneering in new regions.—M. M. Nice.

68. Listening in the Dark. Donald R. Griffin. 1958. Yale University Press, New Haven, Conn. xviii + 413 pp. 16 plates, 15 figures, 12 tables. Price $7.50. One of the most intriguing classes of sensory phenomena known to the biologist is the use by certain animals, including man, of active sonic signals as a means of orientation. In this volume Donald R. Griffin has synthesized a great diversity of facts from the field of biology, psychology, and sound physics into a fascinating account of echolocation as a mode of perception among animals.

The major portion of the book (10 of the 15 chapters) deals with acoustic orientation in bats, for it is in these mammals, particularly the family Vespertilionidae, that echolocation mechanisms have evolved to a particularly high degree of perfection. For those unfamiliar with bats, the brief review of their structure, probable phylogeny, unique physiological characteristics, and general habits presented in the first two chapters will serve to provide a background against which the significance of their means of acoustic orientation can be fully appreciated.

Scientific attention was first focused on the question of how bats avoid obstacles when flying in the dark by the incisive experiments of Spallanzani and Jurine in the late 1700's, but it was not until 1938 that the intense ultrasonic sounds emitted by bats were first heard by Griffin and Pierce, although Maxim and Hartridge had hypothesized some years before that bats employed sounds beyond the range of human hearing for orientation. By about 1945 sufficient data had been accumulated through careful experiments and critical observations to indicate beyond all reasonable doubt that bats of the family Vespertilionidae at least can indeed orient themselves by means of high frequency sounds and that vision is of little importance.

Subsequent research on bat echolocation has been concerned with the precise nature of the sounds produced, the structural and functional adaptations of laryngeal and auditory mechanisms for the generation and reception of these sounds, and the actual role played by echolocation in the lives of diverse types of bats. In the course of seven chapters Griffin details the painstaking field and laboratory experiments by which these and other aspects of acoustic orientation in bats have been and are presently being explored, the acoustical principles involved, and the biological significance of the results. Among the many interesting facts that have thus far emerged from these investigations has been the discovery of several distinctive patterns of sound orientation in bats which are correlated with particular structural and behavioral adaptations. With the exception of *Rousettus*, the species of Megachiroptera that have been studied are strictly visual animals. In the absence of light or when blindfolded *Rousettus* is able to switch from visual to sonic orientation. Its sounds are short audible pulses ranging over a broad band of frequencies, and their production is so fundamentally different from that in the Microchiroptera as to suggest an independent origin of echolocation in the two suborders of bats.

The species of Microchiroptera studied fall into two major groups on the basis of the type of sounds produced. The "loud" bats generate pulsed sounds having considerable energy, and in the most specialized of these the pulses are frequency modulated. These bats are all insectivorous, with the exception of the partially piscivorous *Noctilio*, and evidence strongly favors the fact that some of them actually employ echolocation to hunt down insects in flight. The "whispering" bats are typically fruit eaters or carnivores that feed on relatively large prey. Their pulses have only from 1/100th to 1/1000th the energy of those of the loud bats. Although these sounds probably suffice for orientation with respect to large stationary objects such as vegetation, they are not suitable for echo ranging on small moving targets. Some species within each group diverge from the acoustic pattern generally characteristic of the group. Such variations have been found to be accompanied by important differences in habits.

Biological sonar systems are not restricted solely to bats, and Griffin describes a relatively simple case of orientation by means of mechanical vibrations in the familiar whirligig beetle and presents the evidence for echolocation among fishes and cetaceans. Of particular interest to the ornithologist is the consideration of acoustic orientation in birds. The first species of bird to be added to the list of animals employing echolocation systems was the neotropical Oilbird or Guácharo, *Steatornis caripensis*. An early account of these birds in the Cave of the Guácharos in the Caripe valley, Venezuela, by Alexander von Humboldt emphasized the facts that they frequented dark recesses and were particularly vociferous. In 1953 Griffin visited the Cave of the Guácharos at Caripe with some of the apparatus used to study bat sounds to investigate the possibility of echolocation in the Oilbirds. Initial observations deep in the cave during the day confirmed that the birds did indeed fly in total darkness, but the weird assortment of sounds that was heard gave no clear evidence that the birds were using echolocation. However, observations on the evening flight of the birds from the cave found them emitting only a single kind of sound—a very sharp click. The duration of the pulse is only about 1 to 1.5 milliseconds, in this respect being comparable to bat pulses, but its frequency lies well within the range of human hearing, averaging only about 7,000 c.p.s. Further experiments with captive Oilbirds in an improvised laboratory demonstrated their disorientation when forced to fly in the dark with the ears plugged, whereas their flight was normal when flying in a lighted room with plugged ears.

Observations on the behavior of cave-inhabiting swifts *(Collocalia)* of southeast Asia have strongly suggested that they, too, employ echolocation, and recent preliminary experiments performed on *Collocalia brevirostris* in Ceylon add further confirmation to this hypothesis. The possibility that still other species of nocturnal birds may utilize echolocation should certainly stimulate further investigations of this aspect of bird behavior.

