RECENT LITERATURE

Edited by Bertram G. Murray, Jr.

NEW JOURNAL

1. World Pheasant Association Journal. Published annually by the World Pheasant Association (Daws Hall, Lamarsh, Bures, Suffolk, CO8, 5EX, England). No. 1 appeared in 1976 and No. 2 in 1977. Price £4.00.—The journal's title is slightly misleading, for the subject matter is the entire order Galliformes. Articles in the first two volumes deal with the conservation, status, and biology of rarer Galliformes in the wild, including reports on *Phasianus soemmerringii* in Japan, *Afropavo congensis* in the Congo and in captivity, *Rheinartia ocellata* in Malaysia, *Lyrurus mlokosiewiczi* in Iran, *Colinus virginianus ridgwayi* in Arizona and Mexico, and *Nothocrax urumutum* in the upper Amazon basin. Avicultural topics include first captive breeding records for *Tragopan blythi blythi* and *Lophura inornata inornata*, several papers on diseases of Galliformes, nutrition, artificial insemination, incubation, aviary design, studbooks, and a useful census of rarer Galliformes in captivity worldwide. Both volumes are lavishly illustrated with original artwork and photographs in color and black-and-white, including a photograph of a distinctive but undescribed species of the genus *Crax* from Bolivia. With a WPA membership of almost 800 worldwide, continuation of this specialized but valuable information source seems assured.—Warren B. King.

BANDING AND LONGEVITY

2. Sex differences in the tendency for Brown-headed Cowbirds and Red-winged Blackbirds to re-enter a decoy trap. H. E. Burtt and M. L. Giltz. 1976. *Ohio J. Sci.*, **76:** 264–267.—Authors Burtt and Giltz captured nearly 27,000 Red-winged Blackbirds (*Agelaius phoeniceus*) and 29,000 Brown-headed Cowbirds (*Molothrus ater*) in their decoy trap in Columbus, Ohio, between 1965 and 1974. They analyzed the recaptures of these birds for indications of sex differences in tendency to reenter the trap. Their measure of repeats is "recaptures/total banded"; they believe that the repeats represent a better indicator of tendency to reenter than "% captured birds that are recaptured." Cowbird females were much more likely to reenter than males, although males outnumber females more than 3:1 in the initial sample. The tendency for females to repeat was as much as 2.8 times that of males in one year (1969) and twice that of males in the pooled (8 yr.) data set. Female Red-wings were only slightly more inclined to repeat than males on a yearly basis, but the difference was also statistically significant in the pooled sample. Males outnumber females in initial captures 2.67:1. The authors interpret these results as indicating that females of these species may be more social than males during the breeding season and hence possibly more likely to be attracted to conspecifics in the trap. An unexplained fact is the much greater number of males in the initial capture samples of both species; are males more easily caught?—Paul B. Hamel.

MIGRATION, ORIENTATION, AND HOMING

(See also 47)

3. Spring migration over Puerto Rico and the western Atlantic, a radar study. W. J. Richardson. 1974. *Ibis*, **116:** 172–193.—The intensity, direction of movement, and patterns of migration over Puerto Rico are not as variable as those reported for temperate regions. Most of the migratory tracks were to the WNW, NW, or NNW, and "reverse" migration was not recorded. Only a few diurnal migrants were influenced by the coast line and followed it. No nocturnal migrants were observed to do so. Small numbers of birds approached Puerto Rico from the SE and E (presumably from South America or the Windward Islands) irregularly throughout the day and night. A large exodus of passerine migrants occurred nightly, leaving the island within the first hour after sunset, a pattern similar to that of continental nocturnal migration. Little variance was found between the tracks of individual birds at any given time, and little night-to-night variance in the nightly mean tracks. However, the variation present was significantly related to weather. The weather variable that had the strongest relationship to migration intensity

in Puerto Rico was the strength of the following-wind component. The night-to-night variance in tracks was slightly less than the variance in headings, indicating that migrants were partially correcting for lateral drift by the wind. Both following-wind component and side-wind component were significant in influencing the heading of migrants. Although passerines did not fly directly downwind, their track was somewhat clockwise of the wind; they usually flew with generally following winds. Overcast and magnetic disturbances apparently did not affect the intensity or the orientation of migrants. The long overwater route between the West Indies and the NE U.S. or SE Canada is used less in spring than in autumn. This is attributed to the prevailing winds, which would be side or opposed winds for that route. The same winds provide tail or side winds in spring—Robert C. Beason.

4. Autumn migration over Puerto Rico and the western Atlantic: a radar study. W. J. Richardson. 1976. *Ibis*, **118:** 309–332.—The movements of passerines over Puerto Rico can be generally divided into two categories: movements to the south, and movements to the east and southeast. Migrants moving southward passed over Puerto Rico intermittently throughout the autumn. These movements were mostly very light, especially early in the season. The track from Hispaniola over Puerto Rico and down the Lesser Antilles had moderate intensities of migration much more often than the southward route. The hourly pattern of migration intensities for the "island hopping" was similar to the pattern for continental migration, with a peak in activity occurring about an hour after sunset. Peak densities for the offshore movements to the south, on the other hand, developed at all times during the day and night, dependent upon the individual flight speeds, wind velocities, and take-off points of the migrants. The altitude of migration was much higher than recorded for continental migration. The median altitude of migration on over half of the recorded instances was above 2 km, with individual radar echoes as high as 6.8 km. The intensity of diurnal migration over Puerto Rico from the north was correlated with the "favorability" of the weather in eastern North America 60 hr previous. High densities of southerly migrants were related to westerly or calm winds at Puerto Rico and, at night, to high K index of magnetic disturbance. Movement along the Antilles was also strongly related to westerly or calm winds The mean track direction of migrants from the north was significantly related to wind direction. Westerly winds shifted the tracks eastward. In a day-to-day comparison of the tracks vs. headings, uncorrected lateral wind drift appeared to be taking place. Most migrants flew with the most favorable winds available, but not necessarily with following winds.—Robert C. Beason.

5. Avian spatial orientation as an adaptive phenomenon. (Prostranstvennaya orientatatsiya ptits kak adaptivnoe yavlenie.) V. Ilichev. 1977. *Z. Zhurn.*, **56**(8): 1133–1144. (In Russian with English summary.)—Recognition of the adaptive nature of bird migration, with advances in knowledge of the operation of higher level nerve action of analyzer systems in orientation behavior have led to revision of the traditional concept of "single reference-point—single organ of orientation," or, rather, abandonment of the search for that. Birds may use, relative to ecological situation and geographical location, multiple reference-points, and various analyzer systems, even during migration. Spatial orientation is defined as the capacity to determine one's location in space by means of perception of environmental objects and phenomena. The solution of this problem relates to three main components: orientation behavior, adaptive capacities of the analyzer systems (vision, hearing), and reference-points perceived directly or indirectly by communication with companions and biotic associates. Herein are realized the following objectives: (a) recognition of environment as perceived; (b) determination of area by increase of sensitivity of sensory systems responsive to objects and phenomena; and, (c) resolution by interaction to natural reference-points to which the analyzer systems have become adapted. Thus, there is achieved a sort of "narrowing down" to what is regarded as "home."

