RECENT LITERATURE

Edited by Bertram G. Murray, Jr.

BANDING AND LONGEVITY

1. Migration of nuthatches from Siberia. M. Ojanen and A. Ohtonen. 1977. *Suomen Luonto,* **36**(1): 14–15. (In Finnish with English summary.)—About 2,000 *Sitta europaea* were recorded for the fall-winter season of 1976–1977, the highest total since such invasions were first noted there in 1900.—Leon Kelso.

POPULATION DYNAMICS

2. Polycyclic breeding of songbirds in subalpine Tyan-Shan. (Politsiklchnost razmnozheniya pevchikh ptits v usloviyakh subvysokogogorya Tyan-Shanya.) A. Kovshar. 1977. *Zool. Zhurn.,* **56**(7): 1071–1076. (In Russian with English summary.)—The suspected occurrence of sequential clutches by paired adults was proven by systematic banding. From 1971 to 1975 in Zailiisk Alatau in Tyan-Shan at 2,300 to 2,800 m altitude, repeated nesting in 10 passerine species was observed, totaling 51 instances, including *Motacilla cinerea, M. personata, Troglodytes troglodytes, Phoenicurus erythronotus, P. caeruleocephalus, Calliope pectoralis, Phylloscopus inornatus, Prunella fulvescens, P. atrogularis, Mycerobas carnipes.* Three complete cycles in a season occurred in *Phylloscopus erythronotus* and *Prunella fulvescens.* In such cases the second cycle was reduced from 40 to 65 days to 33 to 36 days, requiring the feeding of the first brood during the rearing of the second, and of the second by a different adult, with a division of duties between male and female. Thus at least half of the subalpine species present hatched and reared two successive broods.—Leon Kelso.

3. The age structure of a breeding population of Tree Sparrows. (Die Alterstruktur der Brutpopulation des Feldsparlings, *Passer montanus* L.) F. Balat. 1975. *Zool. Listy,* **24**(2): 137–147. (In German with English and Russian summaries.)—From 1965 through 1973 3,322 young and 260 *Passer montanus* were banded at two stations in Moravia, Czechoslovakia. Ninety-two birds were recovered: 62% were yearlings; 29%, two-year-olds; 8%, three-year-olds; and none were over four years old. The low recovery rate for birds banded as nestlings (1.57%), as compared with those banded as adults (15.38%), was assigned simply to high mortality, but "The lowest mortality rate falls on the period between the first and second year of life." Also noted was the prevalence of either very close or very distant dispersal. The maximum dispersal distance was 39 km.—Leon Kelso.

NESTING AND REPRODUCTION

4. Reproductive success of Herring Gulls nesting on Brothers Island, Lake Ontario, in 1973. S. M. Teeple. 1977. *Can. Field-Nat.,* **91:** 148–158.—In 1973, Herring Gulls (*Larus argentatus*) nesting on Brothers Island, Lake Ontario, reared 0.06 to 0.18 chicks/pair, an exceptionally poor reproductive rate. Disease, human disturbance, and adverse weather cannot account for the low rate of success. Pollutants and pesticides are the remaining possibilities. No single component (*e.g.*, DDE, DDT, dieldrin, heptachlor epoxide, hexachlorobenzene or PCB's) was sufficiently concentrated to cause death, but the synergistic effect of several organochlorines may have been lethal. Furthermore, sublethal doses may have disrupted parental or chick behavior. Erratic incubation might account for many hatching failures, and many of the dead chicks were malnourished, suggesting failure of the parents to feed or of the chicks to beg. Relatively little is known about synergistic effects or behavioral changes associated with sublethal doses of organochlorine pesticides/pollutants.—Edward H. Burtt, Jr.

5. Brood size manipulations in Herring Gulls. G. T. Haymes and R. D. Morris. 1977. *Can. J. Zool.,* **55:** 1762–1766.—Brood sizes of Herring Gulls (*Larus argentatus*) on Lake Erie were manipulated to give samples of b/1 through b/5. Growth rates of chicks and chick weights at fledging were similar among all control and experimental broods, and chick survival was not reduced in the artificially enlarged broods. Haymes and Morris conclude that food was limiting neither the growth rate nor the fledging success of chicks

from broods larger than the modal clutch size and suggest the adults were using locally abundant artificial food sources, such as fish refuse, to supplement their natural diet.

I am skeptical as to whether these results mean what the authors say they do. Hussell (*Ecol. Monogr.*, **42:** 317–364, 1972) has heavily criticized the approach of this type of study some years ago, but his caveats go unnoticed here. Equally pertinent, the fine series of papers on Herring Gull chick growth by Parsons (*J. Anim. Ecol.*, **44:** 553–573, 1975, and references therein) is ignored. Parsons showed that Herring Gulls use brood reduction as a breeding strategy. This is sufficient to account for the results described here, leaving as the crucial question the cost of shedding the unwanted young to the parents. Without the answer to this question Haymes and Morris, on Hussell's arguments, are not entitled to their conclusions here.—Raymond J. O'Connor.

6. Incubation stages and nesting behavior of shorebirds. (Etapy inkubatsiii gnezdovoe povedenie kulikov.) A. Kondratev. 1977. *Zool. Zhurn.*, **56**(11): 1688–1675. (In Russian with English summary.)—Charadriiform species on the nest manifest certain sequences of responses. The Chukotsk tundra of northeastern Siberia afforded an especially favorable opportunity in the years 1972 to 1975 for a study of the following breeding species (per author's list and sequence): *Pluvialis squatarola, P. dominica, Charadrius hiaticula, Arenaria interpres, Phalaropus lobatus, P. fulicarius, Philomachus pugnax, Eurynorhynchus pygmaeus, Calidris temminckii, C. mauri, C. alpina, C. ptilocnemis, C. melanotos,* and *Limnodromus griseus.* This survey yielded 102,500 units of telemetric electronic recording tape covering 329 days of incubation. The nests recorded per species numbered 1 to 6, species' days of incubation, 2 to 52. Definite incubation stages were defined. First, from first egg to completion of the clutch, brooding is irregular, 2% to 55% of the day; egg temperature does not rise above 24°C; brooding depends on temperature and stress of raptor threat. Second stage, from completion of the clutch to hatching of the eggs, during which the incubation routine is stabilized and persists until onset of pulmonary respiration in the young and the start of their emergence from the shell. Despite a comparatively uniform system of biotopes, nesting behavior varied from a simple mating with equal participation of both partners (*Pluvialis squatarola, Calidris alpina*) to irregular groupings wherein one sex assumes no care of the young (*Phalaropus* and *Philomachus*). The author suggests that during egg laying eggs are warmed minimally to restrict too rapid embryo growth. Further, incubating birds involuntarily alter their occupancy with respect to weather and state of clutch, and thus they control to some extent the time of hatching. The period of hatching proper may be retarded or accelerated two or more days. Non-Russian work is reviewed and discussed, including that of Hildén, Höhn, Impekoven, Nisbet, Norton, Oppenheim, Parmelee, and Payne.—Leon Kelso.

