

Island, Scott County, Iowa. While I was examining the nest and the four nestlings which it contained I noticed that two females of this species showed great concern about my being by the nest. At first I thought that it was another female nesting nearby which had come over when she heard the calls of the other female. On June 30, 11 days later, I again visited the nest for banding purposes. On this visit the nest contained one cowbird *Molothrus ater* (Boddaert), and one redstart, both of which were ready to leave the nest. Again the two females were seen to feed both the parasitic cowbird and the redstart. Within the period of eleven days it would be impossible for a cowbird to be hatched and reared to the point of leaving the nest so it is my impression that this cowbird was reared in another nest nearby and because of some factor it deserted its foster home and in wandering around came upon this nest containing a nestling, merely moved into the nest, where it was fed by the two female redstarts. After both birds were banded the cowbird flew away to another tree while the redstart flew to the ground. When I was in the area of the nest the male redstart left though I did see him previously pay attention to both females. The redstart was banded no. 47-13001 and the cowbird no. 47-13002. This was the first time I had ever found a case of polygamy in the American Redstart or of a cowbird having two sets of foster parents in the nestling or fledgling stage.—James Hodges, 3132 Fair Ave., Davenport, Iowa.

RECENT LITERATURE

Reviews by Donald S. Farner and others

BANDING

1. The Tendency of Blackbird and Song-Thrush to Breed in their Birthplaces. Irene Werth. 1947. *British Birds*, 40(11):328-330. An analysis of 258 recoveries of Blackbirds, *Turdus merula merula* Linnaeus, banded as nestlings, and of 249 similarly banded and recovered Song Thrushes, *Turdus ericetorum ericetorum* Turton, show that in both species there is a tendency for an early dispersal of fledglings followed by a dispersal in winter among the older birds. This is stronger in the migratory Song Thrush than in the Blackbird. There is a greater tendency on the part of the Blackbird to remain in the vicinity of the breeding locality and also to return to the birthplace to breed. Among Song Thrushes recovered during the breeding season, 52 percent were at the birthplace where banded, 31 percent were within five miles, and 17 percent were more than five miles away. In the case of the Blackbird, 72 percent were recovered at the birthplace, 21 percent within five miles, and seven percent over five miles. Although no evaluation is made of the possible bias due to better chances of recovery at the banding place because of the activity of the bander, there is nevertheless clear cut evidence of a strong tendency in both species to return to the birthplace as breeding birds.—D. S. F.

2. The Ornithological Station at Ottenby, Sweden, its Establishment and Report for 1946. (Ottenby fågelstation, dess tillkomst och verksamhet år 1946.) Gustaf Danielsson, Carl Edelstam, and Gunnar Svårdson. 1947. *Vår Fågelvärld*, 6(1):38-51. Much of this paper describes the building and facilities of the new station at Ottenby, on the southern tip of the island Öland. This station has been established under the auspices of the Sveriges Ornitologiska Förening. Because of its favorable location many interesting data should come from the activities of this station. At present plans call for the station to be manned only from mid-July to mid-October. A table summarizes the birds

already banded at this locality, in 1937 and 1938; 4,024 birds of 78 species were banded. Of these 893 were Dunlins, *Calidris alpina* (Linnaeus)=*Erolia alpina* (Linnaeus) of which 17, all banded as juvenals, were subsequently recovered. The recoveries were in winter in England, Belgium, France, and the Jersey Islands. During 1946, the first year of operation of the station, 714 birds of 54 species were banded; 166 were Dunlins; 97 were Curlew Sandpipers, *Calidris testacea* (Pallas)=*Erolia ferruginea* (Pontoppidan); and 70 were Little Stints, *Erolia minuta* (Leisler).—D. S. F.

3. Bird-Banding Activities in Belgium in 1946. (Oeuvre du baguage des oiseaux en Belgique. Exercice 1946.) Ch. Dupond. 1947. *Le Gerfaut*, 37(2): 62-70. This is a summary of the records of 101 birds banded in Belgium and subsequently recovered, mostly in 1946. Species with the greatest number of recoveries and returns are the Starling, *Sturnus vulgaris vulgaris* Linnaeus, nine; Great Tit, *Parus major major* Linnaeus, eleven; Chaffinch, *Fringilla coelebs coelebs* Linnaeus; Mallard, *Anas platyrhynchos platyrhynchos* Linnaeus, eight; Black-headed Gull, *Larus ridibundus ridibundus* Linnaeus, eight. There is an interesting record of a Greenfinch, *Chloris chloris chloris* (Linnaeus), banded at Knocke-sur-Mer 5 April 1937 and recovered at the same locality 19 December 1946. A Mallard banded October 1937 at Bornhem, Anvers, was recovered at Süka-Joky, Gulf of Bothnia, Finland 20 August 1946. A Teal, *Anas crecca* Linnaeus, banded in December 1945 at Meetkerke was recovered in North Cornwall, England 2 January 1947. A Shoveller, *Spatula clypeata* (Linnaeus), banded at Meetkerke in December 1945, was recovered in the Bay of Brinkowski, Black Sea, 8 August 1946. A Lapwing, *Vanellus vanellus* (Linnaeus), banded at Knocke-sur-Mer 29 May 1937, was recovered seven kilometers west at Zeebrugge 10 February 1947.—D. S. F.

4. Birds Banded in Foreign Countries and Recovered in Belgium. (Oiseaux bagués à l'étranger et retrouvés en Belgique.) Ch. Dupond. 1947. *Le Gerfaut*, 37(2):70-75. This is a record of 48 birds of 21 species banded in foreign countries, mostly in Scandinavia and Helgoland, and recovered in Belgium. The species most frequently recovered was the Starling, *Sturnus vulgaris vulgaris* Linnaeus (eight). A Dunlin, *Calidris alpina alpina* (Linnaeus), banded at Jaeren, Norway 23 August 1946 was recovered at Zeebrugge 16 September 1946.—D. S. F.

5. Manual for Bird Banders. F. C. Lincoln. 1947. United States Department of the Interior, Fish and Wildlife Service. 116 pp. Lithoprinted. This is a make-shift reissue of miscellaneous publication no. 58 of the U. S. Department of Agriculture which originally appeared in 1929. The text and illustrations are the same except that two pages and a text figure describing the Verball pole trap have been added, Fish and Wildlife Service and Department of the Interior are substituted for Biological Survey and Department of Agriculture respectively wherever the two latter agencies are mentioned in the 1929 publication, the table showing band sizes required for different species has the birds arranged in the order of the 1931 edition of the A.O.U. Check-List and some changes indicated in the band sizes recommended, due chiefly to the introduction of additional sizes since 1929. An introductory "special notice" indicates that "as soon as possible" it is planned to issue to all bird banding cooperators new descriptions of traps and other banding equipment. Therefore station operators who have designed new traps, improved old models or have devised helpful gadgets are requested to send in drawings or pictures of the same. It would thus seem opportune to call to the attention of the Fish and Wildlife Service that over the years *Bird-Banding* has carried numerous articles and notes, many illustrated, dealing with just this phase of the subject and it is to be hoped that many of these devices may be found worthy of inclusion in the promised new descriptions

which are to be issued "as soon as possible." In view of the very close similarity between the old manual and the new manual it is not clear why the name of the late S. Prentiss Baldwin has been dropped as co-author in the present publication. Bird banders who still have a serviceable copy of the old manual and who have not received the new one need not trouble themselves to send for a copy of the latter. Since the new manual contains none of the improvements in technique made during the last eighteen years, it is outmoded on the very day of publication.—J. L. Peters.

6. An Age Record for a Black-headed Gull. (Hohes Alter einer Lachmöwe.) A. Schifferli. 1947. *Der Ornithologischer Beobachter*, 44(3): 96. *Larus ridibundus* Linnaeus banded as adult 13 January 1931 at Lucerne, Switzerland and captured and released at Prague, Czechoslovakia 26 March 1946.—D. S. F.

MIGRATION

(See also Numbers 2, 3, 4, 13 and 27.)