In passing, the author is critical of or rejects the historical and current hypotheses, such as belief in a single reference-point and astro-navigation (implying for birds impossible acuity in judging outlines, angles and time passage, and a calculating-machine mental capacity, and still lacking in verification). He reviews in detail and finds favor for recent research showing environmental perception through the plumage, particularly via the

filoplumes. "Plumage of the flying bird is definitely electrified. This has been known since the late 19th century." Tactile receptors invite more investigation. Birds are perceptive and reactive to vibrations of the feather vanes. They show a keen capacity to perceive low-frequency vibrations of the substrate. Vibrations of twigs and soil are of major signal value in bird life. The author is very mindful of the numerous recent studies showing unexpected bird sensitivity to odors. These studies, by Papi and others, appear to have motivated this article. Full and adequate discussion of its remarks would justify another book from Ilichev, perhaps the leading avian physiologist of the Slavic world.—Leon Kelso.

NESTING AND REPRODUCTION

6. The evolution of avian polyandry. W. D. Graul, S. R. Derrickson, and D. W. Mock. 1977. *Amer. Nat.*, **111:** 812–816.—The mating of one female to several males, each of which cares for a separate clutch of eggs, is beginning to emerge as a not uncommon reproductive pattern in shorebirds. The authors suggest that initial sex-role reversal is favored by extremely scarce food, where the female devotes her investment totally to egg-production. If the male's confidence of paternity were high, then he has a better chance of producing offspring by assuming most of the care for the eggs and young than in not doing so. Then, if short-term fluctuations produce better food resources, the female's strategy may be to desert the first male (which in any case will have an easier time of it under the new conditions) and attempt a new clutch with a second male. (An intermediate evolutionary step might be to attempt a second clutch with the same male, but with the female taking over the parental duties.) By starting a new clutch with a different male, however, the female is exploiting the first male, and it is unclear why the male has not evolved a counterstrategy to prevent this. It is not to his advantage to allow his female to go off and produce competitors for his own offspring. The authors attempt to explain away this predicament by assuming that once sex reversal-role has evolved "the male is under considerable evolutionary constraints and cannot easily reverse roles again." This special pleading fails to convince me. As in the case of simultaneous polygyny, as elucidated in some birds, I think a viable theory must show that the mating system adopted by a species is of advantage to both sexes.—Jack P. Hailman.

7. Nesting biology of the Sora at Vermilion, Alberta. J. K. Louther. 1977. *Can. Field-Nat.*, **91:** 63–67.—Selection of a nest site depends primarily on the water's depth and only secondarily on the species of plants available to support the nest. Nest predation increases during drought because the nests are no longer surrounded by water and marsh plants are more sparsely distributed. Hence the nest is visible and accessible.—Edward H. Burtt, Jr.

8. A nesting study of Common Grackles in southeastern Minnesota. C. A. Faanes. 1976. *Loon*, **48:** 149–156.—Faanes made intensive observations of Common Grackles (*Quiscalus quiscula*) on a 12-acre study plot during the 1974 and 1975 breeding seasons. The study area was a 20-year-old pine plantation surrounded by agricultural and suburban land. Two subplots, differing in age by two years and in composition by the presence of numerous jack pines (*Pinus banksiana*) on one subplot, were compared. On the plot 540 active nests were discovered during the study (230 in 1974); all but three were built in jack pines, in spite of the presence of several other suitable conifer species. These results point out an interesting aspect of grackle biology. Grackles have long been noted as an adaptable species capable of utilizing a variety of nest sites. At any given colony, however, the majority of nests are often built in only one site type, even when numerous suitable sites of other types are available. Faanes presents other interesting data on productivity and causes of mortality. The paper is somewhat marred by the very poorly proofread bibliography and by the presentation of population change figures as "% of final" rather than "% of original" population. Productivity is presented on a per acre basis, which obscures the fact that colony activities occupy far more than the 12-acre plot, which was the colony nesting site. On balance, this is an interesting paper, especially in view of the very dense colony Faanes was able to study.—Paul B. Hamel.

BEHAVIOR

(See also 43,44)

9. On the adaptive significance of territoriality. J. Verner. 1977. *Amer. Nat.*, **111:** 769–775.—The idea that birds defend larger territories than required to insure their needed ecological resources because this behavior excludes competitors from breeding is not new. The reason for this paper appears to be the discussion of four ways proposed to test the idea of "superterritories." The first suggestion, which is to show that birds defend more than sufficient food for survival and reproduction, is obviously difficult in practice and not-so-obviously difficult in theory. How, for example, can one operationally define "sufficient?" The second test proposes that superterritories should be compressible in size whereas sufficient territories should not, but this hardly seems a logical prediction, partly because of the hazy notion of "sufficient" again. If a pair has a high probability of bringing off their brood on a large territory, they may have a lower probability on a smaller territory—but better to breed on a compressed territory than abandon the attempt altogether or spend too much time trying to defend the indefensible. The third suggestion goes like this: sufficient territories for reproduction "ought to be at their maximum size during the period of maximum food demand, when young are being fed," or at least defense "should be most assiduous at that time." But what if the territory is to assure sufficient food for the female's production of eggs? One expects largest territories or most vigorous defense early in the season. The last proposal is that circular territories are most easily defended in a uniform habitat, so sufficient territories should be circular and superterritories "may or may not" be. The idea is that as territorial size increases, hexagonally packed circular territories allow increasingly larger interstitial spaces (roughly tiny triangles). When these tiny triangles become sufficiently large for a pair to breed upon, then they should be defended, thus distorting the circular territory to a hexagonal one. Despite the obvious practical problems of finding relevant situations in nature, the lack of interstitial spaces in territorial arrays could be caused by many other factors. Among them is the fact that these triangles occur precisely where *two* neighbors have adjacent boundaries, so one expects a bird to defend most vigorously here, attempting to leave no piece of ground in doubt that would cause repeated acrimony and attention. Territoriality is unquestionably a tricky phenomenon to interpret, but I cannot see that this discussion helps much.—Jack P. Hailman.

10. Environment-dependent attachment behaviour of goslings (*Anser indicus*) due to environment-specific separation experience. J. Lamprecht. 1977. *Z. Tierpsychol.*, **43:** 407–414.—The author's summary (grammatically corrected) says it all: "Five-day-old Bar-headed goslings, imprinted on human foster parents, uttered more distress calls when separated from the parent in a place where they had never been deserted before than in a place where they have usually been left alone."—Jack P. Hailman.

