time. During this the birds were not individually identifiable, but after they separated one was seen to be the color-banded female; presumably she was the first mounter. The brevity of the second mounting and the fact that my notes say nothing about a slide down the female's side by the male, as described for this species by Southern (*Auk*, *77*: 218-219, 1960), make it seem that there was not effective copulation in this instance.

The behavior is apparently not fixed in the species. This female, identified by her bands, had solicited her mate without first mounting him on 5 April at 07:32, when she herself was mounted for a second or two, and again at 07:54, when the male ignored her. On these April dates the birds had a nest hole apparently almost fully excavated. Possibly because of Starlings (*Sturnus vulgaris*), that hole was abandoned. On 31 May at 18:32 the female flew from a new hole to the male on a branch, seemed to tap his tail with her bill, and then postured; again there was no reverse mounting, and again he failed to respond. By 22 June, however, young were being fed.—Hervey Brackbill, 2620 Poplar Drive, Baltimore, Maryland, 21207.

RECENT LITERATURE

BANDING AND LONGEVITY

(See also 7)

1. What can we learn from ringing? J. M. Winterbottom. 1968. *Bokmakierie*, **20**(3): 56.—One sometimes wonders what effect international conferences have upon those attending, particularly if the conference is not in their native language. Clearly, one conference at the German bird-banding headquarters at Radolfzell—which, by the way, is a delightful place for a meeting—had an effect. Professor J. Aschoff, who represents the Radolfzell scheme to the sponsoring Max Planck Society, asked the participants bluntly: what can you learn by banding that you can't learn some other way? Professor Winterbottom communicates some of the answers to his fellow South African ornithologists.

Two general types of phenomena studied through banding are migration and population dynamics. A number of important questions can be asked under the first rubric: (a) where are the breeding grounds? (b) the wintering grounds? (c) how quickly does a bird get from one to the other? (d) along what routes? (e) what is the sociology of migration (individuals, parties, flocks)? (f) are flocks family units or of other composition? (g) do these patterns vary with age? (h) with sex?

The study of population phenomena can similarly be broken into questions, a few of which are: (i) what is the age of first breeding? (j) what is the strength of the pair bond? (k) is a species polygamous, and if so in what way? (l) how is physiological condition (weight and fat) tied to the annual cycle? (m) and what is the mortality rate and its causes?

Every bander should ask himself: am I contributing to the solution of such questions, or am I merely hanging bands? The justification of banding is not how much one bands, but what one learns.—Jack P. Hailman.

2. Breeding, migration and survival of Turtle Doves. R. K. Murton, 1968. *British Birds*, **61**(5): 193-212.—This study is a good example of what can be done with the help of nest-reporting cards and bird-banding data in understanding one species' general biology. *Streptopelia turtur* is successfully double-brooded, laying three clutches of two eggs from which three eggs are lost to predators (on the average). Of the young hatched, 82 percent fledge, yielding 39 young for every 100 eggs laid. Success is better in July (48 percent) than in May (34 percent), which correlates with improved food supply in later months. In August the food is still abundant, but parents desert the nests because they "enter an obligatory refractory period of the pituitary gonad mechanism." The ultimate cause is believed to be due to insufficient time for August nestlings and their parents to accumulate fat reserves and other physiological preparedness for the fall migration. The mortality rate among adults is 50 percent per year, higher in

first year birds. Records indicate that juveniles are more liable to undertake inappropriate migratory movements. We need more studies like this one.—Jack P. Hailman.

3. Report on bird-ringing for 1966. Robert Spencer. 1967. *British Birds*, **60** (11): 429-475.—Two notables at the outset of this report are the banding of the five millionth bird since the inception of the banding scheme and the banding of 100,000 nestlings in a single breeding season! Most of these latter were, of course, colonial seabirds, but the banding of nearly 10,000 young tits is impressive. However, the worth of banding is never measured in the numbers banded, but by the amount learned by banding. One can learn much from the bird in the hand, more by continual retrapping, and still more by observing color-banded birds. This report, however, is concerned—as are most such reports from all countries—with recoveries; and an impressive list it is.

Excluding seabirds, there were only two individuals recovered south of the Sahara, which shows once again how difficult it is to get long distance migratory information from banding. However, the total number of recoveries in 1966 exceeded 13,000, which begins to yield valuable data. Only the Blackbird (*Turdus merula*) and the Starling (*Sturnus vulgaris*) have produced more than 10,000 recoveries since the beginning of the scheme, but a number of species have produced more than 1,000 (some shearwaters, cormorants, heron, ducks, geese, oystercatcher, lapwing, gulls, terns dove, swift, swallows, tits, robin, flycatcher, finches and sparrow). The report includes a documented list of selected recoveries made during 1966, including maps of some of the interesting species.

No doubt banding reports encourage banders to band more. But are we learning more as a result? Thorough individual analyses of particular species (e.g., review no. **2**) seems a better use of journal space.—Jack P. Hailman.

MIGRATION, ORIENTATION AND HOMING

(See also 2, 3, 18, 32)

4. The migration at Alanda Lake 1962-1967. (Fågelsträcket vid Ålanda sjön åren 1962-1967.) Stig Fredriksson. 1968. *Vår Fågelvärld*, **27**(4): 309-326. (English summary.)—The observation posts were located in a valley stretching NNE to SSW in mid-western Sweden, which held a river and several elongated lakes. At Ålanda Lake the valley narrowed to a pass 30 meters wide with thickly wooded hills rising on either side. The report covers spring and fall migrations and the results are summarized in a table. Each year in July and August spectacular gull flights occurred. On clear days the gulls rose on the thermal updrafts created over the water in flocks of from 200 to several thousand to glide away down the valley southwards on set wings. The most common species were the Black-headed (*Larus ridibundus*) and the Common (*L. canus*) Gulls.—Louise de K. Lawrence.

5. Orientation of Starlings after displacement to Spain. A. C. Perdeck. 1967. *Ardea*,, **55**(3-4): 194-202.—In a previous and now famous study (*Ardea*, **46:** 1-37, 1958), the author displaced autumnally migrating *Sturnus vulgaris* from Holland to Switzerland. Adults reoriented from their usual migratory direction and were recovered on the wintering grounds, whereas juveniles kept on flying in the usual, but now inappropriate, direction. The experiment suggested that in normal conditions juveniles reach the wintering grounds on the first migration by following a preset compass direction, but they learn where the winter grounds are as a result and thereafter utilize true navigation to reach these grounds.

Instead of moving the birds laterally, as previously, this study moved them southward to Barcelona. (Moving 2700 juveniles and 900 adults is no mean feat.) Again, the recoveries (133 juveniles and 35 adults) are consistent with the idea that adults reorient toward the goal upon displacement, while juveniles continue flying a preset compass course.

The connection between experiments on homing pigeons and the general problems of bird migration is tenuous at best. Perdeck's experiments are more relevant. Regretably few others seem willing to undertake such rewarding research.—Jack P. Hailman.

POPULATION DYNAMICS

(See also 2)

6. The international mid-winter censuses of ducks and swans in Sweden 1967, 1968. Report No. 5. (Internationella midvinterräkningarna av änder och svanar i Sverige 1967 och 1968.) Leif Nilsson. 1968. *Vår Fågelvärld,* **27**(4): 333-344. (English summary.)—These counts are organized in 25 countries and the results are submitted to the Wildfowl Trust at Slimbridge for analysis. In 1967 reports came from 355 localities in Sweden and from 392 in 1968. In 1967 a total of 107,311 ducks of 16 species were counted and in 1968 about 93,540 of 17 species. The Mallards (*Anas platyrhynchos*) were most common inland and the Tufted Ducks (*Aythya fuligula*) along the sea coasts. Among the swans, the Mute Swan (*Cygnus olor*) dominated on the coasts and the Whooper Swan (*Cygnus cygnus*) inland. The weather and the ice conditions influenced population trends most markedly. The counts will continue over a number of years.—Louise de K. Lawrence.