7. Evidence of Trans-Gulf Migration. George H. Lowery. 1946. *The Auk*, 63(2): 175-211. This paper presents, in a well documented manner, new direct evidence to support the theory that land birds make a non-stop flight across the Gulf of Mexico during both spring and fall migration. Previous evidence for trans-Gulf flights was largely indirect since there were few authenticated observations of land birds over the middle of the Gulf. For this and other reasons George G. Williams has recently suggested that the bulk of migrants may not cross the 500 or so miles of open water, but go around the Gulf by way of the Mexico and Texas coasts (see review of William's paper,—*Bird Banding*, 17:40, 1946). In order to investigate the problem further, Lowery obtained passage on a slow freighter traveling between New Orleans and Progreso, Yucatán, during the spring migration period. As the result of this trip and data gathered by other reliable observers who have made similar trips in recent years, Lowery is able to present a list of 62 species of land birds definitely observed during fair weather at such distances from land as to preclude the possibility of their being unintentionally blown out to sea. Furthermore, crew members of one boat regularly plying between New Orleans and Yucatán reported land birds to be commonplace on deck during migration periods and that on occasions "small birds were everywhere." While in Yucatán Lowery was able to observe, with aid of a telescope, birds flying out from land to sea. The fact that he observed birds apparently striking out over 500 miles of open water at 3 a.m. seems indeed remarkable since this would mean that the birds had already been flying many hours before reaching the coast, unless, of course, these birds left their roost in the middle of the night to begin migration, a behavior which has not been demonstrated as far as I know. Equally remarkable is the spring "coastal hiatus" on the Gulf coast of the United States which Lowery and others interpret as meaning that birds do not stop on first reaching land, but continue overland for many more miles unless bad weather forces them down. Therefore, the overall flight in good weather would be far greater than the 500 mile overwater distance, and it would involve 24 hours or more of continuous flying. From what we have recently learned about the remarkable physiological changes (fat deposition, etc.) occurring just before migration such a flight seems theoretically possible for a small bird during the migration season, even though experiments have indicated that the same bird could not possibly endure so long without food in the mid-summer or mid-winter physiological condition.

The direct evidence presented in this paper would certainly seem to indicate that birds habitually cross the open Gulf, apparently in large numbers. Apparently, also, large numbers of birds involving some of the same species are to be found along the western edge of Gulf during the season of migration. Questions

yet to be answered include: What species, if any, use the direct route or coastal route exclusively or may individuals of a given species use both routes? Is Yucatán the principal "take off" point for northward overwater flights or may birds take off from various points along the Mexican coast? Is there a "coastal hiatus" on the southern edge of the Gulf in either spring or fall? Perhaps ultimately the coast and trans-Gulf route may prove to be part of some general fan-shaped northern movement. If small land birds do make non-stop flights of six or seven hundred miles and are able to orient themselves without aid of land marks it would be immaterial whether they pass over land or water. Those birds passing over or near land would presumably be more likely to survive in event of bad weather, but on the other hand the birds flying overwater would have advantage of a shorter route. Have these advantages balanced themselves in course of past evolution, or which has the greatest survival value?

In addition to the direct evidence, Lowery discusses at considerable length various hypothetical conditions, frequently basing his argument for trans-Gulf migration on assumptions which seem quite logical but which, it must be admitted, have not yet been tested. Some of this discussion might have been withheld until more data are obtained. What birds do when they encounter a strong head wind while over water is an especially puzzling problem. Mr. Lowery's excellent paper is preceded by a "prefatory note" which is a very strong endorsement by Mr. Frederick Lincoln. While it is apparent that this statement is Mr. Lincoln's personal opinion and not an official view of the Fish and Wildlife Service, I question the wisdom of the editor in including such an endorsement with the paper since it might be interpreted by many as indicating that the subject is now closed and that no further research is needed, a conclusion which I am sure would be vigorously denied by both Messrs. Lowery and Lincoln.—E. P. Odum.

8. A Preliminary Study of a Physical Basis of Bird Navigation. Henry J. Yeagley. 1947. *Journal of Applied Physics*, 18(12): 1035-1063. This important paper presents a new explanation for the faculty possessed by birds and some other vertebrates of finding their way over vast areas of the earth to predetermined objectives. Although the theory is presented in the paper in a somewhat tentative way and although the experimental work was conducted exclusively with homing pigeons, the result is the most scientific approach made to the problem to date and, as such, it warrants serious consideration by students of avian migration. This paper is the first formal presentation of the work conducted at Pennsylvania State College during the war, although a preliminary non-technical article appeared in the student publication "The Penn State Engineer" in October, 1943. Subsequent reports were made to the U. S. Army Signal Corps.

Dr. Yeagley, after reviewing previous explanations, postulates his theory as follows: (1.) A bird is sensitive by virtue of some organ or organs to the magnitude of the effect of its motion in flight through the vertical component of the earth's magnetic field. Lines of equal magnetic vertical-field forces (hereafter called the electromagnetic effect) are irregular circles centering around the magnetic poles. This effect must be correlated with the bird's speed relative to the earth's surface. (2.) A bird is sensitive by virtue of some organ or organs to the magnitude of the Coriolis force which results from a relationship between the earth's rotational velocity and the motion of a body over the earth. This effect must also be correlated with the bird's speed relative to the earth's surface. Lines of equal Coriolis force are true circles coincident with parallels of latitude. When curves are plotted on a map of the earth representing land speed vs. electromagnetic effect and land speed vs. Coriolis effect, a grid containing a system of unique conjugated pairs is obtained. Hence a bird displaced from its home territory can consciously fly in a direction which will bring the "feel" of these two effects back to that to which it is accustomed.

Sensitivity to magnetic field effects has previously been proposed in partial explanation of the navigating ability of birds; so has sensitivity to the Coriolis effect. Dr. Yeagley has combined the two to produce a rational system of navigation. The magnitude of the effects involved were calculated and found to be quite small which the author suggests may be an explanation for man's failure to uncover them earlier rather than a basis for rejection of the theory.

Existence of the system of unique conjugate points and the existence of areas where the two lines are nearly parallel (portions of Wisconsin, Illinois, Indiana, and Kentucky) provide an opportunity for experimental testing of the theory. Homing pigeons trained in one area should, according to the theory, if released nearer the conjugate point than the home territory, fly toward the conjugate point. This was tried in two series of experiments using homing pigeons of good stock and training and the results, while not completely in accord with the theory, provide very strong evidence for it. Similarly, birds trained in one area and released in the region where electromagnetic and Coriolis lines are nearly parallel should be confused and unable to "home" in a normal manner. The results were not conclusive and will be checked.

A further experiment is described which was designed to determine whether birds are in fact sensitive to magnetic field effects. Theoretically, "if a number of homing pigeons with a superimposed moving experimental field were unable to home normally and a like number with identical training but with attached copper plates of the same approximate mass and size should home from the same release point in the normal fashion, it would be an indication that the earth's magnetic field plays a part in bird navigational guidance." This was tried with twenty birds, ten having superimposed magnets and ten having copper plates, and the results were in good agreement with theory. This concept opens up a vast field for new research. The manner in which birds react to these forces should be further investigated, banding data should be examined with it in mind, and experiments should be conducted with wild birds. The author indicates that some of this work is planned at Pennsylvania State College. Although there are some obvious difficulties, such as the means by which a bird flying over water can determine its speed with respect to the earth's surface, this paper represents a very important step forward in our understanding of avian, and perhaps vertebrate, migration. There is a bibliography of 36 titles.—R. O. Bender.