11. A comparison of the attachment to parents and siblings in juvenile geese (*Branta canadensis* and *Anser indicus*): reactions to brief separation. J. Lamprecht. 1977. *Z. Tierpsychol.*, **43:** 415–424.—Lamprecht should be commended for his terse, informative summaries (see also review no. **10**), in this case about Canada and Bar-headed geese: "Ten hand-reared goslings of each of two species reared in a flock until 2.5 to 6.5 days of age showed signs of great distress when separated from the human foster parent. Separation from a conspecific sibling caused distress only when the parent was also absent, and only in a test room in which the goslings had had little previous contact with the parent."—Jack P. Hailman.

12. Notes on the ecology and the ethology of the Lammergeier. (Bijdrage tot de Ecologie en de Ethologie van de Lammergeier, *Gypaetus barbatus aureus* (Hablizl).) W. Suetens and P. van Groenedael. 1973. *Gerfaut,* **62**(3–4): 203–214. (In Flemish with English and French summaries.)—Bone smashing by the Lammergeier is not a rarity of behavior but a regular event as recorded by the authors in the French and Spanish Pyrenees, in the mountains of Aaragon, and in the Sierra de Cazarla. It may be repeated three times a day at the same site, on mountain slopes covered with big boulders in the neighborhood of the eyrie or roosting place. The sites of 12 nests are described. High quality photos and many other observations are included.—Leon Kelso.

13. Prey selection in the American Kestrel: experiments with two species of prey. H. C. Mueller. 1977. *Amer. Nat.*, **111:** 25–29.—Seven captive *Falco sparverius* were individually given 10 white mice (*Mus musculus*) in succession, then a choice between a mouse and a several-days-old domestic chick (*G. gallus*). After each kill the prey was removed, and after the last trial the kestrel was fed. All falcons chose chicks more than mice in 16 days of such trials following the first choice of chick. Then 10 chicks were presented each day before the choice, and four birds preferred mice whereas two continued to take chicks in the choices. (One bird failed to choose a mouse in the first 16 trials, so the experiment was stopped.) Ignore the ridiculously small sample size, asymmetry in design (no birds were started on chick-presentations and later switched to mice), inexplicable rationale for how many trials were conducted (rendering huge variation in the actual number of trials for individual birds), etc. Just note that the report never says what the kestrels were fed during these experiments! The bibliography provides references to the author's similarly uninterpretable experiments in no fewer than three other journals.—Jack P. Hailman.

14. On the behavioral biology of Audouin's Gull (*Larus audouinii*). (Zur Verhaltensbiologie der Korallenmöwe.) H. Witt. 1977. *Z. Tierpsychol.*, **43:** 46–67. (In German with English summary.)—It is a pleasure to see a relatively complete ethogram, including sonograms of vocalizations, of an increasingly rare gull, thus extending the comparative survey initiated by Niko Tinbergen years ago. Most of the behavior is like that of the Herring Gull (*L. argentatus*) and other large species in general, with a few omissions and distinct modifications. Witt believes the Audouin's Gull is an early evolutionary twig on the larid tree, its closest relative being the Common Gull (*L. canus*).—Jack P. Hailman.

15. Acoustic ability of species recognition in chicks of Arctic and Common Terns (*Sterna hirundo* L. and *S. paradisaea* Pont.) acquired by early experience. (Prägungsbedingte akustische Arterkennungsfähigkeit der Küken der Flussseeschwalben und Küstenseeschwalben.) K. Busse. 1977. *Z. Tierpsychol.*, **44:** 154–161. (In German with English and French summaries.)—Eggs from the two species were switched in half the sample nests so that four groups of chicks resulted: Arctic Terns raised by their own species and by Common Tern foster parents and Common Tern chicks raised by their own and the other species. The chicks were placed individually between two loudspeakers through which the parental calls of the two species were played, and in all four groups statistically significantly more chicks went to calls of the species that reared them than of the other species. Curiously, none of C. G. Beer's similar studies on gulls, showing that chicks learn the individually specific features of their own parent's voices, is cited.—Jack P. Hailman.

16. Brief observations on the Kakapo. R. Morris. 1977. *Notornis*, **44**(1): 52–54.—The Owl-Parrot (*Strigops habroptilus*) persists despite rumored to be near extinction. Its calls fall into two basic forms—"croaks" and "wails." The wail is likened to the squeal of a pig or opossum. No "booming," for which the species is noted, was heard. "It preened its facial disk, using its foot much like a cat would wash its face with a paw." When threatened it drew up owl-like into an erect stiff posture.—Leon Kelso.

17. Socialization of young Budgerigars (*Melopsittacus undulatus* Shaw). (Sozialisation junger Wellensittiche.) U. Engesser. 1977. *Z. Tierpsychol.*, **43:** 68–105. (In German with English summary).—This is a long and detailed descriptive study of 65 aviary birds, documenting which one shows what behavior to whom during development from nestlings to breeding adults. There seem to be no real surprises or novel ideas, except perhaps that young females prefer older males when first breeding. One always wonders in a study such as this whether social behavior might be quite different in the natural environment of the species, because growing evidence indicates that social organization differs geographically and ecologically intraspecifically.—Jack P. Hailman.

18. Components of a visual stimulus used by Scrub Jays to discriminate a Batesian model. E. C. Terhune. 1977. *Amer. Nat.*, **111:** 435–451.—A dozen *Aphelocoma coerulescens* were wild-trapped for initial training, but two died and two were untrainable and so released. The remaining eight were conditioned to discriminate between a blue rectangle with three black stripes (the "model" for which they received either quinine-soaked food

or no food) and a smaller violet rectangle with two black stripes (the "palatable non-mimic" for which they received food). The seven birds that learned to respond preferentially to the non-mimic were then given the model and a choice of mimics that differed from the model only in one characteristic: small size, violet color, or two stripes. One bird avoided all three mimics, and the six remaining chose mainly the violet model. It does seem a long way from these results to the conclusion that color is the most important visual characteristic in mimicry.—Jack P. Hailman.

19. Effect of blackened epaulets on the territorial behavior and breeding success of male Red-winged Blackbirds, *Agelaius phoeniceus*. L. Morris. 1975. *Ohio J. Sci.*, **75**(4): 168–176.—Male Red-winged Blackbirds in two Ohio marshes were trapped and their epaulets dyed black. In one marsh, birds were trapped in the prebreeding stage (n = 4; 2 experimental and 2 control); in the second marsh the treatment was administered after nest building had begun (n = 8; 4 experimental and 4 control). Red-winged Blackbird densities, especially female numbers, were much greater in the second marsh, introducing a possibly complicating variable into the study. Previous workers have accorded epaulet color either a primary role in territory maintenance or in female attraction. Morris's data indicate that epaulet color may function in both roles, but that the role in territory maintenance is more important. Birds with blackened epaulets experienced greater difficulty maintaining territories than in maintaining mates, although their ability to attract mates was somewhat reduced compared with controls. One experimental male in the second marsh was physically attacked and evicted by a previously subordinate yearling male immediately after treatment. Two adjacent males in the first marsh were experimentally blackened but maintained a mutual relationship identical after treatment to their previous boundary association, suggesting a possible individual recognition between neighboring individuals based upon more cues than simply epaulet color.—Paul B. Hamel.