7. Structure of the New England Herring Gull population. John A. Kadlac and William H. Drury. 1968. *Ecology,* **49**(4): 644-676.—Two major conclusions are drawn by Kadlac and Drury; populations of Herring Gulls (*Larus argentatus*(in the northeastern breeding population are increasing rapidly in size, and banding returns are a poor means of determining population age structures. The basis for the first conclusion is made from a number of types of data, including Christmas Bird Counts since 1900 (a notoriously inaccurate source). All information, however, points to a distinct increase in numbers. This increase is believed to be due to three major factors; cessation of egging and the millinery trade and increasing amounts of human debris that provide an important source of food. In fact, colonies near sources of these wastes usually enjoy higher success in nesting than those situated some distance from them. A number of types of indirect data suggest that anywhere from 15 to 30 percent of the adult Herring Gulls in this population may not breed during a given year. Those that do breed usually produce 0.8-1.4 young/pair/year.

Banding data suggest a considerably different age structure of the population than do other types of information, a difference that is generally attributed to band loss. From a number of other papers it is quite evident that banding information is not adequate for such purposes. Nevertheless, Kadlac and Drury discuss this subject in considerable detail, presenting an exhaustive amount of information that could be predetermined as useless for this purpose from a number of studies by other workers. They then proceed to say that it is useless. If it is useless, why is it necessary to present so many data and so much discussion upon it? If this was the first time that such a discrepancy had been discovered (even for the Herring Gull), then this detailed presentation might have some logical basis. As it is, there seems to be none. All in all, this paper seems to be several pages longer than necessary (as well as 12 pages over the usual page limit in *Ecology*).

The authors conclude that the breeding population of Herring Gulls in New England has doubled every 12-15 years since the early 1900's. Some data used in this calculation make the assumption that this population has definite political boundaries, and hence birds nesting on the Canadian side of the Atlantic shore (the Maritimes) are not considered adequately in this or in certain other calculations. Most of the Herring Gull populations along the northeastern coast in 1900 bred in adjacent Canada and certainly must not represent a group isolated from the New England population. Judging from data presented within this very paper upon expansion of breeding range in New England it appears likely that much of the early increase of breeding birds in New England came from Canadian-fledged emigrants. Christmas Count data represent one major source of information utilized in these calculations, yet these are commonly acknowledged to be a poor estimator of population size. Kadlac and Drury point out that this problem is minimized, since there is a tendency for gulls to concentrate about areas of high human populations. However, many of the differences may be the results of increased participation on the counts by bird watchers. Perhaps in the early days of these counts there was a relative underestimate, and a larger percentage doubtless came from the Canadian colonies. Hence, while overall increase may be occurring,

it appears that the relative contribution of the Canadian colonies is inadequately considered, certainly a severe problem when one is trying to document increases with the precision that Kadlac and Drury are working with. Kadlac and Drury indicate that they have applied, "corrections based on judgment" to the Christmas Count data. Nowhere are we told what these corrections are.

The percentages of different groups (adults, second and third year birds, and first year birds) during the winter were determined by aerial censusing from Cape Sable, Nova Scotia (why to Cape Sable and only to Cape Sable?) to Tampico, Mexico. This resulted in an estimate of 68 percent adults, 17 percent second and third year birds, and 15 per cent first year birds—a distribution considerably different from that of banding information, which results in a much smaller proportion of adults. The authors point out that the Herring Gull is ideally suited for aerial censusing, since it is distributed in a narrow zone along the seashore at that season. But is it? And if not, may a different ratio (young/adults) exist on the shore and away from it? Nowhere are these problems grappled with. While censusing stopped in Tampico, Herring Gulls range along most of the Caribbean coast of Central America and throughout the West Indies. While in at least many parts of this range they are infrequent, an extremely large area is involved. No doubt a disproportionately high percentage of these individuals are young birds, for as Kadlac and Drury point out young are more migratory than adults. This apparent under-representation may be balanced by a possible over-representation in the census area of young Canadian birds. However, there is little basis for assigning such values in either case. These are the problems of attempting such a broad survey. The difficulty of obtaining such data is obvious, but the failure to consider all inadequacies is unfortunate.

Further, since the authors indicate that in some cases difficulty was experienced in separating Great Black-backed Gulls (*L. marinus*) and Herring Gulls on aerial counts in the colonies, one worries somewhat about classifying Herring Gulls from the winter censuses to the proper age category, to say nothing of the treatment of Ring-billed Gulls (*L. delawarensis*). While the usual technique was to coordinate the aerial counts with ground observations, we receive no information about how this potential problem was coped with. One would assume that the winter aerial censuses were conducted at a lower height than those done at the colonies, but we are never told about the methods used at the colonies.

All in all, while the authors may have presented a credible case that Herring Gulls are increasing, there are definite difficulties involved in their attempts to provide precise calculations.—Douglass H. Morse.

NIDIFICATION AND REPRODUCTION

(See also 2, 13, 15, 17, 18, 25)

8. On reproduction and food of some birds of the tugai (bottomland) landscape of mid and lower Amu-Daria. A. M. Mambetzhumaev. 1968. *Vestnik Karakal. affiliate, Akad. Nauk, Uzbeck SSR,* **1968**(1): 11-20. (In Russian.)—An outstanding example of local adaptation is the Desert Owlet (*Athene noctua bactriana*), for which of 31 nests observed, 27 were in abandoned magpie structures; 2-6 eggs per clutch; hatching, late May and early June; young 22 days in nest, whereas 25 or more is normal for the species as a whole.—Leon Kelso.

9. A high altitude hummingbird on the Volcano Cotopaxi. G. T. Corly Smith. 1969. *Ibis,* **111**(1); 17-22.—The Andean Hill Star (*Oreotrochilus chimboroza*) nests throughout the year on cliffs between 13,000 and 15,000 feet just south of the Equator in Peru. The range of this intrepid hummingbird coincides with that of the composite shrub *Chuquiraga acutifolia,* the nectar of which offers a staple food, which is supplemented by insects captured by hawking or by foraging over the cliff walls.

The nests are large for a hummingbird; they are built on the lava walls of the ravines under overhangs that protect the young from the fierce midday sun and the almost daily hail storms. "This supreme need for a protected site has apparently forced *O. chimborazo* to accept nesting conditions which would seem repugnant to the nature of most hummingbirds." The author once found five

occupied nests within a radius of two meters. In correlation with the harsh weather conditions, incubation and fledging are prolonged. The author has no figures on his birds, but with another species of the same genus (*O. estella*), nesting in the Peruvian Andes, 1,000 miles further south and at a somewhat lower altitude, incubation lasted 20-21 days, fledging 30-40 days (Dorst, *Oiseau*, 1962).

Smith rarely saw an adult male Andean Hill Star in the ravine with the most nests, but the males seemed to have an area of their own in a much smaller and better protected ravine half a mile away. "Within this area each male seemed to have its own small territory." A fascinating account.—Margaret M. Nice.

10. On the biology of the Shortbilled and Long billed [Kittlitz and Marbled] Murrelets. A. A. Kishchiuskii. 1968. *Ornitologiya*, **9:** 208-213. (In Russian.)—Known nests of the two species of Murrelets of the Genus *Brachyramphus* are so rare that any additional discovery of one is news. Herein is an account of a nest of the Kittlitz Murrelet, *B. brevirostris*, found in an alpine cirque, 16 July 1963, 30 km inland from the Siberian coast at Shelikhov bay, Magadan area, 300 km from the nearest stream, and 8 km from the nearest forest. The nominal nest consisted of a patch of rock detritus about 20 cm in diameter, on the bare gravel of which lay a single egg, 38.7 X 62.0 mm, but slightly incubated, from which the incubating bird was flushed; ground color bluish green, with spots of 2 types: the first deeper and more diffuse, pale grayish-violet to dark ashy gray; and the second a sharper darker, more superficial type, of pale brown to dark chestnut or umber color; spotting decidedly coarser than on the egg of *B. marmoratus*. There is a review of other nest finds of the genus, and a bibliography of 14 titles.—Leon Kelso.

11. Observations and experiments on the Black-capped Chickadee in the nesting season. E. N. Derim-Oglu. 1968. *Ornitologiya*, **9:** 88-94. (In Russian.)—An introduction with general notes on status and habitat of *Parus atricapillus* are followed by results of the following experiments: substituting normal eggs by those of different sizes and colors, even bright red (result, substitutions accepted; while passerines with open nests in early days of incubation reject them); substituting red plastic objects for eggs (visually accepted at first but thrown out after about 35 min. of incubation; open nesting species reject them on sight in early days of incubation); substitution of species' own eggs for growing young (eggs not accepted; while open nesters accept eggs and revert to incubation stage of behavior); taking chickadee young from nest cavity to open Redwing (*Turdus muscius*) nest (abrupt drop in temperature); returning cooled young to nest cavity (female brooded them extra time on feeding visits to restore warmth). Nest cavity air temperature as related to no. of 11-day old young in nest was: with two young, 18°; with 4-19°; 6-21°; 9-25.5°C; with temperature outside 14°. It is concluded that Chickadees have tactile receptors sensitive to temperature of young, located in the brood patch area.—Leon Kelso.