7. First and second captive-bred generations of the Brazilian Owl. W. Grummit. 1974. *Internatl. Zoo Yearbook,* **14:** 97–98. For *Ciccaba hylophila* (or *Strix hylophila*), whose specific distinctness was yet unacknowledged 50 years ago, some data taken from living examples are given here. There are measurements of a male and female and four eggs.—Leon Kelso.

8. Occurrence of strange objects in nests of the Wryneck, *Jynx torquilla*. J. Terhivuo. 1977. *Ornis Fenn.* **54**(2): 66–72. (In English with Finnish summary.)—The tendency to carry strange objects into nests should be studied further in Finland and elsewhere. The rather comprehensive literature on the Wryneck in Central Europe yields little note of it. Is it more common in peripheral populations, or has it arisen more recently? "In a study of 41 nest boxes . . . the sample localities cover the Finnish range of the species fairly well. The samples included items brought to the nests by the Wrynecks, the majority with no nutritional value—pieces of glass, porcelain, plastic, bones, metal, eggshell fragments, shells and fragments of bivalves, and terrestrial snails, stones, etc. It is concluded that to find many of them the birds had to visit unusual feeding sites, and that in some cases they had shifted to novel food items, probably owing to a temporary food shortage. The only feature common to these objects seems to be their shiny surface. The presence of strange objects did not *appear* to affect the number of nestlings per brood, but the frequency of broods with one or more dead nestlings was higher . . . in nests containing such objects. Fourteen dead nestlings were dissected, and four of them (29%) had stones

or a piece of glass in their stomachs." In sum: nests without objects, 17; those with, 24. Total dead in nests with objects, 28; total dead in nests free of objects, 1. "It can be assumed that the parent birds are driven to search for food by their inner motivation (physiological state) and stimuli from the hungry nestlings, and that their subsequent behavior is triggered by stimuli from the food items, probably mostly visual."—Leon Kelso.

9. Breeding season and success in *Phoenicurus ochruros*. (Brutzeit und Bruterfolg des Hausrotschwanzes, *Phoenicurus ochruros*.) J. Havlin. 1976. *Zool. Listy*, **25**(4): 343–354. (In German with English and Russian summaries.)—In Czechoslovakia the breeding season of the Black Redstart, as defined by deposition of the first egg, lasts from the second decade of April to the first decade of July. Of the two regular broods a year, both may overlap in the third decade of May. The interval between the start of first and second clutches is about 40 days. Only 50% of the pairs breed twice a year. Here the average clutch was 4.9 eggs, the second but slightly smaller, with fledged young 0.3–0.5 fewer. The loss during breeding was about 26%. Production of breeding pairs was about 8 eggs per year, with 5.5 young fledged successfully. "When breeding ends the population increases nearly four times, i.e. from 2 to 7.5 individuals per breeding pair. The numbers are maintained at the same level if the annual mortality rate among adults and fledged young averages 73%."—Leon Kelso.

BEHAVIOR

10. Sociobiology of rape in Mallards (*Anas platyrhynchos*): responses of the mated male. D. P. Barash. 1977. *Science*, **197:** 788–789.—Rape is a great reproductive strategy if you happen to be the rapist, but what of the victim's mate? Sociobiological theory states that individuals behave so as to maximize the benefits and minimize the costs of any particular act. Rape of one's mate is a potential cost because the mate's offspring may be fathered by the rapist. What alternatives are adopted by the victim's mate?

Barash found that the female is usually defended by her mate when she is attacked by a single drake. If more than one drake attacks and rapes the female, her mate usually remains aloof. The chance of injury is too high for defense to be adaptive to him. However, following a successful gang rape the victim's mate frequently forces a copulation. Such forced copulations between mates are rare except after successful gang rape of the female. Evolutionarily the drake salvages a bad situation by providing his sperm a chance to compete for fertilization.—Edward H. Burtt, Jr.

11. Male response to apparent female adultery in the Mountain Bluebird (*Sialia currucoides*): an evolutionary interpretation. D. P. Barash. 1976. *Amer. Nat.*, **110:** 1097–1101.—To maximize inclusive fitness, males must avoid being cuckolded! At two different nest sites Barash placed a stuffed, male Mountain Bluebird within one meter of the nest. During nest-building the resident male threatened the stuffed intruder, but more importantly the resident male threatened and even attacked his mate. One of the two males drove away his first mate and obtained a new female with whom he successfully reared young. When the stuffed intruder was presented during incubation and again after hatching, it was vigorously threatened by the resident male which neither threatened nor attacked his mate. The eggs were laid, hence the intruder posed no threat to the resident male's paternity. Sociobiological theory accurately predicts such behavior and suggests intriguing possibilities for further research.–Edward H. Burtt, Jr.

12. Ontogeny and function of rank order in a sibling group of Greylag Geese (*Anser anser* L.). (Ontogenie und Funktion der Rangordnung innerhalb einer Geschwisterschar von Graugänsen.) S. Kalas. 1977. *Z. Tierpsychol.*, **45:** 174–198. (In German with English summary.)—Fighting and other agonistic behavior are described for five hand-reared goslings over several months.—Jack P. Hailman.

13. Aspects of woodcock nocturnal activity in southwestern Quebec. R. A. Wishart and J. R. Bider. 1977. *Can. Field-Nat.*, **91:** 141–147.—Although the American Woodcock (*Philohela minor*) has been frequently and intensively studied, many puzzles remain. Courtship activity wanes as summer progresses, reaches a low in late summer, and then increases again in September. The lull in courtship is correlated with the molt, but how long molting

individuals refrain from courtship or where they go is unknown. Migrants arrive in southwestern Quebec in September, but whether the migrants, the residents, or both account for the autumnal increase in courtship is unknown. Woodcock appear to roost in fields, but the advantage of roosting in open areas is unclear. Are the woodcock's predators nocturnal forest-dwellers? As not infrequently happens, close study of a species raises more questions than it answers.—Edward H. Burtt, Jr.