20. Seasonal movements of blackbirds across the archipelago of western Lake Erie. M. Miskimen. 1977. *Ohio J. Sci.*, **76**(5): 195–203.—Daily flights to and from a roost on South Bass Island in Lake Erie were recorded from March to November in 1971, 1972, and 1973. Sampling was conducted in the first and last hours between sunrise and sunset from two points on the island. Flight directions were recorded only as primarily north or south. Miskimen found significant year-to-year changes in roost use and number of birds passing across the island, differences which she related to changes in water levels in Lake Erie. Modest to large movements of birds in directions opposite to prevailing expectations (e.g., south in spring and north in autumn) indicated that in spring some blackbirds were feeding on the U.S. mainland to the south and roosting on the island; in the late summer some birds raised in Ohio might be flying into Canada to the north for foraging. The study might have detected larger and more patterned movements if the morning observation period had been longer than one hour.—Paul B. Hamel.

21. Status signaling in Harris Sparrows: some experiments in deception. S. Rohwer. 1977. *Behavior*, **61:** 107–129.—*Zonotrichia querula* shows great individual variation in the amount of black on the throat and adjacent areas. From most to least black the birds are "on the average, old males . . . old females next, young males next, and young females," according to the text (no supporting data). The author calls the amount of black "studliness," a doubly unfortunate term: it is barbarous to the ear and eye, leading to terms such as "studlies" and "unstudlies" for birds with different amounts of black, and it is ambiguous. Apparently, the term was intended to connote ornamentation, as in a large-headed nail called a stud; but stud is already established in the behavioral literature in its other meaning as the male that does the breeding (the two "studs" have different Anglo-Saxon derivations). This sort of linguistic cuteness mars the presentation elsewhere, too; for example, the experimental section titled "Living in a disrepectful world." The study itself, however, is quite interesting. Basically, white-throated individuals dyed black did not seem to rise in social status, but did receive more attacks from black-throated birds than before dyeing. Black-throated birds whose feathers were bleached had to fight more to keep their status. Therefore, "deception" (signaling other than one's true status) does not work.—Jack P. Hailman.

ECOLOGY

(See also 12, 40, 42)

22. On competition and variable environments. J. A. Wiens. 1977. *Amer. Sci.*, **65:** 590–597.—Competitive exclusion has provided the paradigm for countless doctoral dissertations since MacArthur's (*Ecology*, **39:** 599–619, 1958) stunning study of warblers. However, few authors acknowledge the assumptions that underlie the theory of competitive exclusion. What are these assumptions? They are (1) that selection on the attributes studied is continuous and intense, (2) that populations, guilds, or communities are at an equilibrium determined by resource limitations, (3) that competition is *the* major selective force determining resource utilization, and (4) that changes toward the predicted optimal state do not initially lower fitness. Wien's point is not that competition theory is wrong or illogical, but that the theory is applicable to reality only infrequently because the assumptions are met only infrequently. Unpredictable environmental fluctuations may produce sharp departures from the equilibrium assumptions of the theory. What is the pattern of variation in the environment? What is the magnitude of that variation? Is the variation predictable? Are populations ever close to or at resource-defined equilibria? How often are resources superabundant? These are important, neglected questions. Close study inevitably shows that different species are different, but the differences cannot be attributed to competition without examination of the assumptions that underlie competitive exclusion. Competition theory is in great danger of becoming a tautology. Only through thoughtful, theoretical analyses such as Wien's can the theory be placed in its proper and useful perspective.—Edward H. Burtt, Jr.

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

(See also 29)

23. Birds as agents of biological control. R. W. McFarlane. 1976. *Biologist*, **58:** 123–140.—With a growing awareness that chemical pesticides have many deleterious side effects and must be replaced with ever more toxic treatments as resistance to them develops, it is refreshing to see increasing attention being given to the role of birds in control of unwanted plants and animals. Although an abundance of information has long been available on the types of foods eaten by the various species of birds, little quantitative information is available on the role of birds in controlling plants and animals considered adverse to human interests. This paper notes the few recent publications reporting efforts to measure the role of birds in alleviating specific pest problems and suggests that management practices be aimed at enhancing the effectiveness of birds in performing wanted services. The imaginative reader cannot fail to acquire from a reading of this paper the feeling that much research remains needed on the possibility of using birds in attacking more weed-plant and animal problems.

In addition to reviewing the limited literature on quantitative studies in economic ornithology and suggesting the need for increased use of management practices involving birds, this short paper also presents an appropriate introduction to some theoretical aspects of the feeding behavior of birds.—Paul A. Stewart.

24. The role of wildfowl refuges on agricultural land in lessening the conflict between farmers and geese in Britain. M. Owen. 1977. *Biol. Conserv.*, **11:** 209–222.—Traditional methods of minimizing the conflict between wild geese and farmers, including population control, harassment, and farmer compensation were considered unsatisfactory. Owen suggests that the problem in Britain can be solved by creation of a network of refuges to which geese can be lured from farmland by providing suitable and adequate food sources on the refuges. Many of the refuges already established protect the geese only when roosting, resulting in their feeding on nearby farmland. It was estimated that about 7,500 ha of well-managed refuges would be required to accommodate the 140,000 geese now causing agricultural problems in Britain.—Paul A. Stewart.

25. Distribution and abundance of waterfowl wintering in southern Quebec. A. Reed and A. Bourget. 1977. *Can. Field-Nat.*, **21:** 1–7.—Between 170,000 and 500,000 ducks winter along the St. Lawrence River and its gulf, a fact that makes the St. Lawrence one

of the North Atlantic's major wintering areas for waterfowl. Teams of ground observers and an airborne team censused ducks along the Quebec shoreline of the St. Lawrence river and its gulf in February 1974, 1975, and 1976. The extent of the census is awe-inspiring; nonetheless the reported populations must be considered minimum estimates because areas of the gulf not bordered by Quebec were not checked and many offshore rafts of ducks could not be accurately counted. Censuses of such magnitude are invaluable indicators of the effects of man's "progress" on ecosystems. The authors have provided detailed baseline measurements against which to measure changes in abundance and distribution that may result from thermal pollution, oil spills, or industrial and residential development of the shoreline.—Edward H. Burtt, Jr.