12. On nestling feeding activity in the desert situation. O. Sopyev. 1968. *Ornitologiya*, **9:** 142-145. (In Russian.)—A record of observations with discussions on visits to the nest of 10 species of birds in the Karakum desert. The rate of visits per hour is graphed for nine species. The pattern of activity much resembles that observed elsewhere in open country: highest rate of visiting with food in morning and evening hours, with sharp decline in heat of midday hours. Nests in poplar and tamarisk groves are an exception, showing a rise in midday hours instead.—Leon Kelso.

BEHAVIOR

(**See also 14, 15, 34, 39, 40, 41, 42**)

13. Social behavior on the lek in the Black Grouse, *Lyrurus tetrix tetrix* (L.). J. P. Kruijt and H. A. Hogan. 1967. *Ardea*, **55** (3-4): 203-240.—An average lek has a dozen males, of which about four are non-territorial, usually young, "intruders" on the periphery, while eight are territorial. These latter are of two types: "central" males that have smaller territories in the center of the

lek, stay at the lek more continuously, display less frequently outside the lek and are more aggressive than the "marginal" males. Females visit the lek in small groups, are courted and copulate at sunrise, apparently selecting particular males. More than 85 per cent of the copulations are with central males, the others with marginal males. A fine study.—Jack P. Hailman.

ECOLOGY

(See also 7, 19, 20, 24, 33, 37, 46)

14. Competition for food between vultures in East Africa. H. Kruuk. 1967. *Ardea,* **55** (3-4): 171-193.—Six species in the Serengeti area actually feed rather differently, and feeding habits are correlated with morphological characteristics. Arrival and departure times, aggressiveness and other behavioral characteristics correlate as well. The overlap of geographical ranges is greatest between species showing fewest similiarities in feeding ecology. If we are to understand how the original African ecosystems functioned, we shall have to have many more fine studies such as this one before it is too late to make sense of the remnants of the fauna left in the wake of human "development."—Jack P. Hailman.

15. The adaptive significance of colonial nesting in the Brewer's Blackbird (Euphagus cyanocephalus). Henry S. Horn. 1968. *Ecology,* **49** (4): 682-694.—This study deals with nesting success of small colonies of Brewer's Blackbirds about ponds resulting from irrigation runoff in eastern Washington. Two major factors of breeding success were investigated, effect of nest predation and distribution of food and its exploitation. The relative importance of the two factors studied was not assessed quantitatively, since they were not measured on a common scale. Both open (often basically round) and linear (long and narrow) colonies were studied, and the effect of colony shape upon success is evaluated.

Predation in these small colonies (5-30 pairs) was high. Horn hypothesizes that in open colonies it is advantageous to nest closely enough together so that there is an overlap in the areas in which a nesting individual will attack a predator. The effect proposed is that joint mobbing behavior will increase protection by maximizing crypticity of a single nest in the resulting confusion accompanying appearance of a predator. However, if colonies are linear, it may be most advantageous to be more widely separated from the nearest neighbor. Linear colonies usually are found where there is only a narrow strip of favorable nesting area in a locality, as along the edge of a stream.

There should be selection for colonial breeding in an area where there are temporary or concentrated areas of food. This situation exists about the small ponds in the study area, where a major item of food, coenagrionid damselflies, often are blown to one side of the pond as they emerge. In such cases the birds in centers of open colonies were slightly more productive than peripheral ones. It is hypothesized that more communication is transmitted (inadvertently) to individuals from the center of the colony than to peripheral ones (the former have more contacts with other birds), and hence these individuals from the center are able to take fuller advantage of outside local food sources than are the peripheral individuals. This explanation is based upon several observations of individuals arriving at a nest with food and subsequently being followed by other adults to the area where they obtained this food. Much of the greater productivity of the central birds is the result of larger nestlings, which may have a higher subsequent survival than small ones.

No new predictions are made by the model presented. Instead, an attempt is made to hypothesize possible selective advantages in particular methods of exploiting certain distributions of food, rather than to suggest that colonial nesting evolved where territoriality was not advantageous.—Douglass H. Morse.

16. The role of animal populations in the formation of biocenoses. A. G. Voronov. 1968. *Byulleten moskovskogo isp. prirody,* otdel. biol., **73**(1): 68. (In Russian, English summary.)—The biocenose is the smallest geographical unit, which, with the biotope forms the biogeocenose. Plants are usually the basic element of structure, which may be multi-storied. Being mobile, animals may

shift, seasonally or momentarily, from one story to another. While plants effect transfer of matter and energy vertically, animals effect it laterally, e. g. seed transportation by birds.—Leon Kelso.

17. Vertebrate ecology of the Tatra Mountain open woods. F. J. Turček. 1968. *Biologiya* (Bratislave), **23** (8): 601-609. (In Slovak. Summaries in English, Russian and Slovak.)—Sample plots of the woods are comprised of 85 mature trees and 112 saplings of spruce per hectare, with six junipers and 208 stumps in various states of decomposition. The numerous dead stumps in part compensate for absence of shrubbery by supplying nest sites for cavity nesting birds. The mean summer density is nine individual birds per hectare, their biomass being about 800 gms. No species of vertebrate is exclusively peculiar to these woods, which constitute a transitional ecotone between cultivated areas and the major forest types.—Leon Kelso.

WILDLIFE MANAGEMENT

(See also 43, 50)

18. The Biology of the Mallard in Karelia. E. V. Ivanter. 1968. *Ornitologiya,* **9:** 169-177. (In Russian.)—A concise account of a 6-year, 1958-1963, study of Mallards in this far northern area, yielding data very suitable for comparison with other areal studies on: distribution and abundance, weights and measurements, spring arrival and nesting, molts, food, helminth infestation, fall migration, fluctuations in numbers, and importance to hunting (comprising about 25 per cent of the bag of waterfowl, and about 14 percent of all feathered game shot annually).—Leon Kelso.

CONSERVATION

(See also 7, 44, 46)

19 Pollution, wildlife and science. R. W. Risebrough. 1968. *Canad. Field Nat.,* **82** (4): 241-243.—Here is a summary, short but not so sweet, of how chlorinated hydrocarbon biocides are threatening to destroy the biosphere itself. The "lowlights" of the story are these. The total carbon fixed by the world's green plants is on the order of 10^{16} grams per annum. The production of DDT in the United States back in 1965 (recent figures are presumably higher) was 5×10^{10} grams, and the yearly total of human wastes projected into the atmosphere has already reached the order of 10^{16} grams. DDT, being chemically stable, vaporizes readily and pollutes the entire earth. The pollutants then fall into oceans, or into rivers and then wash into oceans, where the insolubility of DDT in water and its high solubility in fat causes it to be taken into the food chain and to accumulate at the top. Thus seabirds are showing alarming concentrations already.

Other pollutants are increasing. The polychlorinated biphenyls (PCB) are indestructible components of paints and plastics that will inevitably end up as wastes. PCB concentrations rivaling DDT concentrations are now showing up in a variety of birds and other animals.

Ratcliffe's discovery (*Nature,* **215:** 208, 1967) that these chlorinated hydrocarbons cause birds to lay abnormal eggshells sends a shudder through ornithologists everywhere. The mechanisms underlying this phenomenon are these. Vertebrates possess short-lived enzymes that help rid the body of non-polar, poisonous substances such as waxes and resins, which would be absorbed by the intestine but could not pass through the kidney. These enzymes from the liver make the non-polar substances water-soluble so they can be excreted. However, for a brief time the enzymes also rid the body of steroid hormones, which are non-polar, like resins and pollutants. Therefore, the continued ingestion of chlorinated hydrocarbons has caused this enzyme system to work continuously, not just rarely to exclude occasional waxes or resins eaten. The result is that the sex hormones and other steroids in the body are being unintentionally broken down. These hormones promote reproductive behavior and control to some extent the calcium formation of the eggs in the female. So if the birds manage to get through a less than vigor-

ous courtship (and many do not, now), the weak-shelled eggs are broken before the young develop. The destruction could not have been more cleverly planned by purpose.