9. J. A. Palmén's Theories on Migratory Routes of Birds in the Light of Later, Especially Finnish, Observations and Results of Ring-marking. I. Välikangas. 1946. *Societas Scientiarum Fennica*, Årsbok xxiv B. N:02, 34 pp. This is an address delivered on the occasion of the hundredth anniversary (7 November 1947) of the birth of Johan Axel Palmén, the renowned Finnish ornithologist whose research and theories mark an important stage in the development of our modern concepts of bird migration. Palmén's original thesis, "Om faglarnas flyttningssvagar" appeared in 1874 and then, somewhat revised, as "Ueber die Zugstrassen der Vögel," published in Leipzig in 1876. This treatise, based on large amounts of data for his time, contended that aquatic species, littoral and pelagic, adhere to rather restricted routes in their migration. These routes which are fixed by ecologic requirements are in some places narrow and in others broad. Palmén's concepts were developed largely on the basis of information from 19 species of aquatic birds and then, with some additional information, extended to other aquatic species, and in addition, in a general way to all migratory birds. Palmén's theories drew violent opposition from E. von Homeyer in "Die Wanderungen der Vögel mit Rücksicht auf die Züge der Säugethiere, Fische und Insekten" published in 1881. Although Palmén's subsequent reply, "Antwort an Herrn E. F. von Homeyer bezüglich der 'Zugstrasse der Vögel'" published in Helsinki in 1882, disproved most of von Homeyer's contention, this classic argument did crystallize the controversy of "migratory routes

versus broad-front migration." In this address Professor Väckangas examines the present validity of Palmén's theory in consideration of data obtained from banding. As they pertain to the groups of birds which Palmén studied carefully, i.e., pelagic and littoral aquatic birds, Palmén's theories of restricted migratory routes are for many species still tenable and, in others, tenable in principle although empirical adjustments are necessary. However among passerine, falconiform and other groups there are certainly many which migrate on a "broad front" although individual populations within a species might follow restricted routes. "On the ground of all that has been spoken of above one is, in my opinion, entitled to say that J. A. Palmén's ideas about the migratory routes of birds have by no means shown themselves to be altogether wrong, as some have wanted to assert. This refers particularly to the real subject of his studies, the water and coastal bird-faunas of the extreme-arctic, by which subject his doctrines naturally must be judged in the first place. The new observations made in Finland and abroad after the time of Palmén have not, so far as I can see, very essentially changed the picture that his researches produced as to migratory routes of the said species and their character." (p. 31.)—D. S. F.

10. Spring Migration over the Bay of Viipuri. (Kevätmuutosta Viipurinlahdella.) T. A. Putkonen. 1942. *Ornis Fennica*, 19(2):33-44. The Bay of Viipuri extends from the northeast part of the Gulf of Finland inland 30 kilometers northeastward narrowing from 30 kilometers at its mouth to three kilometers at the city. Many birds which migrate along the Finnish coast in spring concentrate into this area which represents a section of the well-known migratory route from the Gulf of Finland to the White Sea over lakes Ladoga and Onega. The most abundant migrants towards the northeast are the Old Squaw, *Clangula hyemalis* (Linnaeus), and the Common Scoter, *Oidemia nigra* (Linnaeus). "... their numbers probably reach millions." Peak of migration occurs in the latter part of May. Also numerous are the Velvet Scoter, *Oidemia fusca* (Linnaeus); and Brant Goose, *Branta bernicla bernicla* (Linnaeus). The times of most intense migration were early morning to 9:30 a.m. and 6:00-11:00 p.m. for the Brant; sunrise as well as 6:00-11:00 p.m. for the Old Squaw; early morning to 9:30 a.m. as well as 4:00 to 10:00 p.m. for the Velvet Scoter; and 5:30-10:00 p.m. for the Common Scoter. A table summarizes the observations.—D. S. F.

11. Midsummer Wandering of Certain Rocky Mountain Birds. Fred Mallery Packard. 1946. *The Auk*, 63(2):152-158. Many species nesting at low altitudes have a regular habit of moving to higher altitudes in mid and late summer after the completion of nesting. Twenty-two species are listed which exhibit post-natal wandering in the Rocky Mountain National Park and vicinity. Kingbirds, which nest in the foothills, are especially conspicuous up to 8,500 feet in late summer. The author suggests that the eastern counterpart of altitudinal movement, northward post-breeding season wandering, may be more common than generally supposed and may not be restricted to herons and other water birds. Presumably, young birds of the year are mainly involved, but there is evidence that adults of some species are also wanderers.—E. P. Odum.

12. Some Notes on Fall Migration on Stora Karlsö. (Några anteckningar rörande höststräcket på Stora Karlsö.) B. Wahlin. 1947. *Fauna och Flora*, 1947 (1/2):22-27. Stora Karlsö is a small islet near Gottland in the Baltic Sea. The observations recorded in this paper were made from 3 to 9 October 1946. Notes are given on 26 species.—D. S. F.

PHYSIOLOGY

(See also Numbers 8, 23, and 62.)

FOOD HABITS

(See Numbers 16, 17, and 18.)

13. Fat Metabolism in Migratory and Sedentary Birds. (Le métabolisme de graisses chez les oiseaux migrateurs et sédentaires.) A. F. de Bont. 1947.

Le Gerfaut, 37(2): 57-62. Using the Chaffinch, *Fringilla coelebs coelebs* Linnaeus, the author has been able to demonstrate that increasing the period of light exposure results in increased weight due to fat deposition in migrant birds but not in the local sedentary population. The increase in weight accompanies the development of the gonads. These results are correlated with observations on the Wood Pigeon, *Columba palumbus* Linnaeus, and the Stock Dove, *Columba oenas* Linnaeus. Among these the author has noted two groups in spring, (1) lean birds with well developed gonads (presumably sedentary local breeding birds) and (2) fat birds with slightly developed gonads (presumably migrants).—D. S. F.

14. Adrenal and Thyroid Weights in Birds. Frank A. Hartman. 1946. *The Auk*, 63(1):42-64. Adrenal and thyroid weights, expressed as percent of body weight, are tabulated for 143 species representing 38 families with 51 species having five or more individuals measured. Intraspecific variation was relatively large as compared with interspecific variation with result that very few differences between species could be shown to be statistically significant. Wide variation in gland weights, the reviewer suggests, may be partly inherent in the method since it is difficult to obtain accurate weights of fresh glands when water content is unknown and cannot be controlled. Apparently mathematical errors were made in determining significance of differences since a number of figures have been changed in the reprinted copy of the paper, in some cases reversing the conclusions given in original paper as published in *The Auk*. For example, it was originally stated, "There was no significant difference between thyroids in all forms studied," while according to revised figures differences are significant between several species. Although one of Crile's papers is listed in the bibliography no mention is made of Dr. Crile's interesting findings and theories in regard to significance of adrenal-thyroid ratio in animals. Hartman concludes that relative size of adrenals and thyroids bears no relation to activity in birds, yet family averages might be interpreted as bearing out Crile's theory to some extent. For example, warblers, admittedly birds full of nervous energy, have larger adrenals than sparrows or woodpeckers (0.0150 percent body weight as compared with 0.0111 percent and 0.0089 percent). Also, the fact that a captive Snow Bunting had smaller adrenals than active wild individuals is suggestive. All in all, considering the rather meager conclusion and the great amount of work necessary to gather the data one wonders if general surveys of this type are worthwhile when the relation of the weight of an organ to its function is not known. For example, in case of thyroid, it is known that weight of the gland is by no means a direct measure of its activity since an inactive gland may be heavier than an active one due to storage of hormone within the gland. However, general surveys do have a value in that they often suggest problems for more intensive study.—E. P. Odum.

15. Torpidity in Birds. W. L. McAtee. 1947. *The American Midland Naturalist*, 38(1): 191-206. This paper consists largely of an annotated bibliography of 152 titles which will prove to be of tremendous value to anyone who should wish to pursue this interesting phenomenon. Most of the references to torpidity concern swifts, swallows, and hummingbirds although the phenomenon has been ascribed to many others including galliform species. This is a problem which should be investigated experimentally.—D. S. F.

16. The Influence of Diet on the Function of the Uropygial Gland of the Young of Ducks. (Om dietens inverkan på gumpkörtelns funktion hos andfågelsdunungar.) Eric Fabricius. 1945. *Ornis Fennica*, 22(2):33-45. This paper is based on investigations with the young of the Tufted Duck, *Nyroca fuligula* (Linnaeus); the Common Eider, *Somateria mollissima mollissima* (Linnaeus); and the Goosander, *Mergus merganser merganser* Linnaeus. The ability of

diving and swimming birds to keep their plumage from wetting is, at least in part, dependent on the uropygial gland. This ability is sometimes lost among birds in captivity. The author's feeding experiments seem to indicate quite conclusively that the normal function of the uropygial gland in the downy quite of above-mentioned species is dependent on some substance which occurs in insects and crustaceans.—D. S. F.