14. The social and spatial organization of winter communal roosting in Rooks (*Corvus frugilegus*). I. R. Swingland. 1977. *J. Zool., Lond.*, **182:** 509–528.—The distribution of roosting Rooks within and between a sample of four deciduous trees was examined in relation to climatic data and the behavior and physiology of Rooks in the laboratory. Birds congregated on the leeward side of the roost and on the leeward side of the trees used. The top parts of the trees received more wind, were warmer than positions lower down, and were dominated by adult birds. In colder weather the adults moved into the lower parts of the trees, forcing the younger birds into still lower positions, or, in some cases, out of the roost tree and into a less favorable part of the roost. In the laboratory within a single-age flock, the more dominant birds obtained the highest perches, forcing subordinate birds to roost on the ground. In mixed-age flocks adults dominated two-year-olds that in turn dominated one-year-olds. Laboratory experiments in a controlled climate chamber provided data on heat losses in response to changes in environmental conditions. Finally, adults shot at the roost had substantially greater fat reserves and moderately larger food reserves than had younger birds.

Swingland's data explain why it is that the younger Rooks suffer differential mortality in winter in the wild. By day they are dominated by adults on the feeding grounds, and thus arrive at the roost with reduced energy reserves, whereas at night they are forced into inferior roosting positions where they consume these lower reserves at a higher rate. Inevitably some starve. Unfortunately this paper has escaped some desirable editorial criticisms: the section on attendance of birds in relation to weather requires very close reading to distinguish between changes in percentage attendance and changes in percentage variance in attendance attributable to the regressions involved, and an interpretation of Table XI in the paper is beyond me.—Raymond J. O'Connor.

15. Mixed song, interspecific competition and hybridization in the Reed and Marsh Warblers (*Acrocephalus scirpaceus* and *palustris*.). F. Lemaire. 1977. *Behaviour*, **63:** 213–240.—Most of us who have spent a lot of time in the field and know typical songs of species reasonably well have at least occasionally heard one species sing more like another than like its own kind. Yet, real studies of this phenomenon are rare. Lemaire reviews the few analyses reported, including wrens (*Troglodytes* and *Thryomanes*), towhees (*Pipilo*), meadowlarks (*Sturnella*), and buntings (*Passerina*) in North America. The Reed Warbler of Europe is a virtual look-alike of the Marsh Warbler, and all the *Acrocephalus* warblers imitate other species to a certain extent (a point that Lemaire should have stressed). Three individual Reed Warblers were recorded and studied in detail: they intermixed Marsh Warbler song-snatches with their own and defended territories in mixed-species or pure Marsh Warbler areas. These Reed Warblers reacted to playbacks of both species' songs, and the Marsh Warblers reacted to playbacks of the mixed songs of the Reed Warblers. Individuals with normal songs (either species) did not react to the other species' song. One of these mixed-song Reed Warblers mated with a female Marsh Warbler in eastern Belgium in 1975, but both parents abandoned the six-day-old nestlings. It seems likely that these mixed-song Reed Warblers learned their Marsh Warbler phrases from neighboring birds during the post-fledging period. We need more studies like this one in order to understand properly the effectiveness and imperfections in ethological reproductive isolating mechanisms.—Jack P. Hailman.

16. Experimental investigations on the function of mouth markings in nestlings of the Zebra Finch. (Experimentelle Untersuchungen zur Bedeutung der Rachenzeichnung junger Zebrafinken.) K. Immelmann, A. Piltz and R. Sossinka. 1977. *Z. Tierpsychol.*, **45:** 210–218. (In German with English summary.)—Like other estrildid finches, the nestlings of *Taeniopygia guttata castanotis* have particular markings on the gape that are generally supposed to be optical signals eliciting feeding responses of the parents. The authors

reared wild-type and albino Zebra Finches in mixed-sib groups given to both wild-type and albino foster parents. The wild-type nestlings survived better, grew faster, were fed first in the day and so on. This is a nice experiment, but it may fall short of securing the conclusion that the gape-markings are responsible for the wild-type's greater success. Albinos of all species studied well are less viable than wild-types, and in some species such as the domestic cat (*Felis domesticus*) albinism is lethal. I think the experiments of Immelmann et al. need to be followed-up with further studies in which the gape-markings are obscured in wild-type nestlings and gape-markings are painted onto albino birds.—Jack P. Hailman.

17. Effects of cross-fostering on the sexual imprinting of the female Zebra Finch *Taeniopygia guttata*. P. Sonnemann and S. Sjölander. 1977. *Z. Tierpsychol.*, **45:** 337–348.—This is an excellent study of sexual imprinting using Bengalese Finches (*Lonchura striata*) as the foster species. In the first of two experiments 24 Zebra Finch females were reared by Bengalese foster parents and given a choice of one male from each of the two species (genetic and foster). Here are the kinds of things that make this study so good: (a) not one, but 20 different testing sessions were conducted on each female, using a given stimulus male not more than twice and then only in well-spaced trials; (b) not one, but five different behavioral patterns of the female were measured; and (c) the male stimulus birds of both species were reared by Zebra Finches so that both species of males would court the experimental females. The results reward such careful experimentation with clear-cut differences between controls reared by their own species and experimentals. All control Zebra Finch females prefer their own species in all behavioral measures, whereas foster-reared females show essentially no preference. (Actually, some prefer Zebra Finch males, others prefer Bengalese Finch males and still others are like the group mean in making no clear-cut preference.) My only complaint is the one I have frequently voiced in these reviews: the control group was small (seven birds) compared with the experimentals (24 birds). At the expense of sounding like a broken record, I reiterate that the logically important aspect of the data is always the *difference* between the controls and experimentals, so there is no good reason for having different sample sizes in the two groups. The second experiment was similar to the first, but involved multiple-choice testing, with similar results (20 experimental and 10 control females). All in all this is another fine study from the laboratory of Klaus Immelmann, who is emerging as Germany's outstanding ethologist.—Jack. P. Hailman.

18. Social organization and mating success in local song populations of Village Indigobirds, *Vidua chalybeata*. R. B. Payne and K. Payne. 1977. *Z. Tierpsychol.*, **45:** 113–175.—The mating system might be called a proto-lek, with individual males singing from trees usually spaced at least 100 m apart and females visiting a number of males within one neighborhood before returning to copulate with only one or a few of them. Each neighborhood of males is characterized by a song dialect and over the course of this four-year study one dialect population crashed from 15 to only one male, whereas other populations maintained initial levels even though all the initial males had been replaced. Despite turn-over of males, the trees used as calling sites and the dialects of vocalizations persisted. One male in a local population of a couple of dozen may account for half the copulations and a few males may account for nearly 90% of copulations. Females appear to choose males primarily by song and perhaps secondarily on the basis of resources around the calling sites. There is a long and useful general discussion of female choice, sexual selection, evolution of leks and related issues. This is clearly an outstanding study.—Jack P. Hailman.