Risebrough points out that government programs are ineffective and completely misdirected. Industry, more interested in filling pockets with gold than creating a better world, turns its back to the ugly problem. Who is left to take up the burden of protecting our environment and the living creatures in it? We are in the 12th hour.—Jack P. Hailman.

20. Dark days in Dogtown. John Madson. 1968. *Audubon Magazine*, **70** (1): 32-43.—The decline of the Prairie Dog resulting from control work poisoning is of ornithological concern in that with it declines the unique Burrowing Owl from the western U. S. scene. "One of the tragedies of political boondoggling is the shackling effect that it has on professional wildlifers and its erosion of sound conservation principles." And more doggling is seen in the same issue, p. 25, in the presentation of another medal to the head of that administrative empire who should have been able to stop further poisoning with the scratch of a pen.—Leon Kelso.

PARASITES AND DISEASES

(See 18)

PHYSIOLOGY AND PSYCHOLOGY

(See also 2, 11, 19, 26, 28, 45)

21. Shape and position of the pecten in certain alcids. T. M. Korneeva. 1968. *Vestnik Moskovskogo Univ.*, biol. ser., **1968**(5): 119-121. (In Russian)—The various theories of the function of the pecten are reviewed briefly: accommodation for changes of internal versus environmental pressure on eyeball; provision of nutrition for eye internally; a sense organ responsive to temperature and pressure; heating the eye, offsetting its cooling at great heights; protection of retina from damage in strong light; absorption of scattered light, clarifying image on retina; softening tone of bright images on a sky background; casting a shadow on retina, rendering moving objects more visable by flicker effect; supplies oxygen to retina and vitreous body. The pecten is figured and described for four species of Alcidae: ratios of basal length to vertical diameter of eye: Razor-billed Auk, 41.2; Puffin, 36.9; Common Murre, 26.5; Guillemot, 31.0 percent: ratios of pecten height to linear axis of eye: Auk, 28.0; Puffin, 42.0; Murre 20.6; Guillemot, 21.45 percent. A correlation of these ratio differences to diving and feeding habits of the species is attempted.—Leon Kelso.

22. Induced potentials in the acoustic centers of the medulla of the Pigeon. A. V. Grazhdankin and V. D. Ilichev. 1968. *Vestnik Moskovskogo Univ.*, biol. ser., **1968** (5): 3-8.—While microelectronic acoustic responses of the cochlear centers have been described in considerable detail for mammals (particularly the domestic cat) they have been less elaborated for birds. This study provides more precise and numerous details for four centers of the medullary acoustic complex: viz. the angularis, magnocellularis, laminaris, and olivarious superior nuclei. As in the cat, "slow" and "rapid" wave components were present.—Leon Kelso.

23. Physical factors in directional hearing in Aegolius funereus (Linne), with special reference to the significance of the asymmetry of the external ears. Ake Norberg. 1968. *Arkiv. Zool.*, **20** (3-4): 181-204. (In English.)—By electronic microphonal apparatus the effect of extreme aural assymmetry was observed on the interraural reception, finding differences in intensity at frequencies of 2.5-16 KHZ. It was concluded that any divergence of sound source from the horizontal and vertical planes is perceptible to the owl, thus enabling sonar localization of prey.—Leon Kelso.

24. Bioenergetics of captive Willow Ptarmigan under natural conditions. George C. West. 1968. *Ecology*, **49** (6): 1035-1045.—The Willow Ptarmigan is exposed to some of the most severe conditions experienced by birds, with the Arctic winter resulting in cold temperatures, short periods for foraging, and a definite limitation of most available food. Nevertheless, individuals of this species tested appeared to survive without measurable stress under somewhat comparable experimental conditions, in fact showing little tendency even to increase their metabolized energy. This remarkable ability results from a number of factors. To begin with, ptarmigan have a thick insulatory layer of feathers, with even the legs and toes covered. They may also burrow in snow at night. In addition there is a strongly marked tendency for them to stagger their energy-demanding activities sequentially, with only slight overlaps occurring. These include seasonal weight change, molt, egg-laying, thermoregulation, and heightened gross activity (largely the result of courtship and aggressive activity). Hence, demands are coped with one at a time, rather than simultaneously. Most species of the temperate zone also stagger such activities, but apparently not with the precision of the ptarmigan.

These studies were conducted upon caged birds in otherwise natural conditions at College, Alaska (64° 52′ N). The individuals studied were captured at 68°09′ and 69°24′N. They were maintained in pens that were made partly of hardware cloth, and were switched gradually from natural food to wild breeder ration. Thus, two conditions (space and food) were altered markedly from the wild. It is not possible to calculate the effect of these modifications upon the birds, though the energetic values of natural food and ration were compared, as were the energetic values of feces from both situations. The energy needs for such items as maintenance activity may be expected to differ markedly in a restricted pen space with adequate food and in the wild. We note that Willow Ptarmigan exist quite well under caged conditions at temperatures approximating those of their natural habitat; however, we enter this article eagerly hoping to find out what contingencies they may expect to meet in the wild (after all, the title said *natural* conditions). Is there a period of energetic stress normally occurring in the wild, and if so, when, and why? West's paper is a disappointment in this regard, since nowhere do we find *direct* field studies relating to such potential parts of the ptarmigan's life cycle. We are eagerly looking forward to seeing such an attempt, obviously no undertaking for the weak of heart. It will be an important contribution.—Douglass H. Morse.

25. Weight recession in nestling birds. R. E. Ricklefs. 1968. *Auk*, **85** (1): 30-35.—Barn Swallow (*Hirundo rustica*) nestlings surpass adult weight and then return to it before fledging. The weight recession is due to loss of water in embryonic tissues, especially feathers. Swallows, swifts and oceanic birds undergo weight recession.—Jack P. Hailman.

MORPHOLOGY AND ANATOMY

(See also 21)

26. Features of the development of the optic retina in the Pied Flycatcher. N. A. Manuileva. 1968. *Vestnik Moskovskogo Univ.*, biol. ser., **1968** (3): 32-39.—Pigmentation and cell differentiation of the retina begins in the central and temporal areas in the 12-day old embryo (i.e., 2 days before hatching). On the day of hatching (14th of incubation) all the layers for adequate vision have been formed but receptor processes of visual cells are just beginning to appear. After hatching, accelerated differentiation of all retinal cells and their processes occurs. Five days later Muller fibrils appear on the nuclear layer of the retina. As the pigmented epithelium matures the outer nuclear element in the temporal area changes from bi- to unilaminate. At seven days age in the now opening eyes all the main elements of the adult retina are present, but differentiation is still incomplete at departure from the nest, and final maturation comes in the post-nesting season. All visual elements reach higher development than in precocial birds.—Leon Kelso.

27. The size of the olfactory bulb in 108 species of birds. B. G. Bang and S. Cobb. 1968. *Auk*, **85** (1): 55-61.—The table gives the diameter of the olfactory bulb, the diameter of the cerebral hemispheres, the ratio of these figures (in percent) and the sample size for each species; mean ratios are given for the orders. "This list allows us to generalize somewhat more safely than Bumm who, in 1883, said that the olfactory bulbs are largest in swimming birds, medium-sized in marsh birds, and small in all others. Our survey suggests that in kiwis, in the tubenosed marine birds, and in at least one vulture, olfaction is of primary importance, and that most water birds, marsh dwellers, and waders, and possibly echo-locating species, have a useful olfactory sense. In other species it may be relatively unimportant."—Jack P. Hailman.

28. Adaptive features of retinal development in some passerines. N. A. Manuilova. 1968. *Z. Zhyrn.*, **47** (11): 1676-1682. (In Russian, English summary.)—The cellular development of the retina in the region of acute vision and fovea is examined and figured by photomicrographs for 4 species: Pied Flycatcher (*Muscicapa hypoleuca*), Common Redstart (*Phoenicurus phoenicurus*), Great Tit (*Parus major*), and Blue Tit (*P. coeruleus*). The anlagen of this area are characterized from the first by an accelerated retinal differentiation, with progressive changes and formation of a recess. The distinctness of these features varies with the species. Interestingly, foveal development is short of perfection by time of nest departure, and much less perfect at time of eye opening. It varies with the species' mode of life; in open nesters (the first two species) it is decidedly more advanced than in cavity nesters (the latter two species) at time of nest departure. The eco-morphological reasoning is that aerial feeding insectivores need keener vision; yet, some readers might think young growing in cavity darkness require it as much or more.—Leon Kelso.