17. The Physiologic Role of Carotenoid Compounds in the European Robin and other Wild Birds. (Karotinoidien fysiologisesta merkityksestä luonnvaraisille linnville, lähinnä punarinnalla, *Erithacus r. rubecula* L., tehtyjen kokeiden perusteella.) Heikki Suomalainen. 1945. *Ornis Fennica*, 22(3):65-72. This is a review of published material concerning the role of the carotenoid compounds in birds. It is suggested that the selective feeding of European Robins, during migration, on berries rich in vitamin A is an adaptation to provide better night vision. Suggestions are made concerning experimental approaches to this problem.—D. S. F.

18. On the Microbial Decomposition of Cellulose by Wild Gallinaceous Birds. (Family Tetraonidae). Heikki Suomaleinen and Evi Arhimo. 1945. *Ornis Fennica*, 22(1):21-23. A small number of experiments with the Capercaillie, *Tetrao urogallus* Linnaeus; Black Grouse, *Lyrurus tetrix* (Linnaeus); Hazel Grouse, *Tetrastes bonasia* (Linnaeus), and the Willow Grouse, *Lagopus lagopus* (Linnaeus), indicate that there are cellulose-digesting bacteria in all parts of the digestive tract, however, most concentrated in the caeca. Bacterial cultures from the digestive tracts of these birds are less effective in the digestion of cellulose than similar cultures from the digestive tracts of mammals. The author believes that it is important to consider the fact that these birds feed largely on berries during the summer whereas during the winter the diet, particularly in the Capercaillie, consists largely or almost exclusively of needles of coniferous trees. Both of these food materials contain relatively large amounts of ascorbic acid (vitamin C) which is said to be necessary for the activity of cellulose-digesting bacteria.—D. S. F.

NIDIFICATION AND REPRODUCTION

(See also Numbers 33, 34, and 38.)

19. A Contribution to the Knowledge of the Reproductive Biology of the Great Spotted Woodpecker. (Beitrag zur Kenntnis der Brutbiologie und des Wachstums des grossen Buntspechts, *Dryobates major* (L.)) J. Bussmann. 1946. *Der Ornithologische Beobachter*, 43(6):137-156. This paper is based on the observation of two pairs of Great Spotted Woodpeckers in the Lake Lucerne Valley, Switzerland, in 1945 and 1946. The preparation of the nest cavity was done mostly by the male although the female of the second pair helped more than the female of the first. Work on preparation of cavity was done from 7:00 a.m. to midday and from 4:00 p.m. to 6:00 p.m. Time required was 9 and 25 days respectively. The first egg in each clutch was laid two days after the completion of the cavity. Courtship began in March. In pair I the first of five eggs was laid on 7 May. In pair II the first of six eggs 26 April. Eggs were laid at the rate of one per day. Both pairs began incubation two days before the clutch was completed. The male invariably performed the incubation from evening to morning with occasional periods during the day. Incubation by the female was confined to the day and evening. Incubation period was 11 1/3 days for pair I, 10 ± 1/2 day for pair II. Male and female shared about equally in feeding the young. Feeding reached its maximum intensity on the 19th day when 253 feedings were noted. The young were brooded at night by the male. Growth curves are given. Weight plateau was reached at about the 17th day. The young left the nest at 22 days at about 74 grams; adult weight is 80 grams.—D. S. F.

20. Some Bewick Wren Nesting Data. Amelia R. Laskey. 1946. *The Migrant*, 17(3):39-43. During a period of 15 years, 52 nests of Bewick Wren, *Thryomanes bewickii* (Audubon), were recorded in the vicinity of the author's home near Nashville, Tennessee. About half the nests were located in metal mail boxes or bird boxes, the rest in various crevices about buildings. Occupied nests were recorded from late March to late July; presumably two broods are raised, although no mention is made of the number of broods. For 21 nests most closely observed the number of eggs ranged from five to eight, averaging 6.6. From 139 eggs, 79 young were fledged, a 56.8 percent nesting success. Late nests in metal mail boxes were subjected to high temperatures with the result that attentive periods of female decreased (from 53 to 23 percent in one case) and embryos were killed in several cases. The data on attentive periods are not well organized, but it would appear to reviewer that periods are longer in Bewick Wren than in House Wren, *Troglodytes aëdon* Vieillot; but not so long as in Carolina Wren, *Thryothorus ludovicianus* (Latham). Little or no competition was observed between Bewick and Carolina Wrens. On two occasions the species nested 25 feet apart, but in an unusual case a Bewick Wren built a nest over a fresh set of Carolina Wren eggs, the latter birds moving without protest to a new location; this occurred after the original Bewick Wren's nest in a nearby mail box had been destroyed.—E. P. Odum.

21. Nesting of the Northern Bullfinch. (Ueber das Brutleben des Grossen Dompfaffen (*Pyrrhula pyrrhula pyrrhula*). Otto Steinfatt. 1944. *Beitrag zur Fortpflanzungsbiologie der Vögel*, 20:127-132. One hundred hours were spent watching three pairs in the Rominter Heide. The female builds and incubates alone, but is occasionally fed by her mate on or off the nest. One nest was watched all day on the second day of incubation—May 10—; 92 percent of the 912 minutes was spent on the nest in five periods averaging 168 minutes in length; the six periods off ranged from nine to 22 minutes, averaging twelve. At another nest watched June 2 from 10:45 to 18:33, the female incubated 81 percent of the time, her seven periods on averaging 54 minutes, her seven periods off twelve minutes. No information is given as to the weather on the two days. Both parents fed the young by regurgitation; near the end of the fledging period the male of one nest took full charge, while his mate apparently was starting a second nest. Small young were fed 19 times in one day, each nestling being served at each feeding; 16-17 day old young were fed 32 times (by the father alone). The young flew at 17 days.—M. M. Nice.

22. Incubation by Foster-Mothers and Machine. (Ueber Ammen-und Kunstbrut.) O. Heinroth. 1944. *Beiträge zur Fortpflanzungsbiologie der Vögel*, 20(.):123-126. Sketches of incubator used and instructions as to temperature, humidity and cooling. For some birds degree of humidity makes little difference—eggs of the Mallard, *Anas platyrhynchos* Linnaeus, hatch equally well in a dry pine forest in an old hawk-nest as in a wet meadow. Rail eggs, however, incubated in dry cages by pigeons dry out, whereas those that are kept moist hatch well. Dr. Heinroth preferred the use of geese, ducks, hens and pigeons when possible to the incubator, but transferred eggs just before hatching to the machine, partly so that the chicks would be "imprinted" on man, partly because foster-mothers may not recognize the young and treat them as nest enemies; a hen killed a newly hatched Raven, *Corvus corax* Linnaeus, while another hacked to pieces a Bustard, *Otis tarda* Linnaeus, egg because of the unfamiliar peeping of the hatching chick. Rails and sandpipers hatched by pigeons leave the nest early and may fall and be killed.—M. M. Nice.

23. Temperature and Humidity Measurements in the Nests of Geese, Turkeys and Hens. (Temperatur- und Feuchtigkeitsmessungen im Brutnest von Gänsen, Puten und Hühnern.) A. Koch and L. Steinke. 1944. *Beiträge zur*

Fortpflanzungsbiologie der Vögel, 20:41-45. Figures are given of the temperature and humidity curves during incubation by these three species; far more variation was found under geese than with the other fowl. Thermometers fastened between the eggs showed the average temperature with geese to be 33.4° C.; with turkeys 37.8° in the first week, 34.6° in the third week; with hens, 37°. Humidity averaged 37 percent with the geese, 33 per cent with the turkeys, 34 per cent with the hens.—M. M. Nice.

24. The Incubation Period of the Black Tern. (De broedduur de Zwarte Stern, *Chlidonias niger* (L.) Fr. Haverschmidt. 1945. *Ardea*, 33(3/4):237-240. The incubation period of the Black Tern has been generally given in the literature as 14-17 days. The observations of the author show without question that the period is 20-22 which is similar to other Terns. Incubation begins with the laying of the first egg.—D. S. F.

EMBRYOLOGY AND POST EMBRYONIC DEVELOPMENT

(See also Number 19.)

