RECENT LITERATURE

Edited by Edward H. Burtt, Jr.

BANDING AND LONGEVITY

(See 82)

MIGRATION, ORIENTATION, AND HOMING

(See also 33)

1. Bees have magnetic remanence. J. L. Gould, J. L. Kirschvink, and K. S. Deffeyes. *Science,* **201:** 1026–1028.—The interest of this note to the ornithologists is that it calls attention to the existence of magnetic structures in the bodies of certain invertebrates. Apparently in all cases the magnetic matter is Fe_3O_4. Some bees apparently lack these magnetic structures. When present they are oriented transversely to the axis of the insect. It remains to be shown that they actually have any significance in orientation and how the influence, if any, is mediated.—C. H. Blake.

2. Spatial orientation and behavior control. (Prostranstvennaya orientatsiya i upravlenie povedeniem.) V. Ilyichev. 1978. *Zhurn, Obshchei Biol.,* **34**(4): 534–546. (In Russian with English summary.)—Behavioral control as visualized by the author implies an orientated response fully or partly mediated by natural phenomena that the animal recognizes in its familiar ecological setting as reference points to guide a locomotory response. This may involve the following factors: a search for and application of ecological particulars to simulate and incite repellent reactions; a change in the object of attention (formerly it was an individual, now it is a group of birds); an increase in the number of objects regulating the response; invoking inherent habits as well as those acquired through learning. The study of avian behavior as responses to repellent signals is a desirable objective in studies of control. The repellent impulse spreads from one individual to another, and each individual modifies the impulse according to its own impression of the situation. The group generates secondary repellent impulses; each individual receives not just the primary but the altered signals as well. The group response rests on intermediary individuals that sense the repellent effect and show their reactions. A combination of effects including imitated distress calls is recommended. The author suggests that a fear and flight response might be "trained into the birds' mass behavior." Could it be?—Leon Kelso.

POPULATION DYNAMICS

(See also 7, 8, 12, 29)

3. Breeding success and mortality of terns at One Tree Island, Great Barrier Reef. K. Hulsman. 1977. *Emu,* **77:** 49–60.—Although Black-napped (*Sterna sumatrana*), Roseate (*S. dougallii*), Bridled (*S. anaethetus*), Lesser Crested (*S. bengalensis*) and Crested (*S. bergii*) terns breed on One Tree Island, each species is at the periphery of its range. Cyclones, floods, and predation by Silver Gulls (*Larus novaehollandiae*) were the major causes of mortality among eggs and chicks. Inter- and intraspecific competition for food was not a factor in these peripheral populations. In addition to Hulsman's examination of Lack's food limitation hypothesis, there are abundant data on the behavioral tactics used by thieving gulls against terns of different sizes. Gulls could and did push Black-napped and Roseate terns off their nests, a tactic that was not successful against the larger Lesser Crested and Crested terns. Gulls pilfered eggs and chicks from these larger terns by patrolling the colonies and swooping on unattended nests. Most interesting is the fact that several colonies of terns were each guarded by a mated pair of gulls that stole eggs and chicks from "their" colony and drove away other gulls.—Edward H. Burtt, Jr.

NESTING AND REPRODUCTION

(See also 21, 22, 24, 25, 38, 42, 68, 69, 77, 80)

4. Microgeographic prediction of polygyny in the Lark Bunting. Wanda K. Pleszczynska. *Science,* **201:** 935–936.—It is shown that the protection of the nest site from solar

radiation is the chief factor in determining whether a male of *Calamospiza melanocorys* secures zero, one, or two mates. Artificial shading of an otherwise poor territory increased the chance of the resident male obtaining a mate. Furthermore, mating success of males could be predicted in a previously unstudied area before the arrival of the females.—C. H. Blake.

5. Measurements and weights of eggs of the Canada Goose, *Branta canadensis*, analyzed and compared with those of other species. T. H. Manning. 1978. *Can. J. Zool.*, **56**(4): 676–687.—Besides providing an extensive statistical summary and analysis of the length, breadth, and indices of shape and volume for 334 eggs (82 clutches) and also of the weight and density for 125 (30 clutches) of these, Manning presents an extensive review of similar literature for 31 other species. For the Canada Goose, Manning found that the variance of egg measurements within a single clutch was approximately equal to the variance of egg measurements for single eggs compared between clutches. No clear correlations between any of his measurements and clutch size were found either for this species or for any in the literature surveyed. The one clear trend was that the last eggs laid by a Canada Goose have a significantly smaller breadth than earlier laid eggs and hence were lighter. The one nagging question left by this research and apparently the literature reviewed in this paper also is, what does any of this variability have to do with survivorship? Does egg length, breadth, weight, or position in the sequence of laying bear any relationship to the probability of the egg hatching into a bird that will fledge? Although admittedly this is a much harder question with which to deal, it is only in this manner that the adaptive significance of the variation reported by Manning and others can be assessed.—A. John Gatz, Jr.

6. Relationship between nest sites of Common Terns and vegetation on the Eastern Headland, Toronto Outer Harbour. H. Blokpoel, P. M. Catling, and G. T. Haymes. 1978. *Can. J. Zool.*, **56**(9): 2057–2061.—Common Terns (*Sterna hirundo*) on this Lake Ontario shore nest near vegetation and avoid nesting in barren areas.—A. John Gatz, Jr.

7. Egg size, hatching asynchrony, sex, and brood reduction in the Common Grackle. H. F. Howe. 1976. *Ecology*, **57**(6): 1195–1207.—Howe compared egg weight, laying sequence, hatching sequence, nestling growth, and fledgling sex ratio in 16 control and 23 experimental nests of *Quiscalus quiscula* in southeastern Michigan in 1975. His experimental procedure consisted in removing eggs from the nests as they were laid, temporarily replacing them with plaster dummies until clutches were complete, and then reintroducing complete clutches of real eggs. Nestling sex was determined by laparotomy late in nest life. His results indicate a trend toward increasing egg weight during the laying sequence and elimination of hatching asynchrony in experimental clutches. Elimination of hatching asynchrony changed the normal pattern of brood reduction during the nestling period, as follows. Typically in grackles, young from later, hence larger eggs, are most likely to starve. In the experimental nests the deaths in the first few days of nestlife were predominantly from smaller eggs (=those laid first?). Howe does not identify laying sequence of these eggs. In tests of paired, same-sex siblings, egg size and fledging weight were positively related. The experimental clutches produced a sex ratio of 1:1, whereas the control nests produced a ratio favoring females. Because males on the average weigh more than females at fledging regardless of hatch sequence, Howe suggests that males are more costly to raise and that brood reduction, which favors females over males, occurs when food supplies are insufficient to raise a full brood. He discusses hatch asynchrony and increased size of later eggs as antagonistic adaptations allowing parent grackles to raise more young when food supplies unpredictably increase. Fortuitously, food supplies on one of Howe's study areas did experience a sudden increase and birds at that location produced very large young. The study is well organized and the discussion of results in relation to ideas of inclusive fitness is lucid. A sobering difficulty of the study as a field experiment is that typically no less than 80% of the variance in regression analyses of subsequent nestling weights on hatch and laying sequence is attributable to factors other than those controlled by the investigator.—Paul B. Hamel.

8. Effects of addition and removal of nestlings on nestling weight, nestling survival and female weight loss in the Pied Flycatcher *Ficedula hypoleuca* (Pallas). C. Askenmo. 1977. *Ornis Scand.*, **8**(1): 1–8.—Based on two experimental seasons, large broods (up to nine nestlings) fledged fewer young and survival of those few young was lower than in small broods. The proportion of surviving nestlings was larger in reduced broods and smaller in the enlarged ones compared with the unmodified ones. "Due to increased mortality, enlargement of broods did not result in a higher proportion of fledglings." Females with large broods lost more weight than females with small broods.—Leon Kelso.

9. Method for determining the incubation stage of Pied Flycatcher *Ficedula hypoleuca* eggs. M. Ojanen and M. Orell. 1978. *Ornis Fenn.*, **55**(1): 29–31.—The diameter of the air bubble at the blunt end of the egg may show whether the clutch has been completed. When newly laid, eggs lack the air bubble and during the first day it does not exceed 5 mm in diameter. After 4–5 days' incubation it measures 9 mm, and after 9 days ca. 10 mm. Changes of the color profile in the egg during incubation show how far incubation has advanced. "This method (or its modification) is considered valid also for *Phoenicurus phoenicurus, Parus major,* and *Columba palumbus,* and fairly good for *Sturnus vulgaris.*" These data were verified from a collection of about 40 nests of the Pied Flycatcher.—Leon Kelso.

10. Development acceleration of sensory and motor mechanisms of nestlings as factors of systemogeny of some bird species. (Akseleratsiya sensornykh i motornykh mekhanizmov ptentsov kak faktor sistemogeneza nekotorykh vidov ptits.) S. Khayutin and L Dmitrieva. 1978. *Zhurn. Obshch. Biol.,* **34**(2): 289–296. (In Russian with English summary.)—This is a behavioral analysis of the cavity nesting Pied Flycatcher (*Ficedula hypoleuca*) and Great Tit (*Parus major*) whose broods hatch asynchronously from the same clutch of eggs. With optimum diets the nestling period of the youngest chick was shortened by 20–25%. Thus the whole brood tends to depart simultaneously. This was attributed to accelerated development of the youngest chick's sensory and motor components. This was promoted by increased motor activity, by the steady motivation and contact with older nestlings, thus "enriching the environment in which their development takes place." The following factors contribute to synchronized nest departure: 1. A high level of food motivation throughout the nesting season, with steady rise in motor activity. 2. Permanency of young in a sensorially enriched state, enhanced by vocalization and movements of older nestlings. 3. Stabilization by the bulk of elder young before departure. Young hatched later reach the same bulk and depart omitting the "plateau" stage. 4. Increased intervals between feedings just after nest departure of older young. The authors suggest that synchronization of nest departure is an adaptive response determined by mutual acceleration of sensory and motor components. Is this a form of socially enriched "affirmative action?"—Leon Kelso.

11. On lability in evident embryo adaptation of the Common Cuckoo. (O labilnosti v proyavlenii embrioadaptatsii obyknovennoi kukushki.) E. Leonov. 1978. *Biol. Nauki,* **1978**(5): 53–55. (In Russian.)—The author compares the rate of embryological development of *Cuculus canorus* to that of one of its victims, *Serinus canaria,* by means of ovoscopy (candling). Total time of incubation averaged 43 hr less for the Cuckoo embryo than for the Serin. The egg of the latter was only slightly smaller than that of the Cuckoo, 21×16 mm. The Cuckoo embryological development in the first 33 hr equaled that of *Serinus* in 60 hr, the time discrepancy being 27 hr. The progression of the time discrepancy (Serin versus Cuckoo) was 60–33 (27); 72–40 (32); 84–47 (37); 108–71 (37); 192–155 (37); 240–203 (37); 264–215 (49); 288–239 (49); 302–269 (33); 315–272 (43). These results indicate that the Cuckoo egg may be delayed in the oviduct, leading to shortening of its sojourn in the nest of the host. Presumably the shortened incubation is adaptive for several reasons: the female's difficulty in finding hosts, concluded reproductive cycles in potential hosts, necessity of fortuitous host choice, and others. In the course of evolution the Cuckoo has adapted to nest parasitism, by laying its egg at a more advanced stage of development. So here we find evident lability of embryo adaptation, and not accelerated development of the parasitic embryo.—Leon Kelso.