ECOLOGY

19. Perennial population dynamics of wintering corvids in the north Lower-Volga. (Mnogoletnyaya dinamika chislennosti zimuyushchei populyatsii voronovykh ptits v severnoi chasti nizhnego povolzhya.) S. Varshavskii. 1977. *Byull. Mosk. Obshch. Ispyt. Prir., Otd. Biol.*, **82**(5): 51–57. (In Russian with English summary.)—The totals of Hooded Crows (*Corvus corone*), Jackdaws (*C. monedula*), and Rooks (*C. frugilegus*) wintering in the above area from 1960 to 1977 fluctuated in close correlation to snowfall. The first species varied from 1,000 to 26,000, the second, 1,500 to 29,000, and the third, 250 to 520 per annum.—Leon Kelso.

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

20. Do plane landing lights attract or scare off birds at night? (Privlekaet ili otpugivaet ptits nochyu svet posadochnykh far samoleta?) V. Yakobi. 1978. *Z. Zhurn.*, **57**(2): 304–306. (In Russian with English summary.)—Facts, figures, and cited authorities suggest that many birds are attracted and perhaps confused by landing lights at airports. Depending upon area and position on the plane, landing lights have a likelihood of 1% damage to themselves by bird strikes at night; in actuality it has been 15%. "The landing lights of the planes at night appear to attract birds. Therefore the recommendation to switch on plane landing lights at night is evidently unwise."—Leon Kelso.

CONSERVATION AND ENVIRONMENTAL QUALITY

21. Sensitivity of the House Martin, *Delichon urbica*, to fluoride emissions. J. Newman. 1977. *Fluoride*, **10**(2): 73–76.—The occurrence of the House Martin around some aluminum plants stimulated this inquiry. In areas where atmospheric fluoride concentration was within the range of 0 to 30 and 60 to 100 mkg/m^3 its median population frequency was 33 times higher than in areas of yet higher fluoride concentration, i.e., above 100 mkg/m^3.—Leon Kelso.

PHYSIOLOGY

22. Avian eggs: thermoregulatory value of very high near-infrared reflectance. G. S. Bakken, V. C. Vanderbilt, W. A. Buttemer, and W. R. Dawson. 1978. *Science*, **200:** 321–323.—Spectra from a wide variety of avian eggs all show very high reflectance in the near infrared despite evident differences within the visible portion of the spectrum. Thus pigmentation for concealment from predators, which requires absorption of visible radiation with consequent heating of the egg, is possible because invisible radiation is highly reflected. Such sharp distinction between visible and IR reflectance does not occur in feathers, but is known from plant leaves, which encounter the same opposing needs of absorbing visible light (for photosynthesis) and rejecting IR in order to prevent overheating.—Jack P. Hailman.

23. Energy expenditure of the Black-billed Capercaillie in winter foraging. (O kolichestve energii zatrachivaemoi kamennym glukharem na dobyvanie korma.) A. Andreev. 1975. *Ekologiya*, **1975**(6): 90–92. (In Russian.)—A rival of the common Capercaillie in size, this species (*Tetrao urogalloides*) of northeastern Siberia feeds mostly on larch twigs in winter. The energy expended for clipping twigs, calculated as 0.003 to 0.004% of the daily "budget" or 0.95 kcal per gram per degree warmed, was small compared with the heat required to warm 45 g wet weight of crop twig contents; i.e., to elevate this from −40° to +40°C. This requirement was calculated to be 5 to 7% of the daily body energy budget. The number of individual grouse available for these analyses, five, was rather few.—Leon Kelso.

24. Temperature regulation in the Dusky Munia, *Lonchura fuscans* (Cassin) (Estrildidae). W. W. Weathers. 1977. *Austral. J. Zool.*, **25:** 193–199.—Body temperatures, oxygen consumption, and evaporative water loss rates were measured at night in adult munias in Borneo. Body temperatures were variable between individuals. Body temperatures varied with ambient temperature, increasing with T_A to a maximum of 44.1°C at an ambient of 43.8°C. The SMRs averaged 1.87 ml O_2/g-hr, only 51% of the value predicted for passerines of comparable size. Literature data showed other tropical species to have lower than predicted SMRs, averaging 67% of predicted levels. The rate of metabolism at ambient temperatures below thermoneutrality was also lower in munias than predicted, the 19% reduction indicating unusually good insulation. Evaporative water loss rates were high (7.68 mg/g-hr) but showed little capacity to increase at high ambient temperatures. Fat levels were low, thus precluding lipid content as an explanation of the low weight-specific metabolism.

Weathers points out that heat and aridity are quite separate selective factors in adapting to hot climates, a point to be borne in mind in future studies of hot climate physiology.—Raymond J. O'Connor.

25. Constant light: effects on the circadian locomotor rhythm in the House Sparrow. S. Binkley. 1976. *Physiol. Zool.*, **50:** 170–181.—Perch hopping activity in caged House Sparrows (*Passer domesticus*) followed well-defined circadian rhythms entrained by 24-hr light-dark cycles. Exposure to constant light induced arhythmicity in some or most of the birds, increasing with light intensity. Placing such arhythmic birds in constant darkness induced endogenous rhythmicity in hopping, phased to the light-to-dark transition as "dusk." On long photoperiods activity continued to "lights-out." On short (below 8 hr) photoperiods activity was set to coincide with "dawn." These data possibly reflect the 8 to 10 hr insensitive period found in the phase response curve of the birds. When the phase of a 24-hr LD cycle was abruptly shifted by 6 or 12 hr, adaptation to the new cycle was faster if it was the light period rather than the dark period that was shifted.—Raymond J. O'Connor.

26. Avian external respiration. (Vneshnee dykhanie ptits.) G. Chernova and V. Safonov. 1975. *Biol. Nauki*, **1975**(11): 21–36. (In Russian.)—The fine and varied structures that ultramodern techniques have revealed in the avian eye might convince one that this sense organ had been developed to the most complex and complicated extent. Illustrations, micrographs, and descriptions of birds' auditory analyzer could lead one to regard that as the most "highly" developed biological system. Not so complex apparently would seem the avian lungs, which up to recent years have had a little less scrutiny. Yet the "information explosion" so often referred to has not ignored them, in fact but little less than other mechanisms, as one may see from inspection of the 88 bibliographic titles accompanying this review article. Respiration mechanics involves all the other functions of the vertebrate body, particularly in birds since they penetrate virtually all parts of it. Investigations through the approaches of biophysics, biochemistry, and biomechanics have been almost obligatory. The surprising details that have been elaborated have come within the past 10 years, largely reported in *Respiration Physiology*, a luxuriously printed and illustrated journal.