PLUMAGES AND MOLTS

(See 18)

ZOOGEOGRAPHY

(See also 47, 48, 50)

29. First sight record for Sweden of the Isabelline Shrike. (Isabellatörnskatan (*Lanius isabellinus*) anträffad för första gången i Sverige.) Krister Hjalte. 1968. *Vår Fågelvärld*, **27** (4): 327-332. (English summary.)—On 26 November 1967 one individual was carefully observed for a considerable length of time on a beach near Falsterbo, Scania. Several rare accidentals had been noted earlier in the same general region presumably because of the unusual fall weather. —Louise de K. Lawrence.

30. Island patterns in the Solomons Islands bird fauna. P. J. M. Greenslade. 1968. *Evolution*, **22** (4): 751-761.—The Solomons are a group of small islands that form an archipelago southwest of New Guinea. Zoogeographically they are of interest, since isolation appears complete enough that a high degree of endemism exists at the subspecific level. They act as a series of stepping stones from a major source, the Bismarcks, which are close to New Guinea.

Greenslade investigates the bird faunas of this group of islands, considering the species involved and their probable origin. On isolated islands the incidence of endemic taxa varies with island area and distance from source islands. Within the main archipelago, the situation is obscured by expansion of some endemics. The usual method of formation of endemics is for species to become increasingly adepted to lowland rain forests and eventually to become isolated in montane forests. The chief apparent invasion route probably was exposed during the Pleistocene, though it appears that it is not necessary to put this into play as a significant factor accounting for present distributional patterns.—Douglass H. Morse.

31. The Red-whiskered Bulbul in Florida. R. C. Banks and R. C. Laybourne. 1968. *Auk,* **85** (1): 141.—The addition of *Pycnonotus jocosus* to the list of breeding birds of the New World has been noted previously in various local and semi-popular journals, and in a recent field identification guide (Robbins), although never to my knowledge in a major journal (which seems to say something about scientific communication). The bulbuls reared young south of Miami in 1961, and are now locally common in several areas around Miami. It was thought that the species arrived in a shipment from Calcutta, which hypothesis was tested in this study by collecting birds and comparing skins. "The Florida birds are referable to *P. j. emeria,* a race native to the lowlands of eastern India from the State of Madras at least to Calcutta, West Bengal." This species is well established near Kendall, Florida, and may spread. Let us hope someone will study its population dynamics closely, and not let still another golden opportunity slip by, as with the largely undocumented spread of the Cattle Egret, Glossy Ibis, Herring Gull (see review **7**), Black-backed Gull and Fulvous Tree Duck whose ranges have changed drastically in recent years.—Jack P. Hailman.

32. An egret observed on St. Paul's Rocks, equatorial Atlantic Ocean. V. T. Bowen and G. D. Nicholls. 1968. *Auk,* **85** (1): 130-131.—An egret, which is probably the Cattle Egret (*Bulbulcus ibis*) as judged from the photograph, was seen in April 1963 on this island which is located on the shortest line drawn from the western "hump" of Africa to the eastern "hump" of South America, being closer to the latter. The observation may help to explain how this species reached the New World from Africa in this century.—Jack P. Hailman.

33. Avian abundance in northern forest-steppe shelterbelts. V. V. Strokov. 1968. *Ornitologiya,* **9**: 77-87. (In Russian.)—Occupation by birds of northern shelter belts begins 1-2 years after planting, *i. e.,* somewhat earlier than in the south. This is because more precipitation and less summer drought farther north favors faster growth of the trees. Bird occupation starts with ground and shrub nesting species and is complete in about 15 years with the arrival of tree cavity and crown nesters. Snowbreak forest belts along railroads are more preferred than those along highways, owing to greater width and continuity. Railway traffic is less disturbing to birds than highway traffic. As to raptors, the various types of shelter belts show a higher population of the more insectivorous Red-footed Falcon than of the myophagous Kestrel.—Leon Kelso.

SYSTEMATICS

(See also 31)

34. The taxonomy of the herons in the light of ethological studies. (Hägrars (*Ardeidae*) taxonomi belyst av etologiska studier. En preliminär redogörelse.) Kai Curry-Lindahl. 1968. *Vår Fågelvärld,* **27** (4): 289-308. (English summary.)—This is a preliminary report of field studies carried out on 13 species in America, 19 in Africa, and 16 in Europe, Asia and the Oceanic Islands. Distribution, anatomy and morphology, ecology, ethology, breeding behavior and vocalizations were studied. In at least three species-pairs, *Butorides virescens - B. striatus, Egretta garzetta - E. thula,* and *Ardea cinerea - A. herodias,* whose members dwell on separate continents, their behavior, habits and other features were found to be very similar. A reassessment of their systematic status is suggested toward recognizing the members of each pair not as separate species but as races of one species.—Louise de Kiriline Lawrence.

35. A Tufted Duck (*Aythya fuligula*) x Scaup (*A. marila*) hybrid from Reykjavik, Iceland. (Krydsning Mellem Troldand og Bjergand Iagttaget Island 1967.) B. Bruun. 1968. *Dansk Ornithol. Foren. Tidsskr.,* **62** (2): 143-144 (In Danish, with English summary).—There are apparently five previous hybrids of this type known.—Jack P. Hailman.

36. The sequence of bird lists. W. R. P. Bourne. 1969. *Ibis,* **111** (1): 114.—Some years ago R. Moreau (*Proc. Zool. Soc. London,* **137**: 623-626, 1961 and

Bird Notes, **30**: 18-22, 1926) suggested that for bird-lists that were not primarily taxonomic an alphabetical sequence of genera and species within genera should be utilized. The arguments for alphabetical listing were mainly arguments against taxonomic listing: taxonomic lists use widely varying sequences, the taxonomic sequences (which are supposed to reflect multi-dimensional relationships in a linear list) are logically unsound, the taxonomic sequences are based on only the barest threads of direct fossil evidence for relationships, and taxonomic sequences are extremely difficult to use. (Ever try to find a particular species of *Dendroica* while thumbing the *A. O. U. Checklist*?) Some of us, who are not taxonomists, jumped at Moreau's suggestion as just plain sensible (e.g., in the arrangement of gull species in the appendicies of *Behav. Suppl.*, **15**: 147-159, 1967), but the suggestion brought anguished outcries from others.

Bourne is the latest to speak out on this issue, objecting to alphabetical lists in recently published editions of *Ibis*. His objections to alphabetical lists are that "they are liable to separate closely related forms in an erratic way, they lead inevitably to gross rearrangements of the order with changes in the arrangement of the higher categories of classification, and they are disturbed by alterations of nomenclature . . .". Maybe Bourne is correct. However, it seems to one non-taxonomist that ignorance of true relationships also separates closely related forms in taxonomic sequences (and why is that bad, in any case?), and that taxonomic sequences also undergo gross rearrangements of order with changes in higher categories. His last point I accept, but think it so trivial as to be inconsequential (what percentage of species names undergo change now that we have almost reached the asymptote in searching out original descriptions of bird species?). Bourne would have us follow some compromise between the B. O. U. and A. O. U. sequences of species, but these works would have been useless to me when I listed all the gull species of the world. The only attempt at a complete world list is the still unfinished Peter's *Checklist of the Birds of the World*, and some of its volumes are in second edition (with new sequences) before all the volumes are published once. I suppose only time will tell whether alphabetical or taxonomic listing wins out in non-taxonomic works.—Jack P. Hailman.