12. Breeding of Antarctic Terns in the Snares Islands, New Zealand. P. Sagar. 1978. *Notornis,* **25**(1): 59–70.—One summer, 1976, at Snares Islands daily records were kept for 10 nests of *Sterna vittata.* In two periods, late October and late November, one, rarely two eggs, were laid. Both adults incubated an average of 24 days. Both parents fed the chicks which fledged 27–32 days after hatching. Nests were solitary; "slight scrapes in shallow peat and vegetation." "All identified food proved to be fish." The authors note that the fledging period is similar to that of the Common Tern (*S. hirundo*), about 28 days, "but is significantly longer than that of the Arctic Tern, about 21 days." Overall, Antarctic Tern clutch size increases with latitude from 1 to 2 eggs, in contrast to the Arctic Tern (*S. paradisaea*) which shows a decrease from an average of 2.4 to 1.5 from boreal to high-arctic localities.—Leon Kelso.

13. Particulars of the breeding of the Arctic Tern (*Sterna paradisaea*) on the Baltic, White, and Barents seas. (Osobennosti razmnozheniya polyarnoi krachki na Baltiiskom, Belom, i Barentsevom moryakh.) L. Belopolskii, G. Goryainova, N. Milovanova, I. Petrova, and N. Polonik. 1977. *Ornitologiya,* **13:** 95–99. (In Russian.)—The egg-laying, hatching, and fledging dates for 810, 83, and 406 young for the above areas (respectively) were recorded and tabulated as well as graphed in detail. This was a cooperative study carried out in 1970. The Baltic Sea afforded the best nesting weather and other conditions, the clutches usually numbered three eggs whereas in the other areas two eggs and frequently one was the clutch size. Whereas the earliest young appeared on the Baltic, then on the Barents and lastly on the White seas, the hatching peak of all three areas was in the first five days of July. The earliest fledging and flight of young on the wing was on the Baltic Sea, the latest on the White. The greatest span of the nesting period in 1970 was on the Baltic, the shortest on the White Sea. The greatest overlap of the egg-laying, hatching, and fledging phases was recorded on the Baltic Sea. Other important, related remarks and observations are included in this concentrated, cooperative study.—Leon Kelso.

14. Colonies of Anseriformes around Snowy Owl nests on Wrangell Island. (Kolonii guseobraznykh okolo gnezd na o-ve Vrangelya.) E. Syroechkovskii. 1978. *Ornitologiya,* **13:** 211–212. (In Russian.)—That a particular consortium of anatid species cluster their nests around a nest of *Nyctea scandiaca* has been verified by a number of authors, particularly Portenko. These groups consist of Snow Geese, Brent Geese, and Common Eiders (*Anser caerulescens, Branta bernicla,* and *Somateria mollissima,* respectively). On Wrangell Island they are evidently attracted to owl nests for safety from Arctic Foxes (*Alopex lagopus*). As a rule such settlements are not stable. They occur in years of owl and lemming abundance, and disappear in years of scarcity. The owls allow foxes to approach no closer than 200 to 250 m. The proximity of the anatids to the owl nests varies. Closest usually are the Brent, 1 to 15 m, beyond that the Snow Geese, and the eiders usually nest on the periphery of the latter. Observations of 10 owl nests in 1970–1971 found that the owls did not take the goslings although broods of them frequently passed through the owls' foraging territory. On the other hand, nonbreeding owls occasionally swooped at young geese.—Leon Kelso.

15. Nesting of the Great Spotted Woodpecker (*Dendrocopos major* L.) in the Leningrad region. (O gnezdovyakh bolshogo pestrogo dyatla (*Dendrokopos major* L.) v leningradskoi oblasti.) A Sirotkin. 1978. *Biol. Nauki,* **1978**(1): 65–67. (In Russian).—Contained are records of 270 nest cavities of the Great Spotted Woodpecker found between 1927 and 1975 in mixed pine-deciduous forest. Of 217 cavities mostly 3-6 m above ground, 176 (79.8%) were in aspen, 15 (6.8%) in pine, 12 (5.4%) in alder, 7 (3.1%) in birch, 3 (1.4%) in spruce, and 1 each in linden, poplar, larch, and a telegraph pole. Nest measurements averaged: depth, 34 cm, width, 12.5 cm, diameter of entrance, 4.9 cm. Entrances were not directionally oriented, but oriented by the state of decay in the trunk. The chambers appeared to have been enlarged between hatching and departure of the young. One cavity was widened from 10 to 11 cm, deepened from 36 to 44 cm, and the entrance was slightly enlarged, all this between the nestlings' 5th and 23rd day of life. Of 203 cavities inspected from April to June, only 22 (11%) were occupied by *Dendrocopos.* The remainder were occupied by alien species, including Starlings (*Sturnus vulgaris*) and Pied Flycatchers (*Ficedula hypoleuca*).—Leon Kelso.

BEHAVIOR

(See also 2, 3, 10, 28, 30, 31, 32, 65, 66, 70, 72, 73, 77)

16. The behavior and vocalization of young Turquoise-browed Motmots. S. M. Smith. 1977. *Biotropica,* **9**(2): 127–130.—The ontogeny of behavior in nine hand-reared Turquoise-browed Motmots was divided into comfort movements, exploration and feeding, vocalization, play, and displays. Comfort movements (preening, stretching, and scratching) were first observed when the young fledged from their enclosed nest boxes, but were probably developed earlier. Bathing appeared a few days after fledging. Dust bathing took place on the ground in a standard manner. Water bathing behavior was performed by the birds when they heard the sound of rain on the roof (but could not see the rain), and then only when they were on a perch, never on the ground. Play included food manipulation and tail chasing. (No individual ever caught its own tail.) Vocalization and displays are classified according to the circumstances under which they were first exhibited and the age at which they first appeared.—Robert C. Beason.

17. Pair-bond and bonding behaviour in three species of grassfinches of the genus *Poephila* (Gould). R. Zann. 1977. *Emu,* **77:** 97–106.—Pair-bond and associated behavior are described for five subspecies from three species. The paper has several commendable points: the behavioral patterns are given descriptive names (e.g., head jerk, head and tail twist), several excellent line drawings supplement the behavioral descriptions, and a wealth of quantitative data is presented.

Unfortunately, the paper also contains a number of serious faults. Definition of the pair bond is critical to the study, but Zann's definition is neither precise nor operational, hence his observations may not be replicable. Statistics are used freely, perhaps too freely and certainly with too little explanation. Zann misinterprets the data in Table 2. He concludes that ". . . in the two subspecies of (*Poephila*) *cincta* the females did not attack either sex preferentially." The table shows that the quoted conclusion accurately depicts the behavior of *P. c. cincta,* but that females of *P. c. atropygialis* attacked males 41 times and females 17 times, a signigicant difference ($\chi^2 = 9.92$, df = 1, $P < 0.001$) based on the Chi-square goodness of fit, assuming 29 attacks to each sex as the expected value. Chi-square goodness of fit appears to be the test used for making the other comparisons in Table 2. Tables 4 and 5 include the result of a Chi-square test for independence, but the purpose of the analysis is unclear and Zann never refers to the statistical results. Added to the irresponsible use of statistics is the small number of captive pairs, 3 pairs of *Poephila acuticauda hecki,* 2 pairs of *P. cincta cincta,* and 3 pairs of *P. c. atropygialis.* These pairs were augmented by wild-caught breeding pairs, but the number of breeding pairs of any one subspecies never exceeds eight and is five or less for three of the five subspecies. Such small samples could be strongly affected by one aberrant pair and the data are presented as totals for each subspecies, hence the reader cannot assess the variance between pairs. These problems render the study an interesting pilot study, but no more.—Edward H. Burtt, Jr.

18. Observations on the behaviour of Hall's Babbler. R. P. Balda and J. L. Brown. 1977. *Emu,* **77:** 111–114.—Hall's Babblers (*Pomatostromus halli*) live in a stable flock of from 5 to 15 individuals. The flock maintains an exclusive home range in which it forages as a cohesive unit and in which the flock has a single nest. Members of the flock roost communally, share food, allopreen, co-operate in feeding the incubating female and possibly in protecting her nest. Based on observation of only eight flocks during a single week this fascinating paper should stimulate more extensive study.—Edward H. Burtt, Jr.

19. Indiscriminate interspecific aggression leading to almost sole occupancy of space by a single species of bird. D. D. Dow. 1977. *Emu,* **77:** 115–121.—The Noisy Miner (*Manorina melanocephala*), an Australian honeyeater, lives and forages in dense, often large, permanent colonies in open woodland. All avian species that enter the colony are attacked and occasionally killed by colony members. In large colonies that exclude all avian species Noisy Miners exploit a wider range of feeding zones than in small colonies that are unable to exclude all other birds. Here is a communal species that is unilaterally and interspecifically territorial, possibly the only such species. How could such a system evolve? Dow offers several interesting possibilities, but no explanation is entirely satisfactory. We simply

know too little about Noisy Miners. One of the great dangers in seeking an explanation is to resort to group selection and Dow is perilously close to invoking group selection several times. Nevertheless Dow's paper is an eloquent introduction to the biology of the Noisy Miner.—Edward H. Burtt, Jr.

20. An analysis of the song-flight of the Lapwing (*Vanellus vanellus* L.) with respect to causation, evolution and adaptations to signal function. T. Dabelsteen. 1978. *Behaviour,* **66:** 136–178.—The author first describes the particular flight components and sounds accompanying them, the flights being distinguished by differences in such variables as wingbeat frequency and angle at which the wings are held. He then analyzes the sequential structure of song-flights to complete the classification. Next the contextual situations are related: song-flight behavior is basically spontaneous, but modified by external context such as return to territory, presence of male or female conspecifics, presence of predators, time of day, and weather. From these facts Dabelsteen tries to tease apart the "motivational" balances leading to various parts of song-flight, and then discusses their evolution as signals carrying different kinds of information. Conceptually the study is classical ethology: a good piece of quantitative natural history.—Jack P. Hailman.

21. Early learning and its effect on population structure. Studies of a wild population of Snow Geese. F. Cooke. 1978. *Z. Tierpsychol.,* **46:** 344–358.—This is an important study with quantitative data, and as such calls for close scrutiny of the findings and conclusions drawn from them. The Snow Goose (*Anser caerulescens*) colony studied in northern Manitoba is of the subspecies *A. c. caerulescens,* which has a white and blue color phase. Other studies suggest that a single gene complex with blue dominance is responsible for the color, but dominance is incomplete because offspring from mixed pairs show some white on their bellies.

The first set of results is the morphic composition of pairs in the colony, which is very stable over the period 1968–1977 (Table 1, p. 348). White-white pairs constitute about 65%, blue-blue pairs almost 20% of the pairs present, leaving roughly 15% mixed pairs. The conclusion drawn is that "The assortative mating in terms of plumage colour is readily demonstrable," but it is difficult to see that this follows from the data cited. The reasoning is that, based on proportions of the morphs present, mixed pairs should consitute some 35–40% of the colony if mate choice were random. However, the geese do not pair on the colony, but on their wintering grounds where many colonies mix. In order to derive a random mating prediction, one must know the proportion of morphs present when mate choice occurs. If birds from the study colony winter in different sites having different morphic/sexual proportions, then it is impossible to reason about nonrandom mating from the proportions of colony birds the following summer. The author's conclusion might be correct, but it cannot be drawn from the data presented.

Next, the pairings of birds of known parentage are analyzed (Table 2, p. 349). There is a statistically significant tendency for birds to mate with a bird of the color of their parents in all years analyzed, but as Cooke correctly points out this reveals no cause-effect relationship. Therefore, he analyzes the color of the mate of birds from mixed matings (Table 3) and finds that white birds from mixed matings tend to pair with white birds, and blue with blue. This is better evidence, but does not break the birds down by sex, although it is females that tend to return to the natal colony so we may assume that most of the birds in this table are females. Table 4 treats presumably the same data according to the color of the mother, and finds no difference in mate choice according to mother's color. However, the data are not broken down by the color of the bird itself, so this analysis hardly helps in teasing apart any interaction of self-color and color of parents. Table 5 is a (nonspecified) mixture of experimental and field data showing that each sex (not broken down by color) from like-color parentage tends to choose a mate of the parental color (also not broken down by color). The conclusion of all this is: "To summarize, field data indicate that parental colour is correlated with mate choice" (p. 350), to which might be added: so is color of self and sibs. The remainder of the paper is a discussion and modeling of effects based on the conclusions.