25. Notes on the Development of the Nighthawk. C. David Fowle. 1946. *The Auk*, 63(2):159-162. Notes on development of chicks at two nesting sites in British Columbia are given without a single literature reference. For fourteen days a nestling at one site was observed and weighed. Growth was steady despite three days of bad weather and when last found the nestling had moved a total of 262 feet from original nest site.—E. P. Odum.

26. The Postembryonic Growth of Certain Forest Birds and its Bearing on Some Peculiar Features in Their Ecology. L. P. Poznanin. 1946. *Comptes Rendus (Doklady) de l'Academie des Sciences de l'URSS*, 54(3):285-288. From 4 to 16 nestlings of each of six species: the Blue Tit, *Cyanistes caeruleus* (Linnaeus), the Kingfisher, *Alcedo atthis* (Linnaeus); the Song Thrush, *Turdus ericetorum* Turton; the Starling, *Sturnus vulgaris* Linnaeus; the Great Spotted Woodpecker, *Dryobates major* (Linnaeus); and the Sparrow Hawk, *Accipiter nisus* Linnaeus, were weighed at two day intervals from hatching to fledging. Weights are plotted on a graph for direct comparison of the several species. Relationships are noted and discussed between growth rate, duration of the nestling period, adult weight and the nesting ecology of the species. Hole-nesting species grew slower than those nesting in exposed sites, but remained in the nest longer. A loss in weight in the kingfisher and others just prior to fledging is attributed to a cessation of feeding by the parents in preparation for the first flight. More data would make these conclusions more convincing; apparently only one or two nests (the number not stated) were involved in several instances. A bibliography of nine titles does not include important studies of nestling development by German, English and American workers.—John T. Emlen.

BEHAVIOR

(See also Numbers 22, 32, 36, 37, 38, and 64.)

27. Notes on Robins Wintering in North Algeria. K. B. Rooke. 1947. *The Ibis*, 89(2):204-210. This paper is based on notes made in North Algeria during the autumn, winter and spring of 1943-44. Presumably the Robins observed were of the European race, *Erithacus rubecula rubecula* (Linnaeus). Population estimates were as follows: gardens, plantations, etc. of Sahel, 130 per 100 acres; "linear vegetation of open land, 20 per 100 acres; all habitats, cultivated Shael, 63 per 100 acres; Forêt de Bainem, 100 per 100 acres; hillside maquis, 25

per 100 acres. Song was common after mid-October but began to decline after mid-December. Establishment of winter territories was well under way by the end of October. "December and January were months of peace and quiet among Robins, each living in his or her own territory with a minimum of conflict." This was due to stable population conditions and not weakening of territorial inclinations. "Mean territory size varied according to attractiveness of habitats, from a half to two acres, or 50 to 150 yards of linear vegetation." Six attacks against Black Redstarts, *Phoenicurus ochrurus gibraltariensis* (Gmelin), were observed but seemed to be cases of "mistaken identity." Mutual intolerance decreases, but does not disappear, during migration.—D. S. F.

28. Notes on the Winter Territory of a Pair of Mute Swans. D. J. May. 1947. *British Birds*, 40(11):326-327. Although during a spell of very cold weather when most of the 28-acre pond was frozen, the resident pair of *Cygnus olor* (Gmelin) allowed four wintering Swans to remain with them in the same small open area, during all the rest of the winter the visitors were compelled by the owners to stay within a corner no larger than five-sixths of an acre.—M. M. Nice.

29. Studies on the Song of the River Warbler. (Studien zum Gesang des Schlagschwirls (*Locustella fluviatilis* (Wolf).) Gerhard Warnke. 1944. *Beiträge zur Fortpflanzungsbiologie der Vögel*, 20:81-86. Both a River Warbler and Grasshopper Warbler, *Locustella naevia* (Boddaert), observed in northern Russia regularly started to sing about an hour after sunset, i.e. at 11:00 p.m. and continued up until about 2:30 a.m. With the River Warbler songs occasionally lasted 175 seconds.—M. M. Nice.

30. Courtship Feeding of Greenfinch and Song of Female. R. A. Richardson. 1947. *British Birds*, 40(10):307. A female *Chloris chloris chloris* (Linnaeus), "crouched with shivering wings and coition took place," she then received eight deliveries of food in rapid succession apparently from the crop of the male; she returned to her nest where "there may have been young," and "began a deep, slow halting song from the nest."—M. M. Nice.

31. Early Morning Song During Middle and Late Summer. Charles Vaurie. 1946. *The Auk*, 63(2):163-171. This paper, which is based on 47 consecutive early morning observations July 20 to September 4, contains interesting material although some of it is more or less irrelevant and all of it suffers from lack of correlative or comparative analysis. Catbird, Yellowthroat, and Chipping Sparrow stopped singly abruptly about first of August. Robin, Towhee, and Field Sparrow tapered off much more gradually, while Mourning Dove, Wood Pewee, Indigo Bunting, Song Sparrow and others were heard throughout the observation period. In a few species, Crow, for example, calls seems to be confused with true songs. No attempt is made to compare dates of song cessation with beginning of molt or end of nesting, nor was an effort made to determine whether late summer singers were adults or juveniles, a distinction that can often be made in field. The paper has no bibliography and no mention is made of other studies on song periods although a few brief comments by A. A. Saunders are given at the conclusion of the paper.—E. P. Odum.

LIFE HISTORY

(See also Numbers 19, 20, 21, 22, and 64.)

32. On the Spring Life and Breeding Habits of the Pheasant (*Phasianus colchicus*) in Tadjikistan. E. V. Kozlova. 1947. *The Ibis*, 89(3):423-429. This is an important paper because it describes the habits of the Pheasant in its native habitat giving a basis for comparison with the numerous studies which

have been conducted on introduced populations. This study was made in early spring, 1943, in the area of the lower Vadsh River adjoining the northern borders of Afghanistan. The local race there is *Phasianus colchicus bianchii* Buturlin. "The bird occurs equally in riverside thickets of wild olive . . . intermixed with poplars . . . and the giant grass . . . in clear park-like growths of poplars, where numerous glades bear a scanty grass vegetation. Country characterized by shrubs . . . and tufts of the thorny *Lycium ruthenicum*, on saline soils, presents also one of the haunts preferred by the species. It avoids only impenetrable jungles of *Erianthus* and dense reed beds in the neighbourhood of small lakelets. . . It is very abundant throughout the region. In spring we found about twenty pairs per one square kilometre." (p. 423.) Peak of sexual activity in the males occurred in mid-March; the organs of the females were still quiescent at that time. "The behavior up to coition" seems similar or identical to that of the birds established in America. Definite routes for "feeding-love-making" cruises were identified. "The mating period finished, the pairs break up, mostly by the end of April, the male returns to his solitary strides, unless he finds another single hen, and never comes near his incubating female. Neither does he pay any attention to his brood." (p. 425.) No injury feigning was observed on the part of the female. Incubation period was found to be 23 days. When flushed while with downy young, the female immediately takes to wing. There is a description of the development of the plumage in young pheasants.—D. S. F.

33. Observations on the Life of the Green Woodpecker. (Beobachtungen über das Leben des Grünspechtes (*Picus v. viridis*).) Otto Steinfatt. 1944. *Beiträge zur Fortpflanzungsbiologie der Vögel*, 20:48-59;93-97. Two hundred and sixteen hours were spent by the Steinfatts in watching two Green Woodpecker nests in the Rominter Heide in East Prussia; these birds stay in pairs throughout the year. Digging the nesting hole took 27 days in one case, 35 in the other, the male doing most of the work; chips are thrown out of the hole. The male sleeps in the hole before it is completed. Incubation started with the next to last egg, the male, as in other woodpeckers, incubating at night. During an all day observation on the fourth day of incubation, the male spent $7\frac{3}{4}$ hours on the nest, the female $5\frac{1}{2}$ hours in two sessions of 130 and 186 minutes; the eggs were uncovered for 53 minutes in six periods ranging from three to 23 minutes, averaging seven. At the other nest on the third day of incubation the male outdid his mate, but details are not given; on the eighth day, however, the female incubated 24, 264, and 213 minutes, a total of eight hours 21 minutes, while her mate incubated five hours 32 minutes. The eggs hatched in fourteen days. Parents fed about equally and gave the meals by regurgitation. When the young were ten and eleven days old the parents brought food 34 times in a $16\frac{1}{2}$ hour day. When they were 20 and 21 days old the parents brought food 21 times from 7 a.m. to 8 p.m., 1.6 times an hour. The young left at 27 and 28 days. Nine notes of the adults are described.—M. M. Nice.

