RECENT LITERATURE

BANDING AND LONGEVITY

(See also 10, 11, 18)

1. Operation Baltic 1968. P. Busse and M. Gromadzki. 1970. *Acta ornithologica* (Warsaw), **12**(1): 1-24. (In Polish, with Russian and English summaries.)—This progress report gives an account of 32,631 individuals of 98 species of birds banded in 1968. The grand total, 1960-1968 inclusive, is 258,101.—Leon Kelso.

2. Migration dynamics and changes in fat deposition in the Tomtit, *Parus major* L. J. Czaja-Topinska. 1969. *Acta ornithologica* (Warsaw), **11**(10): 357-378. (In English, with summaries in Polish and Russian.)—A total of 8,920 individuals were banded along the Baltic coast, 1963 and 1964, for this study here well elaborated in considerable detail. The majority of the migrant population. 73%, were juvenals. Migration was in waves, the rate, maximum and mean, correlated to the nutritional level of the birds. Spring migration was much more continuous, showing a much more normal graphic curve than that of autumn.—Leon Kelso.

3. A ringing study of the migratory Brown Shrike in West Malaysia. Lord Medway. 1970. *Ibis,* **112**(2): 184-198.—*Lanius cristatus* winters in Malaya in open lowland country, a largely man-made habitat. Individuals are sedentary during the winter season, each occupying a restricted area and exhibiting territorial behavior. Some 11% of birds banded in each winter returned in the next: most of these were handled in the latter part of the winter of initial banding, suggesting that imprinting of the wintering grounds may occur during this period. Data are given on wing-lengths, weights (a mid-winter minimum in November), molt, and pre-migratory fattening. Autumn migrants arrive almost simultaneously over a wide area in southeast Asia: those in Taiwan weigh 13% more than those arriving in Malaya 1,300 miles to the south.—I. C. T. Nisbet.

4. Some results of bird-banding in the Congo (Kinshasa). A. F. DeBont. 1970. *Ostrich,* **40**: 195-199.—More than 100 species have been banded since 1954, and recoveries of several are analysed. The *Hirundo rustica* wintering in Katanga are of eastern European origin (14 recoveries).—Jack P. Hailman.

5. Banded five-year-old Ruby-throated Hummingbird recaptured in Oklahoma. V. J. Vacin. 1970. *Bull. Oklahoma Ornithol. Soc.,* **3**(3): 22-23.—An adult male *Archilochus colubris,* banded on 23 August 1964 in juvenile plumage in Oklahoma City, Okla., were recaptured in the same locality on 29 August 1969. Since 1962 Mr. Vacin has had 16 returns of this species: two individuals two years after banding, 13 one year afterwards.—Margaret M. Nice.

MIGRATION, ORIENTATION AND HOMING

(See also 2, 3, 4, 5, 35, 36, 42, 45, 49, 51, 86.)

6. An attempt to forecast the intensity of nocturnal fall migration. H. Blokpoel. 1970. *Proc. World Conf. on Bird Hazards to Aircraft,* Kingston, Ont.: 287-298.—Ultimately our understanding of the factors influencing bird migration must be measured by our ability to predict it numerically. As part of the continuing radar studies of migration in Alberta (see reviews nos. **7** and **8**) Blokpoel attempted to provide a nightly forecast of bird activity which could be taken into account in planning aircraft operations. Forecasts were regarded as "accurate" if the observed migration, averaged over several hours, differed from that predicted by no more than 1½ points on an 8-point scale of densities. On this basis, about 70 percent "accuracy" was achieved, but this level fell to 54 percent for the dense migrations which are of greatest concern. A substantial fraction of the errors can be attributed to errors in the weather forecasts, but even so there is a lot of room for improvement. The criteria used to derive predicted migration from predicted weather look too simple and inappropriately weighted. With improving *post facto* knowledge of factors affecting migration in the area, these criteria will be revised; at the same time more detailed forecasts, of migration of birds of specific sizes and at specific times and heights, will be required. We will then need to know to what degree the forecasts are improved as additional detail is included: for this we need a more quantitative measure of agreement than Blokpoel's crude measure of "accuracy".—I. C. T. Nisbet.

7. **A preliminary study on height and density of nocturnal fall migration.** H. Blokpoel. 1970. *Proc. World Conf. on Bird Hazards to Aircraft,* Kingston, Ont.: 335-348.—A tracking radar aimed vertically upwards was used to sample migration densities at various altitudes over Cold Lake, Alberta, and hence to estimate the total density for comparison with other studies at the station (see reviews nos. **6** and **8**). Of the birds flying over 1,200 feet, 50 percent were on the average below 3,500 feet, 90 percent below 5,000 feet and 99 percent below 10,000 feet. The highest echoes recorded were below 14,400 feet. Cloud cover and wind direction were probably the main factors influencing the height distribution. —I. C. T. Nisbet.

8. **Temporal variations in the volume of bird migration: a radar study in Canada.** W. J. Richardson. 1970. *Proc. World Conf. on Bird Hazards to Aircraft,* Kingston, Ont.: 325-334.—Three years' radar data from Cold Lake in east-central Alberta revealed bird movements in all months of the year, but mainly in spring and autumn. The predominant directions were NW in spring and SE in autumn. Most large movements were in the western sectors of high pressure areas in spring, and in the eastern sectors in autumn, but this general picture was complicated by a number of observed movements in various sectors of lows. Wind direction was the best predictor of both direction and volume of migration. Inclusion of other weather factors did not improve the predictions significantly, but might do so if species could be distinguished for separate analysis.—I. C. T. Nisbet.

9. **Massive reverse migration of Redwings in spring 1959 in south Finland in relation to weather.** (Massenrückzug der Rotdrossel (*Turdus iliacus*) im April 1959 an der finnischen Südküste in Beziehung zur Wetterlage.) K. Eriksson. 1970. *Vogelwarte,* **25**(3): 193-203. (English summary.)—Following unusually early spring arrivals, vast numbers of Redwings were seen flying south at Helsinki on 12 and 19 April. The movements are attributed primarily to snow showers, but did not start until the sky cleared, and proceeded during the day (unusual for the species).—I. C. T. Nisbet.

10. **Studies on the migration of the Whistling Swan, 1969.** W. J. L. Sladen, W. W. H. Gunn and W. W. Cochran. 1970. *Proc. World Conf. on Bird Hazards to Aircraft,* Kingston, Ont.: 233-244.—Preliminary studies on the migration of *Cygnus columbianus* have involved color-marking birds in summer and winter quarters, radar tracking and following radio-tagged birds in a light plane. Most swans fly on a front of only 100-150 miles from Chesapeake Bay to North Dakota, then north towards their arctic breeding grounds. Optimum conditions for mass spring departures are adequate rest and feeding time, followed by light tail winds in the early evening. Short trial flights sometimes occur in unfavorable weather.—I. C. T. Nisbet.

11. **The Night Heron in Belgium and Western Europe.** (Le Heron Bihoreau, *Nycticorax n. nycticorax,* (Linné 1758) en Belgique et en Europe Occidentale.) L. Lippens and H. Wille. 1969. *Gerfaut,* **59** (2): 123-156. (In French, English summary.)—European colonies of Night Herons are listed and mapped. Banding in French colonies has shown that some juveniles migrate north into northern France, Belgium and the Netherlands in July and August, before migrating south to their African winter quarters.—I. C. T. Nisbet.

12. The Crane migration in Germany in connection with weather and radar. W. Keil. 1970. *Proc. World Conf. on Bird Hazards to Aircraft*, Kingston, Ont.: 245-251.—Some 20,000 to 30,000 *Grus grus* migrate over Germany each spring and autumn. A network of visual and radar observations set up in 1966 has given useful data on timing, speed, altitude, flock size and effects of weather. It is hoped to use the results to predict dense migrations, but the correlation with weather is said to be complicated and few details are given.—I. C. T. Nisbet.

13. Comparative orientational and homing performances of single pigeons and small flocks. W. T. Keeton. 1970. *Auk*, **87**(4): 797-799.—Somewhat surprisingly, groups of four pigeons did not perform better in homing tests than single pigeons.—I. C. Nisbet.

14. Annual fluctuation in pigeon homing. J. Gronau and K. Schmidt-Koenig. 1970. *Nature*, **226**(5240): 87-88.—Under otherwise similar conditions, the homing performance of pigeons is worst in February and March and best in July (experienced birds) or July to September (inexperienced birds). No explanation is offered for this phenomenon, previously known as the "winter effect". The results suggest it is correlated better with climatic winter than with solar winter: hence it is regrettable that variables such as temperature and light intensity were not examined also.—I. C. T. Nisbet.

15. Orientation and distance in pigeon homing (*Columba livia*). L. C. Graue. 1970. *Anim. Behav.*, **18**: 36-40.—Matthews and Schmidt-Koenig have reported that pigeons orient well when released close to their home lofts, or far away from them, but orient badly in an intermediate zone 12-50 miles from their lofts (see *Bird-Banding*, January 1965, reviews nos. **20** and **21**). Graue repeated Schmidt-Koenig's experiment in Ohio, but found no evidence for an intermediate zone of poor performance.—I. C. T. Nisbet.

16. The development of migratory orientation in young Indigo Buntings. S. T. Emlen. 1969. *Living Bird*, **8**: 113-126.—Ten nestling *Passerina cyanea* were hand-reared in various conditions of isolation from view of the sky, and were tested in Emlen cages under natural night skies in their first autumn. Those which saw the sky during the month preceding the migration season oriented southwards, but not so well as adults. Orientation was very weak in birds with less experience of the sky.—I. C. T. Nisbet.

17. Monarch butterflies coinciding with American passerines in Britain and Ireland in 1968. J. F. Burton and R. A. French. 1969. *Brit. Birds*, **62**: 493-494.—The coincidence favors the wind-blown theory of trans-Atlantic crossings, due to the improbability of both birds and insects happening to cross on ships at the same time.—Jack P. Hailman.

POPULATION DYNAMICS

(See also 24, 35, 68.)

18. Mortality and population change of Dominican Gulls in Wellington, New Zealand. R. A. Fordham, with a statistical appendix by R. M. Cormack. 1970. *J. Anim. Ecol.*, **39**(1): 13-27.—This paper is another in a series on the population dynamics of the Dominican Gull (*Larus dominicanus*) about Wellington, New Zealand (see also review **6** of the April, 1970, issue). The present study covers the seasons of 1961-62 to 1964-65. The gulls about Wellington feed heavily upon garbage, with 86% of the stomach contents of sample specimens taken in 1961-62 being comprised of this item. The supply in past years has come from rubbish dumps and slaughterhouse remains. The latter appear to be of particular importance in their role in breeding success of local colonies. Contents of the dumps are now regularly buried (sanitary landfill), so the times that they can be utilized by gulls are limited. Since 1961 new regulations have reduced the amount of offal discharged from the slaughterhouses, with a consequent effect upon the gull population, which had been increasing rapidly since before 1900.