A thorough analysis here would recapitulate the whole summary. Emphasis is directed to contrasts between bird and mammal respiration. A dual pulmonary system is defined: paleopulmo and neopulmo. Air passages are largely parallel rather than dichotomous. Lung surface total is less than that of mammals, and lung walls are scarcely or not at all distensible. Air flow theoretically proceeds unidirectionally, mouth into air sacs, thence laterally and forward through lungs, caudo-cranial, during both inspiration and expiration. Respiratory action proceeds by contraction of a variety of muscles, the relative operation of which in respiration has conflicting opinions. Yet there is general agreement that intake of air occurs at all phases, at both up and down stroke of the wings. Trenchant new advances date from Zeuthen (Ventilation of the respiratory tract in birds, *Kol. Danske Vidensk Selskhol. Biol. Medd.*, **17:** 1–50, 1943). Special structures discussed are: mesobronchi, secondary bronchi, ventral, dorsal and lateral, vestibuli and mesobronchs; ventral and dorsal bronchi are connected by parabronchs, approximately parallel. From parabronchs extend tubules terminating in capillaries, air conductive, and contacting blood capillaries. Here occurs oxygen and CO_2 exchange. Compared with mammals, again, birds manifest extremely labile body temperature. One unexplained paradox is that in air a duck dies if breathing is blocked for 7 minutes, while under water, it may survive 20 minutes.

How much this complication of structure and operation may contribute to buoyancy and duration of bird flight is not discussed. It is suggested that further study may be of consequence for future human interplanetary flight.—Leon Kelso.

MORPHOLOGY AND ANATOMY

27. The walk of the Silver Gull (*Larus novaehollandiae*) and of other birds. A. I. Dagy. 1977. *J. Zool., Lond.*, **182:** 529–540.—Dagy analyzes filmed sequences of walking in Silver Gull and other Australian species, principally with respect to the movement of the tibiotarsus-tarsometatarsus joint. In most species the leg was bent slightly in the mid-stance phase (when it is supporting the bird during the stride); this bending was absent in the Ostrich (*Struthio camelus*), Emu (*Dromaius novae-hollandiae*), Rhea (*Rhea americana*), and Flamingo (*Phoenicopterus ruber*). Larger species tended to have longer step intervals. Hopping is judged an economical gait for small birds and for those using bushes a lot, whereas walking is a better gait for larger species.

This is essentially a descriptive paper, lacking the detailed analyses it would have received at the hands of a McNeil Alexander.—Raymond J. O'Connor.

28. The origin of domestic fowl. A skeletal comparison of the domestic and wild. (K. probleme proiskhozhdeniya domashnikh kur. Sravnenie skeletov domashnikh i bankivskoi kur.) E. Kurochkin and S. Anorova. 1977. *Zool. Zhurn.,* **56**(10): 1511–1520. (In Russian with English summary.)—Remnants of genus *Gallus* were recently unearthed from the paleolithic and neolithic of Ukraine, Moldavia, and Georgia, leading to a critical reexamination of Darwin's theory of fowl domestication. A detailed comparison of skeletons of *Gallus gallus jabouillei* with those of the domestic leghorn and bantam varieties revealed a marked uniformity. Main distinctions were in the sternum and pelvis. Such skeletal differences that occur "can be accounted for from the functional viewpoint." Certain bone surfaces, ridges, tuberosities, and fossae are more prominent in the domestic forms.—Leon Kelso.

PLUMAGES AND MOLTS

29. Some features of photoperiodic regulation of seasonal phenomena in pigeons and doves. (Hekotorye Osobennosti fotoperiodicheskoi regulyatsii sezonnykh yavlenye u golubei i gorlits.) G. Noskov and A. Kotov. 1976. *Vest. Leningrad. Univ., Ser. Biol.,* **1976**(21): 39–46. (In Russian with English summary.)—Reproduction in sedentary feral Pigeons (*Columba livia*) remains normal at daylengths of 9 or more hours. Nuptial behavior and egglaying may persist during shorter days but normal incubaton and hatching do not follow. The molt proceeds more rapidly in 8 to 12 hours daylight. In the nomadic, quasi-migratory *Columba oenas* the fall molt is periodically responsive when daylengths shorten to 7.5 to 8 hours. Later winter molt is more rapid under 12 hr daylight than under 8 hr periods. For the migratory *Streptopelia orientalis* nuptial activity may initiate on 13 hr daylengths interrupting the molt. Fall molt was not controlled by photoperiods, whereas winter molt rate markedly increased on shorter days of 7 to 8 hrs daylight.—Leon Kelso.

ZOOGEOGRAPHY AND DISTRIBUTION

30. Nesting of the Whiskered Tern in Western Ukraine. (O gnezdovanii krachki beloshchekoi [*Chlidonias hybrida* Pall.] na zapade YSSR.) V. Talosh. 1977. *Vestnik Zool.,* **1977**(4): 83–86. (In Russian.)—Formerly a rare migrant, the Whiskered Tern is now nesting sporadically in the Ukraine, Hungary, and Slovakia. Most of the nests examined occurred in Black Tern colonies. Five of eight nests contained three eggs each.—Leon Kelso.

31. Increase in overwintering by the American Goldfinch *Carduelis tristis*, in Ontario. A. L. A. Middleton. 1977. *Can. Field-Nat.,* **91:** 165–172.—Goldfinches became increasingly common winter residents during the mild winters of the 1950's and early 1960's, and the increase in urban and suburban feeding stations has sustained the overwintering population, despite the recent return to harsher winter conditions.—Edward H. Burtt, Jr.

SYSTEMATICS AND PALEONTOLOGY

(See also 28)

32. Occurrence and independent evolution of bilateral ear asymmetry in owls and implications on owl taxonomy. R. A. Norberg. 1977. *Philos. Trans., Roy. Soc. London, Ser. B, Biol. Sci.,* **280**(973): 375–408.—On published and personal research a detailed examination of structure and asymmetry of the outer ears of 16 species of owls is reported. The external ears of three species (*Rhinoptynx clamator, Asio capensis, Pseudoscops grammicus*) are described for the first time. This structure in *Rhinoptynx* and *Pseudoscops* is similar to that of *Asio otus,* which indicates the close affinity of these genera. The evolution of the asymmetry of the outer ear is described. There are at least five distinct lines corresponding to the genera: (1) *Tyto*, (2) *Phodilus*, (3) *Bubo, Ciccaba*, and *Strix*, (4) *Rhinoptynx*, *Asio*, and *Pseudoscops*, and (5) *Aegolius*. It is shown that asymmetry serves as a basis for vertically oriented sensitivity to high sonar frequencies. Vertical localization is based on binaural comparison of intensities and sonar spectra. Based on this comparative analysis of the

outer ear the division of the owl family into Buboninae and Striginae is abandoned.—Leon Kelso.

