April 13, 1969. After second year male.

May 4, 1969. After second year male.

Feb. 14, 1970. After second year female.

In every instance the bird's mouth and throat were filled with bird seed. On incising the skin to examine the trachea, I found one seed that had passed for a distance of about a centimeter down the trachea, obstructing it completely. Through the Cape May County Extension Service, I had one of these seeds identified by Jennie A. Bloodgood, State Seed Analyst, N. J. Department of Agriculture, Trenton, as Prose Millet, *Panicum milaceum*. This seed measures about 2 millimeters in diameter and is an abundant constituent of the wild-bird-seed mix.

Other birds caught at the same time have not had this difficulty. It looks as if the Red-winged Blackbirds first of all gorge themselves and then become over-excited, aspirating the seeds because of increased respiration occasioned by fright. —C. Brooke Worth, R. D. Delmont, N. J. 08314.

RECENT LITERATURE

BANDING AND LONGEVITY

(See also 14)

1. Operation Baltic 1967. (Akcja Baltycka 1967.) P. Busse and M. Gromadzki. 1969. *Acta ornithologica* (Warsaw), **11**(9): 329-354. (In Polish, with English summary.)—This bird-ringing report summarizes Polish work at 4 Baltic Sea stations from 1960-1967 (225,470 individuals of 142 species banded) with work of 1966-1967 reported in detail (38,366 of 91 species). Notable totals of banded species were: Robin, *Erithacus rubecula*, 55,675; Goldcrest, *Regulus regulus*, 51,588; Great Tit, *Parus major*, 25,533. Short-term recoveries totaled overall, 33,960. Previous work of this project was reported *ibid.* **10**(11).—Leon Kelso.

2. Weight changes of Semipalmated and Least Sandpipers pausing during autumn migration. G. Page and A. Salvadori. 1969. *Ontario Bird Band.*, **5**(2): 52-58.—It is usually assumed that migration pauses allow birds to replenish energy reserves for long flights, but there are only a few species for which direct evidence exists. *Ereunetes pusillus* and *Erolia minutilla* were trapped and retrapped, and the data show a convincing weight gain as a function of time during the migration pause. These are the sorts of data that banders should attempt to get for every migratory species.—Jack P. Hailman.

3. "Vogelwarte Helgoland" moved to a new site. G. A. Radtke. 1969. *Ring*, **58A**: 194-196.—The postwar rebuilding of Wilhelmshaven harbor necessitated moving the famous German banding station to a new headquarters in a 1872 fort nearby. Facilities in the new laboratory are described. The well known colony of Herring Gulls (*Larus argentatus*) on dock 3 is now all but gone due to the harbor alterations, after providing nearly two decades of subjects for the careful study of Goethe and others. As a lover of gulls and one-time visitor to the site, I lament the colony's passing.—Jack P. Hailman.

4. The change of rings is endangering the "individuality" of a ringed bird. H. Bub. 1969. *Ring*, **58A**: 187-188.—The inadvisability of removing a band in order to substitute a new one needs repeatedly to be emphasized. If one must put his own band on, put it on the other leg: at least I think that is what the author is suggesting with the terminal sentence, "There is however no scientific argument for double ringing which cannot be expected of a bird on principle."—Jack P. Hailman.

5. Spring weights of some Palaearctic migrants at Lake Chad. C. H. Fry, J. S. Ash and I. J. Ferguson-Lees. 1970. *Ibis*, **112**(1): 58-82.—Some 1,600 migrants of three species of trans-Saharan migrants were netted and weighed in March and April on the Nigerian shore of Lake Chad, a fertile area in the arid Sahel savannah. Fluctuations in numbers and weights indicated departures of heavy birds and arrivals of light birds, which had probably wintered not far to the south. Some birds put on enough fat for a non-stop flight to the North African coast (1,900 km) or even to southern Europe (2,500 km). Others, however, appeared to leave the area, only 60 km south of the margin of the Sahara desert, without enough fat to cross it. Whitethroats *Sylvia communis* which fed on the sugar-rich berries of *Salvadora* put on fat three times faster (0.6 g/day) than Sedge Warblers *Acrocephalus schoenobaenus* which fed on minute midges. Analyses of fat and water contents of 260 collected specimens are given in detail. Among the leaner birds, fat-free weight was found to increase in parallel with the amount of fat. It is speculated that this increase results from development of the flight muscles.—I. C. T. Nisbet.

MIGRATION, ORIENTATION AND HOMING

(See also 5, 33)

6. Spring migration and weather at Madison, Wisconsin. S. G. Curtis. 1969. *Wilson Bull.*, **81**(3): 235-245.—This is one of the first papers in which both arrivals and departures of migrants at the same point have been related to weather. Arrivals were more correlated than departures with rising temperatures, and were positively correlated with rain, whereas departures were negatively correlated with rain. The differences indicate the role of weather in interrupting migration, especially near warm fronts and ahead of cold fronts.—I. C. T. Nisbet.

7. Weather radar quantification of bird migration. S. A. Gauthreaux, Jr. 1970. *BioScience*, **20**(1): 17-20.—Despite its cryptic title (which, we must hope, was the work of a jargon-prone sub-editor), this paper actually describes a method for measuring densities of bird migration, using the Weather Bureau's WSR-57 radars. The method consists of attenuating the echo display (i.e., turning down the gain) until it matches a reference pattern: the degree of attenuation is then an inverse measure of the density of birds at the range and height involved. Measurements in Louisiana agreed singularly well with simultaneous estimates of migration traffic rates obtained by moon-watching. Errors in moon-watching estimates, which may result from changes in height of flight and in altitude of the moon, were standardized by using data gathered in "comparable" conditions, but unfortunately these conditions are not specified. The technique was also used to estimate flock-sizes by day.—I. C. T. Nisbet.

8. Migration departures from Starling roosts. W. J. Richardson and M. E. Haight. 1970. *Can. J. Zool.*, **48**(1): 31-39.—*Sturnus vulgaris* sometimes sets out on migration directly from its mass roosts. Echoes from the migrating flocks form characteristic arcs on a radar screen and can be readily identified. This paper is based on 12 spring and 15 autumn observations of mass departures from roosts in southern Ontario. As compared with other radar studies, it has the advantage of treating only one species; it has the disadvantage of treating an introduced species whose migration may not yet be adjusted to North American weather patterns. Although the authors do not make this point, their results appear more similar to Lack's observations of migrants in southern England (where Starlings are the most numerous species) than to published studies of other species in North America.

Heavy departures were strongly associated with following winds and with temperature, above normal in spring and below normal in autumn. When only days with following winds were considered, the association with temperature remained strong; considering only days with similar temperatures, the association with following winds probably persisted. There was no simple correlation with cloud cover, humidity or wind speed. The observations are plotted on an ingenious, generalized weather map, which might profitably be used by other workers to facilitate inter-regional comparisons.

In a thoughtful discussion, the authors defend their failure to use multivariate statistical techniques, on the grounds that their measure of migration volume was not on an interval scale. However, they also question the appropriateness of multivariate techniques for analyzing correlations between migration and weather, on the grounds that (a) they assume linear relations between the variables, (b) they fail to treat interactions which are known to exist between weather variables, and (c) they do not take account of rare combinations of weather variables. While all these objections are sound, they do not point the way to any better technique. It is indeed important to study non-linear effects of weather variables, interactions, and rare combinations; however, to identify and measure their effects we require a good statistical description of the data as a basis. Multivariate methods provide a better description, in this sense, than any other. A statistical model is not intended to (and cannot) indicate "the actual stimuli used in the mechanism determining whether or not the bird will migrate at a given time"; it should instead be thought of as the *starting-point* for biological analysis.—I. C. T. Nisbet.

9. The migration of the Yellow Wagtail from the equator. D. F. Owen. 1969. *Ardea,* **57**(1/2): 77-85.—Curry-Lindahl and others have commented on the precise timing of the departure of various races of *Motacilla flava* from equatorial wintering grounds, and have proposed that it is controlled by a "physiological calendar", set by events on the breeding-grounds in the previous year (see *Bird-Banding,* **36:** 119, 1965, review no. **3**). Owen, however, presents data from Kampala, Uganda (0°20′N), which show marked month-to-month variations in the abundance of insects, and he suggests that these could provide an external timer for the wagtails. "This hypothesis makes fewer assumptions in the general field of avian physiology than [Curry-Lindahl's]".