Further effects were caused by reclamation work along the shore about one of the discharge areas, which effectively kept most gulls from feeding there. Close correlation was obtained between variation in the number of livestock slaughtered and the fledging success of gulls at the colonies utilizing these food sources. No comparisons are available for mortality figures before 1961.

The majority of production occurred in colonies that were free from predation. Ferrets (*Mustela putorius*), stoats (*M. erminea*) and rats (*Rattus norvegicus*), all introduced species, were the major sources of predation. Some flooding also destroyed nests in freshwater situations. However, of the eggs hatched, the killing of young by other gulls was the major source of mortality. This pattern of intraspecifically-imposed mortality was not random in its pattern, but generally increased from 1961-62 to 1964-65. It was not correlated with nest crowding, but was inversely associated with local food availability (from human sources). Interestingly, almost no cannibalism was noted, with the young gulls simply having their skulls fractured. If a food shortage was involved, these dead young birds would provide an additional source of food. In many other large *Larus* gulls killing and subsequent cannibalism is an important source of mortality.

Statistics on post-fledging survival of these birds are presented, and it is hypothesized that the populations still should be growing (though at a slower rate). The evidence presented on colony size does not permit evaluation of this statement.

R. M. Cormack has contributed a statistical appendix, which contains the usual construction of a life table for this population. He also considers the problems of using banding data and offers a number of precautions.—Douglass H. Morse.

19. Ornithological activity and the number of observations. (Lintuharra-stusaktiivisuus ja havaintomaarat.) K. Hyytia. 1970. *Ornis Fennica,* **47:** 83-86. (In Finnish, English summary).—If A is the total area whose population is to be estimated, a the area covered by one observer, and N the number of observers, then the probability of making all the necessary census observations is $1 - [(A-a)/A]^N$. In English, this means "... that in no case is it possible to regard the number of observations as a linear function of the number of observers" apparently because "... the intercourse of observers diminishes the number of observations ...". (Quotes from summary.)—Jack P. Hailman.

NESTING AND REPRODUCTION

(See also 32, 33, 55, 92.)

20. Reproductive features of the Jay in the forest steppes of European USSR. (Osobennosti razmnozheniya soiki, *Garrulus glandarius* L. v lesostepi evropeiskoi chasty SSSR.) Y. Eigelis. 1970. *Z. zhurn.,* **49**(6): 892-897. (In Russian, English summary.)—Perennial observations on 119 nests in the Voronezh region found that breeding density declined with age of forest, smaller groves being preferred. Nest material varied with locality. Clutches up to 10, usually 5-6, eggs; incubation about 17 days, beginning with median or 5th egg, by female only. Egg loss, 30%; fledgling mortality 40%; nest failure, of 32 nests, 50%. Hatching occupied 2 days; egg tooth lasted 16-17 days; young departed 18-20 days after hatching simultaneously despite age differences. Stunted or starved young developed plumage at same rate as normal ones. A bibliography of 17 titles.—Leon Kelso.

21. On distribution and abundance of the Great Bustard (*Otis tarda*) in the Zaporozh and Donets regions. (O rsaprostranenii i chislenosti drofi v zaporochskoi i donetskoi oblastyakh.) K. Filonov. 1970. *Vestnik zool.,* **4**(3): 82-84. (In Russian.)—This large and human-oriented species prefers alfalfa and winter wheat fields for nesting, but breeds only sporadically; of 17 nests only 5 produced young. While now under legal protection as a rarity it is still a too frequent victim of poaching.—Leon Kelso.

22. Studies on the biology of the Edible-Nest Swiftlets of South-East Asia. (Untersuchungen uber die Biologie der Salanganen von Sud-ost Asia.) Lord Medway. 1970. *J. Orn.*, **111**(2): 196-205. (Translated by E. Stresemann from a paper in English published in the *Malayan Nature Jour.* **22**: 57-63 in 1969.)—After a brief discussion by Dr. Stresemann of the systematics of the little swifts of the genus *Collocalia* Lord Medway informs us that these swiftlets are found from the Seychelles Islands in the Indian Ocean east to New Guinea in the islands of the west and southwest Pacific. In the Malayan Peninsula two species with edible nests breed commonly: the black-nested *C. maxima,* and the white-nested, *C. fuciphaga.* The first species pulls its own feathers out and embeds them into the nest saliva. The second builds its nest out of saliva alone. Chemical analysis of this nest cement shows it has little nutritional value, yet it is highly regarded by the Chinese for its supposed medicinal properties. Harvesting of the nests is profitable to the owners of nesting colonies and should be carefully regulated.

The nesting cycle is prolonged; in *C. maxima,* that lays only one egg in a clotch, the average incubation lasts 28 days while fledging time takes 65. Since the swiftlets faithfully replace nests that have been removed, the approved system of harvesting is to take the first two nests and let the pair raise their third attempt In Java some of the knowing inhabitants construct artificial "nesting caves' inside their houses and thus enjoy a source of income with little trouble. The birds build where the light is dim and sometimes in complete darkness; here they find their way by uttering rapid "clicks"—i.e., by echolocation.—Margaret M. Nice

23. Peregrine nests on man-made structures. (Wanderfalkenbruten an menschlichen Bauwerken) Theodor Mebs. 1969. *Deut. Falkenorden,* **1968:** 55-65. (In German.)—**More about Peregrine nests on man-made structures.** (Weiteres *uber* Bruten des Wanderfalken (*Falso peregrinus*) an menschlichen Bauwerken.) Rudolf Kuhk. 1969. *Deut. Falkenorden,* **1968:** 65-66. (In German.) —The breeding of Peregrine Falcons on man-made structures is an especially interesting aspect of the ecology of this species, even though the number of known cases remains small. On the basis of Mebs' inquiries and from published accounts, a total of 30 unverified and 25 documented cases was ascertained for the period of the last 150 years. These are distributed among countries as follows (the first figure refers to unverified cases, the second to documented cases): Germany 9/12, France 2/0, Great Britain 4/3, Denmark 1/1, Sweden 1/0, Finland 1/0, USSR 4/0, Romania 1/1, Hungary 0/1, Yugoslavia 2/0, Italy 1/0, Spain 3/1, Morocco 1/0, Kenya 0/1, Canada 0/1, USA 0/4. About one half of the verified records refers to castles, ruins, bridge piers, and hunting platforms far from human settlements; the rest of the nestings took place on church towers, skyscrapers, and other high buildings right in the middle of cities. The establishment of breeding sites in cities was most likely initiated by overwintering young individuals, still lacking attachment to a specific nest site elsewhere, and was favored by an ample supply of food (feral pigeons). Mebs also discusses requirements and opportunities for successful breeding in cities.

Kuhk comments on—and supplements some of the records listed by Mebs, and adds 3 records for Germany and one for Czechoslovakia. The reviewer can add one record for Turkey, where according to M. Q. Smith (*Ibis,* **102:** 576-583, 1960) the Peregrines in "1958 nested in Upper Citadel" in Trebizond.—Sergej Postupalsky.

24. Population density and breeding biology of the Honey Buzzard in a study area in Franconia. (Zur Siedlungsdichte und Brutbiologie des Wespenbussards (*Pernis apivorus*) in einem franckischen Beobachtungsgebiet.) Theodor Mebs and Helmut Link. 1969. *Deut. Falkenorden,* **1968:** 47-53. (In German.)—The authors' study area in northern Bavaria was covered with varied intensities during 1945-50, 1955-60, and 1965-68. Thirty-seven nests were located, including 24 during the breeding season. Population density, based on the mean distance between nests of 1352 m (extremes: 520 and 2000 m), was calculated at 132 to 220 hectares of forest per breeding pair. The authors believe this relatively high density to be due to an apparent abundance of wasps, evidently favored by extensive fruit and wine growing in the area.

Breeding Biology: No preference for any particular tree type was apparent Twenty-one nests were new constructions, 16 were old, mostly built by *Buteo buteo*. The usual clutch size was 2 eggs; there was one verified and one suspected clutch of 3 eggs. Eggs were laid 3 days apart. The incubation period, determined for one egg, was 34 days. Nest success: Of 20 nests with complete data, 2 failed (1 clutch of 3 and 1 clutch of 2) and 18 were successful. Of 37 eggs (in successful nests), 4 (11%) failed to hatch. Of 33 chicks that hatched, 4 died (11% of eggs and 29 fledged. Mean number of young fledged per successful nest was 1.61 (78% of eggs), and the overall productivity was 1.45 young per nesting pair (69% of all eggs laid).

Reprints of this paper and those noted in Review No. 23, from the Annual of the German Order of Falconers, a publication not readily available in this country, have been deposited in the Josselyn Van Tyne Memorial Library of the Wilson Ornithological Society located in the Bird Division, Museum of Zoology, University of Michigan, Ann Arbor, Mich.—Sergej Postupalsky.

25. Observations on two Paradise Widow Birds and on the Straw-tailed Widow Bird in East Africa. (Beobachtungen an Paradieswitwen (*Steganura paradisea* L., *Steganura obtusa* Chapin) und der Strohwitwe (*Tetraenura fischeri* Reichenow) in Ostafrika.) J. Nikolai. 1969. *J. Orn.*, **110**(4): 421-447 (Summary in English).—This article describes experiences during two seasons in Kenya and Tanzania. Male *Steganura paradisea* defend their large territories throughout the day from males of the same species by conspicuous display flights. In 1966 in an area occupied by this species, out of 15 nests examined of the host species—the Melba Finch (*Pytilia melba percivali*) 13 were found parasitized and in the same area in 1969 34 of 36 host nests were parasitized. The hosts do not seem to suffer from this practice; although the nestling Widow Birds usually hatch a day before the "finches", are larger and more persistent beggars than the host chicks, yet the parents raise their own young as well as the interlopers. Relationships between parasite and host are very complicated: in courtship the male parasite *sings the host's song* and this song is essential to stimulate the female parasite to solicit copulation! The palates of the nestlings have similar spots in both parasite and host.

Many other strange and surprising facts are given in this notable paper.—Margaret M. Nice.