This is a very difficult situation to analyze, but I do not believe the conclusions to be well founded at any major step in the reasoning. The summary conclusion that "Evidence

is presented that such assortative mating results from pre-pairing experience and that familial colour, both parent and sibling, affects subsequent mate selection" (p. 356) is without substance. Birds tend to be paired with mates of their own color, but until the pairing process on the wintering grounds is analyzed it remains possible that this correlation is due to random mating. Furthermore, if real mate choice by color does occur (nonrandom or assortative mating), there is no firm evidence to dissociate which factors it is based on: color of mother, color of father, color of self, color of sibs—or, indeed, none of these experiential factors at all, but rather the genes of the bird. All these factors are highly covariant among themselves, and the author's method of analyzing for only some of them, and then one-by-one, is not adequate to the task he has set. One must analyze not only for the influence of a particular factor, but also its interaction with all other factors of potential importance. Apparently sufficient data exist for real analysis that would help tease apart influences: namely, an analysis of mate's color in birds derived from mixed parents where the color of the bird, the sex of the bird, the color of each parent (by sex), and the color of the sibs are all known. I would guess from Table 4 that this complete information exists, for roughly 50 birds, and careful analysis of these 50 birds might be very revealing.—Jack P. Hailman.

22. Significance of mother and sibling experience for mating preferences in the Mallard (*Anas platyrhynchos*). T. Klint. 1978. *Z. Tierpsychol.*, **47:** 50–60.—The question was whether a duckling imprints more strongly on its mother or its siblings as revealed in later sexual behavior. The same stock of game farm birds was used for normally colored and white mothers, and their clutches were switched a week before hatching to create differences in color between mother and siblings (controls reared their own eggs). The family was kept together for 12 weeks after hatching, all birds individually marked and then released on the observation pond. Criteria for mate choice were: (a) association, including the female's inciting of other males; (b) mutual raebraeb-palaver ceremony; and (c) precopulatory pumping or actual copulation. Sexes were about evenly distributed in all groups. Birds from homogeneous pigmented families (n = 62) chose pigmented mates (except for one female), birds from homogeneous white families (n = 11) chose white mates (except for one male), and birds from mixed families had mixed mate choices as follows. In normal-mother, white-sib families both males (n = 8) and females (n = 8) divided mate choice equally between morphs; in white-mother, normal-sib families 15 males chose normal partners and 5 chose white, whereas 16 females chose normal and 5 white. Normal birds on the pond outnumbered whites by 3 to 1, and the author uses this ratio to create expected frequencies for Chi-square analysis. More than a third of all birds mated with an actual sib the first year, and unfortunately these data are not broken down by sex (Table 4, p. 56). The author concludes the sib-sib matings are not of great importance in dictating color choices of mates, but I am not convinced. If sib-sib matings are excluded, then birds from normal-mother, white-sib families mated exclusively with normal, nonsib birds; that is, all choices of white birds were due to mating with siblings. In the other heterogeneous family (white mother, pigmented siblings), 18 birds chose pigmented, nonsibling mates and 10 chose white mates. These results suggest to me a somewhat greater influence of the mother's color than the sibs' in later mate choice. This is, in all, a fine study, which also reviews briefly results from similar experiments with other avian species.—Jack P. Hailman.

23. Mobbing in the Pied Flycatcher. Effect of experiencing a live owl on responses to a stuffed facsimile. M. D. Schalter. 1978. *Z. Tierpsychol.*, **47:** 173–179.—A stuffed owl (*Glaucidium passerinum*) was presented on a pole near nests of a dozen pairs of Pied Flycatchers (*Ficedula hypoleuca*), and five pairs showed no reaction. One to two days later a caged owl (*G. perlatum*) was placed near these five nests for 5 min, in each case eliciting strong mobbing reactions. Then one day after that the stuffed owl was again presented, and in all cases elicited strong reactions, although not as strong as to the live owl. Of course, the experiment is not absolutely conclusive—each pair of flycatchers had advanced a few days in the breeding cycle, the obvious controls on the seven pairs of initial responders were not utilized, the live and stuffed owls were of different species, and so on—but the phenomenon is probably real and similar behavior has been reported in other species.—Jack P. Hailman.

24. Comments on the exchangeability of Herring Gull chicks after the first week of life. (Bemerkungen zur Austauschbarkeit von Küken der Silbermöwe (*Larus argentatus*) nach der ersten Lebenswoche.) D. B. von Rautenfeld. 1978. *Z. Tierpsychol.*, **47:** 180–181. (In German with English summary.)—Tinbergen had shown in 1936 that Herring Gulls in a ground nesting colony would not accept a swap of chicks more than four days after hatching, but Esther Cullen later found that cliff nesting Kittiwakes (*Rissa tridactyla*) accepted chicks more than a week after hatching. In a few cursory swaps von Rautenfeld found that *cliff* nesting Herring Gulls also accept chicks after a week. The conclusion of a difference between Herring Gulls nesting in different sites must be established by more extensive and better controlled experiments, hopefully with some real data on the behavior of the parents, but this study is certainly provocative. It suggests that when young are tied to the nest site, parents do not develop individual recognition very rapidly, a point supported by Burtt's recent study on swallows showing that individual recognition takes place only after the young fledge.—Jack P. Hailman.

25. Observations of the behavior of *Sappho sparganura* in the highlands of Santa Barbara, Jujuy, Argentina. (Observaciones sobre la conducta de Sappho sparganura en el cerro de Santa Barbara, Jujuy, Argentina.) F. Contino. 1975. *El Hornero,* **11**(4): 265–270. (In Spanish.)—Field observations at 2,000 m showed that individual male *Sappho sparganura* (Trochilidae) defended territories within isolated patches of two species of flowering shrubs (*Dunalia branchyacanthia* and *Acnistus australis*). At one site, 35 males occupied territories within a 0.5-ha clump of vegetation. In addition to all conspecifics, male *S. sparganura* attacked the smaller hummingbirds *Microstilbon burmeisteri* and *Leucippus chionogaster,* but refrained from attacking larger species. Females established feeding territories near their nests. Nests, which were constructed primarily of lichens, were suspended from slender roots in recesses in the walls of shady, moist, 1–5-m ravines. Two white, cylindrical eggs were usually incubated for 19–20 days, and young flew 31–32 days after hatching. Males did not assist in incubation or care of the young, but in one instance an adult male approached a newly fledged young, displayed, and touched the fledgling with his bill until chased away by the female.—Robert B. Waide.

ECOLOGY

(See also 3, 5, 15, 35, 36, 41, 45, 54, 57, 60, 62, 63, 66, 68, 69, 77, 79, 85)

26. Sympatry in woodpeckers of lowland Malayan forest. L. L. Short. 1978. *Biotropica,* **10**(2): 122–133.—The greatest number of sympatric woodpeckers in the world occurs in Malaya, 13 species from 10 genera. Field and museum observations on ecology and morphology were used to explain the coexistence of so many species. Size varied from 9 to 430 g. Species that were similar in size used different foraging modes, which were related to morphological differences. Most species used foraging techniques other than prolonged woodpecking. Unspecialized species fed mainly on ants and termites that were on or just beneath the wood surface. The most specialized woodpecking species were separated by size. The remaining five species were separated by size, foraging technique, and/or habitat. This study is one of very few competition studies in which morphology is related to the ecology and feeding behavior of the species involved. It would have been even more valuable if a detailed comparison of food types had been given.—Robert C. Beason.

27. Niche shifts in New Hebridean birds. J. M. Diamond and A. G. Marshall. 1977. Emu, **77:** 61–72.—Of the 56 species of birds inhabiting the New Hebrides, 35 shift their niche or abundance if populations on different islands are compared. Twenty-eight species shift the niche spatially by expanding or restricting the habitat occupied, by changing the altitudinal range, or by adjusting the preferred foraging height. Two species show pronounced dietary shifts and five species retain similar habitat preferences in the New Hebrides and elsewhere, but show pronounced changes in abundance. If islands are classified by area or number of resident species, then the "incidence" of a species is that fraction of islands in a given size or resident species class inhabited by the species. If incidence is plotted against area or number of resident species on an island smooth curves

(incidence functions) result. Between the New Hebrides and the Bismarcks or Solomons, 13 species show incidence shifts.

Twenty-one New Hebridean species seem not to shift their niche. Some of these species may occupy such distinctive niches that interspecific competition is unimportant. Some species may be limited by the physical environment (e.g., nest sites) rather than competitors. Some species occur only in the presence of their closest competitors, a few occur too infrequently to be sure of niche shifts, a few will require quantitative studies to assess possible niche shifts.

Diamond and Marshall's comprehensive survey of New Hebridean birds suggests that competitors are a more proximate cause of the species' distributional limits than are adaptations to the physical environment. Are niche shifts merely the result of behavioral adjustment or is genetic change necessary? The lack of morphological differentiation among populations on different islands and the recency of colonization on many islands suggest that colonizing populations may make immediate behavioral adjustments through interference competition or through testing the rate at which a particular habitat can be harvested and settling in the most efficient habitat. Later, gene frequencies will shift as a result of the new selective pressures that result from the behavioral change in the niche.—Edward H. Burtt, Jr.

28. Pollination by birds of native plants in South Australia. D. D. Paton and H. A. Ford. 1977. *Emu,* **77:** 73–85.—Honeyeaters (Meliphagidae) frequently visit (80% of all observed visits) flowers of many species whereas lorikeets (Loriidae) visit flowers frequently but only *Eucalyptus* flowers and a few other birds occasionally visit flowers. Honeyeaters captured in mist nets carried a few to thousands of grains of pollen on the bill (sticky pollen) and facial feathers (triangular grains lodged between barbules). Observation of unpollinated flowers that were subsequently visited by birds confirms that honeyeaters can cross-pollinate flowers. The paper concludes with a speculative discussion of the relative importance of insects and birds as pollinators and the coevolution of flowers and birds. One cautionary note, the first table requires close scrutiny because the print is small and the difference between a capital P, frequent visitor, and a small p, infrequent visitor, is very hard to see.—Edward H. Burtt, Jr.

29. Trophic relations of birds and some invertebrates in tundra ecosystems. (Troficheskie vzaimootnosheniya ptits i nekotorykh bespoozvonochykh v tundrovykh ekosistemakh.) A. Kishchinskii. 1978. *Zhurn. Obshch. Biol.,* **39**(2): 212–226. (In Russian with English summary.)—The total consumption of Dipteran (Tipulidae, *Prionocera* spp.) larvae by birds on the Yana and Indigirka deltas, lowland tundra totaled 2.5 to 3.0% of a nesting season biomass. Larval numbers fluctuate during the growth period but daily consumption varies little. Under this lies the trophic web of polyphagous birds during maximum abundance of larval growth with seasonal feeding on them by the specialized bird species and their subsequent migrations. This affords "stability of relations in the trophic web." The most important effect of the birds is on the more mature larvae, just before and during pupation. The dominant birds in order of listing in this situation were *Calidris melanotos, C. acuminata, Philomachus pugnax, Limnodromus griseus, Phalaropus lobatus, P. fulicarius, Gallinago gallinago, G. stenura, Rhodostethia rosea, Calidris alpina, Somateria fisheri, Pluvialis squatarola, Tringa erythropus, Pluvialis dominica,* and *Anas formosa.* The author theorizes that the polyspecific trophic web resting on *Prionocera* larvae developed during the course of evolution as a predator adaptation to seasonal variation of abundance and availability of yield (with territorial relationships and differential migration of various bird groups) and also prey adaptation (including unavailability in seasons of low numbers). In all this trophic web may be regarded as stable and well balanced. Thus, since in the tundra situation the life cycle of *Prionocera* covers several years, in some years high mortality of certain age classes may occur. Mass flights of crane-fly adults and loss of larval populations at an early stage might occur; then in the next year small larvae might be less available for birds. In such years the system is "unbalanced." Numbers of shorebirds specialized on *Prionocera* diet might be much reduced; they might not nest at all. Such a situation was seen in Taimyr by Yu. I. Chernov (*Ornitologiya,* **8:** 133–149, 1967). However such situations are not frequent. It is suggested that the trophic system "shorebird–crane fly, *Prion-*

ocera" is quite primitive. Possibly it existed before the present tundra, but during its formation it attained some biological advantages and secured a dominant position. Presumably this system is more ancient, more evolutionarily "refined" and perfected than, for example, the trophic chain of "lemming–myophage" in which colossal fluctuations regularly occur.—Leon Kelso.