26. Some aspects of grackle feeding behavior in newly planted corn. J. G. Rogers, Jr., and J. T. Linehan. 1977. *J. Wildl. Manage.*, **41:** 444–447.—In an experimental test of the effectiveness of the repellent methiocarb (3, 5,-dimethyl-4-methylthiophenol methylcarbamate) in reducing bird damage to corn, the authors compared behavior of Common Grackles (*Quiscalus quiscula*) in portions of the same field on the University of Delaware Farm planted with treated and untreated corn. The study occupied 249 man-hours of observations in the early spring in 1975 and 1976. Grackle activities were similar in both parts of the field except that treated corn was preferentially avoided. The birds handled sprouted seed easier than unsprouted, as evidenced by their more frequently dropping the unsprouted seeds. These experiments indicate that the grackles' response to treated seeds is specific and distinct from their response to foraging in the area with treated seeds; the birds avoided eating the treated seeds but did not avoid foraging in the area where the treated seeds were planted.—Paul B. Hamel.

27. The importance of protein in the selection of fruit buds by bullfinches. D. D. B. Summers and F. J. S. Jones. 1977. *Experimental Horticulture*, **28:** 47–50.—Bullfinches (*Pyrrhula pyrrhula*) are well-known feeders on fruit buds and often do considerable damage. In this study three varieties of pear trees were compared with respect to damage done to the buds by Bullfinches and the organic nitrogen content of the buds. The greater the nitrogen content, the greater the damage. The authors point out that other factors, such as size, shape, and hardness of buds, may also be involved in selection of buds by Bullfinches, and thus the importance of the correlation between nitrogen content and bud damage can be determined only by further research on Bullfinch energetics and on the physical characteristics of the fruit buds.—Bertram G. Murray, Jr.

CONSERVATION AND ENVIRONMENTAL QUALITY

28. HELP! a step-by-step manual for the care and treatment of oil-damaged birds. E. P. Dolensek and J. Bell. 1977. *Animal Kingdom*, **80**(4): suppl. (50 ¢ each from Help!, Publications Dept., N.Y. Zoological Society, New York, N.Y., 10460, cheaper in larger quantities.).—Without any question we can expect more frequent and bigger oil spills in the future. And until the birds are gone, efforts will be made to save the victims. This little manual describes the process of saving birds from their capture to release. The most important factor is preparation—that is, what is done *before* the spill. A recovery operation with a hope of any success requires planning, training of personnel, and stockpiling equipment. Two important points are made by the authors: even the best prepared recovery operation will experience a low rate of survival; treatment techniques, which are only in an early stage of development, will no doubt improve. What most needs doing is outside the scope of this manual—spill prevention.—Bertram G. Murray, Jr.

29. A research program for the endangered Masked Bobwhite. D. H. Ellis and J. A. Serafin. 1977. *World Pheasant Assoc. J.*, **2:** 16–33.—This is the first published update on the conservation of *Colinus virginianus ridgwayi* since 1972. Captive breeding at Patuxent Wildlife Research Station is now routine and highly successful. Release of captive-bred birds in Arizona involves training to ensure physical and mental fitness, either by repeated harassment by man, dogs, and a trained hawk or by use of sterilized male *C. v. texanus* as foster parents, the latter being less human-labor intensive and equally successful. No suitable ungrazed or lightly grazed habitat exists in Arizona. In its own version of Catch-

22, the U.S. Fish and Wildlife Service will not acquire land for a refuge for this subspecies until release of captive-bred birds results in successful breeding in the wild. Yet cattle invasions of the 1975 and 1976 release areas wiped out the released populations, including a number of singing territorial birds. The remnant wild population in Sonora, Mexico, has declined seriously and may persist only a few more years.—Warren B. King.

PHYSIOLOGY

(See also 42)

30. Why have some animals evolved to regulate a high body temperature? B. Heinrich. 1977. *Amer. Nat.*, **111:** 623–640.—Birds and mammals, along with a few reptiles and insects, maintain high, stable body temperatures. Stability, Heinrich argues, allows enzymatic specialization and hence metabolic efficiency. He also argues that high-temperature set-points have been selected for because animals cannot quickly dissipate excess heat unless they are hotter than ambient. Alas, I am not sufficiently competent biochemically or physiologically to evaluate the arguments, but I find myself inexplicably skeptical. Why, for example, do birds almost invariably have considerably higher set-points than mammals? The titular question is a good one, but I am unconvinced that we possess a final answer to it.—Jack P. Hailman.

31. Body mass changes and energetics of the Kiwi's egg cycle. W. Calder, III and B. Rowe. 1977. *Notornis*, **24**(2), 129–135.—In an elaborately instrumented study the formation of the large egg of *Apteryx australis* and the weight increase of the hen were recorded through the egg cycle. "The yolk, containing 91% of the energy of the Kiwi egg was completed during the first 7½ days of the cycle, adding 174 to 203% to her standard metabolic budget."—Leon Kelso.

MORPHOLOGY AND ANATOMY

32. Jaw structure features of wheatears, genus *Oenanthe*, relative to modes of reduction of food competition between affiliate species. (Osobennosti stroeniya chelyustnogo apparata roda *Oenanthe* (Turdidae, Passeriformes) v svyazi s voporsom o putyakh snizheniya pishchevoi konkurentsii mezhdu blizkimi vidami.) E. Potapova and E. Panov. 1977. *Z. Zhurn.*, **56**(5): 743–752. (In Russian with English summary.)—The jaw structure of 8 species (*Oenanthe isabillina, deserti, xanthoprymna, hispanica, pleshchanka, oenanthe, picata,* and *finschii*) was dissected and analyzed. The osteo-syndesmal system affords ample culmen movement. Jaw musculature featured reduced pinnateness with elongation of muscle fibers, allowing the beak to open wider and the seizure of both large and small prey. The ability to utilize a wide range of food items makes possible a decrease of food competition between closely allied species. "The absence of interspecific differences in the structure of mouth parts of Wheatears, except certain size characteristics, of the beak, may be considered as evidence of absence of trophic specialization in different species." It is suggested that adaptive radiation in the genus *Oenanthe* did not affect food intake and assimilation and that food specialization had little effect in the evolution of the species.—Leon Kelso.

PLUMAGES AND MOLTS

(See 46)

ZOOGEOGRAPHY AND DISTRIBUTION

(See also 47)

33. The Afrotropical Region: a recommended term in zoogeography. R. W. Crosskey and G. B. White. 1977. *J. Nat. Hist.*, **11:** 541–544.—In describing zoogeographic regions of the world Sclater applied the name Ethiopean Region to the area of Africa south of the Sahara Desert. Because Abyssinia has since been named Ethiopia and because the education of biologists is not what it used to be, zoogeographers have avoided using the Ethiopean Region when referring to the fauna south of the Sahara. The authors evaluate several of the alternative terms that have appeared and propose one themselves—the

Afrotropical Region, which they feel is the "best" if not the "ideal."—Bertram G. Murray, Jr.