34. Observations on the Nutcracker, Especially Concerning the Care of the Young. (Beobachtungen über den Tannenhäher, besonders über seine Jungenpflege.) Otto Steinfatt. 1944. *Ornithologische Monatsberichte*, 52(1/2): 8-16. The Nutcracker, *Nucifraga caryocatactes caryocatactes* (Linnaeus), is a rare species in the Alps; in the northern lowlands of Germany it occurs as a breeding bird particularly in some of the more extensive forest regions of East Prussia; the author's observations were made in the Rominter Heide in a 25-year stand of spruce and pine with some birch. As in the case of its American relative, the Clark's Nutcracker, *Nucifraga columbiana* (Wilson), little is known of its life cycle and breeding habits. On 14 April 1943 a nest was found about seven meters from the ground in a spruce 13 meters high. The nest contained three half-grown young whose age would place their beginning of life at about the middle of March and the beginning of nest construction about the first of March.

The average interval in feeding young was about three fourths of an hour. Food was carried in the pharynx or esophagus. Stomach contents of one young and one adult contained remains of beetles of the genera *Pterostichus* and *Geotrupes*, three spruce needles, and 300 seeds. There are many other observations of interest particularly when compared to the Clark's Nutcracker.—D. S. F.

35. The Biology of the Slender-billed Nutcracker in Siberia. (Ueber die Lebensweise des Schlankschnäbligen Tannenhähers in Sibirien.) Hermann Grote. 1947. *Der Ornithologische Beobachter*, 44(3):84-90. This is a summary of information on *Nucifraga caryocatactes macrorhynchos* Brehm based on the Russian literature. Like the Clark's Nutcracker of North America this nutcracker is a breeding inhabitant of coniferous forests and an early-spring breeder of secretive habits. Adults begin to molt in late May or June. Postjuvinal molt apparently occurs between June and September/October. Seeds from the cones of the principal evergreen species are the staple item of diet. After the young are able to fly large flocks are formed. In years when the cone crop is poor there may be southward and westward invasions.—D. S. F.

36. Some Notes on the Spectacled Warbler in the Maltese Islands. John Gibb. 1947. *British Birds*, 40(10):298-305. *Sylvia conspicillata conspicillata* Temminck, a resident in Malta, "requires a very specialized breeding ground . . . an open uncultivated patch with just enough low cover for the nest, no more and no less." Nest building and incubation are shared by both sexes. Incubation lasts thirteen days \pm 6 hours for first broods in March and twelve days \pm 6 hours for a second brood in June; fledging lasted twelve days \pm 12 hours. "Injury feigning" was successfully employed by a male to lure a snake and a cat away from recently fledged young.—M. M. Nice.

37. Notes on Sand-Martins. 1947. John Tooby. *British Birds*, 40(10): 290-297. Description of the communal hovering at the nest-site by Bank Swallows, *Riparia riparia riparia* (Linnaeus). "The hovering of the singing male at the nesting-site suggests an advertisement flight. There is a vigorous, close and long-sustained sexual chase; here too the pursuing male sings freely. Sexual chase may be followed by coition." Juveniles give a double call-note which is softer than that of the adults.—M. M. Nice.

38. The Gannet on Cape Kidnappers. K. A. Wodzicki and C. P. McKeekan. 1947. *Transactions of the Royal Society of New Zealand*, 76(3):429-452. The Cape Kidnappers gannetry has been protected since 1915; the authors counted 2,837 pairs of *Sula serrat* (G. R. Gray) in the 1945-46 breeding season, but estimated that no more than 16 percent of the eggs were hatched and reared to fledging. The suggestion is made that a very large proportion of the eggs may have been infertile, due, perhaps to the recent establishment of many immature pairs. "The egg is incubated between the webs of both feet, which hold the egg firmly from both sides . . . Several birds were carefully examined, and no brooding patch was found, while in each case the webs of incubating birds were noticeably warmer than one would expect." (p. 442.) Different displays are described and a number of experiments with removing eggs mentioned: "The distance of about 8 in. (20 cm.) seems to be about the limit within which an egg is still recognized by an incubating bird and rolled back into the nest. . . it seems evident that the capacity of perceiving the nest is a much stronger factor than the presence of the egg." (p. 450.) There are photographs of various Gannet activities and two maps showing the location of Gannet colonies in New Zealand; the authors urge that "the breeding, distribution, history, and population of the Australasian Gannet should be studied on a national scale."—M. M. Nice.

39. Observations on the Collared Flycatcher in Nordgotland, Sweden. (Iakttagelser över halsbandsflugsnapparens (*Muscicapa a. albicollis* Temminck)

på Nordgotland.) Hans Brattström. 1946. *Fauna och Flora*, 1946. (1/2): 21-31. These interesting observations, made in 1942 and 1943, are important because the Nordgotland birds are an isolated population representing the farthest northward extension of the species. There are no certain breeding records elsewhere in Scandinavia.—D. S. F.

CENSUS AND POPULATION STUDIES

(See also Numbers 7 and 45.)

40. The Regional Distribution and Number of Land Birds in Southern and Central Finland, Especially in the Eastern Parts, in Consideration of Quantitative Investigations. I. General Part. (Ueber regionale Verbreitung und Anzahl der Landvögel in Süd- und Mittelfinnland, besonders in deren östlichen Teilen, im Lichte von quantitativen Untersuchungen. I. Allgemeiner Teil.) Einari Merikallio. 1946. *Annales Zoologici Societatis Zoologicae Botanicæ Fennicæ Vanamo*, Tom. 12, No 1. 140 pp. This detailed and well-considered treatise with its ten maps, nine diagrams and 28 tables is based on quantitative data gathered in East Finland and, in part, in Soviet Karelia in 1942 together with other data gathered during the period 1941-1945. Briefly stated, the method involved was the notation of birds observed or heard along a prescribed line, noting the distance from the line according to two categories, (1) 0-25 meters on either side (Grundstreife) and (2) beyond 25 meters (Horstreife). In practice, from the starting point in each census, a line of one kilometer was followed northward, then one kilometer eastward, one kilometer southward, and one kilometer westward to the starting point. Careful consideration is given to problems involved in infrequent and inconspicuous species. For comparative purposes data were obtained from a number of loci in western Finland. Biotope analyses were conducted simultaneously with the censuses. There is a general decrease in bird densities from southwestern (181 pairs per square kilometer) to northeastern Finland (88 pairs per square kilometer). This is correlated with the change to less favorable and less productive biotopes from southwest to northeast. The activities of man may either reduce densities by clearing forests or increase densities by the development of hedges, parks, buildings, etc. The most abundant species was the Willow Warbler, *Phylloscopus trochilus* (Linnaeus), 36.9 pairs per square kilometer and with a dominance (percent of total number of birds) of 25.2. The estimated population of this species in Finland south of 66° is 7,870,000. Next in abundance was the Chaffinch, *Fringilla coelebs* Linnaeus, 31.9 pairs per square kilometers and with dominance of 21.8. The estimated population in Finland south of 66° is 6,720,000. Third in abundance was the Tree Pipit, *Anthus trivialis* Linnaeus, 9.5 pairs per square kilometer and dominance of 6.5. Estimated population south of 66° in Finland is 2,050,000. Fourth in abundance was Willow Tit, *Parus atricapillus* Linnaeus, 9.3 pairs per square kilometer and dominance of 6.3. Estimated population for Finland south of 66° is 2,220,000. The data support the observations of other Finnish ecologists in the increasing numbers of southern species in the total avifauna; this is correlated with the development of milder climate. The change was most intense during the 1930's. The total number of land birds south of 66° in Finland is estimated at about 37,000,000 and for all Finland, 46,000,000. This is an important monograph.—D. S. F.