EVOLUTION

(**See also 15**)

37. Competitive interactions and the evolution of ecological niches as illustrated by the Australian honeyeater genus Melithreptus (Meliphagidae). Allen Keast. 1968. *Evolution*, **22** (4): 762-784.—In recent years it has been shown with increasingly frequency that organisms living on "islands" undergo what Schoener has called "ecological release"; that is, their range of foraging may be greater than in a diverse population, as on a mainland area. Concurrently, their morphology may differ from mainland forms. Keast has worked upon this problem in a genus (*Melithreptus*) of Australian honeyeaters, whose species employ a wide variety of feeding methods, from foliage gleaning to trunk feeding. His "islands" are Tasmania, Kangaroo Is., and southwestern Australia, the latter being an area largely separated from the rest of Australia by habitat unsatisfactory for this genus or many others. On these "islands" the species composition (including meliphagids) is reduced and the range of foraging activities for any species present is greater than for the same or closely related species in large "mainland" populations. The change is not one of a complete ecological transformation, but of an increased diversification in activity. Changes in bill, tarsus, and hallux length appear associated with this modification. Over most of the continent of Australia, species of the genus *Melithreptus* show no significant geographic variation.

Two of Keast's methods in collecting data should be mentioned here, since they may influence somewhat the outcome of his results. First, he mentions that "as sexual size dimorphism is only about 5%, adult males only are considered . . .". This problem is then dispensed with, without mention of any possible differences of size or extremities that vary from his "5%". A number of recent studies have shown that sexual dimorphism often increases in depauperate faunas and that a concurrent differentiation in feeding habits of the two sexes occurs. If such is the case, then the foraging of males on the mainland and island populations would

not serve as exactly equivalent measures of habitat utilization of the species involved.

The second point involves his statement that "demands on the environment are greatest during breeding and hence differences between species likely to be most clearcut". This is a *non-sequitur*. While the breeding season is likely the time that a species makes the greatest absolute demand on the environment, it is also usually the period of maximum abundance. Hence the critical factor is the ratio of resources available/resources utilized, rather than the total resources utilized. There is also some question over whether the breeding season is the time that competitive interaction over food sources would be at its maximum.—Douglass H. Morse.

38. Geographical variability of raptors and their food. N. V. Basheenina. 1968. *Ornitologiya,* **9:** 49-57. (In Russian.)—To attempts to correlate avian geographic variation to temperature, humidity, altitude, latitude and combinations of such, there is added this consideration of principal foods available. An analysis of available food information on the Common Buzzard, Short-eared, Long-eared and House (or Little Owls) throughout their broad ranges finds but little correlation between food and geographic subspeciation. Evaluation of a species' food for a given province is a year-round process and available studies are inadequate oftener than not. Incidentally, of some interest is the evidence, although fragmentary, that in some American tropical forms, such as *Rhinoptynx* and *Pulsatrix*, the food, small mammals and insects, is remarkably small in comparison to the size of the birds.—Leon Kelso.

FOOD AND FEEDING

(See 2, 8, 12, 14, 15, 37, 38)

SONG AND VOCALIZATIONS

39. Auditory experience and song development in the Chaffinch *Fringilla coelebs*. F. Nottebohn. 1968. *Ibis,* **110** (4): 549-568.—A competent study confirming other work showing that auditory experience is vital to the development of normal song in this species. The author classifies the types of development of song as (a) those in which no auditory feedback is necessary (all species cited are domestic, which leads one to wonder if this developmental mode is tied to the process of domestication), (b) auditory feedback necessary, but not prior environmental experience (Song Sparrow, *Melospiza melodia*, is the only example known, and it is not well understood), and (c) auditory feedback and prior experience required, as in the Chaffinch and most species studied.—Jack P. Hailman.

40. Dual singing by New Guinea birds. J. M. Diamond and J. W. Terborgh. 1968. *Auk,* **85** (1): 62-82.—Vocal duets are described for mated pairs of four species, plus another in which it occurs occasionally, and a sixth in which it is rare. In five other species duetting may be between adjacent territorial males. Dual singing is thought to arise in environments where visual communication would be difficult, or when there is great need for a pair to remain paired over a long period while awaiting favorable breeding conditions.—Jack P. Hailman.

41. Antiphonal calling in quail. A. W. Stokes and H. W. Williams. 1968. *Auk,* **85** (1): 83-89.—If the female Bob-white (*Colinus virginianus*) says *hoy* the male may answer *hoy-poo* or even *bob-white*. Other examples from quail are given. These calls are primarily locating in function, and antiphony in general may subserve pair formation, spacing of males and reuniting of separated mates.—Jack P. Hailman.

42. On the use of established vocal and general motor reactions by birds. N. P. Ovchinnikova. 1968. *Vestnik Leningradskogo Univ.,* **1968** (15): 154-156. (In Russian, English summary.)—Discusses with many instances,

utterance of same note for various purposes in a variety of situations (e.g., adult females giving food begging call of the young). The repertoire of the Wood Warbler (*Phylloscopus sibilatrix*) is discussed at length.—Leon Kelso.

43. Physical and functional characteristics of bird sounds. V. D. Ilichev. 1968. *Ornitologiya*, **9:** 58-72. (In Russian.)—A review of the author's available literature on the subject. Tables of frequency spectra (of 35 species), basic frequencies of vocal reactions, time duration of bird calls, 21 vocal spectrograms, and 14 oscillograms are portrayed. Principal discussions pertain to ultrasonar high frequency spectra, basic frequencies and auditory reception in general, evolutionary trends, ecological relationships of sounds, the multifunctional use of certain calls, and geographic variation in songs. The growth of the study of avian bioacoustics in importance for biology is noted, along with the use of acoustic repellents around growing crops and airports. The protective effects have proved rather variable according to weather, locality and season. There is a bibliography of 47 titles.—Leon Kelso.

BOOKS AND MONOGRAPHS

44. *Moving the Earth - - for a Song.* M. Wilson Gaillard. 1968. John Knox Press, Richmond, Va. 112 pp.—Conservation is good; right? Right! Therefore, any book that advocates conservation is good; right? Wrong! For those of us who tithe a portion of our lives for conservation, a book that champions our cause is a potential gift for an uninitiated friend. I have always felt that a good book on conservation or nature was a perfect gift, giving as it does part of me, and awakening, as I hope, a slumbering part of my friend. I have found, however, that reviews of conservation books in Audubon Society journals tend too often to confuse praise for conservation with praise for a book on conservation, and thus are of little help in choosing a book for a friend. It is about time that somebody owned up to the fact that there are bad books about conservation as well as good ones—some books exist which as gifts could well do more harm than good. It is worth looking at such a book as a paradigm for what to avoid in choosing a book on conservation.

This is a lavishly illustrated book with nine chapters of randomly selected material. The first 16 pages are on beautiful white paper with color photographs, but from there on the photographs go to black and white, the pages to yellow. I've thrown away better photographs than appear herein. For instance, why must we have both a full color, full page picture of a ceramic model of an Ivory-Billed Woodpecker (p. 7) and also a black-and-white picture of the same statue (p. 82)? And was not one picture of the nature pavilion enough? We have come to expect the author's picture to appear on the dust cover; OK. Tacking up a sign in a sanctuary (p. 14); well, OK. Looking at a birdhouse (p. 70); well? Fooling around in a swamp, too (p. 71)? But did the frontispiece *have* to be a full-length, full-page, full-color photo of Dr. Gaillard? And did the aerial photo of the sanctuary have to feature "Gaillard Lake"?

The text is mechanically written in modern American journalese, in which waterfowls is used as the plural of waterfowl and people as the plural of person. Which and that are consistently confused, and we find "birds who . . .". Exaggerations and half-truths abound: ". . . it is not unusual for the same bird to be netted and recorded two or more times as he wings his way to or from nesting and wintering grounds" (p. 24). (Bird-banders know better.) Early settlers did not have the good hunting practices of the Indians so that "a few greedy hunters changed to some degree the whole history of our nation . . ." (pp. 39-40). "Almost extinct in 1957, the brown pelican staged a comeback" (p. 55). And on page 77 the Ivory-billed Woodpecker is termed "deceased" (despite recently publicized records that it holds on somehow), and the Pilliated (*sic*) Woodpecker is called "endangered." If we exaggerate the perils of our wildlife, we do conservation a grave disservice.