It is good to see published data refuting the text-book assumption that the equatorial zone is environmentally uniform and non-seasonal. However, Owen's data were based on only one year's sampling. The question remains: are the changes in insect abundance regular enough to account for the observed regularity of departure dates? Having spent five springs near the equator, I can suggest many other external changes which are likely to be at least as reliable clues to the season as insect abundance. Excluding rainfall, which as Owen points out is very irregular, these include wind direction, leaf-fall, flowering and fruiting of perennial plants, breeding activities of local residents and movements of intertropical or south temperate zone migrants. If these prove to be insufficiently regular, there are several easily observed astronomical events, such as the passage of the sun overhead at equinox and the hours of rising and culmination of various stars. Why should these not suffice?—I. C. T. Nisbet.

10. Avian orientation. (Orientatsiya ptits.) A. B. Kistyakovskii et al. 1970. *Priroda,* **1970**(1): 56-61. (In Russian.)—The leader of the avian orientation research group at Kiev University reviews their own experiments and the various recent navigation theories, particularly the celestial, finding none of them satisfactory.—Leon Kelso.

11. Are pigeons able to home when released over the sea? F. Popi and L. Pardi. 1968. *Monitori Zool. Ital.,* **2**(3-4): 217-231.—In experiments using 106 homing pigeons, releases were 100-255 km from home, in varied weather but with solar disk always visible; early course of each observed thru binoculars, and data taken. In releases over the sea 52% of adults and 80% of yearlings were lost; in releases over land, 35% of adults and 17% of young. Navigation over water rated very poor and inexplicable by current orientation theories. I believe it demonstrable that rise of humidity in air or plumage hinders homing. [From Russian *Referat. zhurn,* **1969**(12): Aves 71.]—Leon Kelso.

12. Some ideas on avian orientation. (Nekotorye soobrazheniya otnositelno orientatsii ptits.) K. A. Wilks. 1968. *Bioniki i biokibernetika* (Bionics and biocybernetics.), **1968:** 213-218. (In Russian.)—It had to come sooner or later: the thought that ornithology might as well give up on visual, celestial or magnetic navigation in avian orientation and seek its interpretation in molecular physics, in the realms of relativity or quantum mechanics perhaps. This article recommends exploration of such prospects, a further extension of the molecular biology field.—Leon Kelso.

POPULATION DYNAMICS

(See also 15, 16, 28, 30, 31)

13. Ecological studies of the rook (*Corvus frugilegus* L.) in northeast Scotland. Proportion and distribution of young in the population. G. M. Dunnet, R. A. Fordham, and I. J. Patterson. 1969. *J. Appl. Ecol.* **6**(3): 459-473.—Readily observed differences between age classes of organisms provide convenient markers for estimating population age structure. Four age categories of Rooks can be readily defined; nestlings, fledged young prior to the first body molt, individuals between first body molt and first complete molt, and individuals over a year old. Means for distinguishing the latter categories are presented and discussed. Some differences are primarily useful in distinguishing between groups when individuals are in the hand.

Adults and young appear to be somewhat segregated in flocks in autumn and winter. The proportion of young per flock decreases as flock size increases. The authors indicate that the proportion of young Rooks in flocks increases in early spring, presumably resulting from movements as well as from mortality; however, it is questionable whether this difference is significant. While the authors believe that their measurements accurately estimate the proportions of young and adults, they recognize that they may not serve as adequate estimates of total population size. Problems of using these and other data (at roosts, etc.) are discussed at length.

In some rookeries farmers traditionally shoot the young just before they fly, resulting in very low fledging rates in some cases. Nevertheless, the breeding population may increase in such rookeries, indicating a high level of immigration.—Douglass H. Morse.

14. Seasonal fluctuations in the mortality rates of three northern- and three southern-hemisphere gulls. G. F. Tets. 1968. *C. S. I. P. O. Wildlife res.*, **13**(1): 1-9.—On banding returns for 6 species: *Larus ridibundus, L. argentatus, L. glaucescens* (northern), and *L. novaehollandiae, L. bulleri,* and *L. dominicanus* (southern), mortality was calculated by seasons. Maximum mortality occurred in summer (Jan.-July in northern, Jan.-Feb. in southern hemisphere) although conditions then presumably were most favorable.—Leon Kelso.

NESTING AND REPRODUCTION

(See also 19, 55)

15. Some features of recent research on the Takahe (*Notornis mantelli*). B. Reid. 1967. *Proc. New Zealand Ecol. Soc.* **14:** 79-87.—The Takahe is a bizarre flightless rail from New Zealand that was long thought to be extinct, since between 1898 and 1948 no individuals were seen. At that time the species was found in a remote mountain valley west of Lake Te Anau (South Island) and subsequently in several neighboring valleys. Subsequently studies were carried out to learn the life history of the species and what characteristics were vital to its existence. This paper is a report of these studies.

An ambitious banding program has been carried out to learn the population dynamics of the Takahe. Through the 1966-67 breeding season 71 adults and 33 chicks had been banded, which to that time had yielded 117 recoveries, all but 5 from live birds. Judging from subsequent recoveries about 50% of the banded birds were recovered during any particular year.

Takahes apparently mate for life, as no bird has been found with a different mate while its previous partner was known to be alive. They usually occupy the same territory throughout their life. Of 48 birds banded as adults and recaptured in subsequent seasons, only 4 were found in different territories, 3 of these having moved after the death of a mate. Reid suspects that following the raising of young, territories may be no longer defended. During winter they may move as much as 2,000 feet lower than their breeding grounds. The oldest Takahes yet captured were at least 14 years of age.

Young of the year often remain with their parents (7 of 10 captured). Of 7 captured as second year birds, one still was with its parents, while others were scattered as far as 2900 yd. away. Of 34 banded as young, 15 have subsequently been recovered, including 5 from a neighboring valley where banding studies have also been conducted (2200-2900 yd. away). Reid feels it is possible that some of the other 19 have moved into other adjacent valleys that are unstudied.

Takahes appear physiologically capable of breeding when 2 years old, though the evidence for their actually doing so is problematical. Recaptured third-year birds were definitely breeding. Both juvenile and adult mortality appear low, probably in the neighborhood of 33% for birds from banding as chicks through the first year, and 12-17% per year for adults. 72 and 87% of the adults recorded were paired in 2 different years. Pairs do not breed each year, and this appears related to the environmental conditions. While the yearly extremes are not extractable from the data, a mean of 70% of the pairs bred yearly. Of 32 cases in which clutch size was definitely known, 25 pairs laid 2 eggs and 7 laid one. 71% of the breeding pairs hatched chicks, 27% with a clutch of 2, and 44% with a clutch of one. At 6 weeks, 21% still had 2 young, and 45% had one. These combined data indicate that about one-third of the eggs laid survive past their first year. Reid calculates that with the observed clutch sizes and mortalities, the population will be maintained if no 1-2 year old birds breed and 80-85% of the birds 3 and over breed. During the 17 years of the study numbers have remained remarkably constant, and the population (estimated at 47-50 adults) has compensated for 4 eggs, 4 chicks, and 3 adults taken into captivity for a propagation program between 1957 and 1963. This would suggest that the population is almost constantly at carrying capacity.

While the population in this part of their range appears stable, some peripheral populations have disappeared since rediscovery. The total area occupied by Takahes is only 200-230 square miles, and the present estimated population of 370-420 birds probably has not been greatly exceeded in this area. Furthermore, browsing ruminants and stoats now are present in the area. Reid feels that combined with the probable lack of plasticity of such a small population, such developments seriously threaten the existence of this species.

This long-term study has superbly documented the dynamics of a secretive endangered species. The author and his colleagues are to be commended.—Douglass H. Morse.