41. The Regional Distribution and Number of Land Birds in Southern and Central Finland, Especially in Eastern Parts, in Consideration of Quantitative Investigations. II. Special Part. (Ueber regionale Verbreitung und Anzahl der Landvögel in Süd- und Mittelfinnland, besonders in deren östlichen Teilen, im Lichte von Quantitativen Untersuchungen. II. Spezieller

Teil). Einari Merikallio. 1946. *Annales Zoologici Societatis Zoologicae Botanicae Fennicae Vanamo*, Tom. 12, N:o 2. 120 pp. Using the same data on which the general part (see above review) of this treatise is based the author discusses in detail 82 species on which data were gathered. For each species density and dominance data, ecologic correlations and notes, estimated population for the investigated area, and suggestions and discussion concerning factors affecting distribution and density are given.—D. S. F.

42. The Avifauna in the Region of the Central Part of the Course of Swir River. (Fågelfaunan vid mellersta Syväri (Svir).) Bertel Klockars. 1944. *Ornis Fennica*, 21(4):104-134. This is a thorough quantitative analysis of the avifauna of an area of 200 square kilometers at about 61° N, 34° E. Two sub-regions, (A) an almost unsettled mixed-forest of relatively high productivity and (B) the river valley proper where the fields are interrupted by strips of deciduous forest and brush. The investigations extended from September 1941 to May 1944. Quantitative data are given for the winter avifauna, migratory species and breeding species. Breeding species in subregion A with dominance (percentage of individuals in total bird population) values of more than three were the Chaffinch, *Fringilla coelebs* Linnaeus (32.5); Pied Flycatcher, *Muscicapa hypoleuca* (Pallas) (8.2); Tree Pipit, *Anthus trivialis trivialis* (Linnaeus) (6.4); European Robin, *Erithacus rubecula* (Linnaeus) (6.0); Wood Warbler, *Phylloscopus sibilatrix* (Bechstein) (5.5); Goldcrest, *Regulus regulus* (Linnaeus) (3.7); Willow Warbler, *Phylloscopus trochilus* (Linnaeus) (3.2); and the Willow Tit, *Parus atricapillus borealis* Selys (3.2). Species with a dominance of more than three percent in subregion B included the Hooded Crow, *Corvus corone cornix* (Linnaeus) (5.0); Jackdaw, *Coloeus monedula* (Linnaeus) (9.6); Starling, *Sturnus vulgaris* Linnaeus (5.6); Scarlet Grosbeak, *Carpodacus erythrinus* (Pallas) (4.4); Chaffinch, *Fringilla coelebs* Linnaeus (6.0); House Sparrow, *Passer domesticus* (Linnaeus) (6.9); Yellowhammer, *Emberiza citrinella* Linnaeus (4.3); White Wagtail, *Motacilla alba* Linnaeus (3.3); Willow Warbler, *Phylloscopus trochilus acredula* (Linnaeus) (6.6); Garden Warbler, *Sylvia borin* (Boddaert) (4.9); White-throat, *Sylvia communis* (Latham) (7.8); and House Martin, *Delichon urbica* (Linnaeus) (3.4). There is also an annotated systematic list of 119 species. This is a model regional survey.—D. S. F.

43. The Avifauna in the Southeastern Part of the Wilderness Region "Himolan salo" and the Neighboring Villages. (Himolan salon kaakkoisosan ja sitä ympäröivien kyläalueiden linnustosta.) Jorma Soveri. 1942. *Ornis Fennica*, 19(4):97-117. Linear censuses of 5.5 to 11 kilometers were taken during June and July 1942 and the dominance (percentage of a species in the total population) computed. "Numerous hills, lakes, and ponds give a varying topography to this region which is covered with forests and moors and for the most part completely unaffected by culture. . . The edaphic factors and the unfavorable continental climate are responsible for a great poverty of vegetation which among other manifestations appears in the forest-type relationships which present transition forms to the high boreal forest types. Dry heath-forests dominate. Intermediate forms between the *Myrtillus*-type and the *Empetrum-Myrtillus*-type appear on the better soils; the *Oxalis-Myrtillus*-type is rare; grove-like forests are at most sparse. The forest in the sterile part of the region is, in an ornithological sense, 'a fir-dominated mixed coniferous forest' in which small areas with young deciduous trees are encountered. 'Mixed deciduous forest' is very uncommon." Excluding crossbills, the most dominant species were the Chaffinch, *Fringilla coelebs* Linnaeus (24.9); the Tree Pipit, *Anthus trivialis trivialis* (Linnaeus) (16.2); the Crested Tit, *Parus cristatus cristatus* Linnaeus (12.2); and the Redstart, *Phoenicurus phoenicurus phoenicurus* (Linnaeus) (11.6).—D. S. F.

ECOLOGY

(See also Numbers 26, 32, 40, 41, 42, 43, 50, 52, 60, and 68.)

44. Snow Cover as an Ecologic Factor. Its Significance in the Lives of Mammals and Birds in the USSR. (Snezhnyi pokrov v zhizni mlekopitaiushchik i ptits, SSSR.) A. N. Formosov. 1946. *Materiali k poznaniiu Fauny i Flory SSSR, izdavaemye Moskovskim Obshchestvom Ispytatelei Prirody. Novaya Seriya. Otdel Zoologicheskii Vypusk* 5 (XX). 153 pp. This is a monographic treatment of an ecologic factor of considerable importance in temperate and cold areas which has received relatively scant attention in ecological literature. Much of European USSR has a snow cover for as much as 200 days per year whereas a substantial part of Asiatic USSR has a snow cover for 250 days or more per year. The snow cover, together with its peculiar physical properties and its annual recurrence, creates special ecologic conditions for both plants and animals. Among the physical properties of the snow cover which are ecologic importance to birds and mammals are: (1) *Its softness* which hinder locomotion of mammals and running birds, (2) *Its depth or the formation of a crust* may make food unavailable from the surface. (3) *Its poor heat conductance* allows it to serve as an insulator against low temperatures, thus protecting the animals beneath it from these low temperatures. (4) *The coolness* of the snow is advantageous to certain of the larger animals which use it to escape attacks of blood-sucking insects. (5) It has a role as a *source of drinking water* for many animals but as such may contribute to mineral deficiencies. During the period in which there is snow on the ground many galliform birds enter into commensal relationships with large mammals, being dependent on their excavations in the snow for access to food. Considerable attention is given to the role of snow cover in the distribution of species and in the development of the quaternary fauna. There is a wealth of interesting observations and ideas. There is a bibliography of 205 titles, 180 in Russian, and an excellent ten-page summary in French.—D. S. F.

45. Nesting and Production of the Ring-Necked Pheasant in North-Central Iowa. Thomas S. Baskett. 1947. *Ecological Monographs*, 17(1):1-30. This paper deals with data on *Phasianus colchicus torquatus* Gmelin collected in the Winnebago Experimental Area in north-central Iowa during 1939, 1940 and 1941. The Winnebago area is a 1,520-acre tract of intensely farmed land in the Wisconsin drift soil area; it is level or moderately sloped except for two relatively high ridges. Any place where males could be conspicuous appeared to be adequate as crowing places; return to the exact previous crowing spot is regarded as accidental. Males become localized through April and until mid-May "and probably throughout the breeding season . . . There was probably a tendency toward the establishment of crowing areas of territories by male pheasants, but these territories were thought to be very plastic . . ." Fighting among males was usually due to intrusion; a few instances of fighting over females may have occurred. Females probably chose the nesting sites; males may have adjusted territories to include nests. Male/females ratios were 1:20 to 1:2.4. Eggs were laid at a rate of slightly lower than one per day. Principal cover types in which nests were found were hayfields, small grains, and fence rows. Increased nesting densities were absorbed by hayfields. Nests in hay fields mowed late had higher rates of success. Nesting success was from 23 percent to 36 percent. Losses were due to desertion, predation, and injury or death of female. One-third of losses were attributable to agricultural activities. The estimated numbers of chicks hatched in 1939, 1940, and 1941 were 352, 478, and 954 respectively; losses for the first seven weeks per brood were 2.6, 3.3, and 3.3; estimated numbers attaining the age of seven weeks were 247, 305, and 588. "In the case of the Winnebago data I am not able to state whether these variations in rates of gain were functions of cyclic changes in capability to reproduce and survive super-

imposed upon density effects, or whether they were at least partially influenced by interplay of local environmental factors. At any rate, the similarities between the Winnebago and North Dakota information suggests the operation of mechanisms effective over a wide area rather than strong influence of local conditions on population gains." (p. 27.) Subsequent data from many sources confirm the author's suggestion of widespread factors affecting Pheasant populations. This is a very interesting paper.—D. S. F.