26. Experimental studies on the breeding biology of Great and Blue Tits. (Experimentelle Untersuchungen zur Brutbiologie von Kohl- und Blaumeise (*Parus major* und *P. caeruleus*)). W. Winkel. 1970. *J. Orn.*, **111** (20): 154-174. (Summary in English.)—A painstaking, statistical study in 1969 on 53 Great Tit and 39 Blue Tit broods in nest boxes in woods near Braunschweig, Germany. "The first eggs of a clutch frequently did not hatch in the order they were laid." Both species proved to be indeterminate layers. Average length of incubation in the Great Tit was 13.9 days, of the nestling period 18.8 days. The corresponding periods of the Blue Tit were 14.6 and 19.9 days. This paper with its four elaborate charts, its eight impressive tables and its three-page bibliography from European and North American sources is an impressive contribution.—Margaret M. Nice.

27. On the breeding biology of the Aquatic Warbler. (Zur Brutbiologie des Seggenrohrsangers (*Acrocephalus paludicola*.) G. Heise. 1970. *J. Orn.*., **111**(1): 54-67. (Summary in English.)—Since very little reliable information has been published on the life history of this species, the author watched a nesting colony during three seasons and here reports his findings. "In a sedge meadow, with *Carex elata* the dominant species," males and females of this warbler held separate territories, "in some cases considerably overlapping territories held by other individuals of the same or opposite sex." Adults were distinguished by colored bands; 13 nests were watched from blinds. There was no evidence of a firm pair bond between the sexes, "and probably the birds are even promiscuous. Females try to chase away males from the neighborhood of their nests. Aggressiveness between neighboring males has not been observed."

Females alone incubate. Intensive observations on four females in 1961 showed the following rhythm: during 1504 minutes 76.7% of the time was spent on the nest, and 437 minutes (23.3%) off the nest. Attentive periods ranged from

5-39 minutes, averaging 15.7; inattentive periods ranged from 2-10 minutes, averaging 4.8. The female alone feeds the young. These leave the nest when 13-14 days old. A very interesting paper showing a most unusual pattern of territorial and pair relationships —Margaret M. Nice.

28. Communal behaviour of nesting Noisy Miners. D D. Dow. 1970. *Emu,* **70:** 131-134.—At least ten *Myzantha melanocephala* visited a nest at the rate of 30-50 times each hour. Only one female brooded, and most of the activity was by two birds; however, all individuals fed the nestlings and fledged young. Dow's studies of this phenomenon are continuing.—Jack P. Hailman.

29. Cooperative breeding and altruistic behaviour in the Mexican Jay, *Aphelocoma ultramarina*. J. L. Brown. 1970. *Anim. Behav.,* **18**:366-378.—The paper is about cooperative feeding of the young, in case the title seems obscure. Flocks of eight to 20 birds help feed the nestlings, when parents do 38-53% of the feeding. Post-fledging, the parents feed only 26% and show no preference for their own young. This is the most careful study of the phenomenon done to date, with data on color-banded individuals. The findings are not, at this point, connected with the growing literature on this subject.—Jack P. Hailman.

BEHAVIOR

(See also 22, 25, 28, 29, 38, 69, 80, 88, 89, 90, 91.)

30. Collection of water by the Australian Pelican. W. J. M. Vestjens. 1970. *Emu,* **70:** 140.—*Pelecanus conspicillatus* raises its upper mandible while holding its lower one horizontally. The 0.039 m^2 opening caught 170 ml of rain in 10 minutes and 270 ml in a 16-minute rain. About 200 birds showed the extraordinary behavior.—Jack P. Hailman.

ECOLOGY

(See also 19, 22, 25, 26, 35, 66, 67, 85.)

31. The "niche-variation" hypothesis: a test and alternatives. M. Soulé and B. R. Stewart. 1970. *Amer. Nat* **104**(935): 85-97.—Van Valen's paper on morphological variation and the width of the ecological niche (*Amer. Nat.,* **99:** 377-390 1965) has been the subject of much recent interest (see also review **25** of the April 1970 issue). Soulé and Stewart are particularly critical of Van Valen's hypothesis, even attacking the title of his paper on the grounds of his speaking about "width" of ecological niches, arguing that such a statement is anthropocentric. Van Valen had examined bill sizes of mainland and island populations and found that the island ones showed greater variability than the mainland ones. He explained this as being the result of the island populations occupying wider niches, presumably as a result of the absence of competitors. To test his idea, Soulé and Stewart examine series of skins of three euryphagous species and three stenophagic species, all from central Africa. These conditions are not identical to those tested by Van Valen, but should be relevant to his considerations. For euryphagous species the Pied Crow (*Corvus albus*), Blackeyed Bulbul (*Pycnonotus barbatus*), and Masked Weaver (*Ploceus velatus*) were chosen; for stenophagic species the Little Bee-eater (*Merops pusillus*), Jameson's Fire Finch (*Lagononstica rhodopareia*), and Bully Seedwater (*Serinus sulphuratus*) were used.

First, it appears that Soulé and Stewart are essentially comparing apples and oranges; while one might accept their statement that the first group was less specialized than the second, it would have been more appropriate to have searched for situations where a relatively 'specialized' and relatively 'generalized' species within a genus (or at least a family) could be chosen. The comparison of crows and finches in this regard seems a bit strained. Furthermore, one wonders whether the members of the euryphagous and stenophagic groups are as disparate in this regard as the authors claim. They may be, but little is said that will convince the reader. Only extremely general statements about their feeding techniques are supplied, even though the present authors state that correlation of diet-item diversity and variation are necessary conditions for Van Valen's hypothesis. To improve upon Van Valen's techniques it seems to me that we need very much more precise information upon foraging behavior than we find in this paper.

Soulé and Stewart state that the members of their euryphagous group have fewer competitors than those of the stenophagic group, which again may indeed be so, but with the general lack of precise information this assertion is so sweeping as to be of limited significance. The major basis for this statement is that congeners are assumed to be each others' strongest competitors, and in the first group they are less numerous than in the second group. While this situation probably holds far more often than not, it again seems that at our point of our sophistication, more convincing information than this is extremely desirable, if not necessary.

Through the discussion, the conclusions drawn are that rather than finding marked variability about a single peak that they apparently felt was necessary to confirm Van Valen, they find sexual dimorphism in bill size occurring, which they feel refutes Van Valen's hypothesis. However, sexual dimorphism is an expression of variability within a population and represents one possibility for increasing "niche width". While Van Valen indicates that the variation of species he investigated did not suggest a polymorphic system or show greater sexual differences than on the mainland, he does not reject them as being inconsistent with his hypothesis, and in fact cites a number of probable examples of polymorphism from the literature. Soulé and Stewart assert that to confirm Van Valen's hypothesis it would be necessary to find the marked variability they are searching for within males and females. Such a stand ignores the fact that this dimorphism has accomplished in part in an ecological sense what unimodal variation might be expected to: that is, to provide different-sized implements for habitat exploitation. It is hardly a secret that this structural dimorphism is regularly found on islands (see Selander, 1966, *Condor* **68:** 113-151).

Having concluded that Van Valen's conclusions are invalid, the present authors try to construct an alternative hypothesis, which to this reader appears little if at all more satisfying than the one they have chosen to reject. They present an involved discussion of canalization, and state that the differences that Van Valen reported may have been the result of a release of variation concomitant with deterioration of canalization. This may be all well and good, but its relevance to the argument is questionable. Even if this condition obtains, it does not bear unfavorably upon Van Valen's conclusions. If a species is canalized in a mainland situation, the release of suppressed genetic characteristics should be consistent with the Van Valen hypothesis. Van Valen has not hypothesized the in-depth genetic mechanism necessary to produce the desired result.

Next, Soulé and Stewart argue that according to Van Valen's hypothesis if releases of canalization occur in certain island situations, they should occur in others. While implying that there are many such examples, they mention only the geospizine, *Pinaroloxias*. One example does not make a new hypothesis. Certainly the ideas on the significance of lack of variation in island isolates are not parsimonious enough to rest firmly on a single example.

In summary, I feel that the present paper has done little to advance thinking on this subject, other than to indicate that Van Valen picked a rather small group of species for comparison and could have profited from expanding his sample. It is becoming painfully obvious that what we need are measurements of known individuals whose behavior has been studied in the field in detail. Only then will we advance substantially in this area.—Douglass H. Morse.

32. Observations on Spotted and Crowned Sandgrouse in the Northwest Sahara. (Beobachtungen an *Pterocles senegallus* und *Pterocles coronatus* in der Nordwest-Sahara.) U. George. 1970. *J. Orn.*, **111**(2): 189-195. (Summary in English)—Two species of sandgrouse were studied in 1968 and 1969, the former year having enjoyed ample rainfall, the later being very hot and very dry. The Spotted Sandgrouse (*Pterocles senegallus*) inhabits semidesert; in 1968 a large population bred freely, but the next year only a few birds of a small population bred at all. The Crowned Sandgrouse (*Pt. coronatus*) inhabits true desert and five individuals were observed in the study area in 1968; however, in 1969 it had moved north of its original range and a number were found breeding. The author watched males of both species soaking their breast feathers in pools of water and flying home to water their chicks. The sandgrouse populations were regularly preyed upon by Lanner and Barbary Falcons (*Falco biarmicus* and *F. peregrinoides*).—Margaret M. Nice.

33. Birds of a Euphorhia-Acacia woodland in Ethiopia: habitat and seasonal changes. E. W. Beals. 1970. *J. Anim. Ecol.*, **39** (2): 277-297.—Speculations upon the characteristics of tropical populations and communities have occupied much time and interest of field biologists in recent years, but in spite of this fact, first-hand data are few. Beals' study (a two-year investigation of a five acre plot) is a welcomed exception to this dearth. This area supports a bird population that by our standards is remarkable. On the plot, which certainly does not contain an amount of vegatation comparable in volume to a tropical rain forest, Beals found a yearly breeding density of about 900 pairs per 100 acres, a figure two to five times what might be expected in eastern North America. In addition, at certain times of the year, large numbers of migrants were present. During the two years 37 species nested, and 102 species were observed, including migrants. Relatively few congeners were present, and when they did exist as breeding species, a marked tendency existed for their breeding seasons to be different. This factor was clearly defined even at a familial level.

The problem of where migrants fit into a tropical community has occupied the interest of many workers. Beals notes that the periods of maximum numbers of migrants coincide with the periods of minimum breeding activity of the local species. Since the area in concern has a well-marked dry season that coincides with the influx of migrants, this timing should be advantageous to the residents. Whether or not causality is involved is not determined, though some other workers have hypothesized it.