16. Observations on the Ivory Gull in southwest Spitsbergen. (Obserwacje nad mewa modrodzioba, *Pagophila eburnea* (Phipps), w poludniowedj czesci Zachodniego Spitsbergenu.) K. Birkenmajer. 1969. *Acta ornithologica* (*Polska akad. nauk*, Warsaw), **11**(13): 461-476. (In Polish, Russian and English summaries.)—The author, professionally or largely a geologist per his publications in local libraries, has been following the fate of the Ivory Gull over the two recent decades, as may be read at institutions receiving the Norsk Polarinstitut serials (not available here). Summarized herein are his and others' observations and the species' published history at the above locality. Salient points are that while in the past century its colonies numbered 100 or more pairs, now about 20 is the limit; and that on the whole, being a bird of the pack-ice, it depends in the winter on seal and Polar Bear excrement, and remnants of meals of the latter, for food. The total Spitsbergen population is a calculated 344 pairs, very few in comparison with the 19th century. There are a map of breeding colony distribution, a colony-structure diagram, and a bibliography of 17 titles.—Leon Kelso.

17. The Cuckoo's ability to find a nest where it can lay an egg. J. Seppä, with an introduction by L. von Haartman. 1969. *Ornis Fenn.*, **46** (2): 78-79.—This is a posthumous translation from a 1930 Finnish journal (*Luonnon Ystävä*) by a schoolteacher and ornithologist. His observations suggest that the nest parasite finds its host nest, not by random and not by watching the parents build, but by invading their territories and searching where their alarm cries are most intense. A clever tactic, and one which I think a number of us have used unconsciously when trying to locate a nest.—Jack P. Hailman.

BEHAVIOR

(See also 17, 20, 23, 33, 39, 55, 57, 62)

18. The evolution of ritual in biological and cultural spheres. (Evolyutsiya rituala v biologicheskoi i kulturnoi sferakh.) K. Lorenz. 1969. *Priroda,* **1969**(11): 42-51. (In Russian.)—This article by that eminent author (three of whose books are now on sale in general bookstores), bears the footnote "translated from the English", it is extracted largely from his "On Aggression". Following an editor's account of Lorenz's life and work the article first discusses the probable evolution of ritual behavior in vertebrates in general, drawing much from the author's avian experiments and observations, illustrated by diagrams of courtship patterns of ducks and the Lapwing. Then, he turns to a detailed application of the principles derived to human conduct, customs, and cultural evolution. He implies that since evolutionarily-developed morphological characters take taxonomic recognition, a population featuring a distinctive set of behaviorisms may be considered at least a quasi-species. There are such other arresting observations as "It must be remembered that even partial loss of cultural tradition is very dangerous, and may very easily occur." Also that what is regarded as "good behavior" or not may evoke resentment, or even war (reminiscent of that group which was described as "overpaid, oversexed, and over here"). In these days of pell-mell social experimentation and amalgamation, it might be recalled that what one group considers trivial, another takes as a thundering insult.—Leon Kelso.

19. Observations on the Shakhin in Central Asia. (Nablyudeniya nad shakhinom (*Falco pelegrinoides babylonicus* Sclater) v srednei Azii.) L. S. Stepanyan. 1969. *Byull. moskovskogo obshch. isp. priorody, otdel. biol.,* **74**(6): 37-48. (In Russian, with English summary.)—This comprises a review of avail- observations on its breeding biology and winter life in the USSR, and a discussion of its systematic status (i.e. whether or not distinct specifically from the Peregrine Falcon). One behavioral feature related is that the adults when bringing food to young 5-6 days fledged, released it in the air, affording the young the challenge, successfully met, of catching the prey before it hit the ground. There is a bibliography of 39 titles.—Leon Kelso.

ECOLOGY

(See also 9, 13, 41, 58)

20. Body size, prey size, and ecological segregation in five sympatric tropical terns (Aves: Laridae). N. P. Ashmole. 1968. *Syst. zool.,* **17**(3): 292-304.—The answer to the puzzle of persistent sympatry on a Pacific island of *Sterna fuscata, Anous stolidus, Anous tenuirostris, Gygis alba,* and *Procelsterna caerulea* was sought in a detailed comparison of their food items' size and mode of feeding. Ritualistic behavior differences might also have been considered.—Leon Kelso.

21. The forest is replete with storage. (Les polon kladovykh.) A. N. Formozov. 1969. *Priroda,* **1969**(10): 120-125. (In Russian.)—The zoologist whom visiting naturalists have found revered as practically the George Washington of Soviet vertebrate ecology here reviews the food storage habits of palearctic forest birds and mammals, which activity he finds quite prevalent. Fall harvest work of numerous species, first of mammals, then birds, is described and discussed, winding up with their most famous of all, the *kedrovka* or Nutcracker. The large aggregate of cached material would seem to comprise in itself a special stratum in the ecosystem.—Leon Kelso.

22. Bird species diversity: components of Shannon's formula. E. J. Tramer. 1969. *Ecology,* **50**(5): 927-929.—Shannon's index of diversity has of late become widely used in ecology. This index has two components, species richness and relative abundance. In this paper Tramer cauculates bird species diversity

from 267 breeding bird censuses (from *Audubon Field Notes* and other sources). In breeding-bird populations diversity patterns are strongly correlated with variations in the species richness components, while the relative abundance component is quite stable. This being the case, breeding-bird diversity can be adequately described merely by counting the number of species present. Recent studies of phytoplankton suggest a directly opposite situation; diversity patterns are correlated to variations in species relative abundance, while species richness remains stable. The only case in which relative abundance values for birds appear comparable to that of phytoplankton is in marshes, areas characterized by gregarious and often polygamous species. These data imply that the condition demonstrated by birds in other areas may be the result of intraspecific territoriality. One would then predict a lower relative abundance value outside the breeding season, when territoriality breaks down. Tramer suggests that the conditions demonstrated by phytoplankton and breeding birds represent extremes of strategies to two general types of environments: rigorous ones that very widely and often unpredictably in climate or resources, and nonrigorous ones in which these variations are small or relatively predictable. These tentative conclusions are significant ones, and we await tests upon appropriate organisms and environments to test them.—Douglass H. Morse.

23. Intra- vs. interspecific aggression in Pygmy Nuthatch flocks. C. E. Bock. 1969. *Ecology,* **50**(5): 903-905.—This study reports the interrelationships of Pygmy Nuthatches (*Sitta pygmaea*), White-breasted Nuthatches (*S. carolinensis*) and Mountain Chickadees (*Parus gambeli*) occurring together in winter flocks in ponderosa pine forests of Colorado. These are the three commonest species in mixed foraging flocks, and they predictably partition the habitat, though overlapping exists. Basically the White-breasted Nuthatch is a trunk forager, the chickadee a foliage forager, and the Pygmy Nuthatch a generalist that forages equally frequently on trunk, branches, and foliage. Intraspecific aggression was more frequent than interspecific aggression, though the relative frequency of interspecific aggression in Pygmy Nuthatches was greater than would be predicted by chance alone. This is explained by the high degree of intraspecific gregariousness of this species and by its social dominance over the other two species.

In an attempt to study the three species in a similar situation, feeding trays were then set up. As predicted, the relative frequency of interspecific aggression increased initially, though it then fell, apparently because the Pygmy Nuthatches were by then actively avoided by the other species.

This study is of interest to operators of feeding stations, in that it indicates how observations about the shelf may throw light upon the interactions of different species under natural conditions. A few points of comparison between the Pygmy Nuthatch and the closely-related Brown-headed Nuthatch (*S. pusilla*) of the southern pine forests may be in order. Both species are highly social. The Brown-headed Nuthatch is the only species I have ever seen in these woodland flocks that will allow other conspecifics to remain so close that they may occasionally touch each other (usually when two or more are simultaneously feeding upon a cone). As many as five Pygmy Nuthatches might feed simultaneously on one of Bock's feeding trays; White-breasted Nuthatches and chickadees did not permit the presence of a single conspecific on the tray when feeding. However, the Pygmy Nuthatches were dominant to both the chickadee and the much larger White-breasted Nuthatch. White-breasted Nuthatches that I studied in Louisiana were dominant to Brown-headed Nuthatches (Morse, *Ecol. Monogr.*, **40:** 119-168, 1970). To have a small congener socially dominant to a decidedly larger one is probably the exception, rather than the rule.—Douglass H. Morse.