EVOLUTION AND GENETICS

33. The Emperor Penguins: a strategy to live and breed in the cold. Y. Le Maho. 1977. *Am. Sci.*, **65:** 680–693.—The male Emperor Penguin (*Aptenodytes forsteri*) is a remarkable bird. Imagine standing for 95 days without food on the Antarctic ice in temperatures as low as −48°C with winds of 40 m/sec ruffling your feathers and all the while balancing an egg on your toes. He accomplishes this feat by a combination of physiological, morphological, and behavioral adaptations.

Physiological adaptations include a lower critical temperature (environmental temperature at which the body temperature can no longer be maintained by the basal metabolic rate) of −10°C, the lowest known lower critical temperature. Countercurrent heat exchange occurs at the proximal ends of all appendages. A male penguin that weighs 37.5 kg has about 10 kg of fat, the most efficient fuel possible. Furthermore, circumstantial evidence suggests that Emperor Penguins lower their basal metabolic rate during fasting thereby stretching their fat reserves. Curiously the insulative properties of penguins are only moderately good.

Morphological adaptations include the large, egg-shaped body and small appendages that minimize the surface-to-volume ratio. Feathers grow all over the body, not just in feather tracts, and the feathers have a remarkably stiff rachis and overlap like shingles making the plumage very resistant to ruffling from the wind.

Behavioral adaptations include reduced activity so that energy expenditure can be reduced to the basal metabolic rate. While incubating, the male rests on his intratarsal joints and tail with the toes covered by the abdominal feathers. Under severe conditions an isolated penguin may lie down exposing less surface to the air and putting himself near the ground where wind speeds are minimal. Huddling in which 500 to 6,000 birds mass together at densities as high as 10 birds/m^2 reduces daily weight loss 25 to 50%. Birds unable to huddle, but able to use all other energy-saving tactics are unable to fast more than 60 days.

Le Maho's study is fascinating, comprehensive, provocative, and well illustrated. I heartily recommend it to all biologists or anyone in search of an amazing tale.—Edward H. Burtt, Jr.

FOOD AND FEEDING

34. Food and feeding behavior of a captive Costa Rican Least Pigmy Owl, *Glaucidium minutissimum rarum* Griscom. (Aves, Strigidae). D. Janzen and C. Pond. 1976. *Brenesia,* **1976**(9): 71–80.—"A captive nearly mature least pigmy owl *Glaucidium minutissimum rarum* Griscom from Limon Province was found to eat a very wide variety of animals and animal parts. When capturing prey or taking food she always closed her eyes shortly before contacting the food, apparently to avoid eye damage; she had the ability to regurgitate pellets of indigestible material in the order in which it was consumed. With the exception of sea turtle meat, meat from vertebrates was accepted readily; she ate worms, crustaceans and a leech but rejected whole or fragmented scorpions. Cryptic orthopterans and other cryptic insects were readily eaten, and many aposematic romaleinid grasshoppers were consumed, and cryptic walking sticks and some moths were rejected." From authors' summary.—Leon Kelso.

35. Features of Whinchat and Stonechat ecology in the middle Dneiper drainage. (Osobennosti ekologii chekanov v usloviyakh osushennykh ploshadei srednego pridneprvya.) V. Kuzmenko. 1977. *Vest. Zool.*, **1977**(4) 34–37. (In Russian.)—Perennial grass and hay stubble are the preferred biotopes of *Saxicola rubetra* and *S. torquata* in late stage Dneiper drainage. This study was favored by food diet analyses of 14 stomachs of the former and 6 of the latter species. The food was 98% insects. Beetles totaled 70% for *S. rubetra* and 77% for *S. torquata* diets. In the former, carabeid beetles, 26 species, prevailed, in the latter, 9 species. In the insect diet for both species as a whole, phytophages totaled 40%; pantophages, 36%; carnivores, 13%; and saprophages, 7%.—Leon Kelso.

SONG AND VOCALIZATIONS

36. Sounds in the behavior of the Black Tern. (Zvuki v pobedenii chernoi krachki, *Chlidonias nigra* [L.]) I. Nikolskii. 1977. *Vestnik Mosk. Univ., ser. biol.,* **1977**(4): 83–86. (In Russian with English summary.)—Five distinct calls of the Black Tern were defined and portrayed with oscillograms at a colony on Engure Lake in Latvia. The terns were associated with a colony of *Sterna hirundo* and *Larus minutus.* As compared with *S. hirundo* its calls were demonstrably less piercing and more "tonal" and "harmonic," and it manifested two distinct "aggressive" calls rather than the five recorded for *S. hirundo.* In this the author notes a greater passivity of the species evident in some physical dominance by the latter.—Leon Kelso.

37. Early phase development acoustic signaling in birds of family Corvidae. (Rannie etapy razvitiya zvukovoi signalizatsii ptits semeistva Corvidae.) V. Korbut. 1977. *Z. Zhurn.,* **56**(9): 1357–1365. (In Russian with English summary.)—Using advanced electronic equipment, including oscillograms, vocal development in embryo and during the first day after hatching is discussed and analyzed. Main concern is the development of signals and maturation of structure and function. The species included *Corvus corone, C. monedula, C. frugilegus,* and *Pica pica.* Development progressed from the most primitive sounds linked with hunger and respiratory stimuli to patterns characteristic of the individual species. The sounds emitted by the various species were found to be similar in principle, however they seem to the human ear. The "clicking" sounds in the embryo stage, the subject of various papers, the author regards not as a primitive evolutionary stage in development but as an artifact of respiration, which fades as the latter is stabilized.—Leon Kelso.

38. A comparative study of the songs and alarm calls of some *Parus* species. W. Latimer. 1977. *Z. Tierpsychol.,* **45:** 414–433.— Territorial songs are species-specific in areas of sympatry, although song is variable within most species. In calls, information appears to be encoded by differences in modulation rate and carrier frequency, and there is marked convergence of calls among species whose ranges overlap.—Jack P. Hailman.