A number of rather widely accepted ideas are challenged by Beals on the basis of his data, which, however, he rightly emphasizes to be from one small area However, the findings, if nothing else, should make us wish to reexamine some current opinion. He believes that the observed staggering of breeding seasons, particularly between ecologically comparable species, is a factor that may be responsible for at least part of the richness of this avifauna. Others have concluded that this factor contributed little to tropical diversity. He feels that the dry season in the Ethiopian Rift Valley is probably as adverse to life as are winters in the milder temperate regions. However, two rather different conditions are being considered here (moisture and temperature), and it is difficult to back such a conclusion one way or the other. The matter is of considerable importance, however, because it is one piece of evidence used against the possibility of the great observed diversity being accounted for by the absence of conditions unfavorable to life processes.

Beals believes that plant species diversity may have an effect upon bird species diversity, a factor that MacArthur and co-workers found to be relatively unimportant in certain temperate habitats. He brings up the familiar topic of whether or not niche overlap is greater in the tropics than elsewhere. He believes that it is not and that there is little information to support the contrary assumption.

An interesting proposal put forth is that the long period of nesting observed may be the result of interspecific interactions. Since the present study involved only a single small plot, the critical data are not available to test this assumption adequately. Analysis of other areas would be helpful to test this assumption.

It is heartening to see the recent increase in number of data-filled papers dealing with tropical biology. The theory has been hotly debated, and the time has arrived to obtain the information that will link it with fact.—Douglas H. Morse.

CONSERVATION AND ENVIRONMENTAL QUALITY

(See also 21, 23, 68.)

34. The convergence of environmental disruption. M. I Goldman. 1970. *Science*, **170**(3953): 37-42.—This well documented and distressing report shows that polution is as widespread and serious in the USSR as in the United States; their rivers are as dead as ours, their shorelines oiled and eroding; their wildlife imperilled. Dr. Goldman, an Associate of the Russian Research Center at Harvard University, concludes that "it is not private enterprise but industrialization" that is the primary cause of environmental disruption." "The replacement of private greed by public greed is not much of an improvement.—Margaret M. Nice.

35. Recent wintering of the Red Kite in southern Sweden. (Die neuzeitliche Ueberwinterung der Rotmilans, *Milvus milvus*, in Südschweden.) S. Ulfstrand. 1970. *J. Orn.*, **111**(1): 85-93. (Summary in English.)—It is pleasant to read of the increase of a raptorial bird. Red Kites that bred in South Sweden used to be migratory, but in the latter part of the 1950's and ever since, between 20 and 40 birds have been wintering in Scania. "The change in the migratory pattern is regarded as a consequence of changed food habits, refuse dumps and similar sites being used much more than previously. There seem to be small losses only among the wintering birds."

Similar situations occur with other species: for instance, the Buzzard (*Buteo buteo*) finds additional prey in the victims of the automobile, while the Herring Gull (*Larus argentatus*), that feasts on city garbage, is increasing out of all reason. —Margaret M. Nice.

36. Changes in Africa as a wintering area for Palaearctic birds. R. E. Moreau. 1970. *Bird Study*, **17**(2): 95-103.—". . . I do not think anything spectacularly horrible has happened in Africa from the migrants' point of view." Most northern migrants winter in the more arid habitats, which are being modified by man only to a limited extent, and by traditional methods. Only 4 or 5 migrant species seem to depend on the dwindling evergreen forest. Pesticides and plantation agriculture have so far affected only a small fraction of the area important to migrants. Planting of rice and building of dams have provided new habitats. In the future, ". . . a crunch can be foretold", which ". . . could mean disaster for some species." "But then would he not be an optimist who expected the number of migrants seeking a winter home in Africa to be maintained without diminution in face of continued 'development' in Eurasia?"—I. C. T. Nisbet.

PARASITES AND DISEASES

37. New species of subcutaneous mite in Shags and Cormorants. J. W. MacDonald and G. R. Potts. 1970. *Brit. Birds*, **63**: 80-81.—*Phalacrocorax aristotelis* and *P. carbo* are infected by *Neottialges evansi*, which was more common on normal Shags (83% infected) than on Shags that died from paralytic shellfish poisoning (22% infected). The reason is unknown.—Jack P. Hailman.

38. Ectoparasite load in a Laughing Dove with a deformed mandible. J. A. Ledger. 1970. *Ostrich*, **41**: 191-194.—Four genera of Mallophaga were recovered from an injured *Streptopelia senegalensis* and seven normal individuals. One genus, *Coloceras*, was more common on the bird that could not preen normally. There is a short discussion of factors that determine the abundance of ectoparasites in birds that cannot preen.—Jack P. Hailman.

PHYSIOLOGY AND PSYCHOLOGY

(See also 2, 30, 53, 54, 55, 58, 79.)

39. Responses to diving in the Dipper, *Cinclus mexicanus*. D. Murrish. 1970. *Comp. biochem. physiol.*, **34**(4): 853-858.—Along with emigration of academics to beyond our borders, much ornithological production now exceeds the bonds of bird journals and appears elsewhere, seven such articles in this single issue of the above. Such anatomical diving modifications as "nasal flaps to prevent water from entering the nostrils, a large uropygial gland to facilitate oiling and waterproofing of the feathers (couldn't this expression be called "gratuitous anthropomorphism" by one so inclined?), some muscular modifications related to the swimming motion of the wings, and probably emmetropic vision in both air and water." The purpose was to find if Dippers show such typical avian aquatic adjustments as decline in heart rate, and increased oxygen storage in blood on diving. They do. Heart rates decreased 55-69%. —Leon Kelso.

40. Responses to temperature in the Dipper, *Cinclus mexicanus*. D. Murrish. 1970. *Comp. biochem physiol.*, **34**(4): 859-869.—Plumage denser, yet need for thermal conductivity higher, and standard metabolic rate (1.65 ml 02 g. per hour as determined by adequate instrumentation) lower than for other passerines of same size. Heat conductance by legs was very essential; above critical temperature of 36 °C the body overheated without water to carry heat from legs. Standing in still water of 23 °C their heat dissipation was 4 times that of still air. Heart and breathing rates were recorded and discussed. A bibliography of 17 titles.—Leon Kelso.

41. Internal features of the Caucasian Redbreasted Redstart and the Black Redstart. (Interernaya kharakteristika kavhaskoi krasnobryukhoi gorikhvostki (*Phoenicurus e. erythrogaster*) i gorikhvostki-chernushki (*Ph. o. ochruros*.) D. Baziev. 1970. *Ekologiya*, **1970** (2): 66-71. (In Russian.)—In this study effected by comparison of the morphological features of the larger Redbreasted species of the high-montane (3-4,000m alt.) central Caucasus, with with those of the lowland (1,850m alt.) smaller Black Redstart, a special mathematics was applied to eliminate size inequity. Thus there was found in the former species greater heart and kidney development presumably in adaptation to lower oxygen pressure, but less development of muscles, principally of wing and leg. The plumage density per cm^2 was decidedly higher in the upland species. This and other differences would seem to be adaptations to lower temperature of higher altitudes.—Leon Kelso.

42. Energy expenditure for free flight by the Purple Martin (*Progne subis*). G. Utter and E. Lefebvre. 1970. *Comp. biochem. physiol.*, **35**(3): 713-719. —Per refined calculations the energy expenditure in flight should be 3.5 kcal/hr or 0.069 k cal/g per hour. In actual measurement on experimental birds the heat production was 4.6 - 6.1 times the standard level of metabolism. This they note is lower than corresponding recorded values for non-passerines.—Leon Kelso.

43. Analysis of gas exchange in the avian lung: theory and experiments in the domestic fowl. P. Scheid and J. Piiper. 1970. *Respir. Phys.* **9**: 246-262.—The authors assume the parabronchi as continuously ventilated tubes surrounded by blood-perfused capillaries. From this equations are derived for the relationships between partial pressures of CO_2 and O_2 in pulmonary gas and blood and ventilation, perfusion and diffusing capacity. Theory was applied to experiments on chickens.—Joel Cracraft.

44. Quantitative and organizational features of the avian renal medulla. O. W. Johnson and J. N. Mugaas. 1970. *Condor*, **72**: 288-292.—The renal medullae of seven species of birds were studied by injection. In those species that conserve water medullary lobules were two to three times more abundant. Other features of potential importance were discussed.—Joel Cracraft.

45. Fat, water, weights and wing-lengths of autumn migrants in transit on the northwest coast of Egypt. R. E. Moreau and R. M. Dolp. 1970. *Ibis*, **112**(2): 209-228.—Data are presented for the fat and water contents of 410 specimens of 11 species of trans-Saharan migrants. There are considerable variations both within and between species, the latter being attributed tentatively to differences in aerodynamics, ecology and migration routes. Mean fat contents ranged from 49% to 110% of lean dry weight; even after allowing for the fact that the birds must already have flown 500 miles from Asia Minor, these seem low in relation to measurements on long-distance migrants elsewhere, and too low to carry the birds across the Sahara on their next flight. One wonders whether only the less fat birds descend in such inhospitable places as northwest Egypt.—I. C. T. Nisbet.

46. Physiological and physical aspects of temperature regulation in the Burrowing Owl, *Speotyto cunicularia*. H. Coulombe. 1970. *Comp. biochem. physiol.*, **35**(2): 307-337.—This American paper in a foreign printed journal, affording it 30 pages including a bibliography of 35 titles, presents its many facts elaborated by very advanced biophysical instrumentation and methods in considerable detail. One suspected fact sustained is that the juvenal plumage affords better heat conductance and reflection with less discomfort than that of adults; it is likewise true that that the young can stay in the shade of burrows during hours of hot sunlight while the adults labor to feed them.—Leon Kelso.

47. Body weight, wing length, fat deposits and bird flight. (Ves tela, dlina kryla, zhirovye otlozheniya i polet ptits.) T. Blyumenthal and V. Dolnik. 1970. *Z. zhurn.*, **49**(7): 1069-1072. (In Russian, English summary.)—This examines intraspecific individual variation as related to energy economy. In analysis of over 35,000 small passerines weights, including 21,000 Chaffinch, taken at Rybachi, Kaliningrad district, it was found that wt. of fat carried in migrants is correlated to body weight and wing length. Flight power required increases with body weight as W7/6, but in flying at speeds conforming to that of a flock the requirement is W4/3; yet availability increase is only as W/0.723. Therefore it was concluded that weight increase due to fat is compensated for by extra wing effort or operation capacity, as W/0.61.—Leon Kelso.