30. Test of optimal sampling by foraging Great Tits. J. T. Krebs, A. Kacelnik, and P. Taylor. 1978. *Nature,* **275**(5675): 27–31.—Great Tits (*Parus major*) were given two foraging patches that differed in food availability, and tested to see how they decide which patch to exploit. Two models were tested: "immediate maximising" (always forage in patch with higher expected reward rate), and "two-armed bandit" (explore each patch to acquire more information about relative quality, before making a choice). Simulation of the latter model used a Bayesian approach to measure the information available to the bird at each stage. Results supported the "two-armed bandit" model, with birds sampling both patches at approximately equal probabilities until a decision is reached, and then sampling nearly continuously at the patch with the higher payoff. Birds tended to sample in short bouts before switching patches during the exploration phase. A weak component exists for "immediate maximising" in their strategy due to a slight tendency to switch patches after a run of bad luck.—B. Dennis Sustare.

31. Feeding behavior and predator avoidance in heterospecific groups. D. H. Morse. 1977. *BioScience,* **27**(5): 332–339.—Morse attempts to evaluate the advantages accruing to individuals in heterospecific feeding assemblages. Although he considers other taxa as well as birds, the literature on avian flocks contributes the bulk of the data presented. Theories about the adaptive significance of such groupings invoke either more efficient foraging or better predator surveillance as the primary advantage for participants. Morse cites four possible advantages under each category, and then attempts a general synthesis based on both theory and field data. He suggests that foraging overlap should decrease when birds join heterospecific flocks that are predator mediated, whereas in food mediated flocks foraging overlap should increase. He concludes that the primary advantage for most heterospecific groups is probably better predator detection, whereas monospecific groups are primarily an evolutionary response to the need for more efficient energy acquisition. However, there is no reason why members of heterospecific groups cannot be deriving both benefits simultaneously. This is an excellent review and synthesis of an interesting and provocative problem.—Elliot J. Tramer.

32. Ecological aspects of the time budget of the American Avocet. F. Gibson. 1978. *Am. Midl. Nat.,* **99**(1): 65–82.—Time budgets were recorded for 36 Avocets (*Recurvirostra americana*) in an Oregon marsh. The 422 hr of observation spanned one breeding season; 12 categories of behavior were noted. Maintenance and reproduction comprised 76% and 26% of total time, respectively (Σ = 102%?). Feeding time averaged 36%, but varied as seasonal energy requirements changed. Activity peaked in early morning and afternoon. Males appeared more aggressive, while females devoted more time to incubation. Otherwise the time budgets and ecological roles of the sexes were similar.—Elliot J. Tramer.

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

(See also 9, 80, 86)

33. A transmitter attachment for blackbirds. M. L. Martin and J. R. Bider. 1978. *J. Wildl. Manage.,* **42**(3): 683–685.—The authors describe a 2.8-g, 2 × 1 × 1-cm transmitter with guitar string antenna. Life expectancy of the mercury battery is 25–45 days. Martin and Bider give explicit directions for attachment of the device, using a procedure that overcomes numerous previously encountered problems including effective attachment during molt. No information is given about the strength of the transmission from the unit. Eight male Red-winged Blackbirds (*Agelaius phoeniceus*) so tagged were followed from 5–35 days. The tagged birds resumed normal movements on the first day following tagging. The method seems a promising way to study movements, particularly local movements, of medium-sized birds for periods up to one month.—Paul B. Hamel.

34. Sheep losses on selected ranches in southern Wyoming. J. R. Tigner and G. E. Larson. 1977. *J. Range Manage.*, **30:** 244–252.—Sheep losses to all causes were assessed on five ranches during 1973–1975, with about 6,000 ewes and their lambs monitored each year. Of 4,440 dead sheep and lambs examined, predators killed 1,030 (23%). Of the 1,030, Golden Eagles (*Aquila chrysaëtos*) killed 93 (9%). The loss to Golden Eagles per sheep-year was thus about 0.5%. With the loss to eagles being in the killing of lambs, it seems probable that, with appropriate research, management practices for averting even this small loss might be found and used as an alternative to killing the birds.—Paul A. Stewart.

35. The impact of foraging meadowlarks, *Sturnella neglecta*, on the degradation of cattle dung pads. J. R. Anderson and R. W. Merritt. 1977. *J. Appl. Ecol.*, **14:** 355–362.—In searching for undigested barley seeds to be used for food, meadowlarks in California pastures during the fall and winter tear apart cattle dung pads. After 12–15 months, 90–100% of the ground surface originally covered by the pads pecked apart by the birds was covered with newly sprouted vegetation. Without their being pecked apart, the dung pads inhibited plant growth during 2–3 growing seasons. Although it is in itself a small contribution to man's economic interests, the pecking apart of cattle dung pads in pastures must be considered when assessing the economic value of the meadowlark. Much opportunity now exists for this type of imaginative research in economic ornithology.—Paul A. Stewart.

36. Predation of cossid moth larvae by Yellow-tailed Black Cockatoos causing losses in plantations of *Eucalyptus grandis* in north coastal New South Wales. R. S. McInnis and P. B. Carne. 1978. *Aust. Wildl. Res.*, **5:** 101–121.—Wood-boring insect larvae are eaten by the Yellow-tailed Black Cockatoo (*Calyptorhynchus funereus*), the larvae being extracted from the trunks of *Eucalyptus grandis*. In extracting the larvae, the birds weaken the trees so that many of the trunks are later broken by strong winds. *Eucalyptus grandis* is extensively used for pulpwood production in the area where this study was made, and losses of the trees by breakage sometimes amount to 40% of the stand.

From results of this study the authors conclude that tree breakage caused by the feeding activities of cockatoos might result in a desirable thinning of the stand in traditional forestry systems and in the regeneration of logged native forests. However, tree breakage in pulpwood plantations involves a loss that cannot be repaired during the life of the plantation. Cossid infestation was most severe in plantations experiencing some form of stress, particularly competition with grasses at an early stage of tree growth. The recommendation was therefore made that use of old grasslands be avoided in establishment of plantations or that the grass be controlled with selective herbicides and that fertilizer application be made to accelerate tree growth. Another approach recommended was to encourage the development of a vigorous understory of woody perennials to discourage foraging activity of the cockatoos.

The study reported in this paper adopts a mostly proper ecological approach to an insect-bird problem.—Paul A. Stewart.

CONSERVATION AND ENVIRONMENTAL QUALITY

(See also 46, 75, 81, 85, 86)

37. Productivity of Ospreys in Connecticut-Long Island increases as DDE residues decline. P. R. Spitzer, R. W. Risebrough, W. Walker II, R. Hernandez, A. Poole, D. Puleston, and I. C. T. Nisbet. 1978. *Science*, **202:** 333–335.—The productivity of Osprey (*Pandion haliaetus*) nests at Gardiners Island, Orient Point, and the Connecticut River estuary fell to a low in the early and mid 1960's and has since returned to the levels observed in 1938–1942. Exchange of eggs between their area and Maryland, where the hatching rates were higher, showed that the lower levels were a property of the eggs and not a consequence of adult activities or human disturbance. Shell thickness was positively related to hatching rate. Four pesticides and pollutants were studied by analyses of eggs that failed to hatch: DDE, PCB, dieldrin, and mercury. The number of young produced per nest is inversely related to the level of the first two but not clearly related to the level

of the last two. However, dieldrin poisoning of eggs and adults was more marked in the Connecticut River estuary than elsewhere. This is a paper worthy of detailed study.—C. H. Blake.

38. Is the Little Bustard doomed? (Obrechen li strepet?) Yu. V. Kostin. 1978. *Byull. Mosk. Obshch. Isp. Prirody, biol. div.,* **83**(3): 67–71. (In Russian with English summary.)—The nesting requirements of the Little Bustard (*Otis tetrax*) are "highly specialized." The peculiarities of the steppe are not the sole nor principal requirements for nesting. On both virgin and ploughed land the Little Bustard avoids monocultures: tall and dense grassland, closely grazed areas, areas with brief growing periods for its main food plants. The Little Bustard's survival is considered unlikely unless decisive measures are taken, including detailed analyses of nesting biotopes, followed by restoration and maintenance of protected nesting sites in its preferred biotopes.—Leon Kelso.

39. DDE and PCBs in eggs of Norwegian seabirds. N. Fimreite, Bjerk, N. Kveseth, and E. Brun. 1977. *Astarte,* **10**(1): 15–20.—The wide distribution of these chemicals in the environment is now well known but we know little of their occurrence in the eggs of Norwegian seabirds. Concentrations were measured in 203 seabird eggs from 10 localities, in eggs of *Sula bassana, Larus argentatus, Alca torda, Uria aalge,* and *Rissa tridactyla.* The average concentrations of DDE on a wet weight basis were 2.05, 1.57, 1.20, 0.80, and 0.37 ppm respectively. Corresponding concentrations for PCB's were 7.71, 8.49, 5.40, 2.19, and 2.87 ppm. "With respect to biological effects neither DDE nor PCBs are especially lethal." For PCB's much remains to be explored but it seems clear that the shell thinning effects of chemicals of this group are minimal.—Leon Kelso.

PARASITES AND DISEASES

(See 11)

PHYSIOLOGY

(See also 10, 47, 49)

40. Resting metabolic rates of ratite birds. W. A. Calder and T. J. Dawson. 1978. *Comp. Biochem. Physiol.,* **60A:** 479–481.—Those who have followed the large volume of publications dealing with avian metabolism over the past few decades may have doubted that further important contributions could be made. However, this paper demonstrates the fallacy of this opinion. Metabolic rates of ratite birds (based upon analyses of four species: three kiwis and the emu) are much lower than is predicted from the previously generated Ashchoff-Pohl equation (*J. Ornithol.,* **111:** 38–47, 1970). This short but interesting paper points out that "despite several decades of metabolic measurements . . . we still do not understand the evolutionary meaning of basal metabolism and how and why it is set at different levels in different groups of animals."—C. R. Blem.

41. Physiological and ecological correlates of tunnel nesting in the European Bee-eater, *Merops apiaster*. F. N. White, G. A. Bartholomew, and J. L. Kinney. 1978. *Physiol. Zool.,* **51:** 140–154.—Mammalogists have extensively investigated the ecological physiology of the benefits and debits of living in burrows. The present paper appears to be the first ornithological attempt at similar analyses. Although the authors have little direct evidence of the drawbacks, they employ an imaginative series of techniques to illustrate the advantages and potential disadvantages and integrate ecological and physiological aspects of the problem in a comprehensive manner that is enviable.—C. R. Blem.