Echolocation is not without significance to mankind. Griffin discusses the pioneer studies of Dallenbach and his associates at Cornell which conclusively demonstrated that acoustic orientation was the basis of the so-called "facial vision" by which blind men are able to detect obstacles in their path and the artificial systems that have been developed for human echolocation. He points out that although many of the military and commercial applications of sonar and radar devices have been realized, much of their potential is yet to be exploited. The possibility of utilizing mechanical vibrations instead of x-rays for medical diagnosis is merely one example of future applications of these principles.

In closing his account of echolocation among animals, the author states his conviction that in this era of science the richest rewards in the study of functional natural history are to be gained through the rigorous use of the experimental method. This book should stand along with such works as Von Frisch's on the language of the bees as a classic example of the value of such an approach to the study of living organisms—James N. Layne.

69. The Birds. Oskar and Katharina Heinroth. 1958. University of Michigan Press. Ann Arbor, Mich. 181 pp. $5.00. Twenty years ago I reviewed Oskar Heinroth's "*Aus dem Leben der Vögel*" *(Bird-Banding,* **9**(3): 171) with this concluding sentence: "This little book is so full of sane, illuminating wisdom that its translation into English would be a boon to the bird students of England and America." This has now come true—a translation by Michael Cullen of a second, enlarged edition that appeared in 1955 with additions by Dr. Heinroth's second wife and changes of some of the illustrations.

From the years Oscar and his first wife, Magdalena spent in hand-raising most of the species of central Europe, and from his experience with exotic birds in the Berlin Zoo, he wrote a book that is a mine of information on the biology of birds. He tells us: "there is no such animal as The Bird . . . The experienced ornithologist is astonished by the many different ways in which different species solve a particular problem, each in accordance with its own structure and habits and each in a more or less unvarying and instinctive way."

A few statements are in error: "In geese and swans . . . the male shares the incubation of the eggs" (the word "seldom" should have been inserted). The Emperor Penguin is said to incubate as long as 15 days at a stretch (recent studies have shown that the male incubates for 9 weeks). As to ducks pairing in winter quarters, "it may happen that a female from England follows her new

husband to Siberia, or vice versa" (in reality it is the drake that follows the hen to her home).

There is an index of species giving scientific names and page citations, but no references. Mr. Cullen has been most successful in translating this book that will be of value both to the serious student and to the beginner.—M. M. Nice.

70. Observations on Birds of Southeastern Brazil. Margaret H. Mitchell. 1957. University of Toronto Press. pp. i-x, 1-258. Price $5.50. Mrs. Mitchell has written a pleasant, readable book about her birding experiences during her 4-year stay in Brazil. Much more than a bird-watcher's diary, it contains a great deal of worthwhile material, particularly on the habits and behavior of unmistakable species. Its core is the annotated list of the 289 species of birds she "identified positively" of the perhaps 2,000 species occurring in Brazil.

I am much impressed by the author's success in familiarizing herself with a new and strange avifauna without recourse to collecting. She studied the birds carefully afield, made copious notes on the spot, and made good use of the excellent skin collection in Rio de Janiero to identify what she saw. She also studied the literature thoroughly, as the extensive bibliography and her constant references to it prove. For a non-systematist she has handled the nomenclature well, largely by following Hellmayr *et al* for both scientific and English names. Not least of her contributions is the close attention she paid to local vernacular names and their origin and meaning.

I have the greatest respect for the author's ability in field identification as shown by her writing. I do not for one moment question her integrity, and I am most favorably impressed by her conservatism and her frankness in admitting her inability to identify many of the birds she saw. Nevertheless, the question of identification is always present in a work based entirely on sight observation, and it doesn't help matters one bit to include uncertainties under such headings as "Terns sp.?", "Small Sandpipers sp.?", "*Limnodromus* sp. Dowitcher," and "*Himantopus*, sp. Stilt." Identifying birds positively at a distance on the grounds that they couldn't be anything else, as she apparently does with the Brown Pintail, the Dowitchers, Stilts, and Cabot's Tern among others, can always be suspect, and omitting all such uncertainties would have strengthened the book. The careful student of status and distribution is forced to reject them, and they just clutter up the literature.—O. L. Austin, Jr.

71. Birds of Maryland and the District of Columbia. Robert E. Stewart and Chandler S. Robbins. 1958. North American Fauna, No. 62. U. S. Department of the Interior, Fish and Wildlife Service, Washington, D. C. vi + 401 pp., 1 plate, 69 maps, paperbound. Price $1.75. This is the first full-scale treatment of the birds of Maryland since 1895, and the most detailed treatment of the birds of the District of Columbia. It is based in part on intensive field work by the authors since 1941. Compared to other recent "state books", it is strong in the use of banding data and breeding bird censuses, with excellent distributional and migration maps.

Species have been admitted to the regular list on a conservative basis, "if any one of three prerequisites is satisfied: (1) a specimen preserved; (2) a satisfactory photograph taken; or (3) three or more reliable sight observations made." Obviously, difficulty in identifying certain species has been given weight; e.g. the Great [formerly European] Cormorant is kept on the hypothetical list despite four sight records listed.

Stewart and Robbins have given us an admirable example to support the belief that what a "state book" needs most is a solid text and an abundance of maps. While some first-rate books have used good color plates to advantage, color plates—good or bad—have been used too often to cover up the drawbacks of a tired text.—E. Alexander Bergstrom.