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

(See also 13)

24. 5th international symposium on migratory birds in the spread of arboviruses. (V mezhdynarodnyi simpozium po pereletnykh ptits v rasprostranenii arbovirusov.) A. I. Cherepanov. 1969. *Vestnik Akad. Nauk, USSR,* **1969** (12): 109-110. (In Russian.)—In Novosibirsk academycity, 20-27 July 1969, this

was attended by representatives of the U. S. and 14 other nations, and 128 papers were read. The American party reported transmission of equine encephalitis in Florida (in only about 1 per thousand of individual birds examined), and vection of various other viruses by migrants across the Gulf of Mexico. Six stems of arbovirus were found in gamasid mites from nests in bird colonies along the Pacific coast. But various mammals and arthropods were also numbered among arbovirus vectors. The next session is scheduled for 1972.—Leon Kelso.

25. The dispersal of Starlings from woodland roosts and the use of bio-acoustics. T. Brough. 1969. *J. Appl. Ecol.* **6**(3): 403-410.—Starling (*Sturnus vulgaris*) roosts appear to be considered as undesirable in England as they are in this country. In some cases it is considered desirable to find means of dispersing these assemblages. The author is partial to the technique of playing distress calls and compares this technique of dispersal with others that have been attempted.—Douglass H. Morse.

26. Fifth All-union Ornithological Conference. (V vsesoyuznaya ornitologicheskaya konferentsiya.) A. P. Fedorenko. 1969. *Vestnik zool.*, **3**(6): 94, 95. (In Russian.)—At Ashkhabad, Turkmeniya, 23-27 September 1969, it was attended by 350 persons and 270 papers were presented. The 3 main sections of the conference were devoted to: Central Asian ornithology, main prospects and trends in avian ecology, and census problems. There were special commissions and resolutions on a game bird survey, a revision of Russian bird names with unification of nomenclature, and on a survey of raptorial birds, with proposals for more research on systematics, morphology, ecology, and physiology, regional faunas, and conservation.—Leon Kelso.

CONSERVATION AND ENVIRONMENTAL QUALITY

(See also 15, 61)

27. Government move to ban chlorinated hydrocarbons. T. Mosquin. 1969. *Canad. Field-Nat.*, **83**(3): 189-190.—The *Canadian Field-Naturalist* is a journal that has occupied an important position in the scientific involvement in questions of environmental poisoning. Its pages contain papers of the physiological mechanisms of biocide damage, and the effects of biocides upon natural populations of animals. And the journal uses its first pages for informative quasi-editorials that keep track of the impact of the basic research. Here, for instance, we find that Sweden's two-year trial ban on DDT also covers aldrin, dieldrin and lindane (began 1 January 1970). Norway has already banned both the manufacture and import of DDT, and all use will be banned by 1 October 1970. Denmark has a permanent total ban already in effect, as does Hungary. The United States and Canada are making "intention moves" in the same direction, but clearly fall behind the progressive actions of some European countries. Australia, as well as several states, provinces and cities in North America, have imposed various controls and restrictions.

This might all seem hopeful. Like an iceberg, though, most of the problem is still hidden. Even if there were an immediate, permanent, world-wide ban on pesticides, the amount already in the biosphere would present tremendous hazards for future years and perhaps generations. And even this is only half the problem. No moves at all have been made against the industrial spread of deadly poisons such as the group of compounds known as polychlorinated biphenyls (PCBs). The fight to preserve the planet has only begun.—Jack P. Hailman.

28. Regional population declines and organochlorine insecticides in Canadian Prairie Falcons. R. W. Fyfe, J. Campbell, B. Hayson and K. Hodson. 1969. *Canad. Field-Nat.*, **83**(3): 191-200.—*Falco mexicanus* shows the same decreasing eggshell thickness with increased DDE contamination as has been documented for so many other birds. Field work showed a 34% reduction in occupancy of nesting territories known in the previous ten years, and current nest production is low. Lowest production was in areas of highest DDE concentrations. I wonder how long this magnificent species will be with us?—Jack P. Hailman.

29. Toward legislation to protect young Peregrine Falcons. T. Mosquin. 1969. *Canad. Field-Nat.*, **84** (4): 297-299.—This is so sad I can hardly bear to repeat the story. The North American Falconry Association (NAFA) is vigorously fighting laws protecting falcons. Read the excerpts from the letter of retiring Canadian Director of NAFA, a Mr. Frank Beebe—if you have a strong stomach.—Jack P. Hailman.

30. Significance of chlorinated hydrocarbon residues to breeding pelicans and cormorants. D. W. Anderson, J. J. Hickey, R. W. Risebrough, D. F. Hughes and R. E. Christensen. 1969. *Canad. Field-Nat.*, **83** (2): 91-112.—This study concerns Double-crested Cormorants (*Phalacrocorax autitus*) and White Pelicans (*Pelecanus erythrorhynchos*). Egg residue levels reflect fat-stored contamination in the female birds. Detailed data are presented showing the inverse relationship between eggshell thickness and chlorinated hydrocarbon residues. The authors map out a plan for further research, but end with the lament "We hope this will be accomplished before the fish-eating birds have disappeared." Careful studies such as this one document the mechanisms by which biocides are doing-in our coinhabitants on this planet. How many species will be lost before something really effective is done about the problem?—Jack P. Hailman.

31. Breeding success and organo-chlorine residues in Golden Eagles in West Scotland. J. D. Lockie, D. A. Ratcliffe, and R. Balharry. 1969. *J. Appl. Ecol.* **6**(3): 381-389.—The effect of persistent organochlorine pesticides on the reproduction of raptors has been a matter of serious concern. It is believed that the recent low productivity of the Golden Eagle (*Aquila chrysaetos*) in Scotland can be accounted for on this basis. Thus, the partial cessation of the use of dieldrin (the most abundant organochlorine pesticide in eagle eggs in the area) in January, 1966, presented a possible opportunity to test this hypothesis. Eagles in the Western Scottish highlands feed extensively on sheep carrion, particularly when mortality is high. Sheep have traditionally been dipped annually in a pesticide-containing compound; it was from feeding upon carcasses of dipped sheep that the eagles obtained most of their DDT & dieldrin since 1960.

In 1963-65, a mean of 0.86 ppm of dieldrin was found in eagle eggs sampled, and a mean of 31% of the aeries reared young during this time. During the 1966-68 period, following the cessation of organochlorine pesticides in the dips, the mean level of dieldrin fell to 0.34 ppm, while average success in rearing young rose to 69%. Both trends are highly significant. In Central and Eastern Scotland, eagles eat little or no carrion, and success of eagles was high and concentration of pesticides low throughout the period.

The authors feel that dieldrin, rather than DDT or DDE, was largely responsible for the changes in success, since the eagles were being actively studied while DDT rather than dieldrin was being used in the dips. They cite another paper in press by one of them (Ratcliffe), which reports that the increase in success has been accompanied by a significant recovery in the thickness of eggshells since 1966. It is hearthening news to hear that such a vulnerable species appears to have the ability to recover from the effects of pesticides.—Douglass H. Morse.

PARASITES AND DISEASES

(See 24)

PHYSIOLOGY AND PSYCHOLOGY

(See also 2, 5, 9, 12, 30, 44)

32. Skin temperature and its topography in some avian species. (Temperatura kozhi i ee topografiya u nekotorykh vidov ptits.) E. S. Lysov. 1969. *Vestnik Zool.*, **3**(6): 16-20. (In Russian, with English summary.).—By electrothermometer with probe or fine-point thermistor, the temperatures of 62

individuals of 30 species in the Leningrad Zoopark were taken, under uniform conditions as to time of day, 14-15:00, air temperature, 18 °C, and state of rest, at cloaca and 10 external points: crown, back between wings, sacrum, pectoralis major muscle, wing axil, abdomen, thigh, bend of wing, digit 1 of wing, and throat. Among many details it was noted that avian skin temperature is correlated to species' ecology, evolutionary level, individual size, nutrition, age, environment and seasonal phenomena; highest on the body, lowest on the extremities, in a specific pattern per individual species. The maximum skin temperature for Falconiformes (*Aegypius monachus, Neophron percnopterus, Circaetus ferox, Pernis apivorus, Circus cyaneus, Pandion haliaetus, Buteo rufinus, Cerchneis tinnunculus, Milvus korschun, Buteo buteo*) was on pectoralis major muscle, 39.3 °C, on Passeriformes (*Corvus corone, C. frugilegus, C. monedula, Garrulus glandarius, Passer domesticus,* and *Taeniopygia castanotis*) on the back between wings, 41.2 °C, in Strigiformes (*Bubo bubo, Nyctea scandiaca, Asio flammeus,* and *A. otus*) on the abdomen, 40.8 °C and in Charadriiformes (*Larus argentatus, Haematopus ostralegus, Sterna hirundo, Vanellus vanellus, Pluvialis dominicus, Actitis hypoleucus, Philomachus pugnax,* and *Gallinago*) in the wing axil, 40.5 °C. On the average of all species investigated, the lowest was at the bend of the wing, 30.2 °C, and the highest on the throat, 39.7 °C. External skin temperature was often but little lower than in the cloaca, and in *Corvus corone* and *Larus argentatus,* over the pectoralis muscle, it was 0.4 to 0.2 °C higher.—Leon Kelso.