42. Temperature dynamics of the fertile chicken egg. S. Kaplan, G. L. Kolesari, and J. P. Bahr. 1978. *Am. J. Physiol.,* **234**(5): R183–R187.—Most papers published by sophisticated physiological journals are not generally useful to a wide range of ornithologists because of the complexity of technique, the orientation (i.e., not toward the function of the organism in nature) or because of the tendency to use domestic species. At first glance, this paper would seem to fall into all three categories. Computer analyses were used to model heat fluxes in chicken eggs. However, the technique used could be extended to studies of natural eggs of wild birds and could result in better understanding of in-

cubation. The authors contend that the site occupied by an early embryo cools more rapidly than it warms. This finding may be useful in interpretation of incubation during the early phases of nesting.—C. R. Blem.

43. Seasonal acclimatization to temperature in Monk Parakeets. W. W. Weathers and D. F. Caccamise. 1978. *Oecologia (Berl.),* **35:** 173–183.—Monk Parakeets were released in the United States about 15 years ago and have been increasing in numbers and geographical distribution. This paper deals with aspects of their physiological characteristics. Fasting levels of metabolism, evaporative water loss, and heat transfer properties were measured in parakeets maintained during the summer in outdoor aviaries. These data were compared with previously published information gathered on similar individuals maintained under winter conditions (*Oecologia, Berl.,* **18:** 329–342, 1961). Fasting levels of daytime metabolism and heat transfer coefficients of summer and winter birds were similar but nocturnal levels of metabolism, body temperature, and evaporative water losses were significantly lower in winter birds than in summer individuals. The authors attempt to answer the perennially nagging questions concerning whether winter birds in general really do have a higher basal metabolic rate than do summer birds, and, if so, what is the functional significance of such elevation in winter. Analysis of all values available in the literature reveals a trend that in winter the basal rate exceeds the summer one in small birds but that the converse holds true for larger birds. This issue is clouded by the fact that smaller birds generally have higher levels of metabolism at any time of the year than larger birds, as the authors note. No new insights were forthcoming about the functional significance of increased levels of metabolic rate during winter.—Cynthia Carey.

44. Estimation of effective parabronchial gas volume during intermittent ventilatory flow: theory and application in the duck. P. Scheid. 1978. *Resp. Physiol.,* **32:** 1–14.—A major problem in the investigation of avian respiration has been that the effective volume of the parabronchial lung has never been accurately measured. Anatomists using casts have estimated that the parabronchial lung volume, including the air capillaries, might occupy only 10% of the total gas volume in the avian respiratory tract. But even the anatomists agree that these estimates are subject to technical difficulties. A new approach using physiological, rather than anatomical, techniques has been developed in this study. The technique employed here involves the general principle that gas volume is a determinant of gas exchange under nonsteady state conditions (intermittent flow) but is not a determinant under steady state conditions (continuous flow). Therefore, if gas exchange is measured under the two flow conditions, the ratio between the apparent diffusing capacity of the lung under intermittent flow and the true diffusing capacity under continuous flow can be used to calculate the effective volume of the lung. These measurements on ducks produced an estimate of 93 ml for the average volume of the parabronchical lung, exceeding the prediction of 42 ml based on anatomical measurements. The author concludes that diffusion and convection occurring across the open ends of the parabronchus probably contributes toward enlarging the physiological gas volume available for supply of oxygen above that represented by anatomical space.—Cynthia Carey.

45. The use of the equivalent black-body temperature in the thermal energetics of small birds. S. A. Mahoney and J. R. King. 1977. *J. Thermal Biology,* **2:** 115–120.—One ultimate goal of physiological ecologists is to predict accurately the metabolic rate of free-ranging animals in their natural habitat. This paper represents one step toward this goal. Since some of the factors affecting metabolic rate are characteristics of the animal (insulation, feather characteristics, etc.) and some are environmental factors (wind speed, temperature, radiational properties of the environment, etc.), the model incorporates both properties of the animal and the environment in one temperature, the equivalent black-body temperature (T_e). The ability of T_e to predict metabolic rate of resting White-crowned Sparrows under laboratory conditions is tested and the predictions match observed metabolic rates within a mean algebraic error of -1.1%. T_e can also be used to interpret laboratory experiments in which several environmental factors (ambient temperature, wind speed, solar radiation, etc.) are varied independently. It now remains to test T_e under field conditions with some yet undefined reliable means of measuring met-

abolic rates in order to verify the predictions based on T_e. This paper is mandatory reading for those who love equations.—Cynthia Carey.

46. Influence of weathered crude oil on liver enzyme metabolism of testosterone in gulls. E. H. McEwan and P. M. Whitehead. 1978. *Can. J. Zool.*, **56**(9): 1922–1923.—Previous work has shown that a single oral dose of fresh crude oil can induce increased liver activity of Herring Gull chicks. The present paper is significant because it reports the effects of weathered crude oil, i.e., oil that has floated in a tank of water for two to three weeks was used in the experiments. Although the research was short on replicates and high on variability, it appears that daily oral dosages of 100 or 500 mg of oil for up to 156 or 134 days induce no change in levels of either testosterone or its polar metabolites in adult Glaucous-winged Gulls. Levels of nonpolar metabolites did decrease in gulls receiving the higher dosage of oil, although the authors offer no explanation for this effect. Surely further replicated research is appropriate in this area because more birds are apt to contact weathered than fresh crude oil.—A. John Gatz, Jr.

MORPHOLOGY AND ANATOMY

(See also 44, 58, 59, 61)

47. Visual pigments and colour vision in a nocturnal bird, *Strix aluco* (Tawny Owl). J. K. Bowmaker and G. R. Martin. 1978. *Vision Res.*, **18:** 1125–1130.—Owl retinas are about 90% rods, but do contain cone receptors with three types of visual pigments: 21 of 24 cones absorbed maximally at 555 nm and contained a pale yellow oildroplet filter. Two cones were found with a 503-nm pigment and dark yellow oildroplet. One cone's pigment had peak absorption at 463 nm and a pale yellow oildroplet. Red oil droplets also occur in the Tawny Owl's retina but no intact cones could be measured, so the visual pigment is unknown. The cone equipment is not extensive, but Martin has shown in a different study that this owl does possess color vision.—Jack P. Hailman.

48. The lung and air-sac system of the Strigidae, 1. M. Kadosaki. 1977. *Tori*, **26**(2–3): 87–92. (In English with Japanese resume.)—In four species: *Asio otus, Otus scops, O. bakkamoena,* and *Strix uralensis,* an interclavicular sac occupies a narrow space surrounded by the *truncus brachiocephalicus* and *t. sternotrachealis.* The outer region of this space is occupied by extensions of the anterior thoracic sacs. Accordingly, the interpectoral, axillary, and subscapular sacs arise from the anterior thoracic sacs. This feature suggests that the lack of a part of the interclavicular sac is compensated by the extension of the anterior thoracic sacs, and may be considered characteristic of the Strigidae. Although the position of the ostium of the A-connection, which joins the interclavicular sac and the lung, is variable among species, it is yet located adjacent to the lung hilus and the *margo acutus* in the four species examined. These details are largely in the terminology of the author's summary.—Leon Kelso.

49. The size of swans, geese and brant relative to adaptation to polar conditions. (Razmery lebedei, gusei i kazarok v svyazi s adaptatsei k polyarym usloviyam.) E. Syroechkovskii. 1978. *Z. Zhurn.*, **57**(5): 738–749. (In Russian with English summary.)—The development of young Anatidae from egg-laying to fledging is influenced by and correlated with the appearance of thawed ground or open water, in spring, and the freezing of surface water in the fall. These observations apply to the genera *Cygnus, Anser,* and *Branta.* The longer the growth period, the larger the final size of the individual. Adaptations of the arctic forms to the brevity of the polar summer are suggested. In both Eurasia and North America the larger species of the three genera favor the southern areas of the continents, whereas the smaller species venture farthest to the north, 78° N lat. or beyond. The springtime arrival of the larger races is earlier than for the smaller forms. Altogether both geographic range and initiation of nesting operate to favor smaller size as an adaptation to the short polar summer. This runs contrary to the Bergmann rule of larger size northward, but in continental Asia such reversals are seen in other bird families, in the Tetraonidae, for example. Thus, both geographic distribution and start of nesting of various Anserinae would indicate that smaller size is more adaptive to a short polar summer.—Leon Kelso.

50. Herbst corpuscles of remiges in two species of gulls. (Teltsa gerbsta makhovykh perev dvykh vidov chaek.) T. Borodulina. 1978. *Zool. Zhurn.,* **57**(4): 619–622. (In Russian with English summary.)—More and more evidence has been accumulating on responsive sensitivity of bird plumage to the aerial environment. The researches of 11 authors in addition to the account of tactile sensory corpuscles associated with the flight feathers of *Larus ridibundus* and *L. melanocephalus* are summarized here. Similar sensory bodies have been found throughout most of the avian class. Mass accumulations numbering from 2 to 29 have been found in tissues adjacent to the calami and follicles of the distal primaries of both of these gull species. The size of these corpuscles is also exceptional, as long as 1,100 μ. Each of the corpuscles, like the neural bundles supplying them, is surrounded by densely pigmented cells. In general the pronounced development of these structures corresponds to the energy delivered through these associated remiges and to the weight supported by them in flight.—Leon Kelso.

51. Telephoto lens system of falconiform eyes. A. W. Snyder and W. H. Miller. 1978. *Nature,* **275**(5676): 127–129.—The visual acuity of falconiform birds, based on grating detectability, is about twice that of humans, even though birds with an axial eye length equal to man's have a minimum intercone spacing only slightly less than in the human retina. The concave portion of the deep nasal fovea in falconiforms may serve as a negative lens in a telephoto arrangement, producing an effective focal length exceeding the physical length of the eye. This design may yield increased resolving power beyond the limitation imposed by optical crosstalk between densely packed cones.—B. Dennis Sustare.

PLUMAGES AND MOLTS

(See 21, 22, 50, 77, 81, 82)

ZOOGEOGRAPHY AND DISTRIBUTION

(See also 49, 58, 60, 61, 62, 72, 79, 81, 85)

52. Aztec Emperor Auitzotl and the Great-tailed Grackle. P. D. Haemig. 1978. *Biotropica,* **10**(1): 11–17.—This interesting paper postulates an explanation for some of the discontinuous distributions of Central and South American species that also appear in the Mexican highlands. Prior to European conquest, the Aztecs used many brightly colored feathers for ornamentation of themselves. To meet the demand, many species were imported live through trade with, and poaching expeditions to, southern Central America and northern South America. Records kept by the early Spanish explorers document the aviaries and their tropical avifauna, including Quetzals and macaws which do not occur within several hundred kilometers. The introduction of the Great-tailed Grackle was told to Sahagún, an early 16th century friar. The grackle was introduced and liberated by the Aztec Emperor Auitzotl from the region of Veracruz. The activity of people living in Central America and western South America and their trafficking of exotic birds to Mexico must be considered when trying to explain modern distributions.—Robert C. Beason.

53. The Carolina Parakeet in Indiana. D. McKinley. 1976. *Indiana Quart.,* **54**(4): 97–107.—Careful scholarship is a pleasure to encounter, though not always easy to read. The present account is one of a continuing series resulting from McKinley's historical researches into the biology and history of *Conuropsis carolinensis.* The author analyzes a large number of original accounts, reconciling inaccuracies between these data and the summaries by Butler (*Auk,* **9:** 49–56, 1892; "Birds of Indiana," 1898; *Rept. State Geologist, Indianapolis,* **1897:** 515–1197, 1897) and Ridgway (*USNM Bull.,* **50:** pt. 7, 1916). Analyses are presented in sections following a generally north-south sequence of divisions of the state. Carolina Parakeets were found virtually throughout the year in the southern part of the state, especially in the White River watershed and lower Wabash River valley. A paucity of records along the Ohio River probably reflects a bias in reporting by observers who, having noted the bird in Ohio or Kentucky, did not mention its presence in Indiana. The latest authenticated record for the state is apparently 1858. The paper suffers in that

the author provides neither a summary of his findings nor a map indicating the distribution of this extinct species in Indiana. Unfortunately McKinley did not see a proof of the paper and was unable to correct numerous typographical and other errors in the paper.—Paul B. Hamel.