48. The flight of swifts. (Der Flug des Mauerseglers, *Apus apus*.) H. Oehme. 1968. *Biol. Zentralblatt*, **87**(3): 287-311. (In German, English summary.) —A very detailed analysis of the aerodynamic elements involved finds that avian flight muscles must be far more efficient than those effecting mammal locomotion. Otherwise they must be credited with "excellent aerodynamic qualities which do not exist." . . . "The fundamental accuracy of these calculations is demonstrated by estimating the daily food requirement of the bird." In other words there still remains some yet unrecognized and undefined element in the energetics of bird flight. There is a bibliography of 27 titles.—Leon Kelso.

49. Response patterns of cutaneous mechanoreceptors in the domestic duck. P. K. Dorward. 1970. *Comp. biochem. physiol.*, **35**(3):729-735. —This study, from Australia even, on avian dermal electrophysiology, in light of the almost psychopathic aversion to study of feather physiology elsewhere, is significant. On 9 anesthetized *Anas platyrhynchos*, herbst and pacini corpuscles' neural responses to slight contacts and vibrations were tested and recorded by refined electronic equipment. Down feather, tactile, wing covert base, pressure, and vibration receptors and their areas were defined. Those bodies associated with primary shafts were extremely sensitive and responsive. "They formed a sizeable contribution to the cutaneous receptor population, and in the follicular location may well play an important role in the sensory input from the wing concerned with the regulation of flight".—Leon Kelso.

50. Biological signals and functional features of the pigeon's auditory system. (Biologicheskii signal i funktsionalnye kharakteristiki slukhovoi sistemy golubya.) V. Ilichev, et al. 1970. *Z. obschchei biologii*, **31**(3): 268-275. (In Russian, English summary.)—Employing modern electronic instruments, spectrograms and oscillograms of auditory neural activity of adults and young were obtained showing spectral and amplitude features of impulses duration of sounds of nuptial cooing, threat notes and fledgling calls. Correlation was found between cochlear, medullary, and mesencephalic potentials, and "parameters" of the acoustic signals. But neither were closely correlated to the role of the various sounds in pigeon behavior. Since variation of individual voice in pigeons is considerable, it was concluded that visual perception predominates in their life. —Leon Kelso.

51. The effects of microwaves on birds. J. Tanner, C. Romero-Sierra, and S. Davie. 1969. *J. microwave power*, 4(2): 122-128.—The problem of bird "strikes" on airplanes, and the prevention thereof, which has been growing apace, was the motivation for this study. The escape reaction of birds exposed to a field intensity of 45mW/cm^2 was definite in Ring-billed Gulls, common pigeons, and leghorn fowl, with some wing and head orientation to wave direction. Shielding the head slowed the response but slightly. There was some panting and other heat stress indicated but it was found that infra-red or heat alone evoked no such response. Still unsolved are avenues of effect, whether they be nerve action interference, "molecular resonance or chemical excitation.—Leon Kelso.

52. Structure and alleged functions of avian pineals. C. L. Ralph. 1970. *Am. Zool.* **10**(2): 217-235. Bibliography of 137 titles.—According to this comprehensive review the pineal has been adequately analyzed for only the domestic chicken, Cormorant (*Phalacrocorax carbo*), and Common Gull (*Larus canus*). It is almost absent in nocturnal owls. Its mode of operation is still undecided. ". . . . photic information about the bird's environment (overhead illumination primarily) may be preferentially (although not exclusively) conducted by the relatively transparent pineal to the diencephalic receptors postulated by Benoit. This hypothesis, highly speculative though it is, may at least encourage re-interpretation of some of the data in an area that is replete with confusion, oversimplification, and biased conclusions."—Leon Kelso.

MORPHOLOGY AND ANATOMY

(See also 31, 39, 47, 52, 64, 68, 81, 92.)

53. Further investigations on the fine structure and innervation of the pineal organ of *Passer domesticus* L. (Weitere Untersuchungen zur Feinstruktur und Innervation des Pinealorgans von *Passer domesticus* L.) M. Ueck. 1970. *Z. Zellforsch.*, **105**: 276-302. (In German; English summary).—This paper reports on the light and electron microscopy of the pineal organ. Within the parenchyma of the pineal organ nerve cell axions intermingle with pinealocyte processes containing synaptic ribbons which are, in turn, in contact with vesicles and granules. This suggests to the author that sensory and secretory structures are present in the same pineal cell type. Efferent sympathetic nerve fibers enter the pineal organ but apparently do not penetrate the basement membrane of the parenchyma cells. The relationship between photo-neuro-endrocrine regulation and the pineal organ is also discussed.—Joel Cracraft.

54. Some histological features of avian kidneys. O. W. Johnson and J. N. Mugaas. 1970. *Amer. Jour. Anat.*, **127**: 423-436.—This paper reports on a histological study of the kidneys in a large number of avian species (16 orders, about 125 species). Descriptions concentrate on the cortex and the cortical-medullary boundary, the intramedullary, organization of Henle's limbs and collecting ducts, and the pattern of ureteral branching.—Joel Cracraft.

55. The changes in egg shell strength during incubation. J. Vanderstoep and J. P. Richards. 1970. *Poultry Sci.*, **49**: 276-285.—White Leghorn chicken eggs were studied. Under a load of 500 grams shell strength decreased through incubation with the greatest deformation taking place between days 14-18. Although the shell membrane loosens during the period of greatest shell strength change, it is not the membrane itself that affects the shell strength but rather the amount of moisture.—Joel Cracraft.

56. A comparative account of the dimensions of bony elements of the feeding apparatus of certain Herons (Family: Ardeidae). M. S. Dubale and A. P. Mansuri. 1969. *Proc. Nat. Acad. Sci., India*, **39**(B): 226-232.—This paper records statistical data for eight measurements (all but one from the skull) of *Egretta garzetta*, *Ardeola grayi*, and *Bubulcus ibis*. The sample size for each species was only six. Some ratios are given and possible correlations with feeding habits are suggested.—Joel Cracraft.

57. Thermodynamic efficiency and physiological characteristics of the chick anterior latissimus dorsi muscle. G. Goldspink, R. E. Larson, and R. E. Davies. 1970. *Z. vergl. Physiol.*, **66**: 379-388.—(In English).—The anterior latissimus dorsi, compared to the posterior latissimus dorsi, has a rate of shortening 15 times slower, can sustain isometric tensions for longer periods of time, and is relatively inefficient in performing isotonic work but relatively efficient in sustaining isometric tension. Coupled with the fact that the ALD is composed mainly of felderstruktur fibers and the PLD mainly of fibrillenstrucktur fibers, this is an important paper for any future functional study to consider.—Joel Cracraft.

58. The spleen of the cowbird. D. F. Ewart and D. B. McMillan. 1970. *J. Morphology,* **130:** 187-206.—The spleen of the cowbird differs from those of mammals in lacking trabeculae and smooth muscle. Loss of trabeculae has resulted in a reorganization of the veins and arteries. Reticular fibers provide support for the vessels. The absence of smooth muscle implies the loss of blood storage and pumping.—Joel Cracraft.

59. The function and evolution of the supraorbital process in ducks. R. J. Raikow. 1970. *Auk,* **87:** 568-572.—The author notes that a correlation exists between ducks that feed on the bottom of streams, lakes, and so forth and a well developed supraorbital process of the lacrimal. Presumably the enlarged process affords protection for the eye against objects encountered while bottom feeding. He briefly discusses the problem of homology of the process within ducks. Raikow admits that by standard definitions (i.e., inheritance from a common ancestor) the enlarged processes in the different tribes cannot be considered homologous, but he circumvents this obvious conclusion by invoking a shared evolutionary potential inherited from a common ancestor and thus calls the processes homologous in this sense. But this is a word game which obscures the most important point—the multiple evolution of a structural-functional complex because of similar responses to selection.—Joel Cracraft.

60. The fine structure of pigeon breast muscle. D. E. Ashhurst. 1969. *Tissue and Cell,* **1:** 485-496.—The electronmicroscopy of the pectoralis major is described. Two muscle fiber types are recognized mainly on the basis of differences in number and size of mitochondria. Morphological criteria for classifying muscle fiber types are discussed.—Joel Cracraft.

61. Arterial system of the Herring Gull (*Larus argentatus*). R. E. Gobeil. 1970. *J. Zool.,* **160:** 337-354.—This is a descriptive study. Gobeil found little individual variation in the larger arteries but considerable variation in the origin, course, and number of the smaller arteries.—Joel Cracraft.

62. A study of the normal development of the leg skeleton in the quail (*Coturnix coturnix japonica*). A. B. G. Lansdown. 1970. *J. Anat.,* **106:** 147-160.—The leg skeleton begins to differentiate at day 5-6. Cartilage of the femur, tibia, and fibula is present by day 6 and is initially ossified a day or two later. Ossification of the tibiale, intermedium, and fibulare starts at the 13th-16th day when they fuse to the metatarsals. Through development the tibia maintains a constant proportion to total leg length, whereas the femur becomes proportionately smaller and the distal segment proportionately longer.—Joel Cracraft.

PLUMAGES AND MOLTS

(See also 3, 39, 40, 41, 46, 77, 93.)

63. The pterylography of the mature partridge *Perdix perdix* L. K. Kostron and J. Hromas. 1970. *Folia Morph.,* 18: 172-180.—This is a short, superficial description of the various feather tracts. Some spurious "functional" conclusions are made regarding protection against cold and rain in a terrestrial bird. That explains it all, of course.—Joel Cracraft.

64. On use of color characters as genetic markers in a bird population. (Ob ispolzovanii okrasochnykh priznakoi v kachestvie geneticheskikh markerov populyatsii ptits.) L. Dobrinskii. 1970. *Ekologiya,* **1970**(1): 100. (In Russian.)—The extremely variable and individual nuptial plumage color patterns of the Ruff (*Philomachus pugnax*) readily identify individual birds in nature, but are such patterns constant from year to year? Observation of 18 captive males through 1968 and 1969 found some slight variation in rufescent tints but otherwise the colors were constant. Therefore males could be reliably identified in behavior studies from year to year by the patterns, particularly of the "ruffs' and "cape".—Leon Kelso.

ZOOGEOGRAPHY AND DISTRIBUTION

(See also 21, 45, 92, 93, 94.)

65. Stage of taxon cycle and distribution of birds on Jamaica, Greater Antilles. R. E. Ricklefs. *Evolution*, **24**(2): 475-477.—A number of workers have suggested that as island groups are colonized by species, these species display particular patterns of distributions within the habitats available. When a species is initially invading a series of islands, it will typically show little differentiation and will be characteristically found in marginal habitats, except on small islands. At a later time, subspeciation may be noted and there may be local extinctions. Eventually, remaining species of such colonizations will become endemics. As this so-called "taxon cycle" progresses, the populations in consideration become characteristic of the central and montane parts of the islands, rather than the fringes or marginal areas.