33. A hypothesis for extrinsic timing of circadian rhythms. F. A. Brown. 1969. *Canad. J. Botany,* **47**(2): 287-298.—This leader of the school of belief in the externally-induced and controlled circadian rhythms, as opposed to that supporting the doctrine of inherited endogenous rhythms, states that adequate investigation has shown that organisms possess extraordinarily sensitive receptive capacity for the "natural geoelectromagnetic fields." Responses to light and temperature fluctuations have been found modified by "subtle geophysical responses", e.g. lunar transit, or "geosolunar" effects. "Organisms have been demonstrated to possess exactly that composite of capacities to enable them to use exogenous "coordinate" timing of circadian and other rhythmic physiological patterns." Activity and feeding periods, maintained in continuous light or darkness, or in the field, in bright or cloudy weather regardless of temperature or wind, are meant. The "solunar" term in the language of the rhythm students is derived from the "Solunar Tables" and publications of the late angler-amateur-naturalist, John Alden Knight; yet, while Gregor Mendel's amateur status did not deprive him from due credit in genetics, the now fairly numerous discussions and summarizations of rhythmicity research fail to recognize the work of the above fisherman, although his contribution rather exceeds and antedates theirs. This paper summarizes a bibliography of 45 titles.—Leon Kelso.

34. Mechanism of the stimulating effect of ultraviolet radiation on the incubation of chicken eggs. V. A. Baraboi and Z. Z. Yanchuk. 1969. *Biofizika,* **14**(1): 130-134. (In Russian, and in English translation, Pergamon Press.) —At least 6 research projects have found that ultraviolet radiation of incubating eggs augments viability of young, weight after hatching (by 6-10%), and reduces spoilage. While 2-3 minutes radiation benefits, 9-15 minutes has the opposite effect. Since shell and membrane are theoretically impenetrable to ultraviolet rays, the mechanism of their effect, like that of orientation, remains an unsolved problem. Ozone, created by ultraviolet in the surrounding air and on the shell, is one explanation suggested. There is a bibliography of 30 titles.—Leon Kelso.

35. Cloacal and salt-gland ion excretion in the seagull, *Larus glaucescens,* acclimated to increasing concentrations of sea water. M. R. Hughes. 1970. *Comp. biochem. physiol.,* **32**(2): 315-325.—Gulls were acclimated sequentially to drinking fresh water 1/3, 2/3, and sea water 3/4 for 1-2 months. Sodium, potassium and chlorine concentrations in plasma, cloacal fluid, and table-salt-induced salt-gland secretion were determined; also body weight and "hematocrit". Sodium concentration was lower in fresh water birds than in those getting 1/3 sea water. Further increase of salinity had no effect. Body weight was lower in sea water drinkers.—Leon Kelso.

36. The flight muscle in a bird with high wing-stroke frequency, the Zebra Finch. A. Aulie and P. S. Enger. 1970. *Physiol. Zool.*, **42:** 303-310.—The wing-stroke frequency in the Zebra Finch (*Taeniopyga castanotis* = *Poephila guttata*) is about 32 strokes/second. Complete single twitches (contraction plus relaxation) last about 25 msec for the pectoralis and 50 msec for the gastrocnemius. In the gastrocnemius the tension and contraction time increased steadily with an increase in number of stimuli, whereas in the pectoralis the tension increased markedly with increasing number of stimuli up to four/second but little additional tension was developed at a higher number of stimuli. The authors conclude from their experiments that a bird is able to maintain a fairly constant wing-stroke frequency while the power output per stroke can be varied.—Joel Cracraft.

37. Motor unit recruitment pattern and tonic activity in respiratory muscles of *Gallus domesticus* [sic]. M. R. Fedde, P. D. deWet, and R. L. Kitchell. 1969. *J. Neurophysiol.*, **32:** 995-1004.—Increase in respired CO^2 levels (5-14 percent) caused phasic contraction of the transversus abdominus and external intercostal muscles. Three types of fibers were distinguished in these muscles using myosin ATPase activity and two types were found using oxidative enzyme activity (NAD-D).—Joel Cracraft.

38. Studies on the stomach oils of marine animals - II. Oils of some procellariiform birds. R. W. Lewis. 1969. *Comp. biochem. physiol.*, **31:** 725-731. While previous studies of tubinares' stomach oils judged them to be of gizzard glandular origin, these analyses of those of Flesh-footed Shearwater, *Puffinus carnipes*, Westland Black Petrel, *Procellaria westlandica*, and Wandering Albatross, *Diomedea exulans*, suggest they are food residues. This does not account, however, for certain glycerol esters and squalene found; perhaps there is a mixture of glandular and food derivatives. A bibliography of 23 titles is included. —Leon Kelso.

39. Sunbathing behaviour of birds. R. J. Kennedy. 1969. *Brit. Birds*, **62**(7): 249-258.—A useful short review of this still poorly-understood behavior. Kennedy lists six functions suggested in the literature: (1) "pleasureable" stimulus of warmth; (2) sun-light stirs up ectoparasites for easier preening; (3) dry wet plumage; (4) vitamin D production; (5) aids in molting; and (6) increases secretion of preen gland. Many of these possibilities have been covered in previous reviews (see *Bird-Banding*, **40** (1): 58, 63, 70, 1969: reviews **28, 49** and **70,** respectively). A value of this review is the appendix listing some 170 species that have been observed sunbathing.—Jack P. Hailman.

40. Regulation of oxygen consumption and body temperature during torpor in a hummingbird, *Eulampis juglaris*. F. R. Hainsworth and L. L. Wolf. 1970. *Science*, **168** (3829): 368-369.—When birds and mammals reduce their temperature and oxygen consumption the state is called torpor. This species is apparently the first bird known to *regulate* its temperature during torpor, keeping it at about 18° to 20° C over a range of ambient temperatures from 2.5 to 18° C. Oxygen consumption during torpor is linearly and inversely related to temperature. The authors speculate that physiological regulation during torpor may allow the bird to emerge from torpor quickly. Regulated torpor is thus a compromise between conservation of energy consumption and the need to become active again with minimum delay.—Jack P. Hailman.

MORPHOLOGY AND ANATOMY

(See also 49, 56, 59, 62)

41. Ecological and anatomical adaptations of North American Tree Ducks. M. K. Rylander and E. G. Bloen. 1970. *Auk*, **87:** 72-90.—This study compares the anatomical adaptations between the Fulvous Tree Duck (*Dendrocygna bicolor*), which nests on the ground, and the Black-bellied Tree

Duck (*D. autumnalis*), which nests in tree cavities. The authors focus their attention on the hindlimb anatomy of the chicks and attempt to explain the morphological differences in terms of adaptations exhibited by the Black-bellied Tree Duck for leaving the nest cavity.

Most of the paper deals with differences in the myology and with a mathematical model which "proposes a mechanical climbing advantage in the duckling musculature of the cavity-nesting *autumnalis*." Unfortunately, parts of the anatomical discussion that are central to the discussion of adaptive differences are incorrect and thus invalidate the basis of their mathematical model.