54. Observations on the naturalized distribution of the Red-vented Bulbul in the Pacific, with special reference to the Fiji Islands. D. Watling. 1978. *Notornis,* **25**(2): 109–117.—Watling discusses the history and distribution of *Pycnonotus cafer,* which was accidentally introduced at Fiji and several other islands around 1900. Its distribution seems related to that of the weed species that constitute its principal food.—J. R. Jehl, Jr.

55. Seabirds found dead in New Zealand in 1976. C. R. Veitch. 1978. *Notornis,* **25**(2): 141–148.—Excellent analysis of 5,990 seabird specimens found on New Zealand beaches in 1976. No major wrecks occurred. Rarities include *Puffinus nativitatis* (first N. Z. record) and *Procelsterna cerulea.*—J. R. Jehl, Jr.

56. New bird records from the Fiji Archipelago. F. Clunie, F. C. Kinsky, and J. A. F. Jenkins. 1978. *Notornis,* **25**(2): 118–127.—A complete list of taxa recorded subsequent to 1967. Some of the records have been published previously, but data on 15 new forms are presented for the first time.—J. R. Jehl, Jr.

SYSTEMATICS AND PALEONTOLOGY

(See also 56, 74)

57. *Presbyornis* and the evolution of ducks and flamingos. A. Feduccia. 1978. *Amer. Sci.,* **66:** 298–304.—The author reviews the terrain and formation in which significant skeletal remains (especially the skull) of *Presbyornis pervetus* have been found. The species is related to a shorebird stock from which descend the flamingos and in another line via *Presbyornis*, the Anseriformes. To the reviewer the reconstruction of *Presbyornis* is reminiscent of the Magpie Goose (*Anseranas semipalmata*). Note that in Fig. 4, the labels should be moved 1 cm to the right and, in addition that for the postorbital process should be lowered 0.5 cm.—C. H. Blake.

58. The identity of the fossil ducks described from Australia by C. W. DeVis. S. L. Olson. 1977. *Emu,* **77:** 127–131.—Olson has reexamined fossil material from which DeVis identified nine species of extinct ducks. No valid extinct species were found. The material represents five species, four ducks, and a pigeon, all alive today. Each of the five species is now confirmed as having lived in Australia since the late Pliocene or early Pleistocene, not an unexpected result.—Edward H. Burtt, Jr.

59. Notes on subfossil Anatidae from New Zealand, including a new species of Pink-eared Duck *Malacorhynchus*. S. L. Olson. 1977. *Emu,* **77:** 132–135.—In a brief potpourri of paleornithology Olson identifies a new, larger species of Pink-eared Duck (*Malacorhynchus scarletti*) from subfossil deposits at Pyramid Valley, South Island, N. Z. He recommends that the name *Biziura delautouri* Forbes 1892 be retained for the subfossil specimens of *Biziura* from New Zealand and he identifies a right humerus attributed to *Mergus australis* as coming from a coot (*Fulica sp.*). The evidence is detailed and convincing.—Edward H. Burtt, Jr.

60. Banded Dotterel at the Auckland Islands; description of a new subspecies. R. A. Falla. 1978. *Notornis,* **25**(2): 101–108.—*Charadrius bicinctus exilis,* a well-marked resident form from the Auckland Islands is described as new, with notes on its biology and ecology. The total population is very low, perhaps less than 100 individuals.—J. R. Jehl, Jr.

61. Plio-Pleistocene bird remains from the Carpathian Basin III. Strigiformes, Falconiformes, Caprimulgiformes, Apodiformes. D. Janossy. 1977. *Aquila,* **84:** 9–36.—A lengthy, detailed catalogue of fossil bones and bone fragments from the Carpathian Basin leads to the following conclusions:

1. The divergence of the two European forms, *Strix aluco* and *S. uralensis,* may begin with the Middle Pleistocene form (*S. intermedia*).

2. Traces of a large owl, the size of the present Eagle Owl (*Bubo bubo*), are known from the beginning of the Neogene until recent times.

3. A representative of the Hawk Owl (*Surnia ulula*) was present in the Lower Pleistocene in the southern regions, whereas the modern form of the Hawk Owl appears only in the northern regions.

4. The ancestor of the Little Owl (*Athene noctua*) was present only in the northern region in Lower Pleistocene times, and survived the Middle and Upper Pleistocene in the southern region.

5. The remains of nightjars (Caprimulgiformes), swifts (Apodiformes), and diurnal birds of prey are considered sporadic finds.

The paper, although written in English, is grammatically difficult to follow. The occasional tables and figures offer the reader little help in interpreting the text. The introduction, like the rest of the paper, deals with the orders Strigiformes, Caprimulgiformes, Apodiformes, and Falconiformes, but there the resemblance ends. The introduction discusses the evolutionary relationships among the orders whereas the paper is a cataloguing of fossil bone fragments without comparison of any type. Taken as a catalogue and description of avian fossils, the article is a valuable reference.—Sharon M. Minnich.

EVOLUTION AND GENETICS

(See also 7, 18, 57, 58, 61, 71)

62. Reunion Harrier (*Circus aeruginosus maillardi*) on Reunion Island. (Le Busard de Maillard (*C. a. m.*) de L'Ile de la Reunion.) M. Clouet. 1978. *L'Oiseau et R. F. O.*, **48**(2): 95–106. (In French with English summary.)—Unlike other subspecies of *C. aeruginosus* which inhabit forest edge or grassland, *C. a. maillardi* is a bird of the forest. Clouet presents data compiled during approximately a year of observing in 1975–1976. Seven nests were observed the first year, and two pairs were also studied in 1976. Clutch size is 2–3 on Reunion compared with 3–5 elsewhere. This is interpreted as an adaptation to island existence, as is the relatively small size of this subspecies. Measurements of 14 specimens, including three immatures, indicate that sexual size dimorphism in *C. a. maillardi* may be greater than in the Madagascan subspecies *C. a. macrosceles*. This harrier is the only Reunion raptor; Clouet interprets the greater size dimorphism as a character release in the absence of competition. Other observations on the biology and life history of this interesting species are given.—Paul B. Hamel.

63. Recent evolution of *Zosterops lateralis* on Norfolk Island, Australia. P. R. Grant. 1978. *Can. J. Zool.*, **56:** 1624–1626.—A cautionary tale with enough information to tease, but not satisfy, our curiosity. Grant returns to the Norfolk Island population of *Z. lateralis* founded in 1904, and sampled in 1912–1913 and later in 1926. Specimens from the two collections illustrated a narrowing bill width in *Z. lateralis*, which indicated divergence away from its established congener *Z. tenuirostris*. A good example of character displacement? Alas, no, for later collections (1968–1969) show that the evolutionary trend had reversed in *Z. lateralis*, with bill width increasing to the point where it was indistinguishable from the original 1912–1913 sample. After ruling out a number of biologically uninteresting explanations for the reversal, Grant ruled out hybridization. He concludes that the pattern resulted from "drift" or selection in a temporally varying environment (i.e., changed food supplies). With obvious frustration, he notes that there is no way to distinguish between alternatives with the little information available. He suggests that such frustration and loss of opportunity should be guarded against by more careful study of populations founded within memory.—William M. Shields.

64. Biochemical homeostasis of the heterozygote at the lysozyme locus in the Japanese Quail. G. Lucotte and M. Kaminski. 1978. *Biochem. Syst. Ecol.*, **6:** 145–147.—Here is a frustrating and puzzling electrophoretic investigation of a polymorphic lysozyme protein in the quail's egg-white. The authors report a Hardy-Weinberg equilibrium of the genotypes of the two alleles observed in three quail "populations." They neglect to inform us what a "population" is, natural or laboratory. Equally frustrating and even more puz-

zling is their discussion of the biochemical versatility of the heterozygote, which displays an intermediate pH optimum, which they view as an "advantage of the heterozygote phenotype." Their rationale for this view is elegant and follows traditional thinking. Yet they reported a Hardy-Weinberg equilibrium, which more often leads to a conclusion of little selective difference between phenotypes. Perhaps the confusion would have disappeared had the authors published in their native language?– William M. Shields.

65. Response to bidirectional and reverse selection for mating behavior in Japanese Quail *Coturnix coturnix japonica*. D. L. Cunningham and P. B. Siegel. 1978. *Behav. Genet.*, **8:** 387–397.—This is a baseline study of the genetics of mating behavior of what is rapidly becoming the avian equivalent of *Drosophila* or the laboratory mouse in experimental genetics. Male selection was effective in increasing and decreasing the number of successfully completed matings in replicate sublines, indicating significant genetic (additive) variance for mating frequency. Reversed selection was also effective in later generations indicating that the selective regime had not depleted all the variance. The most interesting point raised was a positive phenotypic correlation between relative aggressiveness and mating frequency. The authors attribute this selection of correlated aggressiveness to the body-size dimorphism in the quail, with smaller males needing aggressiveness as a component of successful mating, since there is no elaborate courtship.—William M. Shields.

FOOD AND FEEDING

(See also 26, 29, 30, 34, 35)

66. Feeding behavior and food habitats of the Boat-billed Heron (*Cochlearius cochlearius*). J. O. Biderman and R. W. Dickerson. 1978. *Biotropica,* **10**(1): 33–37.—The authors used a night vision device to study the nocturnal feeding patterns of this heron. They found no differences in feeding techniques or types of prey taken between the Boat-billed and other herons living in the same area. They conclude that the specialized bill is not an adaptation to a novel feeding technique or novel food types, but probably for display purposes.—Robert C. Beason.

67. Toheroa predation by Black-backed Gulls on Darganville Beach, North Auckland, New Zealand. P. M. Brunton. 1978. *Notornis,* **25**(2): 128–140.—*Larus bulleri* is an important predator on beach clams (*Paphies ventricosa*), which are of commercial importance in New Zealand. The ecology of the clam and the feeding habits of the gulls are discussed. Gulls may take up to 20 clams per day, and the local impact of this predation can be very high.—J. R. Jehl, Jr.

68. Food of the Long-eared Owl *Asio otus* in Sweden. H. Kallander. 1977. *Ornis Fenn.*, **34**(2): 79–84.—The availability principle of both food for the bird and of the bird for human observation is operative in this study. Information on the diet of *Asio otus* is available now from such diverse sources as date palm groves in Iraq and timberline areas in Norway. About 14,000 prey items from an unspecified number of pellets collected in southern Sweden were analyzed. "The staple food of the Long-eared Owl in Sweden is *Microtus agrestis,* and *Apodemus* spp." "It seems safe to conclude that it relies heavily on voles and mice, especially *Microtus,* and that its food niche is fairly restricted, at least compared with that of the Tawny Owl, *Strix aluco.*" There is some evidence that abundance of *Microtus* largely determines the breeding density of this owl but the question of nomadism in this species is still undetermined.—Leon Kelso.

69. Stored nuts, *Castanopsis cuspidata*, as a food resource of nestling Varied Tits, *Parus varius*. H. Higuchi. 1977. *Tori,* **26**(2–3): 9–12. (In English.)—This island population stores nuts not only as a principal winter food but to feed broods through fledging. Such a habit is unknown for the mainland population and for other *Parus* spp. except *P. cinctus.* Nuts are held pointed end forward. Forced into a niche "the obtuse end is knocked on by the bill to push it in deep, and finally a chip of wood or a clod of earth is stuffed into the stored place." Nuts were inserted separately or by two's rarely. Storage use persists through December to May. "Sometimes only part of a nut is eaten and then restored in a different place."—Leon Kelso.