Ricklefs reports on some observations of birds made on Jamaica, which are generally in concurrence with the pattern reported above, but which show some variation. Briefly, the major difference involves the undifferentiated forms, which he found to be abundant and widespread with respect to habitat. Since the sources cited for comparison (Wilson's study of Melanesian ants, *Amer. Nat.*, **95:** 169-193, 1961; Greenslade's study of freshwater and land birds in the Solomons, *Evolution*, **22:** 751-761, 1968) often involve small islands that have been less thoroughly altered in recent times than those of the Greater Antilles, one wonders whether they are directly comparable. Could some of the difference be due to the extensive human disturbances that have occurred in Jamaica?—Douglass H. Morse.

66. Insular biogeography in continental regions. I. The northern Andes of South America. F. Vuilleumier. 1970. *Amer. Nat.*, **104** (938): 373-388.—In recent years, the biogeography of islands has received a great deal of attention from biogeographers, ecologists, and evolutionary biologists. This is for good reason, as they offer a number of unique advantages for studying such phenomena as colonization and extinction patterns, habitat utilization, and ecological release. In spite of the interest directed toward oceanic islands, other "ecological islands" have been accorded much less attention. Among the most likely areas for study are the tops of high mountains, which are isolated in space and time from other similar areas. In this paper Vuilleumier explores the avian distributional patterns found in several patches of páramo vegetation (above the treeline) of the northern Andes. The data presented are the result of extensive field work in that area by the author, plus additional information from the literature. Fifteen "islands" are considered in this study, and the data gathered from them are compared with comparable data from oceanic islands. Three measurements were taken from each "island": area, elevation, and base altitude. Four inter-island measurements were also made: distance from source, distance to nearest island, distance to nearest island to south (previous studies had determined that the páramo avifauna has spread uniformly from the south northward), and distance to the nearest large island (over 200 sq. km.).

To test his assumptions and to determine which of the above-mentioned variables contribute most heavily to diversity and endemism, Vuilleumier utilizes stepwise multiple regression with linear, semi-log, and log-log models. The number of species is correlated positively with area. With the linear model, area is the best single predictor of the number of species, with distance to nearest island to south and elevation also contributing significantly. With a semilog model, the distance from the large southern páramo was the most important predictor. The fit to the linear model is better, however.

Endemism is not correlated with area, as was the case in a number of other published studies. With both linear and semilog models, distance to nearest large island and elevation are more important predictors than area.

Species-area curves of páramo birds fall within those for oceanic areas. However, when percentage of faunal saturation is plotted against distance from source, the decrease proceeds in a more linear fashion than the exponential plot seen for oceanic islands. This may be due to the fact that potential colonizers of páramo vegetation have the opportunity to rest temporarily part of the way between two areas that might be favorable for reproduction, while individuals colonizing an oceanic island will have no temporary haven and will die immediately if they cannot negotiate directly the gap to be covered. Also, during interglacial periods certain now-isolated mountain areas were connected, a situation not duplicated by truly oceanic islands. Thus, at such times the possibility of receiving new propagules changes dramatically.

This paper provides a fresh view of island biogeography, complete with information from a rather different set of circumstances.—Douglass H. Morse.

67. Chilean bird distribution. M. L. Cody. 1970. *Ecology*, **51**(3): 455-464.—The local distributions of Chilean birds display marked differences from those of several other areas in temperate latitudes. A high percentage of land and fresh-water species breeding there occur in a wider variety of habitats than do comparable species in studies made thus far in other temperate areas, habitats contain more species there than would be predicted from previous investigations in other temperate areas, and in only a few cases is there more than one species of a genus found in a habitat at a given locality. Representatives of extremely widely-distributed genera occupy the widest range of habitats in Chile. These include such well-known taxa as *Troglodytes, Turdus, Zonotrichia, Mimus*, and *Elaenia*. Another group of typically South American genera also occupies a wide range of habitats within a particular latitudinal range, only to be replaced elsewhere by a congener. Included in this group are certain furnariids, tyrannids, and fringillids. A few genera have more than one representative in the same locality. These are in many cases also typically South American genera, though the genus *Fulica* (coots) is an exception.

Plots of bird species diversity and habitat diversity fit North American and Australian patterns only if vegetational profiles are divided into four layers, rather than the typical three. While within-habitat bird species diversity is large, between-habitat diversity is low. Cody suggests that this situation may be attributable to the isolation of Chile from other faunas by deserts and high mountains. Though the bird fauna is sizeable, Cody believes that it arrived slowly, with colonists spreading out considerably over a variety of vegetation types after arriving. Speciation upon arriving is largely prevented by the absence of north-south barriers within a considerable part of the country. This describes probable conditions of colonization that may differ from most continental areas, but does not explain why the Chilean species under these conditions have evolved a high within-habitat diversity and a low between-habitat diversity rather than the condition found in other temperate faunas. Cody suggests that the slow development of the bird fauna permitted early residents to occupy a wide variety of habitats within an area, with the result that when a successful newcomer arrived, it was difficult for that newcomer to exclude the older resident from all of the many habitats that it occupied. It is further suggested that once such a within-habitat diversity was established, food resources might not permit addition of new species that occupied a narrow range of habitats, because of the presence of other species. This argument is quite speculative, and it seems to me as if the in-detail basis for this interesting difference is still largely unsolved.

A number of characteristics of this avifauna are considered in detail. Where congeners appear near each other, a high degree of interspecific territoriality exists. These species are extremely similar morphologically. Outside the breeding season these different similar species often join multi-species groups together. Thus, Cody believes that the plumage patterns serve both as territorial displays and as attracting mechanisms at another season. This is an interesting addition to Cody's series of papers upon character convergence. It raises some interesting questions, not all of which are answered.—Douglass H. Morse.

68. The bird bazaar on Tyulenyi Island. (Ptichi bazar na ostrov Tyulenem (Dalnii vostok.)) Q. Golovkin and A. Georgien. 1970. *Byull. moskovskogo obschch. isp. priorody, otdel. biol.*, **75**(2): 53-59. (In Russian, English summary.)—The colony in a dot of land in the Okhotsk Sea consists of Murre (*Uria aalge inornata*), 152,000; Brunnich's Murre (*U. lomvia arra*), 100; and Kittiwake, (*Rissa tridactyla*), 300. The first figure represents a decline from an estimated 628,000 in 1949. To check out the suggestion of a number of authors that egg measurements might bear out the distinctness of the occasional intermixed "bridle" or "spectacled" form, the greatest and least diameters of 971 eggs collected at random there were analyzed statistically. When plotted on a graph the data obtained showed no significant variance from a normal distribution curve. Size averages were 84.4 X 51.9 mm; extremes 96-74 X 56-42 mm. Food brought to the young consisted mainly of 7 species of non-commercial fish.—Leon Kelso.

SYSTEMATICS AND PALEONTOLOGY

(See also 81, 83.)

69. Non-morphological criteria and their use in classification, as exemplified by Burhinidae. (Nemorfologicheskie kriterii i ikh ispolzovanie v klassifikatsii, na primere semeistva Burhinidae (Aves)). L. Stepanyan. 1970. *Z. obshchei biologii*, **31**(3): 291-301. (In Russian, English summary.)—Since, according to the author, the polytypic concept of the species has become prevalent in recent decades, it devolves on us to seek other than morphological criteria. So a comparison of Stone Plovers with apparently related groups on basis of ecological and ethological characters was attempted, employing all the literature available to the author. This found them closer related to the Charadriidae than to the Otididae, contrary to some classifications of the past. There is an ample review of previous treatments of the group, with a bibliography of 46 titles.—Leon Kelso.

70. A comparative electrophoretic study of avian plasma proteins. C. G. Sibley and H. T. Henrickson. 1970. *Condor*, **72**: 43-49.—The authors studied the plasma proteins of 450 species (1,500 specimens) of 106 families and 25 orders using starch-gel electrophoresis. No consistant patterns within or between taxonomic groups were observed, and the observed variation is attributed to taxonomically nonsignificant factors such as age, sex, nutrition, etc.—Joel Cracraft.

71. Serum proteins of two sibling species of Giant Petrel (*Macronectes spp*). P. D. Shaughnessy. 1970. *Comp. Biochem. Physiol.*, **33**: 721-723.—Starch-gel electrophoresis was performed on the serum proteins of 45 samples of *Macronectes giganteus* and 52 samples of *M. halli*. No differences in mobility between the two species were observed for the three proteins (transferrin, albumin, and a haem-binding protein) that were discovered. "These observations . . . indicate that the two groups are very similar genetically, as well as morphologically." But the data only suggest similarity in three proteins, which probably have a similar underlying genetic basis.—Joel Cracraft.

72. A small woodhen from New Zealand. R. J. Scarlett. 1970. *Notornis*, **17**: 68-74.—A new species of rail, *Gallirallus hartreei*, is described from deposits of late Pleistocene or early Holocene in age. This is the smallest species in the genus.—Joel Cracraft.

73. A new anseriform genus and species from the Nebraska Pliocene. Lester L. Short. 1970. *Auk*, **87**: 537-543.—This paper describes a new gooselike bird, *Heterochen pratensis*, from the Valentine Formation (lower Pliocene). The type tarsometatarsus is very distinct and the new form cannot be related to a specific tribe, although Short thinks it may have affinities with the Tadornini.—Joel Cracraft.

74. On the deposition of the Solnhofen lithographic limestone (lower Tithonian, Bavaria, Germany). K. W. Barthel. 1970. *N. Jb. Geol. Palaont. Abh.*, **135**: 1-18. (In English). —This paper discusses the stratigraphy and sedimentation of the Jurassic limestones of Solnhofen. There are some important comments concerning *Archaeopteryx*. The well preserved Berlin specimen was recovered from near-shore facies, whereas the London and third specimen (in Maxberg, Germany) were found in the off-shore region of the lagoon. Berthel says that the bones of *Archaeopteryx* lacked pneumaticity, but this may not be true.—Joel Cracraft.

75. A new turkey from the Pliocene of Nebraska. L. D. Martin and J. Tate, Jr. 1970. *Wilson Bull.*, **82**: 214-218.—The authors describe a new genus and species of turkey, *Proagriocharis kimballensis*, from the upper Pliocene (Kimball Formation) of Nebraska. Several shortcomings make it difficult to evaluate the validity of their new genus. First, intra- and interspecific variation in size and morphology is very great among turkeys and the authors fail to discuss this in any detail. In this regard the authors do not mention how many skeletons of Recent and fossil turkeys were examined in order to evaluate the range of variation in the inclination and placement of the spur cone (which they use to separate several genera) and other morphological characters. Second, why were measurements of all the new fossil material not presented? Also, the photographs are too poor for accurate comparison with other papers or specimens. In general, strong justification for the creation of a new genus is lacking.—Joel Cracraft.