After dissection of the thigh muscles, the authors found that the only noticeable difference between the two species was the relatively larger iliotrochantericus muscles in *D. autumnalis*. The mistake appears when the authors assume the iliotrochantericus muscles to be extensors of the femur. However, the largest of these muscles, the iliotrochantericus posterior, arises from the anterior iliac fossa and inserts onto the proximal end of the femur *slightly dorsal to the hip joint*. Hence, this muscle cannot be a protractor (extensor) but is instead a retractor. Actually, the muscle probably functions to absorb shock and as a postural muscle when the femur is in the protracted position. The notion that the iliotrochantericus posterior is an extensor of the femur has been eternal in the anatomical literature, and I first discovered otherwise in my functional studies of the Domestic Pigeon hindlimb. In order to verify these results for the tree ducks, I dissected the leg of *D. bicolor* and found that the muscle does indeed insert slightly dorsal to the hip joint. The other iliotrochantericus muscles are so small and their fibers are so short that it is very doubtful they play much role in extension. Rather, they are probably more important in rotating the femur.

It can also be noted that their mathematical model is unduly complicated and could have been replaced by simple free-body diagrams with no loss of information. But any model that is not based on an approximation to reality, which theirs is not, fails to justify its use.

The authors make several other morphological comparisons between the two species, but none of the differences can be clearly associated with well-marked functional adaptations for climbing out of nest cavities.

Rylander and Bolen have pointed out an interesting problem that would repay more detailed studies.—Joel Cracraft.

42. The inactive salt gland of ducks. (Über die inaktive Salzdrüze von Enten (*Anas platyrhynchos*.) G. Burock et al. (In German with English summary.) —1969. *Zeitschr. f. Zellforsch. u. mikroscop. Anat.*, **97**: 608-618. This gland was found to contain glycogen. The significance of this, and numerous well-illustrated structural details, is undetermined.—Leon Kelso.

43. Comparative studies of the color of the avian iris. (Vergleichende Untersuchungen über die Färbung der Vogelirs.) H. Oehme. 1969. *Biol. Zbl.*, **88**(1) 3-35. (In German, English summary.)—Iris color is often a combination of factors: pigments (melanins, pterins, carotenoids, Hemoglobin), light reflective substances (colorless pterins, transparent lipids, collagen fibres), and structural blue evoked by the Tyndall (light scattering) effect. These factors and their identification are described, with various cells and their corresponding color effects detailed. Thirty-two types of factor combinations are distinguished. Ontogenetic changes of color and their relation to metabolism are discussed. In the young Snowy Owl (*Nyctea scandiaca*), for example, the iris is pale yellowish in prevalence of colorless pterin; in the adult in is deep yellow owing to accumulation of yellow carotenoids. There is a bibilography of 18 titles.—Leon Kelso.

44. The nature of "canals" in Falconiformes' egg-shells. (Das Wesen der "Kanale" in den Falconiformes' Eischalen.) W. J. Schmidt. 1968. *Z. Morph. Tiere*, **62**(1): 1-8. (German. English summary.)—Micro canals in falconiform eggshells, known since Nathusius (1870), examined later by Tyler (*J. Zool.* (London), **150**: 413-425, 1966) are vertical to surface, visible under high magnification of shell sections of *Aquila, Haliaetus, Vultur, Gyps*, and *Buteo*, and are remnants of a "cleft system" in calcite formation. These could serve for air and ion respiration during incubation.—Leon Kelso.

45. Tongues of the Zosteropidae (White-eyes). R. E. Moreau, M. Perrins, and J. Trevor Hughes. 1969 *Ardea,* **57:** 29-47.—Through the years inaccurate and contradictory accounts of the tongue structure of white-eyes (Zosteropidae) have accumulated in the literature. The present study is the first in which a large number (5 genera, 30 species) have been examined and it constitutes an important advance over previous work.

The authors found that the tongues of all white-eyes conform to the same structural pattern. The tongues are quadrifid and are fimbriated on the sides and tip. In contrast to some reports, the authors conclude that tubulation of the tongue is artefactual. Most of the individual variation could be attributed to postmortem changes that vary with the method of preservation.

Published accounts and correspondence with many field ornithologists lead to the conclusion that the white-eyes seldom utilize nectar and that it comprises a very small portion of their diet. Unfortunately, detailed field observations are rare and thus the methods of feeding and the structure of the tongue in the living bird are not well documented.

The tongues of the Zosteropidae and Meliphagidae are similar morphologically, and whether this is due to closeness of relationship or convergence remains to be discovered. The authors call attention to the interesting evolutionary problems associated with feeding specializations within the zosteropid-meliphagid complex.—Joel Cracraft.

46. Keratinization of the avian epidermis. An ultrastructural study of the newborn chick skin. A. G. Matoltsy. 1969. *J. Ultrastructure Res.,* **29:** 438-458.—Using light and electron microscopy the differentiation of chick epidermal cells was studied. The protective horny cells were found to be structurally and chemically different from those of other vertebrates.—Joel Cracraft.

47. Structure and ultrastructure of the liver in the domestic fowl, *Gallus gallus*. M. D. Purton. 1969. *J. Zool.,* **159:** 273-282.—The morphology of the liver was studied using electron and light microscopy and by the preparation of latex corrosion casts.—Joel Cracraft.

48. The snapping strength of the egg shells of various orders of birds. C. Tyler. 1969. *J. Zool.,* **159:** 65-77.—This study investigated the shell strength of 11 orders of birds. Within an order and also within subgroups of an order a significant correlation was found between the square of the thickness and snapping strength. However, between orders there is a large difference in shell strength for a given thickness. For example, the penguins have particularly strong shells, almost twice as strong as those of the grebes. The presence or absence of a cover on the shell did not account for differences in snapping strength although its presence did increase impact strength in *Pelecanus* shells. No other shell characteristics were found to explain differences in snapping strength.—Joel Cracraft.

PLUMAGE AND MOLTS

(See also 57)

49. Studies on feather waxes of birds. VIII. The chemical composition of the wax in the free flowing secretion from the preen gland of the Oystercatcher (*Haematopus ostralegus* L.). H. Karlsson and G. Odham. 1969. *Arkiv för kemi,* **31**(2): 143-158.—Bewilderingly numerous details are illuminated with 15 figs. and 3 tables. "The preen gland wax of the oystercatcher has been investigated. The wax acid moiety was found to be a mixture of monomethyl- and dimethyl-branched chain acids. Most of the structures have a branch at position 2. The dextrorotation of the structures indicates L-configuration at this asymmetric carbon atom.", but can this subject material be regarded as truly "feather wax"?—Leon Kelso.

50. The pterylosis of the African Bush Shrike *Tchagra m. minuta* (Hartlaub). Frits de Vree. 1969. *Le Gerfaut,* **59:** 157-191.—This is a very detailed study of a species of bush shrike (Malaconotinae) and is the first paper in a series on the pterylosis of the Laniidae, Prionopidae, and Vangidae. The author found very little variation in the eleven alcoholic specimens he examined. Furthermore, either side of the specimen would suffice since the pterylographic pattern is almost completely bilaterally symmetrical.—Joe Cracraft.

ZOOGEOGRAPHY AND DISTRIBUTION

(See also 52, 53)

51. Ancestral relationships of the Saker and Gyr Falcons, and a tentative history of their dispersal. (Rodstvennye svyazi sokolov-balobanov i krecheta i veroyatnaya istoriya ikh rasseleniya.) E. V. Kozlova. 1969. *Z. zhurn.,* **48**(12): 1838-1851. (In Russian, with English summary.)—Here the eminent author of 3 thoroughgoing morpho-ecological books on shorebirds turns to raptors and gives a geographical analysis of sex and age plumage pattern variations finding that the Saker Falcon, *Falco cherrug,* may have originated not in central Asia as previously supposed but in southeastern Europe, its eastward spread into other environments accounting for graduation into other color patterns, as e.g. *F. c. milvipes.* She considers its closest relatives to be the Gyr Falcon, *F. rusticolus,* the Lanner, *F. biarmicus,* and our Prairie Falcon, *F. mexicanus,* which is discussed at some length. Regarded as remotely related, put perhaps more like the ancestors of these on account of its "more primitive plumage pattern," is the Indian Jugger Falcon, *F. jugger.* It is suggested that southern Asia was the ancestral home of the group as a whole.—Leon Kelso.