SONGS AND VOCALIZATIONS

(See also 2, 20, 74)

70. Structure of the vocalizations of a speech-imitating African Grey Parrot. (Struktur der Lautäusserungen eines Sprache imitierenden Graupapageis (*Psittacus erithacus* L.).) N. Rauch. 1978. *Behaviour,* **66:** 56–105. (In German with English summary.)—The 15-year-old bird named Jako learned the Swiss dialect of German from its owners, and Rauch has made an exhaustive and detailed study of its taped vocalizations. Sounds were classified into about 100 types of "behavioral elements" and a detailed temporal analysis made to reveal constants and variables in vocalization structure. Many structural constancies were discovered, but the actual choice of a phrase-type (element or sequence of a repeated element) and the duration of a given vocal pattern were variable. Changes in vocalization parameters were also found over a 2.5-month period. An invaluable study for those interested in talking birds.—Jack P. Hailman.

71. Species-typical and individually distinctive acoustic features of crow calls of the Red Jungle Fowl. D. B. Miller. 1978. *Z. Tierpsychol.,* **47:** 182–193.—The highlights of this analysis of recorded vocalizations by captive, free-ranging Red Jungle Fowl (*Gallus gallus*) are (1) the constancy of features in crowing by a given individual, (2) the multiple differences among individuals, and (3) the similarity to crows of the domestic fowl. Miller points out that vocalizations of the other three species of *Gallus* are much less similar to those of domestic fowl, reinforcing the view of monophyletic origin of the latter from Red Jungle Fowl. Darwin proposed this derivation but poultry geneticists keep suggesting hybrid origins for domestic fowl. In fact, I am continually puzzled by all the proposals of hybrid derivation of domestic animals (e.g., the quite mistaken notion that the jackal as well as the wolf is ancestral to the dog, proposed hybrid origins of the ring dove, domestic cat, and so on). It does seem possible that the Alpaca originated by breeding the domestic Llama back to the ancestral Guanaco (*Lama guanicoe*), but that is not a hybrid between two natural species. I suspect that theories of hybrid origin in fowl, ring doves, and other domestic forms come from generalizing botanical origins; however, wild plants are known to speciate by hybridization. A simple truism is in order: animals are not plants.—Jack P. Hailman.

72. On rare and little known birds of Bikin River Basin. (O redkikh i maloizuchenykh ptitsakh basseina Reki Bikin.) Yu. B. Pukinskii. 1978. *Priroda,* **1978**(1): 56–76. (In Russian.)—An illustrated popularized account portrays a niche along a river of the Ussuri, with its general environment of mixed conifer-deciduous timber. There are 22 sharp black-and-white photographs detailing 10 species. The special concern of the author is for the owls: *Ketupa blakistoni, Ninox scutulata,* and *Otus sunia.* Their duet calling, or antiphonal vocalization is detailed in special accounts. Further search for actual occurrences in nature of vocal antiphony or duetting is recommended by this author. The author "taped" and photographed vocal performances at length. In this locality such duetting was first recorded for the East Asian Fish Owl (*Ketupa blakistoni*) which is perhaps the largest as well as heaviest of all owl species.—Leon Kelso.

73. The sound repertoire of the Great Grey Owl, *Strix nebulosa*. (Lappuglans *Strix nebulosa* laten.) V. Berrgren and J. Wahlstedt. 1977. *Var Fagelvarld,* **36**(3–4): 243–249. (In Swedish with English summary.)—Various calls of *Strix nebulosa* were recorded during 1972–1974 in Sweden. The male started calling at sunset and continued until sunrise or later. No daytime calling was reported. Calling was recorded in autumn and winter 1973–1974, also through April and May. The female called when the male delivered food, a call similar to that of the nestlings and juveniles. It was also uttered to the male as an invitation to approach for mating.—Leon Kelso.

74. Acoustic behavior of the Twite, *Acanthis flavirostris* (L.) (Passeres, Fringillidae) and taxonomic status of its disjunct geographic forms. (Akusticheskoe povedenie gornoi chechetki i taksonomicheskii status ee geograficheski razobshennykh form.) M. Zablotskaya. 1978. *Zool. Zhurn.,* **57**(1): 105–114. (In Russian with English summary.)—The physical and functional vocal qualities have been analyzed bioacoustically by sonograms for *A.*

f. montanella for frequency spectrum, energy distribution of frequencies, patterns of frequency modulation, duration, and "temporal structures." The adult repertoire included 12 calls and 3 types of songs: random, normal, and courtship. A comparison of functionally effective acoustic signals in *A. f. flavirostris, A. f. pipilans,* and *A. f. montanella* shows the existence of vocal differences in Western European and Central Asian forms. A definite divergence occurs between geographic races that may require a taxonomic revision of these forms since each appears to deserve species rank.—Leon Kelso.

MISCELLANEOUS

75. The letters of John S. Cairns to William Brewster, 1887–1895. M. B. Simpson, Jr. (Ed.) 1978. *North Carolina Hist. Rev.,* **55:** 306–338.—John Simpson Cairns (1862–1895) came to Buncombe County, N. C., as a boy. Early he became interested in the fauna of the neighboring mountains and published a list of the county's birds in 1887. Evidently this led to a letter from Brewster and the subsequent correspondence of which 28 surviving letters are published here with extensive notes and illustrations of people and places. Cairns was a keen observer. He was aware of the distinctness of the Carolina Junco and Cairns' Warbler (see A. O. U. Check-list, ed. of 1931). He sent Brewster a considerable number of skins, nests, and eggs. Cairns foresaw the changes likely to occur when the mountains could be exploited and made this clear to his friend, Zebulon Weaver, 10 years his junior, who, as a member of Congress introduced and insured the passage of the act establishing the Great Smoky Mountains National Park. Cairns was killed by the accidental discharge of his own gun. The man who led the search for him was Thomas D. Wilson, who, in 1857, had found the body of Elisha Mitchell.—Charles H. Blake.

76. Work Output of *"Zoologicheskii Zhurnal"* in 1974–1976. The Editors. 1977. *Zool. Zhurn.,* **56**(5): 806–807.—In 1974, 1975, and 1976 the *Zoologicheskii Zhurnal* published: leading papers (per years respectively)—170, 153, and 165; brief notes—131, 102, and 107; papers in the section "Methods of zoological research"—18, 14, and 10; other accounts—36, 27, and 39. Since 1976 the journal has started to publish accounts of defended and approved candidate and doctoral dissertations in zoology. As before, the board desires that papers published in *Zoologicheskii Zhurnal* amply protray the status of zoological research in our nation. In each number are included papers presenting work in the various fields of zoology, and pertaining to animals of the various taxonomic groups. As a whole the relative number of publications for various fields of zoology has fluctuated but little. Most numerous are taxonomic papers (1974—90, 1975—86, 1976—101); in second place are papers on ecology (respective to years: 78, 54, and 65); third, papers on ecological physiology (39, 32, and 20). Less varied are those relative to various taxonomic groups. Most numerous were the publications on insects (1974—84, 1975—72, 1976—73), somewhat fewer—mammals (by years: 54, 42, and 48); birds (24, 42, and 21); Crustacea (26, 26, and 25); flatworms and roundworms (21, 19, and 28); Arachnida (19, 18, and 20); Mollusca (17, 13, and 9); amphibians and reptiles (18, 12, and 13); and fishes (6, 17, and 4).

As in past years, most papers published in the journal were by authors from Moscow (1974—106, 1975—106, 1976—115), and Leningrad (respectively: 62, 57, and 52). Papers by authors working neither in Moscow nor in Leningrad, were published: 1974—155, 1975—106, 1976—134.

In 1974, the average time from date of receipt of papers to publication was 12 months, in 1975—14, in 1976—16. The basic cause of time increase was authors' desire to avoid at all events the shortening of papers. Notwithstanding all efforts of the editors occasionally papers are published whose length exceeds the advised rules for authors.

In consequence (of the increasing length of papers) the number of papers making up an issue is minimized. While in 1974 there was an average of 29.7 papers per issue, yet in 1975—only 24.7; in 1976 the situation improved somewhat (26.7 papers per number) but at present the board's portfolio is overloaded. Now the board accepts extra length only in cases where the paper is reserved for the author and the excess previously arranged for. All other papers whose length exceeds the regulation limit of "Rules for authors" are not considered and are returned to the authors.

In planning each number of the journal the board desires to include primarily papers that are of interest to a broad range of zoologists. The time from the date of receipt of such papers to their publication is definitely less than the average. Nevertheless it must be said that the great majority of papers received by the board of *Zoologicheskii Zhurnal* and published in its pages are on particular topics, primarily description of new species. In no measure minimizing this genre of work, the board observes that in some cases the authors are in excessive haste for publication, not using adequately the material at their disposal. Often descriptions are not adequately detailed for a distinctive diagnosis. The board asks of authors close attention, and, as a favor, to familiarize themselves with "Rules for authors," and with recommendations for drawing descriptions, published in no. 10 of 1975.

The board asks that reviewers attend more strictly to evaluation of papers containing descriptions of new species, not only to mark authors' errors, but also to indicate whether or not it is desirable to postpone publication until the author makes comparison of the new species with other species of the genus.

The board expresses sincere thanks to those referees who carefully and promptly scrutinize the papers submitted to them for review. We must note, however, that some referees hold papers extremely long, or make superficial readings not affording judgment of the merits and faults of the work. The board asks that referees in those cases when they do not expect to render judgment in the next three months return the paper to the board.

The essential fault of *Zoologicheskii Zhurnal* continues to be its less than effective representation of the life in zoological establishments of the nation. Thus, accounts of conferences or congresses are published a year after the event itself. The board takes pains to hasten publication of news items; however, favorable results will be obtained only if authors of reports present them to the board immediately after the conclusion of the conference or congress whose proceedings constitute these reports.

Collaboration of authors, referees, and editorial boards makes it possible to promptly publish papers received, and helps make *Zoologicheskii Zhurnal* of interest to the broadest spectrum of zoology readers.—Leon Kelso.

BOOKS AND MONOGRAPHS

77. The Coot and the Moorhen. J. Feldsa. 1977. AV-Media, Biological Monogr., Copenhagen. 56 p. text (seen) and cassette, 24 color slides, set of exercises, and teachers' notes (not seen). (No price given).—*The Coot and the Moorhen* is one of a series of monographs intended "to give a picture of the way in which animals live. The books are not merely intended to give a mass of detailed information about what we know about each individual species. It is just as important to explain why the animals live and behave the way they do." The stated purpose is admirably and delightfully fulfilled in a booklet that brims with facts and excitement. The writing is crisp and concise, a tribute to the author and to the translator. The excellent photographs complement the text well, but the pen-and-ink drawings are outstanding. Drawings are often in series to illustrate a complete behavioral pattern, for example diving, running, or the motion of the coot's toes during the power and recovery strokes of swimming. Drawings illustrate variations in behavior, for example the seasonal change in grazing behavior as the reeds grow. Far more could be said in praise of the book's illustrations, suffice it to say that they alone are worth the book's price.

Occasionally the text lapses into teleology and functional interpretation is excessive in places. The distribution maps lack legends, which renders them almost uninterpretable, and a map of seasonal changes in breeding territories is unintelligible despite a clear legend. However, these are minor objections to an otherwise informative little book.—Edward H. Burtt, Jr.