How about a sample of outright errors? The rather nice color photograph of a Snowy Egret on page 6 is labelled "Cattle egrets stand in a rookery." Migrtory routes "are inbred in each species" (p. 20). Despite the semantic difficulties (for "inbred" read "inborn" or "innate" or "instinctive" or some such thing, and

for "each species", read "each individual of a species"), the statement simply is not true as a generalization, as has been known for several decades (e.g., in geese). On page 45 we learn that herons are "smaller cousins" of the American Egret, which statement should delight our friends the Great Blue and Great White Herons, if they could read. On page 91 we learn of "nature's plan of making a river take the longest possible route as it winds its way across the land before eventually reaching the ocean." The geologists will get a chuckle over that one. On page 103 we find that penguins don't need wings, whereas their north polar counterparts, the auks, must be able to fly because there is so much open water. It is strange that a conservationist is not acquainted with the flightless Great Auk. On the following page we learn that "owls have eyes which see in darkness". (It is irrelevant that *animals* see, not eyes—the point is that no animal sees in darkness, by definition. In fact, owls have vision about like ours, but a much keener sense of hearing.) Such statements permeate the book.

Is all this nit-picking? Do these little things just detract from a real message? The book is basically a confused presentation of local and national conservation strides. The story of the author's own tiny sanctuary — a swamp not suitable for a projected golf course when builders exploited a beautiful coastal island — is so confusing that one cannot tell how he got the land. And on the national scene the book is really worrisome. Lack of conservation in the southern states (the author is from Alabama) is blamed on — you guessed it — the Civil War! The Sierra Club member will certainly find it strange that the oil companies and the Army Corps of Engineers emerge as the great conservation forces of our day! (See page 80 and following if you don't believe it.) But then, the courtesy for some of the photos, including one of Gaillard himself, is due Sinclair Oil! Hmmm.

Gaillard is a hunter, and attempts to build a case that hunters are really responsible for most of the conservation efforts in North America. He continually defends killing of animals, as long as it is not done for profit. I have always wondered whether killing for subsistance was really worse than killing for pleasure. I'm glad to find such a definitive answer. Gaillard's rationalizations on killing are couched throughout in religious language, and he even shows a photograph of a birdhouse with a cross nailed to it. Gaillard's own version of the evolutionary process (p. 105) is such a mish-mash of Lamarckian inheritance, divine creation, genetical nonsense and religious language that one ends the book in utter despair.

My favorite quotation from the book is on page 105: "But all people are not clear thinkers."—Jack P. Hailman.

45. Color preferences in the pecking response of newly hatched ducks (Anas platyrhynchos). R. W. Oppenheim. 1968. *J. Comp. Physiol. Psychol. Mong. Suppl.*, **66** (3, part 2): 1-17.—The author felt that previous investigators had not sufficiently demonstrated that the pecking preference of Mallard and Peking ducklings was for color and not the intensity of the stimuli used; moreover, the role of possible early experience had not been evaluated in the earlier studies by Hess and Kear. This study consists of seven experiments aimed at clarifying the nature of the pecking preference in newly-hatched ducklings.

The first three experiments utilized basically the same method. An octagonal box similar to that used by Hess (*Psychol. Repts.*, **2:** 477-483, 1956) had a pecking spot on each wall. The spot was illuminated from the rear, and pecks on the spot were recorded automatically via a microswitch arrangement. Ducklings were "tested in groups of five or individually." The stimuli were of much narrower bands of wavelengths than in previous studies, being created with interference filters in this case (the light source being a 100-watt tungsten microscope lamp). Intensity was "controlled" by using a variable transformer on the microscope lamps. (More on the intensity problem below.)

In the first experiment, groups and individual Peking ducklings behaved similarly at each of four intensities used. With one exception in the eight sub-experiments, a wavelength of 531 nm (green) was the preferred stimulus; in the exception, the peak was at 568 nm (also green). The stimuli used were neither all of the same physical intensity nor all equally bright as perceived by the ducklings, so another sub-experiment was conducted in which green was made about 100 times brighter than the other stimuli and then the other stimuli were made about 100 times brighter than green. About the same results were gotten in these two groups (preference for the green).

The second experiment explored a narrow range of wavelengths in the green and found pecking to be about the same from 500 to 568 nm. The third experiment presented all the spectrum except green, so that the most pecks went to the spectrally closest color to the usual green peak (in this case yellow at 581 nm). Experiment four was ingenious: the egg shells of duckling embryos in the incubator were broken open to expose the eye. One group was held in the dark as a control, three groups were exposed to white light, and three groups to monochromatic yellow light (590 nm), in order to test for the effect of early sensory experience on later pecking preferences. In essence, all rearing groups responded similarly to those in the previous experiments.

In order to find out whether the attractiveness of green was merely as a background (i.e., ducklings feeding among green leaves), the colored stimuli were presented in the fifth experiment against green walls. The color of the wall had little effect on preference for the stimulus spot color. In the sixth experiment stimuli were flickered in various groups, but this had little effect on the color preference. In the seventh experiment Mallard ducklings were obtained from the St. Louis zoo and given the same type of experiment as the first one on Pekins—with the same result.

The discussion section leaves unresolved the adaptive significance of the green preference. It discusses possible physiological mechanisms of the response (with my own hypothesis on color preferences in gull chicks being misunderstood), and finally ties the study to Schneirla's "approach-withdrawal" theory of psychology.

There are many citations of "color preferences" of birds in the literature, but precious few that are analytical enough to demonstrate that a true color preference exists. Therefore, any analytical study should be considered carefully as a possible model on which new studies could be based. There are thus two questions concerning the present study: (1) does it demonstrate a color preference, as it purports to do? and (2) should it be used as a model for future studies?

With regard to the first question, many persons will be tempted to say that a color preference has *not* been demonstrated. Yet, I disagree, and it is worth stating the issues involved. By "color preference" we mean that an animal responds differentially to the spectral position of light (wavelength or frequency) without reference to subjective brightness differences. Now these experiments do not in any case present stimuli that differ in wavelength but not in brightness, so that no *direct* proof of a color preference has been offered. Psychologists accustomed to testing color vision in birds via training procedures will thus tend to reject these experiments. For instance, a pigeon can discriminate on the basis of brightness alone, two stimuli that differ only because one beam of light has passed through two tiny, thin microscope cover slips and the other has not (I've tried this, and I do not believe that I am capable of making this minute brightness discrimination). However, in such studies as the one that demonstrates this discrimination, pigeons are rewarded for distinguishing two stimuli, and the birds do it in any way they can. I see no reason that natural selection would build into a newly-hatched duckling such an acute preference for the brightness of stimuli, when this difference would be obliterated by the day-to-day variations in sunlight due to the relative humidity, not to mention cloud cover.

It seems to me to be strong evidence for a true color preference when one finds that birds will respond to the same wavelength under drastically differing intensity relationships. Such a phenomenon would be hard to explain in terms of brightness preferences alone. In other words, I think that Oppenheim's evidence is satisfactory because the contrary hypothesis is simply untenable.

Pedants will find much to object to about the control of intensity in this study, since the author is obviously not as sophisticated about physical aspects of light stimuli as are contemporary psychologists who study vision. His intensity measurements are photometric, which means that they relate to the spectral sensitivity of the human eye. We cannot assume that ducklings have the same spectral sensitivity as we do, so that stimulus values should be expressed in radiometric terms (either in energy or quantum flux of the stimuli). Furthermore a "selenium photocell connected to a milliameter" was used to check the light intensity in these experiments. Yet no data are given concerning the spectral sensitivity of this cell (which does not respond equally to all wavelengths; nor does it have the same spectral sensitivity as the human eye). Furthermore, the altering

of intensity in these experiments was performed by a transformer on the lamps, meaning the lamps burned at different color temperatures at each intensity, and therefore changed their own spectral emission characteristics. The result is that the nominal wavelength of the stimuli changed slightly at different intensities (but the change is relatively small). Despite these lapses—which, by the way, could *not* be tolerated in a training experiment—I think that the color preference of the ducklings has been demonstrated.

Having said this, I must disagree with the statement that "the results of Experiment 1 indicated that intensity and position were not important determinants or cues for the green preference." It is perhaps true that a preference for green exists, and has been demonstrated, but this does not mean that the preference curve is unaffected by intensity. It is important to keep separate the conclusion that the animals are using color from the conclusion that they are using *only* color; the experiments do not demonstrate the latter—in fact, they contradict it (Table 2). Intensity *is* an important determinant of the response.