SYSTEMATICS AND PALEONTOLOGY

(See also 19, 48)

52. The birds from the Burdigalian fissure-fillings of Wintershof (West) near Eichstätt in Bayaria. P. Ballmann. 1969. *Zitteliana* (Munich), **1:** 5-60. (In German, English abstract.)— This important paper discusses the avian fossil remains from the Burdigalian (early to middle Miocene) of Wintershof (West) in Bavaria. The fauna consisted of nearly 900 bones, almost 700 of which belonged to passerines. The identification of the passerine bones has not been completed and only a few are reported on.

The introduction is followed by a section giving figures illustrating the different skeletal elements and the morphological features discussed in the text. The major part of the paper deals with systematics. Two new genera are described: *Capitonides* (Capitonidae) and *Zygodactylus* (Passeriformes, family *incertae sedis*); seven new species are described: *Taoperdix miocaena* (Gallinuloididae), *Palaeortyx? intermedia* (Phasianidae), *Alectoris bavarica* (Phasianidae), *Strix brevis* (Strigidae), *Otus wintershofensis* (Strigidae), *Capitonides europeus,* and *Zygodactylus ignotus.* In addition to these new forms, the author also assigns some elements to the Phoeniculidae and Eurylaimidae, but he was unable to determine the genus and species in either case. It should be noted that the author discusses the systematic position of the above taxa in some detail.

Dr. Ballmann's paper contributes substantially to our knowledge of European fossil birds. The first fossil remains of the Capitonidae, Phoeniculidae, and Eurylaimidae are finally discovered and represent important European records. The fauna has a noticeable Ethiopian character and suggests a climate somewhat warmer that that of the present day.—Joel Cracraft.

53. The Miocene birds of La Grive-Saint-Alban (Isere). Peter Ballmann. 1969. *Geobios* (Lyon), n.o. **2:** 157-204. (In French, German summary)— The material reported on in this study came from two fissure-fillings of Tortonian (late Miocene) in age. There is a short but detailed section on osteological terminology. In the systematic portion of the paper Dr. Ballmann describes

three new species, *Buteo pusillus* (Accipitridae), *Musophaga meini* (Musophagidae), and *Zygodactylus grivensis* (Passeriformes, family *incertae sedis*), and a new subspecies, *Palaeortyx phasianoides grivensis* (Phasianidae). He also removes the genus *Palaeopicus* from the Picidae and places it in the genus *Colius* of the Coliidae. As a consequence of this change, Ballmann recognizes four species of coliids from the European Tertiary. Another significant component of this fauna is the family Musophagidae. In addition to the new *Musophaga meini*, a tibiotarsus was also placed in this family but a determination as to genus and species was not possible. Ballmann also referred a carpometacarpus to the Capitonidae. All of these fossils demonstrate that this Miocene avifauna, like that of Wintershof (West) [see previous review], has a distinct Ethiopian element. Further studies of fossil avifaunas from the Tertiary of Europe should do much to bury the static viewpoint perpetuated by numerous ornithologists and zoogeographers in their discussions of the origin and development of the European and African avifaunas. —Joel Cracraft.

54. A new Pliocene woodpecker, with comments on the fossil Picidae. Joel Cracraft and John J. Morony, Jr. 1969. *Amer. Mus. Noviates*, no. **2400:** 1-8.—A new genus and species of woodpecker, *Palaeonerpes shorti*, is described from a left tibiotarsus from lower Pliocene sediments of Nebraska. *Palaeonerpes* is morphologically distinct from all genera with which it was compared, and no clear evidence is present to assign *Palaeonerpes* to any genus of Recent woodpecker.

General comments on the systematic status of the known fossil picids are presented. *Palaeopicus* has several features which suggest that it probably should be excluded from the Picidae [see preceding paper]. *Uintornis* is not a woodpecker, as Shufeldt correctly surmised. The Pliocene *Pliopicus* is a morphologically distinct genus that does not appear related to any genus of North American woodpeckers. [From authors' summary.]

55. A study of seedsnipe in southern South America. G. L. Maclean 1969, *Living Bird*, **8:** 33-80.—This paper is the result of four months of observation of the Lesser Seedsnipe (*Thinocorus rumicivorus*) and the Gray-breasted Seedsnipe (*T. orbignyianus*) in Chile, Argentina and Tierra del Fuego. Most of the observations were made on the former species. Much of the previous work on this little known family is assembled here and is considerably augmented by the author's information.

Seedsnipe were found to inhabit open, sparsely vegetated terrain where they feed solely on vegetable matter (seeds, shoots, leaves). Water is apparently obtained from succulent plants and no birds, adult or young, were seen to drink. The breeding season is in the summer. Males defend a territory and sing from an elevated perch. Nests are a scrape in the ground lined with loose organic matter; males lack brood patches and only the female incubates. When leaving the nest the female covers the eggs with the nest lining. The incubation period is about 25 days and the young leave the nest together a few hours after hatching Chicks soon feed by themselves and are not fed by the parents. Distraction displays may be given by females suddenly flushed from the nest and by males guarding the chicks. At night seedsnipe were found roosting in individual scrapes in the ground, usually in groups of four to eight. Two species of hawks accounted for the only observed predation.

Maclean is known for his extensive field studies of other little-known birds, especially the sandgrouse (Pteroclidae). Part of the impetus for his study of seedsnipe was to enable a comparison of this family with the sandgrouse. In addition to his valuable behavioral studies, Maclean has diverged into the field of systematics. In one paper (*J. Ornithol.*, **108:** 203-217, 1967), which received undeserved praise in this journal (Nice, *Bird-Banding*, **39:** 67, 1968), he concluded on the basis of behavior and egg-white proteins that the Pteroclidae "are not at all closely related . . . to the doves, but rather to the Charadriiforms" and that anatomical similarities between the sandgrouse and the doves "can be interpreted as the results of convergent evolution . . ." (p. 108). This conclusion is by no means acceptable to many taxonomists and I would like to point out the recent writings of Stegmann (*J. Ornithol.*, **109:** 441-445, 1968; *Zool. Jb.*, (Syst.), **96:** 1-51, 1969) as being quite in opposition to the views of Maclean. Even the most perfunctory comparison of skeletons of pteroclids will disclose that, element

for element, they are scarcely distinguishable from columbids and that both differ significantly from any Charadriiform type, including the Thinocoridae. A number of other characters linking the doves and sandgrouse have been noted by several early authors. It is inconceivable that this multitude of characters is attributable to convergence. The affinity of the Columbiformes with the Charadriiforms is not a new idea. Gadow (Bronn's *Klassen und Ordnungen*; *Vogel, II Syst.*, 1893) long ago suggested that the Charadriiformes consist of two suggroups, the Laro-Limicolae and the Pteroclo-Columbae, and today this remains as the most realistic systematic treatment. Within this grouping there is little question but that the position of the Pteroclidae lies much closer to the Columbidae than to other existing groups and that any resemblance of the seedsnipe to the sandgrouse is due to convergence. "Es ist daher auch in dieser Hinsicht am wahrscheinlichsten, das die Flughühner einen Seitenzweig der Tauben bilden. Das umgekehrte wäre gar nicht denkbar." Stegmann (1968: 443).—Storrs L. Olson.

56. On variability of meristic characters in birds. (Ob izuchenii izmenchivosti meristicheskikh priznakov ptits.) A. B. Yablokov and A. V. Valetskii. 1970. *Z. zhurn.*, **49**(1): 121-130. (In Russian, English summary.)—Bibliography of 12 titles. One idealistic endeavor in some quarters of the new systematics is to inquire if not prove whether any one character is as good as any other to distinguish and classify species or trace evolutionary development. These authors, previously distinguished as mammalogists, on examination of specimens of *Larus argentatus, L. canus, L. ichthyaetus, L. ridibundus,* and *Sterna hirundo,* (a few individuals of each) taken at one locality, in the summer of 1968, attempt the above by counts of numbers of cartilaginous rings in trachea and bronchi, no. of keratinous scutes on tarsi and toes, of horny formations on edge of webs between toes, and no. of papillae at base of tongue, on fore edge of glottis, and on palate. For example, the number of tracheal rings was on average 108.6, 120.8, 112,2, and 96.6 for species 2 to 4 above respectively. Papillose formations on edge of choana numbered about the same in all species. While admitting the above features are not adequately distinctive specifically, it is said they do not vary per sex or age. However, are they constant throughout the species' ranges?—Leon Kelso.