34. Atlas of Eastern Canadian Seabirds. Supplement 1. Halifax-Bermuda Transects. R. G. B. Brown. 1977. Ottawa, Canadian Wildlife Service. 24 p. (In English with French summary).—This first supplement to the larger work (rev. **30**, *Bird-Banding*, **47:** 378–380, 1976) presents data on seabird distribution in the subtropical northwest Atlantic Ocean—south of 40°N and west of 28°W. The data were collected mainly on cruises between Halifax, Nova Scotia, and Bermuda. The main species considered are Cory's Shearwater (*Puffinus diomedea*), Greater Shearwater (*Puffinus gravis*), Audubon's Shearwater (*P. lherminieri*), Leach's Storm Petrel (*Oceanodroma leucorhoa*), Wilson's Storm Petrel (*Oceanites oceanicus*), and the White-tailed Tropicbird (*Phaethon lepturus*). In general, from June through September, the densities of seabirds decline from the Canadian coastal zone southward to the Sargasso Sea, more or less following a similar decline in the biomass of fish and plankton. Human destruction of the Bermudan seabird colonies is also responsible for the low seabird numbers in the Sargasso Sea.—Bertram G. Murray, Jr.

35. Pelagic birds of Monterey Bay, California. R. W. Stallcup. 1976. *Western Birds*, **7:** 113–136 (covered reprint available only from Phil Schaeffer, 376 Greenwood Beach Road, Tiburon, CA 94920, $1.50, payable to Western Field Ornithologists).—This paper, which describes the occurrence and distribution of pelagic birds in Monterey Bay, includes much useful information on identification. Subtle but nevertheless distinguishing field marks not included in the standard field guides are discussed and illustrated, either with black-and-white photographs or drawings. Other birds and mammals that might be found are listed. There are tips on birding in Monterey Bay, including a route that makes the best use of the sun. A map would have been a useful addition.—Bertram G. Murray, Jr.

36. A checklist of the birds of Washington State, with recent changes annotated. P. W. Mattocks, Jr., E. S. Hunn, and T. R. Wahl. 1976. *Western Birds*, **7:** 1–24 (covered reprint available from Phil Schaeffer, 376 Greenwood Beach Road, Tiburon, CA 94920, $1.25, payable to Western Field Ornithologists).—This is the first updating of the list of Washington birds since the "Birds of Washington" by Jewett et al. was published in 1953. A complete list of the species that are accepted by the authors is presented. The status of some species is indicated by a combination of two letters. Additions to the state list and radical changes in status of species between 1953 and 31 December 1974 are dealt with in a separate annotated list. Observations, specimens, and tape-recordings are fully documented. A hypothetical list includes the authors' reasons for their decisions.—Bertram G. Murray, Jr.

37. Annotated Checklist of the Birds, Mammals, Reptiles, and Amphibians of the Virgin Islands and Puerto Rico. R. Philibosian and J. A. Yntema. 1977. Fredericksted (St. Croix), Information Services. 48 p. $2.00. (Information Services, P.O. Box 305, Fredericksted, St. Croix, U.S. Virgin Islands 00840).—This slim, pocket-sized checklist covers the amphibians, reptiles, birds, and mammals that have occurred during the past 200 years (fossil species are included) within the area bounded by Mona Island on the west, Anegada on the east, and St. Croix on the south. The area is divided into seven subareas, and the status of each species is indicated usually by a single letter. Endangered and endemic species get an additional symbol, and birds have another symbol representing seasonal occurrence. Scientific, English, and Spanish names (when available) are given for 393 species.—Bertram G. Murray, Jr.

SYSTEMATICS AND PALEONTOLOGY

38. Phenetic variation in the avian subfamily Cardinalinae. J. J. Hellack. 1976. *Univ. Kansas Mus. Nat. Hist., Occ. Pap.* **57:** 1–22.—Hellack developed a data set composed of 49 measurements of 231 skeletons of 31 species of traditional Cardinaline finches (genus *Passerina*—11 sp., *Saltator*—10 sp., *Pheucticus*—4 sp., *Cardinalis*—3 sp., and *Caryothraustes*, *Pitylus*, *Rhodothraupis*, and *Spiza*, each monotypic). From it the author computed 27 phenograms representing various combinations of similarity measures (correlation and dis-

tance), characters (all, or subsets comprised solely of pelvic or skull measures), and five separate transformations intended to reduce the effect of size. In addition, an analysis of the similarity of basic similarity matrices and resulting phenograms was conducted. Fourteen of the resulting phenograms are presented, representing samples from the several groups computed in the analysis of similarities of phenograms. No two phenograms were precisely alike, although several differed only in the placement of one or two species. Phenograms constructed from the data set without reduction of the effect of size showed that size was the major factor in their determination. The single most significant result of these analyses was the fairly consistent presence of two major clusters across many phenograms, clusters comprised of species of *Passerina* and of *Saltator*. The remaining species clustered differently with respect to these groups in the various phenograms. The author indicates that this raises the possibility of gradual rather than discontinuous variation in Cardinalinae.

Several *Saltator* species (*S. aurantiirostris*, *S. orenocensis*, and *S. atricollis*) rarely clustered with the other Saltators, however, prompting Hellack to suggest that these species may be misclassified, as Ridgway had done earlier (*Bull. U.S. Nat. Mus.*, **50,** pt. 1, 1901). Two pairs of the species analysed hybridize in the North American Great Plains. *Pheucticus ludovicianus* and *P. melanocephalus* clustered together almost universally in the phenograms, although their joint relationship to other *Pheucticus* sp. was not always the same. *Passerina cyanea* and *P. amoena*, however, showed no such consistency.

Hellack proposes one of the phenograms, in which all characters were used and size effects reduced by dividing measures by their species projections onto the first principal component (usually the most size-dominated component), as perhaps the "best" phenetic classifications produced. This study represents an enormous amount of numerical analysis and provides an outline for further analysis using other techniques to resolve the relationships of the species that did not cluster consistently with one of the two main groups.—Paul B. Hamel.

39. Covariation patterns in the postcranial skeleton of moas (Aves, Dinornithidae): A factor analytic study. J. Cracraft. 1976. *Paleobiology*, **2:** 166–173.—Cracraft made 42 measurements of 32 skeletons of eight species of the extinct moas, representing the genera *Dinornis*, *Emeus*, *Euryapteryx*, *Pachyornis*, and *Anomalopteryx*. Solutions of several factor analytic algorithms were compared in the paper. Small differences in magnitudes of the factor loadings resulted, but the major patterns of covariation were consistent across techniques. As is usual in such studies, factor 1 was a general size factor; factor 2, commonly a shape factor, was in this case most strongly related to widths of pelvis and long bones. Cracraft interpreted these factors as representing functional separation between body size itself and adaptations for support. Factor 3 was related primarily to sternum width, interpreted as involved with trunk support, somewhat independently of body size; further study will be required to elucidate the interpretation of this factor. Factor 4 was another size factor, but involved other variables than those which loaded most heavily on Factor 1. The patterns of variation uncovered by this study outline the differences in size and shape between the two subfamilies Dinornithinae and Anomalopteryginae. The study is of interest as it blends a functional morphologic viewpoint with multivariate statistical analysis.—Paul B. Hamel.