76. A redescription of two Pliocene cormorants. B. G. Murray, Jr. 1970. *Condor*, **72**: 293-298.—Includes a description of new material of *Phalacrocorax idahensis* and *P. macer*. The author makes the important point that "Characterization and identification of species on the basis of a single bone, or even a few bones, should be tentative, especially when the variation within related Recent species is not well known."—Joel Cracraft.

77. A third specimen of a lower Cretaceous feather from Victoria, Australia. M. Waldman. 1970. *Condor*, **72**: 377.—The author describes a complete, small (total length about 15 mm), lanceolate feather.—Joel Cracraft.

78. The presence of *Anas leucophrys* (Aves, Anseriformes) in sediments of Ensenadan (Middle Pleistocene), Buenos Aires Province. (La presencia de *Anas leucophrus* (Aves, Anseriformes) en sedimentos de edad snsenadense (Pleistoceno medio) de la Provincia de Buenos Aires.) E. P. Tonni. 1969. *Ameghiniana*, **6**: 309-313. (In Spanish; English abstract).—An incomplete humerus of this Recent species was found in middle Pleistocene deposits of the southeastern part of Buenos Aires Province, Artentina. This record indicates a more southerly distribution of *A. leucophrys* in middle Pleistocene times.—Joel Cracraft.

EVOLUTION AND GENETICS

(See also 31, 59, 64, 65, 67, 92.)

79. Geographic size variation in birds and its relationship to climate F. C. James. 1970. *Ecology*, **51**:(3): 365-390.—Is Bergmann's Rule a valid generalization? This is a question upon which opinion has been divided. In fact, according to James' translation of Bergmann's original paper (1847), there is some confusion over what it originally stated. The three major points appear to have been that the constant temperature of homeothermic organisms is maintained by a balance between the production of warmth within the volume of an animal and the loss of warmth from its surface, that the limitation of the ratio of a homeotherm's body surface to its volume is one of the factors determining its size, and that when other factors are constant the smaller species in a genus will occur in a warmer climate. This differs considerably from Mayr's definition in *Animal Species and Evolution* that races of warm-blooded vertebrates from cooler climates tend to be larger than races of the same species living in warmer climates.

Do either of these generalizations have any basis? James conducted a detailed survey of six largely resident species of eastern and central NorthAmerica (Hairy Woodpecker, *Dendrocopos villosus*; Downy Woodpecker, *D. pubescens*; Blue Jay, *Cyanocitta cristata*; Carolina Chickadee, *Parus carolinensis*; White-breasted Nuthatch, *Sitta carolinensis*; and Eastern Meadowlark, *Sturnella magna*) in order to evaluate the relationship between climate and size variation. Less detailed information was also obtained for another five species (Red-shouldered Hawk, *Buteo lineatus*; Sparrow Hawk, *Falco sparverius*; Screech Owl, *Otus asio*; Common Nighthawk, *Chordeiles minor*; and Yellow-shafted Flicker, *Colaptes auratus*). Wing (chord) measurements were obtained from over 4,000 specimens, mostly from museums, this measurement serving as an estimate of overall size. Precautions were taken to minimize variations due to sex, age, or season. Where populations were considered migratory, only breeding-season specimens were used.

The data revealed a close correlation with combined effects of humidity and temperature. Consideration of this pair of factors appears to resolve several cases where apparent exceptions to Bergmann's Rule have been suggested. Considerations in this paper have been on an intraspecific level, which was not that suggested by Bergmann, his level being the intrageneric. James makes no evaluation of this phenomenon above the specific level. At the intraspecific level, she proposes to modify the statement to indicate that size variation in homeotherms is related to climatic variables, including temperature and moisture, working in combination. Small size is associated with hot or humid conditions, large size with cool or dry conditions. The usual explanations accounting for the adaptive basis of this variation are aired, and the objections to them are considered.—Douglass H. Morse.

80. The effect of experience and novelty on avian feeding behavior with reference to the evolution of warning coloration in butterflies. II. Reactions of naive birds to novel insects. R. P. Coppinger. 1970. *Amer. Nat.*, **104**(938): 323-335.—What factors determine whether a predator will attack an unfamiliar prey object? In an earlier paper Coppinger reported that at least in his system (avian predators and insect prey) rejections of novel objects were not infrequent; furthermore, they were often accompanied by behavior on the part of the predator. Here he reports upon attempts to determine whether this behavior is innate or learned. Naive (hand-reared) birds of three species (Blue Jays, *Cyanocitta cristata*; Common Grackle, *Quiscalus quiscula*; Red-winged Blackbird, *Agelaius phoeniceus*) were utilized as predators, and three species of frozen nymphaline butterflies from Trinidad served as test material. Prior to presentation of this material, all birds were trained to eat mealworms. The significance of this point to the experiments only became evident much later in the paper.

The results again indicate that these birds often avoid novel stimuli, and furthermore they reject these stimuli in a way indicating that the basis was (according to Coppinger) neither learned or innate. Rather, the amount of difference between the novel stimulus and previously experienced ones was of apparent considerable importance. Though not considered by Coppinger to be the result of learning, it seems to the reviewer that the responses have to be considered at least an indirect manifestation of learned behavior. The argument here is only semantic. These results would suggest that there need be no association with noxiousness in order for selection to proceed for conspicuousness. However, if such conspicuous items frequently are noxious and the general sort of learning indicated above exists, then avoidance of conspicuous items may often be advantageous, and even though no special resemblances exist. The resemblance may be only conspicuousness, which might even be considered a special example of Muellerian mimicry. Regardless of the interpretation, the avoidance of novel stimuli increases the opportunity for new mutants to be established. This is a satisfying solution to a problem raised by R. A. Fisher many years ago. Fisher was concerned that if an original mutant possessed a distinctive pattern, it would have to be sampled in order that its noxious quality be detected. It thus might be eliminated long before it could become established in the population, and before its warning device could become recognized by predators.—Douglass H. Morse.

81. Genetics of melanism in the Fantail *Rhipidura fuliginosa*. G. Caughley. *Notornis,* **16:** 237-240.—Reanalysis of data by Oliver (*New Zealand Birds,* 1955) shows that melanism in the South Island Fantail is caused by a single dominant allele and is not recessive to the Pied allele as thought. Heterosis and panmictic mating hold the allele at a frequency of about 7% in the population, thus causing the frequency of melanistic birds to be about 13%. The hypothesis by Oliver that the pied and black forms are "semi-species" is inconsistent with this clarified interpretation of the genetics of melanism in the Fantail.—Jack P. Hailman.

82. Convergence between jacamars and bee-eaters. C. H. Fry. 1970. *Ibis,* **112:** 257-259.—This note discusses convergence in some behavioral and ecological features, especially those associated with feeding. The diet of both families consists of about 80-85 percent Hymenoptera. Both families also nest in holes, have similar clutch sizes, incubation and fledging periods, and lack pronounced sexual dimorphism in plumage. The causal factors of this convergence have not been adequately explained, but Fry suggests that the social organization is probably similar in the two groups.—Joel Cracraft.

83. Independent evolution of the Dodo and the Solitaire. R. W. Storer. 1970. *Auk,* **87:** 369-370.—This unhappy little note contains several ideas that I hope will not gain credence with the ornithological public. Storer asserts that because the Dodo of Mauritius and the Solitaire of Rodrigues are structurally different and are found on widely separated islands that would preclude rafting of a large flightless bird, the Dodo and the Solitaire were derived independently from flying ancestors and should be accorded the stutus of separate families. He speculates that if and when remains of the large "didine" bird(s) of Reunion (as yet known only from old contemporary reports) are found, that "they will prove to be unrelated either to the Dodo or the Solitaire," and that they may have been "derived from rails or some group other than pigeons."

He goes on to cite the work of Luttschwager as proposing the descent of the Dodo and Solitarie from rails. I have examined Luttschwager's papers on this subject (*Zool. Anzeiger,* **162:** 127-148, 1959 and "Die Drontevogel" in Die Neue Brehm-Bucherei series, 1961) and find them less than convincing. The characteristics of Dodos and Solitaries that Lüttschwager gives as differing from typical doves and as resembling flightless rails are mostly those that may be attributed to flightlessness and are not useful indicators of relationship. Nowhere does he offer convincing evidence that the didine birds are derived from rails and indeed this would be most difficult to do since they are *not*. The skeletal elements of the Dodo and Solitaire that I have examined are so markedly columbiform that to postulate any other origin seems preposterous to me. Even the vestigial wing bones retain a remarkable resemblance to columbids, despite their loss of function.

As to the "separate evolution" of the Dodo and Solitaire, this is true for at least part of their history, as they are different birds found on different islands. But bear in mind that although pigeons and doves have reached many isolated islands, nowhere save the Mascarenes, have they differentiated into large flightless forms. It is not unreasonable to assume that the Dodo-like birds of the Mascarenes were derived from a common columbiform ancestor which colonised all three islands before having lost the ability to fly and that these species are more closely related to each other than to any other known taxa. Contrary to Storer, I would be most surprised if the didine bird of Reunion proves to be anything other than columbiform.—Storrs L. Olson.

84. Genetic polymorphisms of esterase isozymes of the plasma in two species of doves, their hybrids and backcross hybrids, and in other species of Columbidae. L. G. Boehm and M. R. Irwin. 1970. *Comp. Biochem. Physiol.,* **32:** 377-386.—Electrophoresis of plasma esterasis shows that there are nine phenotypes in *Streptopelia senegalensis* and one in *S. risoria*. Separate alleles are postulated for each pattern; dominance relationships are not known. Nineteen other species of columbids were examined and each could be distinguished on the basis of esterase pattern.—Joel Cracraft.

FOOD AND FEEDING

(See also 35, 37, 68, 82.)