78. Roberts' Birds of South Africa. G. R. McLachlin and R. Liversidge. 1978. The Trustees of the John Voelcker Bird Book Fund, Cape Town, South Africa. 660 p.—With the caveat that my experience with ornithological field guides encompasses only the standard North American guides plus the William's guides to East African birds, and that I was

unable to field test this latest (4th ed.) of *Roberts' Birds of South Africa,* I give it a very high mark. Of the 72 color plates by Norman C. K. Lighton and Kenneth Newman, 31 are new. All seem accurate; all of the plates are beautiful. The plates of flying falcons and hawks, buzzards, kites, and harriers come to mind as especially lovely. Each bird species is assigned a number which appears next to the drawing of the bird. The plates are described on the facing page, where each bird painting is identified by number, scientific name, common English and Africaans names, and sex and age class where appropriate. The text copy for each species is easily found in nearby pages by reference to the species number, its binomial, or common names. Native names in a variety of local dialects are also included. The plate number that contains the drawing of the described species is clearly indicated in the text. Species accounts are organized into sections on identification, distribution, habits, food, voice, and breeding. Marginalia include range maps, line drawings of curious aspects of species morphology and of subspecific morphological differences. Each family of South African birds is also described in the text. Introductory sections include nomenclature and classification, regions of South Africa, a few historical notes, along with statements on field equipment, field identification, and descriptive ornithological terms. I believe that this field guide should be easily and satisfactorily used by the neophyte as well as the seasoned birder and the professional ornithologist.—Patricia A. Gowaty.

79. The English Sparrow in the American Landscape: A Paradox in Nineteenth Century Wildlife Conservation. R. Doughty. 1978. Research Paper 19. School of Geography, University of Oxford. 36 p.—This short research paper on one of North America's most successful avian immigrants, the English Sparrow or House Sparrow (*Passer domesticus*) is an amusing, essentially sociological account of changes in human attitudes towards introduced species. The historical background of attitude change towards *P. domesticus* from active nurturance of the "feisty little foreigners" (introduced by Nicolas Pike in 1851 and successors including Eugene Schiffelin who worked to introduce all of the birds mentioned in Shakespeare into the United States) to eradication programs of the "hun-like sparrows" is paralleled by the biological background of rapid range expansion, ecological release, and successful interspecific competition of these birds. The biological factors as such are not analyzed. This monograph will be useful in undergraduate courses on management philosophy or where need exists for an illustrative example of the complexities of wildlife management in relation to the vagaries of human value systems.—Patricia A. Gowaty.

80. Birdhouses. (Nichoirs d'oiseaux). R. Cayouette. 1978. Charlesbourg, Que., Soc. Zool. de Quebec. 36 p. $4.00. (In French.)—M. Cayouette has prepared an attractive publication dealing with nestboxes, their construction, and briefly describing the biology of 20 species of Quebec birds that use them. Written in popular form the book will find its widest use among birdwatchers. Land managers, park personnel, and other professionals will profit from the compendium of specifications for nestboxes for species ranging in size from chickadees to Wood Ducks, (*Aix sponsa*) and Common Goldeneyes (*Bucephala clangula*).

The book is introduced by a discussion of the rationale for aiding hole-nesting species which are often faced with a paucity of nest sites in an environment dominated by human activities. Control of pest insects is given a more prominent place as a reason than it probably deserves. Construction, materials, predator and parasite control around nestboxes, and provision of suitable nesting material for hole-nesting species are adequately treated. Hole-nesters are assigned to one of three groups depending on the frequency of their use of birdhouses. Within groups the species are listed and treated in an order which this reviewer has not been able to figure out.

Species accounts feature a watercolor illustration by Jean-Luc Grondin; a capsule noting such features of the bird's biology as clutch size, incubation time, length of nestling period, food, range, and migration dates in Quebec; a narrative describing the bird's habitat, use of nestboxes, and other interesting details. The account of the Cliff Swallow (*Petrochelidon pyrrhonota*) for example, gives sound advice for providing suitable nesting material for the species. Often additional line drawings by M. Grondin illustrate a partic-

ular feature made in the text. Most memorable of these is the depiction of Tree Swallows (*Iridoprocne bicolor*) routing a cat on p. 13. The watercolor paintings are painstakingly detailed, although some of the birds, such as the American Robin (*Turdus migratorius*) on p. 24, do not appear lifelike. Nevertheless, the overall effect of this little book is a most pleasing one, and worth the price. C'est dommage que cette brochure est écrite seulement en français.—Paul B. Hamel.

81. Water Birds of California. H. L. Cogswell. 1977. Univ. Calif. Nature Guides no. 40, 399 p. Illustrations by Gene M. Christman. $5.75, paperback.—This is a comprehensive review of current information on the distribution and biology of western water birds, with emphasis on California. Although not intended strictly as a field guide, it provides sufficient information to allow most species to be distinguished by the layman. It is intended for a broad audience and includes a wealth of interesting information, much derived from the author's extensive experience, that will help interest the educated layman in birds as well as in problems of conservation.

A well thought out introduction includes material on a wide variety of topics including general avian biology and behavior, identification, watching birds, keeping records, developing research projects, banding, and photography. Conservation is stressed, especially the importance of habitat restoration. Included are balanced remarks on hunting and scientific collecting, which are especially appropriate in these days of almost thoughtless protectionism. All of these topics are treated succinctly but never superficially.

The bulk of the book provides a detailed description of each species, data on identification, habits, nesting range, and a current synopsis of status and distribution in California that is not available elsewhere. The text is accurate, although a few statements are debatable. For example, all (not "most") confirmed skua records in California refer to the South Polar form. The idea that skuas look like buteos, repeated here, is an impression I have never received. Insufficient distinction is made between the Yellow-footed (*livens*) and other races of Western Gull (*Larus occidentalis*) even though its biology, plumages, and distribution are markedly different. Cogswell alleges that the Thayer's Gull (*Larus thayeri*) is suspected of migrating around the coast of Alaska; I cannot recall the origin of that suggestion, and the bulk of the evidence suggests otherwise.

The book is enlivened by many sketches of Gene Christman and includes 12 color plates. Each of the major water bird families is represented by one or more of the commoner or more conspicuous species that will be encountered by the beginners. For this reason, the inclusion of the Harlequin Duck (*Histrionicus histrionicus*) is puzzling.

About one quarter of the book is devoted to appendices. One provides information on organizations with interest in California ornithology. The major appendix, comprising nearly 100 pages, is a "graphic calendar," summarizing seasonality and distribution for each species. Similar synopses have been printed elsewhere as complete books, so this is a real bonus.

This book will be useful to a wide audience, but may be of special value as a supplementary text to college courses in introductory ornithology, natural resources, or conservation. A companion volume on land birds would be useful.—J. R. Jehl, Jr.

82. Guide to the Identification and Ageing of Holarctic Waders. A. J. Prater, J. H. Marchant, and J. Vuorinen. 1977. British Trust for Ornithology 17, 168 p. (No price given.)—This outstanding guide was written mainly for banders but will find wide use among museum workers and field birders. It treats in detail all of the Holarctic waders (Rostratulidae, Haematopodidae, Ibidorhynchidae, Recurvirostridae, Dromadidae, Burhinidae, Glareolidae, Charadriidae, and Scolopacidae, including phalaropes), some 58 of the world's wader fauna. For each species there is general information on distribution and migratory habits and detailed notes on identification, aging of various age classes, sexing, geographic variation, and measurements. A useful introduction deals with molt and wear patterns, and their use as cues to aging. The photographs (including a color frontispiece of the Spoon-billed Sandpiper (*Eurynorhynchus pygmeus*) and Lesser Sandplover (*Charadrius mongolus*)) are first rate and have been carefully chosen to illustrate age class differences for representative species. Although the authors are somewhat less familiar with the Nearctic waders, their treatment of those species is good. The guide

includes much information that is widely scattered or not previously available. A fine contribution; buy one.—J. R. Jehl., Jr.

83. A Guide to North American Bird Clubs. J. E. Rickert, Sr. 1978. Avian Publications, Inc., P. O. Box 310, Elizabethtown, KY 42701. 564 p. $15.00.—Billed as "the most complete bird finding sourcebook ever compiled," this book summarizes information on some 835 clubs from Hawaii and Alaska through the Caribbean region to Panama. When information is available, the author includes favorite birding areas of each club, a selected list of local birder contacts with phone numbers, membership information, club meeting times and places, and their publications. Clearly some of this book's information may quickly change; in fact, even before publication some names and addresses were already out-of-date. Nonetheless, a birder traveling around the country will find the book useful for its total contents.—David W. Johnston.

84. The Dream of Lhasa. The Life of Nikolay Przhevalsky (1839–1888), Explorer of Central Asia. D. Rayfield. 1976. Ohio Univ. Press. Athens, Ohio. XII, 221 p. $13.50.—Immense, remote, and mostly barred to foreigners Central Asia received no systematic attention until the 19th century. Imperial Russia sent more gifted explorers into the region than any other country before or since. Rayfield, a lecturer in Russian and a specialist in Chekhov, presents the first biography in English of the most assiduous and spectacular explorer of all. Nikolay Przhevalsky was known throughout the world in his day, but is little noted now except in USSR. This book serves as an introduction and guide to his explorations. As a rebel who lived for his work, he was hostile to European customs and took on his expeditions only humble subordinates trained by himself. He avoided marriage, chafed at civilization, and was ever anxious to be off to the wild again. Except for his dream of reaching Lhasa, his supreme hope never realized, he worked on no definite plan. Known now for the Przhevalsky horse, his collections revealed many other new animal and plant species. He was not above killing many animals for sport. On one occasion he abandoned many tons of yak meat to the wolves. His exploits had international import, for the British saw his exploits as foretelling future Russian expansion and acquisition and chose to counter Russia by sending their own expeditions from India. The author consulted many and varied sources for this survey, including four volumes by Przhevalsky, two available in English.—Leon Kelso.

85. Birdlife of the Adirondack Park. B. McP. Beehler. 1978. Adirondack Mountain Club, Glens Falls, N.Y. 210 p. $9.95.—The Adirondack Mountains are the site of an extensive, and surprisingly unspoiled, area of wilderness in upstate New York. As another in the excellent series of guides to the region published by the Adirondack Mountain Club, this book contains information on the habits, distribution, and abundance of the more than 250 bird species recorded within the park. Introductory sections give brief coverage of the park's history and ecology, plus an account of human impact on the region and its birdlife. Included in these chapters are lists of avifauna by habitat as well as resident or transient status. Most of the book is taken up by the species accounts of every bird on record in the park. A typical entry includes status of the species, habitat, field marks, nesting data, records in Breeding Bird Surveys, migration or wintering information, records of maximum numbers seen, and historical comments by early Adirondack naturalists such as T. Roosevelt, C. H. Merriam, E. H. Eaton, and A. A. Saunders. An appendix contains a gazetteer of places mentioned in the text, coded to U.S.G.S. 15-min quadrangle maps.

Although the book will, I hope, soon require updating, since the birdlife of many portions of the Adirondacks has as yet been minimally studied, I give this useful reference high praise, as indeed I recommend the beautiful Adirondacks.—B. Dennis Sustare.

86. Canada's Threatened Species and Habitats. T. Mosquin and C. Suchal (Eds.) 1977. Ottawa, Canadian Nature Federation. 185 p. $8.00.—This volume is the result of a 1976 symposium on Canada's threatened species and habitats and includes 43 contributions that span the gamut of topics from plants to mammals and oceans to mountaintops. Five of the chapters deal specifically with birds. Each contribution is short, averaging only three pages, and some could more properly be considered abstracts. As a result,

some broad topics and particularly interesting subjects are treated in a superficial way. This is not, therefore, a reference book that provides technical details on specific endangered species projects or habitat preservation programs, nor is it truly comprehensive in covering all of Canada's conservation programs. Instead it is selective and provides the reader with a general overview.

The content of the chapters varies considerably from rather technical topics, such as those dealing with environmental toxicants, to very general ones (conservation ethics and policies). Especially in the latter type of chapter, usually no bibliography is included so that the interested reader has no chance to go further into the subject. Some contributions are conspicuously out of context, for example, a chapter dealing with the conservation of wolves in Europe.

Perhaps the main value of the volume is that it provides a capsule overview of the ways in which various Canadian conservationists viewed the problems of threatened species and habitats within their country in 1976.— Stanley A. Temple.