EVOLUTION AND GENETICS

(See also 6, 9)

40. Comparative ecology of Galapagos Ground Finches (*Geospiza*: Gould): Evaluation of the importance of floristic diversity and interspecific competition. I. Abbott, L. K. Abbott, and P. R. Grant. 1977. *Ecol. Monogr.*, **47:** 151–184.—Adaptive radiation in the six species of Galapagos Ground Finches has been explained as a consequence of interspecific competition ever since Darwin first described them. Lack's 1947 book ("Darwin's Finches." Cambridge Univ. Press) is the modern statement of this view. On the other hand Bowman (*Univ. Calif. Publ. Zool.* **58**, 1961) proposed an alternative hypothesis, that the current diversity resulted primarily from each species' relationship with its food supply (floristic and habitat diversity) rather than from its relationship with congeners. Abbott

et al. designed an elegant field study of the finches on seven islands to test the relative merits of these two arguments.

Field data were collected on feeding behavior, diet, physical characteristics of the food (especially seed hardness), bird morphology, plant distributions, plant phenology, floristics, and food availability. Analyses included interspecific comparisons of food preferences (% in diet vs. % available), degree of diet specialization, the relationships of morphology to diet and feeding efficiency, and zoogeographic isolation.

The results produced supporting evidence for both the competition hypothesis and the floristic hypothesis. Rather than assigning a greater relative importance to either, the authors concluded that interisland variations in vegetation (particularly seed and fruit diversity) led to the initial differentiation among allopatric *Geospiza* populations while competition increased later.—Douglas Mock.

41. Gene flow and local adaptation in a colonially nesting dimorphic bird: the Lesser Snow Goose (*Anser caerulescens caerulescens*). R. F. Rockwell and F. Cooke. 1977. *Amer. Nat.*, **111:** 91–97.—Females banded as nestlings at La Pérouse Bay, Manitoba, commonly return from the wintering grounds with unbanded males, whereas males banded at La Pérouse return more rarely. Therefore, differences in frequencies of white and blue morphs among colonies cannot be maintained by genetic isolation, because color-determination is not sex-linked. The differences may be maintained by the suggested tendency of birds to pair with mates of the same color. The data seem all to be taken from previous studies; this straightforward reasoning could have been mentioned in discussion instead of being imbedded in an unnecessarily discursive separate paper.—Jack P. Hailman.

FOOD AND FEEDING

(See also 27, 40)

42. Diet, feeding, and ecological relations of metabolism and thermoregulation in *Colius striatus*. (Regime, comportement alimentaire et regulation ecologique du metabolisme chez *Colius striatus*.) J. Decoux. 1976. *Terre et Vie*, **30**(3): 395–420. (In French with English summary.)—An aggregate of 1,500 hours covering three years of observations on a captive colony and in the wild at Makokou, Gabon, were analyzed. This amply detailed account of the Bar-breasted Coly is essential for any future consideration of this peculiar family. Their diet is mainly vegetarian: fruits in daytime, leaves and flowers in the evening. Geophagy was observed. Nestlings were fed by regurgitation. Adults swallowed feces, some of which were regurgitated to the nestlings. Estimated vitality was low, and of "incomplete thermoregulatory capacity, with considerable time spent sunning themselves." "Thinly feathered areas of the skin are darkly pigmented, and certain postures characteristic of sunning behavior allow for a maximum use of solar energy." Heat is evidently conserved at night by clinging to each other with their claws, which evidence an automatic gripping mechanism. Their unique features of behavior and physiology "seem to represent an adaptation to a diet poor in calories." And does this represent the usual situation for birds resorting to vegetarian life?—Leon Kelso.

SONG AND VOCALIZATIONS

(See also 15)

43. The functions of vocal duetting in some African birds. J. L. Harcus. 1977. *Z. Tierpsychol.*, **43:** 23–45.—This study concentrated on the Southern Boubou Shrike (*Laniarius ferrugineus*), Bokmakierie Shrike (*Telophorus zeylonus*), and Bar-throated Apalis (*Apalis thoracica*). Duetting became less common during the breeding season and more common when a potential predator was discovered, and it served to maintain contact between the permanently paired, long-lived birds living on year-round territories in habitats of thick vegetation in relatively stable environments.—Jack P. Hailman.

44. The functions of mimicry in the vocal behaviour of the Chorister Robin. J. L. Harcus. 1977. *Z. Tierpsychol.*, **44:** 178–193.—*Cossypha dichroa* is an African Robin-chat (Turdinae) in which the male commonly mimics some local species. Birds were monitored throughout the year, and playback experiments of their own and other species' vocali-

zations were performed within territories of various males. Chorister Robins may be recognized individually by their voices, but no evidence exists that other birds use this information. Sometimes in monitoring and commonly in playbacks, the robins mimetically matched vocalizations of another species. Not all local species were mimicked: instead of mimicking closest competitors, the robins appeared to mimic selectively loud songs that occurred during their own favored singing periods, including the mimetic vocalizations of other Chorister Robins. Harcus argues that mimicry does not function in interspecific territoriality but might serve to interfere with acoustical communication in other species. Avian mimicry is a complex phenomenon about which we still know far too little to propose a comprehensive understanding, but Harcus's suggestion of acoustical interference is a new twist, so far as I know, and it might prove useful to reinvestigate the Mockingbird (*Mimus polyglottos*) and other mimics in light of his suggestion.—Jack P. Hailman.

MISCELLANEOUS

45. Redpoll caught in hook-sedge. P. Child. 1977. *Notornis*, **24**(1): 58.—One *Carduelis flammea* required rescue from entanglement of its primaries in *Uncinia* sp. "After removal of the attached seeds the bird flew off quite vigorously." Previous accounts of avian capture in seeds of this plant genus are briefly noted.—Leon Kelso.

BOOKS AND MONOGRAPHS

46. The Sequence of Plumages and Moults of the Passerine Birds of New York. J. Dwight, Jr. 1900. *N.Y. Acad. Sci. Annals*, **13**(2): 73–360. (Reprinted in 1975 by Dover Publ., New York.)—The 1975 reprint is a photographic reproduction of the original book, to which have been added (1) an index to scientific and English names (both 1895 names and current ones), (2) a 3-page introduction by Kenneth Parkes, and (3) a photograph of the author, apparently taken at a funeral, about 25 years after publication. The first six chapters are devoted to a discussion of feather tracts, the process and sequence of molts, early plumages and molts of young birds, and the indoor and outdoor study of molt. Next follows a "classification" of molt, in which Dwight grouped the various passerine species into 10 classes depending upon the number and completeness of molts they undergo. Unfortunately, as pointed out by Parkes, this potentially useful classification has been shown by more recent studies to have so many inaccuracies and individual variations that it is best ignored.