85. A study of avian and invertebrate trophic relationships in biogeocenoses of the tundra. (Izuchenie troficheskikh svyazei ptits i bespozvonochnykh v biogeotsenozakh tundry.) V. Sosin, V. Ryzhanovskii, and Y. Novozhenov. 1970. *Ekologiya*, **1970**(2): 55-65. 4 graphs, 4 tables.(In Russian.)—In a new journal initiated this year by a leading vertebrate zoologist, S. S. Schwartz, special modern electronic instruments (actographs) for avian nesting studies provided records of circadian nesting activity, and growth of young of Meadow and Red-breasted Pipits, Yellow Wagtail, Lapland Longspur, Bluethroat, and Little Bunting, 18 nests in all. On their foraging territories the invertebrate biomass was measured by locally devised methods, July & August, 1968, at "Kharp" station at the polar terminal of the Ural Mountains. By comparison of calculated food requirements with amount actually provided the young, it was found that the latter was less than the need; also that there was a definite adherence to energy balance of young under tundra conditions. The adults foraging exerted a definite effect on numbers of invertebrates, effecting a definite role in tundra communities. In the nesting period the calculated young consumption was 30-45% of the invertebrate biomass in the foraging territories. Avian occupation of forest-tundra zone communities was close to saturation. Arachnids predominated over insects in the territories, and were prominent in the food brought to the young. Notwithstanding the illumination was 24-hour dayround, cessation of feeding came at equivalent midnight; the active day of the Bluethroat being 19, Longspur 20, and Little Bunting 21 hours. Many more details are given with ample discussion and a bibliography of 24 titles.—Leon Kelso.

86. The autumn migration and wintering ecology of the Siskin *Carduelis spinus*. K. Eriksson. 1970. *Ornis Fennica*, **47**(2): 52-68.—Numbers of Siskins wintering in Finland are correlated with the seed-crops of both birch and spruce. These trees usually produce good crops in synchrony, so that the Siskin populations in good years are hundreds of times larger than those in bad years. The numbers seen on autumn migration fluctuate correspondingly, but the dates of passage are similar in good and bad years (in contrast to an earlier report from Sweden). There is evidence that the breeding range shifts from year to year in accordance with the seed crop of spruce, and that the breeding season is longer in good seed years.—I. C. T. Nisbet.

87. The fauna of micromammals from Valul-Lui-Traian in the years 1958-1962, according to *Asio otus* pellets. B. Schnapp. 1968. *Travaux Mus. Histoire Natur. Grigoire Antipa*, **8**(2): 1045-1062. (In English.)—In Long-eared Owl pellets gathered over a 5-year period remnants of 21,000 animals were found. Of these 94.1% were mammals; the rest mostly passerine birds and insects; of murine rodents, 18,496, 66% were the Common Vole. Ratio of rodent numbers varies with abundance in the wild per year and season.—Leon Kelso.

88. Age and hunting success in the Brown Pelican (*Pelecanus occidentalis*). G. H. Orians. 1969. *Anim. Behav.*, **17**: 316-319.—Older ones do better, which is consistent with delayed maturation and smaller clutch sizes of younger birds.—Jack P. Hailman.

89. Comparative foraging efficiency of adult and immature Little Blue Herons (*Florida caerulea*). H. F. Recher and J. A. Recher. 1969. *Anim. Behav.*, **17**: 320-322.—Ditto.—Jack P. Hailman.

SONG AND VOCALIZATIONS

(See also 50.)

90. Territorial and courtship songs of birds. D. H. Morse. 1970. *Nature,* **226:** 659-661.—Morse discovered earlier (*Wilson Bull.,* **79:** 64 ff, 1967) that the Black-throated Green Warbler, *Dendroica virens,* sings two different songs. One seemed to be directed to neighboring males, the other to the mate. In this study, he compares the singing of male warblers on small isolated islands (one warbler pair per island) with those on a nearby large island. The song thought to be given to other males is almost absent on the small islands, while the other song is more frequent through most of the season. Therefore, in this clever "natural experiment" Morse has provided further evidence for the distinction between "territorial" and "courtship" songs in warblers. A fine piece of quantitative field work.—Jack P. Hailman.

91. Song recognition by territorial male buntings (Passerina). W. L. Thompson. 1969. *Anim. Behav.,* **17:** 658-663.—Species react more strongly to their conspecific songs than to songs of other congenerics. The temporal relations and frequency structure of the song seem critical in the identification, as shown by playing the recordings backward, at slower speed, etc.—Jack P. Hailman.

BOOKS AND MONOGRAPHS

92. *Ornithological Anthology.* (*Ornitologicheskii Sbornik.*) A. I. Ivanov (editor). 1970. Academician P. P. Sushkin 100th anniversary memorial volume, *Trudy zool. inst. akad. nauk,* **47:** 1-264. "Nauka" publishing house, Leningrad 2 roubles, 40 kopecks (about $6.00 U. S.). (In Russian, with English titles.)—In honor of one of the most distinguished Russian zoologists of his time, who published extensively outside as well as inside Russia, and even traveled widely, spending about 2 years in the U. S., this volume comprises a foreword and memorial appreciation by A. I. Ivanov, nine ornithological papers and two pages of abstract summaries. *Dispersal of the pheasant, Phasianus colchicus, in the deserts of central Asia,* by E. V. Kozlova, emphasizes its taxonomic variation, and also relates memories of Sushkin's work on the topic and as a teacher. *P. P. Sushkin as faunist and zoogeographer,* by L. A. Portenko, enlarges in considerable detail on his work in those fields. *The biological significance and evolution of cranial kinesis in birds,* by K. A. Yudin, presents an ample historical review, with bibliography of 47 titles and 12 figures, plus also additional work of his own and discussion of recent studies by Bock, Zusi and others. *A survey of ornithological explorations in Karelia,* by I. A. Neufeldt, is historical and very detailed, with a bibliography of 209 titles, and a list of the 231 bird species recorded. *The downy young of some Asian birds,* also by Neufeldt, emphasizes need for details of newly hatched young, and gives descriptions of 86 species, mostly passerine, of such, many previously undescribed, with sharp photographs of 27 of them. There is also a table of data on down plumage of 251 species of Asiatic bird nestlings gleaned from other authors, in a bibliography of 68 titles. There is a section on collection and preparation, with notes on the institute's special collection of nestlings. *Zoological subdivisions of northeastern Asia based on the distribution of birds,* by L. A. Portenko, defines the arctic and Euro-Siberian zoogeographic subregions, 3 provinces, 7 subprovinces, 8 districts, and 4 special sections of the region, listing their definitive bird species, and discusses their relationship to arctic America. *Comparative survey of the Spruce Grouse (Falcipennis* and *Canachites,* Tetraonicae) *of Asia and North America,* by R. L. Potapov, attempts a general monograph of the group, finding the species congeneric under the Elliot name *Falcipennis,* with ample review and discussion of recent contributions by American authors. *Morphological features of penguin wings,* by the eminent anatomist B. K. Stegmann, illustrated by 8 figures, finds much to disagree with in the conclusions of Lowe and others, particularly that the non-pneumatic nature of penguin bones does not preclude their origin from flying ancestors. *On reduction of wing muscalature during evolution of Class Aves,* by Stegmann, with 8 figures, makes a strong case for overall evolutionary simplification of the mechanism of bird flight, the hummingbirds for example retaining fewer wing muscles than the flightless penguins. The book as a whole is a worthy memorial and a landmark in Russian ornithology.—Leon Kelso.

93. *Birds of Guatemala.* Hugh C. Land. 1970. Livingston, Wynnewood, Pa. xiv + 381 pp, 44 color plates. $10.—This fine English-language field guide comes "hot on the heels" of Smithe's *Birds of Tikal* (see *Bird-Banding,* October 1970, review # **57**). Land's work covers the entire country, about the size of New York State, which has as many species as the United States and Canada combined. The volume is a fine tribute to Land's life work, cut short by Hodgkin's disease in his 40th year.

The illustrations (some of which appear in Smithe's volume or elsewhere) were done by the author and H. Wayne Trimm. Trimm's plates are undoubtedly superior, but Land's are certainly more than adequate. I like the printing of page references right on the plates for quick reference. Scales in both inches and centimeters are given at the bottom of each plate. It is unfortunate that these scales are sometimes crammed almost into the illustrations themselves. It is also unfortunate that the scales are drawn variously, having bars on some and tics on others, inches on top with cms on the bottom on some and *vice versa* on others, etc.; such variations add to the difficulty of quick visual reference in a field guide.

Species' accounts are ample, giving English and Spanish names, Latin binomial, range, subspecies, description, habitat and so forth. I like particularly the range maps, showing not only the known ranges, but also the relative abundance of the species throughout its range (in five degrees of shading). Unfortunately, range maps are grouped, mainly at the bottom of text pages, and labelled only by Latin names. The (more costly) procedure of having the map integrated with the species' account would have been far more effective.

There are several dozen pages of useful front matter giving the climate, geography, life zones, avifaunal zones, and so forth about Guatemala. Perhaps unique to field guides is a section toward the end on "Bird Watching in Guatemala"—sort of a miniature "Pettingill" for that area. There are five maps.

The guide is sponsored by Frank B. Smithe, whose contribution to Central American ornithology continues to grow. The book is published for the International Committee for Bird Preservation (Pan-American Section), in hopes of encouraging greater interest in and conservation of the wonderful avifauna of the American tropics.

Each new bird guide that appears seems to be pushing the standards higher. Perhaps it is no longer a far-fetched dream: that vision of being able to go anywhere in the world with an adequate field guide in one's pocket. A work such as this should prove valuable to the recreational nature lover, conservationist and professional biologist alike.—Jack P. Hailman.

94. *Birds of the Southern Kurile Islands.* (*Ptitsy yuzhnykh kurilskikh ostrovov.*) V. A. Nechaev. 1969. "Nauka" Publishing House, Leningrad. 246 pp., 37 figs., 2 tables, bibliography of 114 titles. 1 rouble, 18 kopecks (About $3.00 U. S.) (In Russian.)—Selected for study because avifaunistically they are a continuation of the Japanese islands (Hokkaido) to the south while those to the north are not, Kunashir, Shikotan, Itrupa and nearby isles of the archipelago are emergent portions of a deep underwater volcanic mountain chain. Some hitherto had never been explored ornithologically. This account is based on about 2 years continuous resident study by the author and a review of about all extant pertinent published data. The broadest significance of the information here is that it well supplements numerous other recent studies of insular faunal tendencies, particularly the fewness of species with reduction of area. Thus, on Kunashir, area 1400 km^2, were found 227 species, 107 breeding; on Shikotan, area 260 km^2, 170 species, 90 breeding. There also appears a south-to-north reduction of species number independent of insular area.

There is an introduction; a physiographic review; a history of previous exploration; a systematic list of the 233 bird species recorded, well annotated with local notes on life history, measurements, and occasional discussion of subspecific status; an ornithogeographic review; a chapter on economic and conservation considerations; the bibliography; a check-list of Russian and Latin names; and a useful bonus is a similar check-list of local and Latin names of plants noted in the habitat descriptions. All in all it is a decidedly worth-while book, especially in consideration of the price.—Leon Kelso.