BOOKS AND MONOGRAPHS

39. The California Quail. A. Starker Leopold. 1977. University of California Press. 281 p. $14.95.—This book was a joy to read, being packed full of information on the species and written in readable style. The author says in his preface, "this volume is the cumulative product of many people," i.e., six Ph.D. dissertations and at least one recent M.S. thesis which appears as Appendix C. The author's acquaintance with Ian McMillan and Ray Conway has added to the part on management. Other persons assembled information, such as the use of quail by the California Indians. The colored frontispiece and numerous line drawings by Gene M. Christman, and the well-drawn maps, and selected photos add to the book's value and enjoyment.

The body of the text is separated into three parts: The bird and its history, natural history, and quail management. This is followed by an epilogue, Appendices A, B, and C, and an extensive bibliography. I can find little fault with the book, resorting in review to only a few omissions. It would perhaps have been well for the author to include John Hubbard's remarks about the possible evolution of the five species of western quail (*Living Bird,* **12:** 175, 1973), Bartholomew and MacMillen's paper on water economy (*Auk,* **75:** 150–156, 1961), and Crispen's "Bibliography of Quails and Partridges of North America" (Univ. Washington Press, 1960).

Especially stimulating are the parts on the history of population changes, from first impact of man to recent management projects. The pattern of presettlement stage, settlement and crude agriculture, and the era of agricultural intensification, as described by the author's father, Aldo Leopold, affecting the Bobwhite in the northcentral states, was repeated by the California Quail in the central valley of California.

The part dealing with rainfall and reproductive success is also particularly interesting and well done. Michael J. Erwin's research, under the author's direction, was fortunately conducted during a two-year period that included a dry and a wet year, 1972 and 1973. Erwin showed that recrudescence and regression of quail testes and ovaries are considerably different in timing in dry and wet years and that the progress of molt follows these

different patterns. He presented evidence that strongly suggests that during a wet year it is not the green leaves but the seeds of early flowering legumes providing the stimulus for sustained breeding. He also showed that phytoestrogens are produced in leaves of stunted desert annuals in a dry year; when ingested by quail, these inhibit reproduction, preventing overpopulation in a poor year. Forbs (mostly legumes) in wet years grow vigorously and phytoestrogenic substances are largely absent. Quail then breed prolifically, and the abundant seed crop carries the enlarged population through the winter.

This is an excellent little book, beautifully organized and illustrated, and admirably completing what the author set out to accomplish: To write a volume that would serve as a stimulus and a guide to the preservation and management of the California Quail.—Stephen W. Eaton.

40. Concentrations of Radioisotopes by Animals and Their Effect on Populations. (Kontsentrirovanie zhivotnimi radioizotopov i ikh vliyanie na populyatsiyu.) A. Ilenko. 1974. "Nauka" Press, Moscow. 168 p. (In Russian.) (Price uncertain).—This is a summary of presumably all the available published material, plus some original research, on the cumulative effects and correlations of radioactive isotope radiation levels in the environment of animals. Strontium-90 and Cesium-137, or radioactive wastes thereof, are chief elements receiving attention. And while the subject is animals in general, most of the available research data and studies pertain to mammals, about 45 species in the wild, and the usual laboratory white mice and rats. About 540 bibliography titles and other research yield sparse and inconclusive data for birds and do not add to information reviewed by F. J. Turcek in "Birds as Biological Indicators" (Rev. 67, *Bird-Banding*, **43**(4): 304, 1972). There is concern in defining the relative lethal dose for experimental work, i.e., the amount of gamma radiation necessary to induce 50% mortality in a test species in 30 days. In one test this was worked out for 10 species of waterfowl and about 42 species of mammals. The few conclusions expressed are tentative. There is a problem of radioactive resistance: for mammals this tends to be higher in arid areas. For birds and mammals "sensitivity" (responsiveness?) tends to decline with age. For vertebrates in locales with rising soil content of natural radioactive elements weaker resistance has been noted to parasite infection. Infection rates by ixodid and gamasid mites 1 to 3 times higher have been found in such situations. There is discussion of radioactive sensitivity as related to geography, climate, and altitude. There are also comments relative to taxonomic groups, and individual sensitivity as related to sex and season. The five chapters of text include: Ratios of accumulation of radioactive isotopes in animal organs and populations; Some physiological features of animals determining accumulations; Migration of radioactive isotopes along food chains; Features of population existence in biotopes contaminated with Strontium-90; and Animal adaptations to rising levels of natural and artificial ionizing radiation as abiotic factors in the habitat. A main conclusion of the research reported here is that animals' capacity to accommodate to the current increase in radioactive isotope waste has not been proven.—Leon Kelso.

41. Letters from North America. John (Janos) Xantus. 1975. Translated and edited by T. Schoenman and H. Schoenman. Detroit, Wayne State University Press. Illustrated by the author. 198 p. Price $12.95.

Travels in Southern California. J. Xantus. 1976. As above. Detroit, Wayne State University Press. Price $12.95.—There is a scarcity of autobiographical books about pioneer bird collectors. With the general plethora of new volumes some items of such may be ignored. The readability of these handsomely produced translations would have one wonder if that is because of the skill of the translators or the excellence of the original writing. Xantus's father was an official on a nobleman's estate in Hungary. Himself a jurist, Xantus was drawn by the tumult of his times into a military career. He was arrested as a suspected subversive, escaped, and by way of Hamburg and London arrived in America in 1851. Ten years later he returned to Hungary, then back to the U.S., and a final trip to Hungary in 1864. He became director of the zoological garden in Budapest, and until his death in 1894, a curator in the Hungarian National Museum. In America, he, like other immigrants, engaged in various occupations, including farming, surveying, teaching, and U. S. Army service. He was privileged to observe America from the Atlantic

to Oregon and Lower California. He studied and commented on Indian life and Nature. With no medical degree he rose to rank of Assistant Surgeon-General of the U. S. Army, and later he was U. S. Consul in Manzanillo, Mexico. The America he knew was opportunistic, optimistic, untrammeled, prosperous, and above all, free. These volumes, published in Budapest in Hungarian in 1857 and 1860, well illustrated by himself and extremely readable, fascinated his compatriots. The editors who prepared these two books deserve high praise for the translation, the editing, and general presentation as does the institution that published them. A sample of Xantus's writing: "(somewhere in southeastern Colorado) I have heard from many Indians that in the autumn, just before the first cold storm all the inhabitants of the 'dog city' can be seen busy as bees, gathering twigs, thick weeds, and dirt, and sealing the entrances in spite of the biting cold, although this is usually followed by nice warm weather. This is the Indian's infallible barometer .... It is worth mentioning the curious fact that a species of small owl is their inseparable cohabitant. One can see these owls in numbers almost as large sitting in front of the entrances when the dogs are away, and on the top of the mounds when the dog family is in its chambers. Why this friendship between owl and dog? I have never been able to discover the reason, although I have examined every possible basis of common interest."—Leon Kelso.