The meat of the book, about one page per species, is a concise description for each species, organized under seven headings: Natal Down (frequently "No specimen seen"), Juvenal Plumage, First Winter Plumage, First Nuptial Plumage, Adult Winter Plumage, Adult Nuptial Plumage, and Female. Bill and foot color are given for many species, but seldom is eye color mentioned. No measurements or weights are included. Reproduction of the seven black-and-white plates is not as sharp as in the original.

Every serious bander of passerine birds in North America should have a personal copy of this book—not to follow as gospel, but as a well-organized starting point from which to study age and sex determination of birds. Dwight covers many good clues that have been overlooked by banders. However, lacking the opportunity to examine the same individual bird in different seasons and lacking access to a good series of winter specimens from the tropics, he reached a few incorrect conclusions. For example, Dwight credits the Cardinal with a "complete postjuvenal moult" (see Wiseman, *Bird-Banding*, **48:** 206–223), and he claims the female White-breasted Nuthatch "never" acquires enough black on the cap to be mistaken for a male, which is true in New York but not in Kentucky (see Mengel, *Ornithol. Monogr.*, **3:** 339, 1965).

This reviewer wishes that someone had bought a sheet of rub-on asterisks and applied them throughout the original copy of the book everywhere there is an erroneous statement or one that has frequent exceptions. Lacking this, banders should mark up their own copies freely and miss no opportunity to exchange plumage and molt notes with other banders and with the Bird Banding Laboratory.—Chandler S. Robbins.

47. Alberta Birds, 1961–1970, with Particular Reference to Migration. T. S. Sadler and M. T. Myers. Provincial Museum of Alberta, Natural History Section, Occas. Paper

No. 1, 314 p. $3.25.—This publication summarizes salient data on bird migration and distribution in a large Canadian province for a full decade. For each species the authors provide a general statement on past and current status, as well as a detailed list of records emphasizing migration dates, peaks of abundance, and unusual breeding records. Major weather events that may be presumed to affect bird distribution in this period (e.g., floods, droughts, prolonged cold) are outlined. A thorough bibliography is included.

This report, the first in a new series of publications, was designed "to permit rapid dissemination of information . . . [to] . . . interested specialists." Thus "normal production procedures" were bypassed and, except for the cover, the entire text has been reproduced by photo-offset from the original manuscript copy. The result is an attractive, useful, and inexpensive volume that will be of reference value to students of migration and Canadian birds.—J. R. Jehl, Jr.

48. Colored Canaries. G. B. R. Walker. 1977. New York, Arco Publ. Co. 139 p. $9.95.—This small book appears to be a gem for canary fanciers and breeders. It is, for example, beautifully illustrated with color photographs by Dennis Avon and Tony Tilford. The first several chapters are devoted to history of canary breeding, basic genetics, hybrids, and the main lipochrome varieties—Red Orange, Apricot, Dimorphics, Ivory, and the like. Most people with whom I have talked have never heard of "red" canaries; the redness is introduced into yellow canaries from the Black-hooded Red Siskin (*Spinus cucullatus*), a native of Venezuela and the Monas Islands. A multitude of controlled breeding crosses, described in this book, produces the many varieties—Apricot, Green, Agate, Opal, Satinette, Pearl, and others. Mechanics of breeding (cages, stock selection, molt) are also presented.

I found it especially interesting that canary breeders have never reached the goals of producing either blue or black canaries. Crosses with the Indigo Bunting (*Passerina cyanea*) have as yet been unsuccessful, as have crosses with the Bolivian Black Siskin (*Chrysomitris atrata*). Experimental crosses are being continued.

Those interested in breeding canaries will find this book to be quite useful and informative.—David W. Johnston.

49. Identification Guide to Cage and Aviary Birds. Michael Stringer. 1977. New York, Arco Publ. Co. 61 p. Illustrated by author. No price given.—This attractive little book contains information of limited use on purchasing birds, cages, aviaries, foods, breeding needs, and sicknesses and accidents. Most of the book is devoted to an identification guide (colored illustrations and a brief paragraph on miscellaneous needs) of some 80 kinds of birds from parrots to canaries, finches, mynah, quail, and a dove. Apparently the author's selection of species (for example only one kind of dove) was based upon commonness in captivity (in Great Britain?). Readers in the United States will be shocked to find therein our ("Virginian") Cardinal, Indigo Bunting, Lazuli Bunting, and Painted Bunting because they are protected here. Perhaps these species are imported from Central America into Great Britain. In a similar way, I wonder if it is legal to cage native British birds such as the Jay, Hawfinch, Linnet, Redpoll, European Goldfinch, and Chaffinch (all illustrated here) in Great Britain.—David W. Johnston.

50. Fly into Danger. Joan Phipson. 1977. New York, Atheneum. $6.95.

The Great Rat Island Adventure. Charlene Joy Talbot. 1977. New York, Atheneum. $7.95.

Spill. Chester Aaron. 1977. New York, Atheneum. $6.95.—These three books are adventure novels for teenage readers. In each, teenagers are involved to some extent with birds. In the first a young girl first learns of the lucrative trade in smuggling exotic birds, especially parrots, when she confronts two bird catchers on her father's ranch in Australia. A wildlife ranger tells her of the techniques used in smuggling the birds out of the country. A few days later the girl is flying to London to visit her mother. She suspects a couple of passengers to be smugglers, and the tension mounts as she attempts to find the birds.

In the second a boy is, reluctantly, to spend the summer with his ornithologist father on Great Rat Island, located off the eastern end of Long Island. His father and several graduate students (white, black, and female) are studying tern colonies, but the story focuses on the developing maturity of the boy as he handles increasing responsibilities and in fact unintentionally plays hero during a severe storm. Only the briefest mention

is made of the details of the terns' life history, bird banding, or the reasons for doing research on birds. A missed opportunity.

The third story concerns the efforts of a young girl, her family, the local community, the Audubon Ranch, and the Point Reyes Bird Observatory to clean up an oil spill from a tanker collision near the entrance of San Francisco Bay. The oil makes its way northward to the vicinity of Bolinas at the base of Point Reyes. The sweat, dirt, frustration, and near futility of unorganized clean-up projects (see rev. **28**) is well described. A subplot that runs through the story involves the girl's brother, once a budding biologist, who is drifting toward the drug crowd. Well, almost everything works out in the end. The birds, of course, do not make it.

These books reflect the trend toward "realism" in the arts. The parents in the first two books are separated or divorced, the children shuttling between them. The family in the third book is not separated but is confronted with a minor drug problem. Ornithology is integrated in the second book. Perhaps the attempt to depict the world as it is is the reason why those who have an interest in birds are not portrayed as aberrant human types. All of this social comment, however, only serves as background to these well-written, fast-moving adventure stories.—Bertram G. Murray, Jr.