The second question was whether this study would be used as a model to investigate color preferences in birds. I think not. The author's assertion that "the most reliable method for examining color vision in animals involves the random or systematic variation of the intensity of each color" is misleading. Systematic variation, yes; random, no. The best color preference experiments I have read are those by Chapman (*J. Comp. Physiol. Psychol.*, **61:** 429-435, 1966) on the bullfrog. First give animals stimuli of equal physical intensity to determine the spectral curve; then give the animals stimuli that come as close to possible to appearing equally bright to the animals. If the shape of the spectral response curve is not altered by this latter change, then a true color preference is involved (so far as I am aware, my gull studies are the only ones on birds that have used the Chapman method). Also, Chapman varies the physical intensity at a single wavelength, for many wavelengths in the spectrum. This procedure evaluates the intensity variable and provides further evidence for color vision, by reasoning that is too involved to spell out here. In short, believe Oppenheim but copy Chapman.

Oppenheim's study demonstrates the sophistication toward which ethology is struggling. It nicely combines interest in physiological, ontogenetic and evolutionary aspects of a single behavior pattern, and in this sense, is a fine model for future studies.—Jack P. Hailman.

46. *The Subversive Science: essays toward an ecology of man.* Paul Shepard and Daniel McKinley, editors. 1969. Houghton Mifflin Co., Boston. 453 pp. $8.95.—To recognize the universality of ecology and to apply the researches and thinking of some of its students to the increasing complications of the human dilemma; to rescue some of their more profound and thought-provoking essays from the obscurity of the numerous modern journals: those would seem to be the general services of this book. Rather than tidbits from more readable scientists and nature writers, usually included in anthologies for prestige or entertainment value, here are 36 articles, each substantial, and sometimes sufficient to constitute a small book at least, in itself. Making it worthy of notice here is the ornithological element of the authorship, which, in addition to McKinley, includes contributions by P. B. Sears, V. C. Wynne-Edwards, A. Portmann, P. L. Errington, F. Fraser Darling, Aldo Leopold, and A. Starker Leopold, the last contributing an editor's foreword. The articles are classed under parts 1 - 5: Men as populations; The environmental encounter; Men and other organisms; Men in ecosystems; Ethos, ecos, and ethics; each with an editors' preface, and a bibliography (if such was provided in the original). There is a final bibliographical chapter of additional readings. The idea for the title was derived from Sears' "Ecology—a subversive subject," *Bio Science* **14** (7): 11, 1964. One university English professor has selected this book as a text for his class.—Leon Kelso.

47. *The London Bird Report*, No. 32 for 1967. Ed. by F. H. Jones. 1968. London Natural History Society. 102 pp. 3s.—Lest the "compleat synik" believe that cities must be ornithological wastelands, devoid of interesting birds and offering no subjects for serious study, we note the most recent edition of this fascinating annual. It contains articles on the research projects, records and other

items of interest, including studies of the Kestrel and two owls, and of the Swift in Central London. I wonder what a "New York Bird Report" would be like.—Jack P. Hailman.

48. *Bird Guide of Thailand.* Boonsong Lekagul. 1968. Ramin Press, Siphya Bangkok, Thailand. xxxii 277 pp., illus. $7.50 plus $1 mailing. (Obtainable from 4 Old Custom House Lane, Bangrak Bangkok.)—This remarkable guide is the product of over ten years of painstaking, meticulous labor by a remarkable man. Professionally, Dr. Boonsong is a busy, practicing physician who operates his own clinic, yet finds time avidly to pursue his hobby of natural history and conservation. He is founder and moving spirit of the Thai Association for the Conservation of Wildlife, compiler and editor of a periodical, "Conservation in Southeast Asia," a freelance writer and programmer for the press, journals, radio, and television, a volunteer professor in several Bangkok universities, master mind of a private natural history museum and scientific study collection, civic leader and government adviser. A self-created photographer and artist, he emphasizes, as his book illustrates, the unpretentious from which something is to be learned. An intense doer, he never imparts an impression of tension and hurry, is relaxed and always ready to greet and entertain the many scientific dignitaries who may "cry-in in the bye-gaein."

The book is a field guide with text relaxed, but, at times, terribly terse: "as brief as possible to avoid bulkiness." In the main, the book includes colored illustrations of 828 Thai birds painted by the author with a six- or eight-line account conveniently near the appropriate picture. The text includes only one or two remarks which the author considers important for field identification. The subjects are scientifically grouped into families but no notes are given on family characteristics which are so helpful to bird-watchers. Emphasis is given to physical characteristics for species identification in the field with sparse references to call notes and songs. A Thai inflection clings to the interpretation of the voices of the subjects.

Respective paragraphs for each subject begin with a figure number, a common name in English, the scientific name, the Thai common name in Thai, and a transliteration of the Thai into English. A chuckling aside: each local name begins invariable with "nok", meaning "bird," repeated 828 times. As if to repeat "eagle-bird," "duck-bird," "sparrow-bird . . ." Upon inquiring about the name of any bird in the field, this reviewer received but one, invariable reply, "nok lek," meaning "little bird." Colors of illustrations are too intense for field comparison, but this fact is of little significance for identification purposes. Only scant reference is made to such topics as abundance, migratory status, range, and conservation problems including threats to survival of species. With these the author is quite familiar. Here and there, all too infrequently, the author's enthusiasm, emotions, and response to beauty seep through: "sings sweetest song," "watching birds is more fun than killing them," "these colorful winged animals are our wonderful companions." Black and white photographs reveal portraits and glimpses of life habits of subjects as well as the skill of the author as a photographer. There are several explanatory sketches and a map of Thailand in color that shows the boundaries of the 71 Thai changwat (provinces), four zoogeographic regions, and respective vegetative types. The book includes an introduction by S. Dillon Ripley, Secretary of the U. S. Smithsonian Institution, who was a sponsor of the work; a brief zoogeography of Thailand; a list of 15 references; an English-Thai glossary of terms; and indices of scientific names and of common names in English and Thai. Throughout the book, the influence of Roger Tory Peterson and Bertram E. Smythies, the author of *Birds of Burma*, is pervasive. So also is the work of the late Herbert G. Deignan of the Smithsonian.

Ten years ago, the reviewer spent two delightful years in the field and the laboratory in close association with the author. He recalls vividly the long hours Dr. Boonsong spent in intense review and study of texts and illustrations of all the birds, careful comparison with study skins and living specimens in hand, check and recheck by tireless observation of wild, free birds, endless hours of consultation with authorities and amateurs. The author has a spacious fly-cage in his courtyard to study and enjoy live specimens. Summed up, the result is a monument of dedication, devotion, and love. May it be only the start to further contribution by this amazing man to our knowledge and appreciation of birds of Thailand.—George C. Ruhle.

49. *Birger's Birds.* Birger Roos. 1968. Golden Press, N. Y. 42 pp unnumbered. $1.50.—Each colored cartoon goes for between a nickle and a dime in this format, but they may be worth it. Nothing since the *Indoor Birdwatcher's Guide* so delightfully pokes fun at the common names of birds. You can just guess how Bananaquit and Barn Swallow are pictured. The book is dedicated to the author's two cats.—Jack P. Hailman.

PASSENGER PIGEON (EXTINCT)

Ectopistes migratorius

50. *Biology and Economic Value of Birds of the Moscow Region and Adjacent Territories.* E. S. Ptushenko and A. A. Inozemtsev. 1968. Moscow University Publishing House. 123 figs. 461 pp. (About $5.00 U. S.) (In Russian.)—While the authors, two outstanding economic ornithologists of USSR, generously allow that other areas of the land have been more intensively explored than the subject area, the amount of information summarized herein, from 638 titles in the bibliography and numerous cooperating contributors, makes this book a valuable local ornithology. Following a foreword and an introduction there are chapters providing: a review of ornithological research in the Moscow region; formation (geo-historically) of the Moscow avifauna; composition and pattern of the bird population, detailed as: (1) forest ornithological formation (with spruce, pine, birch, and alder consocies), (2) shrub formation, (3) aquatic formation (with riverbank, and lacustrine-bog consocies), (4), open space formation (with meadow and plowed-ground consocies), and (5) human settlement formation (with populated locale and arboreal plantation consocies), the latter including orchards, roadsides and parks. The annotated account including about 289 species and races, 177 of them breeders, occupies the bulk of the book. The individual accounts, as long as six pages, supply much new data on nesting and food habits, particularly for less known insectivorous species, a point on which the latter author has specialized. Many of the numerous figures illustrate nest site, territorial, and courtship flight patterns. A very thought provoking and thorough discussion: "Economic value of birds of the Moscow region" concludes the text. Indices of Latin and Russian common names conclude the book.—Leon Kelso.