42. The Buzzard. C. R. Tubbs. 1974. North Pomfret, Vermont, and West Vancouver, Canada, David and Charles, 199 p.—"The image of the Buzzard emerging repeatedly from older literature is of an idle and cowardly bird, dependent for a living on whatever small and defenseless creatures it can catch unawares, and much given to idle soaring." The author further declares: "This book seeks to describe the history and ecology of the buzzard in Britain. British buzzards belong to the nominate race, *Buteo buteo buteo,* of a species which breeds across the Palearctic region from Western Europe to Japan." If the two chapters on the history of the species seem to form a disproportionately large part of a mainly biological book, it is because its history explains much about its present status. "It is a part of our own social history and as such is worth the telling," he says. The author's study was concentrated in New Forest, in Hampshire, from 1962 to 1971. The main foci of interest were the monitoring of territory size and reproductive success, and determination of factors controlling these. The author's affinity to this background may explain the facility in writing and readability of the book, for who can handle his language as well as a native Britisher? With its convenient size and well-illustrated makeup it is a good buy. The chapters: The Buzzard (generalities); Decline (1600–1914); Recovery (1915–1971); Social behavior; Breeding biology; Population ecology; Appendix: scientific names in text; Notes and references. This largely covers the abundant literature that has accumulated on the species.—Leon Kelso.

43. Owned by an Eagle. G. Summers. 1976. Glasgow, W. Collins Sons & Col., and New York, Dutton. Illus. 223 p. Price about $9.00.—The bird concerned is a Golden Eagle (*Aquila chrysaetos*) which for 16 years before this publication had succeeded in tapping the wells of human kindness of the author. It inspired him and his associates into studying eagles and other raptors, some rare and from remote areas. A prolixity of incidents is related. There is much information for humans interested in the care of such species. Deserving special mention are the line drawings by Eva Hulsmann.—Leon Kelso.

44. A Bird Watcher's Adventures in Tropical America. Alexander F. Skutch. 1977. Austin, Univ. Texas Press. 327 p. $13.95.—In his lifetime Alexander Skutch has had many ornithological adventures in areas far beyond his Costa Rican farm. In this well written popular book he shares his experiences. Thirteen chapters include three types of essays: travelogues, discussions of avian families, and topics of tropical bird biology. To be sure there is a welcomed mix of topics in each chapter, but the essay categories I have outlined provide a fair summary of contents. The travelogue chapters take us through small parts of Mexico, Guatemala, Amazonian Peru, Ecuador, Costa Rica, and Venezuela. Typically, his adventures in these areas were during the 1930's and 1940's, so the conditions of travel are in marked contrast to those enjoyed by so many tropical birdwatchers today. One can appreciate the undisturbed forests and rich faunas so effectively described by Skutch, with

sad realization of their recent losses. He makes us well aware of historical changes in our neotropical habitats. In addition to the discussions of local birdlife and vegetation, these chapters contain various short stories of human interest, with some dramatization.

Chapters on single avian families reflect the myriad dimensions of Trochilidae, Cotingidae, and Dendrocolaptidae. Even for experienced tropical birdwatchers, his accounts are engaging. From a lifetime of fieldwork he presents personal descriptions of the birds with particular interest in the different nesting behavior patterns within each family. There is little reference to current literature, and two of these three chapters are reprints of pre-1970 magazine articles.

The remaining three chapters provide topical essays on birds and ants, the *Cecropia* tree, and dawn songs in tropical birds. Much sentimentality is found in each, but then there is a good deal of science as well. Any biologist would be impressed by the diversity of ant-bird interactions in the neotropics. Skutch organizes his review as ants as enemies of birds (second only to snakes in egg destruction), ants as food and as purveyors of food for birds, avian nesting sites with or near ants, and anting behavior. The chapter on the *Cecropia* tree contains a wealth of natural history anecdotes on the tree itself, the ant-inhabitants of such trees, and fruit-eating birds. It is most frustrating, however, that this chapter dwells on an "unsolved" mystery, the benefit of ants to the trees. Janzen (*Ecology*, **50:** 147–153, 1969) solved the mystery by showing the importance of ants in removing epiphytes from the *Cecropia*. Current readers of Skutch's chapter, a reprint of a 1945 article, should have been provided with this update, at least as a footnote.

Skutch's discussions of dawn songs are imaginative. Clearly the biological functions of the songs remain as ethereal as the songs themselves. The book concludes with a personal naturalistic philosophy, in an epilogue entitled "the appreciative mind." The index provides the scientific names to identify English bird names in the text, some of which are outmoded (e.g., "Castlebuilder").

The artist of this volume, Dana Gardner, provides fine ink drawings for 22 species of birds, on individual half or full page plates. This book is the third in a well produced ornithological series (C. H. Hooks series) from the University of Texas.—Charles F. Leck.

45. Birds in Bass Strait. Ken Simpson. 1972. A. H. and A. W. Reed Pty. Ltd. (Imported for sale by C. E. Tuttle Co., Inc., Rutland, VT) 112 p. $11.00.—This interestingly written, informative book covers the birds of the sea separating Australia from Tasmania. It is divided into the breeding seabirds (16 species), "freshwater seabirds" (4 cormorants and 2 terns), regular summer (5 species) and winter (15 species) migrants, rare visitors (6 species), shorebirds (6 species migratory and 5 resident), and the Black Swan, Cape Barren Goose, and White-breasted Sea Eagle. Also included are discussions on landbird migration, techniques of studying seabirds, and marine mammals, as well as a good suggested readings list and a useful index. The many black-and-white and color photos are well integrated into the species accounts, which are based on the author's extensive experience in the area and comprehensive knowledge of the relevant literature. Disarmingly written personal accounts intersperse the extensive data: for example, the observation of a Sea Eagle stooping on a flock of Galahs and Cockatoos feeding on the ground in a melon patch, only to impale its talon in a large melon, "killing it instantly, I have no doubt." This book will be primarily of interest to the amateur birder, but it forms a welcome addition to my "seabird" library. The author and the Oil and Gas Division of Broken Hill Proprietary Co. are to be congratulated on a fine, uncompromising collaboration.—R. W. Schreiber.