EVOLUTION AND GENETICS

(See also 45, 51, 52, 56)

57. Importance of bright male coloration to sexual selection in Mallard Ducks. (Znachenie yarkoi okraski seleznya v polonom otbore u kryakovoi utki.) N. V. Nekipelov. 1969. *Izvestiya vost-siber. otdel Geograph. Soc. USSR,* **66:** 93-97. (In Russian.)—This examines the question of sex ratio and color change of nuptial plumage in *Anas platyrhynchos* as effected by artificial clipping off of head neck and speculum feather tips with loss of iridescent sheen. With decided preponderance in number of females there was no change in attitude toward dull plumaged males, which were not rejected as mates. Pairs previously formed did not separate notwithstanding loss of males' bright colors. With numerical predominance of males the females showed preference for the bright colored ones. With subequal ratio of bright to dull males the females accepted only the former. It is suggested that in natural conditions likelihood of individual female choice is much greater than in the experimental groups, used here, and that such experiments provided verification of origin of bright coloration in males as a consequence of sexual selection. [From *Russ. Abstracts Journal, biology,* **1970**(1): 47 in absence of original.]—Leon Kelso.

FOOD AND FEEDING

(See also 20, 21, 23)

58. The Nutcracker. (Kedrovka.) N. F. Reimers. 1970. *Okhota i okhotniche khozyaistvo,* **1970**(1): 20-22. (In Russian.)—The principal Russian re-

searcher on the ecology and economics of *Nucifraga caryocatactes* concisely summarizes the present-day knowledge of it, with special attention to migration and food storage. A new detail is that it sometimes stores whole undismembered cones in densely brushy-twigged parts of conifers, so placed that the wind cannot dislodge them. Authors' photos show a nut-filled food pouch, a snow-encrusted nest with eggs, and a burrow for cache recovery in the snow.—Leon Kelso.

SONG AND VOCALIZATIONS

59. Respiration during song in the Canary (*Serinus canaria*). W. A. Calder. 1970. *Comp. biochem. physiol.*, **32**(2): 251-258.—While a human must sing with sustained exhalation, these fringillids, when emitting trilled or warbled notes which may be sustained nearly half a minute, replace pulmonary air during song by "mini-breath" cycles. No preliminary deep breath is needed. Some workers have been led to calculate high quantities of air exhalation on the latter supposition. Simultaneous oscilloscope recordings (4 oscillographs pictured here) showed a 1:1 correspondence between song notes and respiratory movements. Even trills of 25 notes per sec. involved individual "minibreaths". There is even a gain of total bodily-contained air during trills.—Leon Kelso.

PHOTOGRAPHY AND RECORDINGS

60. New Palearctic bird sound recordings during 1968. J. Boswall. 1969. *Brit. Birds*, **62** (7): 271-281.—Another supplement to these valuable lists (see *Bird-Banding*, **40** (4): 349, 1969, review **93**).—Jack P. Hailman.

BOOKS AND MONOGRAPHS

61. *The Conservation Fraud.* Charles Zurhorst. 1970. Cowles Book-Co. New York. XI + 164 pp. $4.95.—What conservation can mean was shown when, with the incoming of a new administration to Washington, in the 1930's, the U. S. Bureau of Biological Survey, with its aged and established programs and divisions devoted to Bird-Banding, Food Habits, Refuge programs, game laws, general vertebrate animal distribution and classification surveys, waterfowl restoration program, Wildfowl Diseases study, and also mammal control work, was condemned as a failure at "saving the wildlife", variously reorganized and dismembered by a wrecking crew, and finally dragged from the U. S. Department of Agriculture over into the Department of the Interior, and given various "service" names thereafter. To those employees who had to "take it" or get out into a jobless world in the depth of the Depression, conservation became a consequential word.

If science can bear outside criticism, then conservation gets it in this book written, per the jacket, by one who has been a successful free-lance writer for the past 18 years, a consultant for oil, chemical, and manufacturing companies. "He knows Washington, he knows industry, and he knows the conservation groups. He also knows where they meet—head on." While this background might seem critical, yet when long-qualified academics in biology or conservation face being put pounding the pavement looking for another job, on any disapproved utterance, criticism is left to such as him by default. His work here is admirable journalistically; a punch line on every page, or every paragraph, or a number of paragraphs comprised of such.

There is an introduction, including his own outdoor experience; 15 chapters: What is conservation (as the term is used, misused and abused . . . it is a term that cannot be adequately defined."); Conservation in retrospect (Each group sees conservation through its own eyes.); Backstage: conservation organizations (what these groups are the public little knows; rarely openly questioned); Backstage: government (in excess of 20 billion a year spent in this "undefined field".); Survival and conservation (pollution control needs "more than base lines and hope."); Who pollutes the air (. . . if it were subject to the nation's pure food and drug laws it would be illegal to ship it from state to state . . ."); Who pollutes the

water (almost every city totally ignores pollution caused by storm water runoff.); Other resources and conservation (claims threatened losses and shortages are compensated by "remarkable research and technological skills of American industry."); Recreation and conservation ("The general public could not care less about conservation of wilderness areas for recreation."); Our national parks ("The modern camper . . . is quite a stranger to sleeping bags, ground tents, wildlife, forests and solitude."); The wildlife myth (disputes seriousness of endangered species list.); America the beautiful (litter cleanup costs taxpayers an estimated 500 million dollars annually.); The basic trouble (lists 112 Federal agencies and groups involved.); A possible solution (reduce conservation to a 4-way division of areas: survival, industrial resources, recreation and esthetics conservation.); Salvation through the courts (we must develop new legal remedies.); and also appendices: A. Typical conservation organizations (lists 64, with addresses, 13 of which are headquartered in Washington, D. C., including only National Audubon and Audubon Naturalist societies of the scientific bird groups); and B. Sample environmental law complaints (2 samples drawn up in detailed legal form, one against degradation of Oklawaha ecosystem, and the other opposing use of persistent chemical biocides.)

One historical observation, not agreeable to this reviewer, is to the effect that F. D. Roosevelt's administration was "marked by . . . the creation of a multitude of conservation-oriented bureaus and agencies, . . " Actually, with the rise of totalitarian dictators, the personality cult air pervaded the world, the *eine volk, eine fuehrer* ideal. If they did anything, F. D. R's. Iowa native Secretary of Agriculture, and his 2 likewise Iowan Survey Bureau chiefs opposed and inveighed against multiplicity and non-cooperation of conservation groups, and the extraction and later fusion of the Survey with Fisheries under various names is proof. This book is at least very stimulating reading, and may prove a landmark in conservation history.—Leon Kelso.

62. ***The Life of the Emu.*** Maxine Eastman. 1969. Angus and Robertson, Sydney. 37 shillings, 6 d. ($4.53 U. S.).—This slim volume is essentially a picture-book; but let that not be taken as a point of derogation. The 16 colored plates, 89 black and white photographs, and 12 line drawings give the viewer an exceptionally good idea of the attitudes and environment of the Emu (*Dromiceius novaehollandiae*). Especially exquisite are the four color plates of habitat (pp. 36-37).

The text is minimal and is written in popular style with no references. Throughout it are points with which one might take issue. For instance, on page 5: I doubt seriously that the pitiful vestiges of wings possessed by Emus could materially aid in stablizing a hundred-pound bird on the run; nor by any stretch of the imagination can Emu feathers be considered "completely primitive" as the author asserts. To anyone interested in comparative ethology of ratites, the text will provide little satisfaction. Courtship and nesting behavior receive the most lengthy treatment but not in depth. The chapter entitled "their territory" treats previous abundance and decline and not territoriality at all. There is a chapter on the interaction of Emus and aborigines, illustrated with aboriginal rock paintings of Emus. Readers of the Sauers' (Sauer and Sauer, *Auk*, **84:** 571-587, 1967) paper on Ostrich (*Struthio camelus*) maintenance activity should note the colored plates on p. 38 that show the open-mouth threat display and yawning by Emus. Neither of these activities are discussed in the text or even in the figure caption in the case of the latter.

Though much remains unsaid here concerning the life of the Emu, to anyone with even a remote interest in ratites the photographs in this book will be well worth looking at.—Storrs L. Olson.