46. The Ten-Year Cycle in Plant-Feeding Birds and Mammals and Some Points of View Concerning its Explanation. (Ueber den 10 jährigen Massenwechsel bei pflanzenfressenden Vögeln und Säugetieren nebst einigen Gesichtspunkten zu seiner Erklärung.) Olavi Kalela. 1944. *Ornis Fennica*, 21(2):42-62. This is a very interesting review and discussion of the ten-year cycle in the populations of certain plant-feeding birds and mammals. Among the possible causative factors considered are disease during overpopulation, cyclic vitamin E deficiency, mineral deficiencies in the diet, and sunspots and their cycles. The author proposes that meteorologic cycles, possibly of short duration, may account for population cycles via their influence on growth and metabolism of plants. Into this concept he introduces the idea of "critical periods" *i.e.*, periods of normally rapid growth such as spring, early summer, or the beginning of the rainy season. When the depressing part of the meteorologic cycle coincides with the "critical period" of the species there could be a depression in growth or metabolism which in turn could be reflected in the populations of other species dependent on it. For example, a cycle of 74.54 days with constant "critical periods" from year to year could result in ten year cycles. This proposal could also account for "lows" developing in successive years from one area to another.—D. S. F.

47. A Phenological Record for Sauk and Dane Counties. Aldo Leopold and Sara Elizabeth Jones. 1947. *Ecological Monographs*, 17(1):81-122. This interesting and valuable paper gives dates annually for the period 1935-1945 for 328 events at two stations, in Sauk and Dane counties respectively, Wisconsin. The latter station is about one degree Fahrenheit warmer in mean annual temperature and has a frost-free growing season of 171 days compared to 139 days for Sauk. Both stations lie in the general region of the confluence of the prairies, oak-hickory forest, and coniferous forests. Included in the events are arrival dates for various species of birds, first date of song of certain species of birds, blossom and seed dates for plants, last killing frost, freezing and thawing dates for bodies of water, etc. Of particular interest in avifaunal dynamics is the fact that the spring events appear to be about two weeks earlier than in 1881-1885. The northern station (Sauk County) is about three days later in spring than the southern, twice the expectation under Hopkins' Law. There is an excellent evaluation of the reliability of the data and the sources of error.—D. S. F.

48. The Canvasback in Minnesota. J. Donald Smith. 1946. *The Auk*, 63(1):73-81. It is estimated that about six percent of the continental population of Canvasbacks, *Aythya valisineria* (Wilson), stops in Minnesota, practically all concentrating on Lake Christina. This lake, which apparently was not used by Canvasbacks at all prior to 1900, seems attractive at present because of large area of shallow water, absence of emergent vegetation and abundance of submerged vegetation especially sago pondweed (*Potamogeton pectinatus*), a favorite food item. In spring, the ducks arrive in two or three waves, males preceding females to a considerable extent (2.3 males per female first flight, 1.2 males per female at height of migration). Courtship and pairing occurs on the lake, the flocks gradually breaking up into isolated pairs which then move on to more northern nesting grounds. Details of courtship behavior were similar to that described by Hochbaum in studies made in Manitoba. Only a few pairs nest

in the state, but nesting population may be increasing in recent years. Fall migration occurs during October and was a more orderly affair with birds tending to flock with other species to a greater extent than in spring. The sex ratio as determined by study of hunters' bags was about even with females slightly outnumbering males. Age ratio was one adult to 5.5 juveniles.—E. P. Odum.

49. Breeding Birds of the Forest Edge. Verna R. Johnston. 1947. *The Condor*, 49(2):45-53. The distribution of the breeding birds of two Illinois woodlots and their edges were studied in 91 hours of field observation. Ten species were found primarily in the forest interior and fourteen at the forest edge; four species occurred extensively in both situations. Since the forest edge supported a characteristic set of species, the author believes that it should rate as a distinct community. Peculiar habitat requirements which seem to influence habitat selection in various species are discussed. An elevated singing or lookout post near the nest is considered to be a basic habitat requirement of the Field Sparrow, *Spizella pusilla* (Wilson). Pewees, *Myiochanes* (Linnaeus), and Crested Flycatchers, *Myiarchus crinitus* (Linnaeus), frequently locate near the forest edge and make use of the insect food available there. A flexibility and possibly a local modification in habitat requirements is conjectured for the House Wren, *Troglodytes aedon* Vieillot, and Indigo Bunting, *Passerina cyanea* (Linnaeus), both of which were found nesting commonly in the forest interior as well as in the edge community.—John T. Emlen.

WILDLIFE MANAGEMENT AND METHODS

(See Number 45.)

CONSERVATION

(See also Numbers 63 and 68.)

50. Ornithological Results of the Baffin Island Expeditions of 1928-1929 and 1930-31 Together with More Recent Records. J. Dewey Soper. 1946. *The Auk*, 63(1):1-24; (2):223-239; (3):418-427. Observations are presented in the form of a detailed annotated list of 66 species and a good 13-page summary of the ecology of Baffin Island region which lies entirely within the Arctic Life Zone or Tundra Biome. The author finds that the four sub-divisions of the polar world, namely, transition zone, grass tundra, desert tundra, and polar desert, used by Nordensköld in his paper "Geography of the Polar Regions" serve as very satisfactory sub-units from standpoint of bird distribution. Since the "transition zone" includes the areas of dwarfed willow, birch, etc. a designation "willow tundra" would be more descriptive and in line with the other terms; these shrubby areas are too small and scattered to have a very distinctive bird life on Baffin Island. The polar desert or "ice desert" (to coin a more descriptive term again) is virtually lifeless since it is covered by ice the year around. The grass or low tundra regions which border the west coast and the lakes have by far the greatest concentrations of birds. The very extensive desert or high tundra is only thinly populated largely by the Snow Bunting, *Plectrophenax nivalis nivalis* (Linnaeus); Horned Lark, *Eremophila alpestris* (Linnaeus); American Pipit, *Anthus spinoletta rubescens* (Tunstall); and Rock Ptarmigan, *Lagopus mutus rupestris* (Gmelin). Thus, the spectacular but often limited concentrations and the uneven distribution of birds in the Arctic are largely the result of sharp differences in ecological conditions. The annotated list contains not only distributional information but observations on life histories as well.—E. P. Odum.

51. Preliminary Report on the Canada Geese of the Mississippi Flyway. Harold C. Hanson and Robert H. Smith. 1947. *Illinois Natural History Survey, Biological Notes*, No. 18:1-17. That a refuge may lure birds to their de-

struction is shown by the history of Horseshoe Lake in southern Illinois where more and more *Branta canadensis* (Linnaeus) congregated and, responding to man as provider, lost their natural wariness, so that the flock was cut in half in two years. "During recent hunting seasons there, the geese exhibited an almost complete disregard of gunfire, flying back day after day to fields that were heavily shot." The authors suggest that, in order to reestablish wildness, refuges be established on nearby bars of the Mississippi and the Geese dispersed there, also that contact between humans and Geese be reduced to a minimum.—M. M. Nice.

52. Bird Preservation in the Territory of Curaçao. J. H. Westermann. 1946. *Uitgaven Studiekring Suriname Curaçao, Jaarboek* 1945-1946:78-85. The territory of Curaçao consists of two groups of islands, (1) Curaçao, Klein-Curaçao, Aruba, Bonaire, and Klein-Bonaire which are the westernmost islands of the Leeward Group off the Coast of Venezuela and (2) St. Maarten, Saba, and St. Eustatius which are the northernmost islands of the Windward Group between Trinidad and Puerto Rico. The first group lies within the low rainfall belt (450 to 550 millimeters per year) whereas the second group is within the high-rainfall area (1100 millimeters per year). The Blue Pigeon, *Columba squamosa* Bonnaterre, and the Wood Dove, *Zenaida aurita aurita* (Temminck), are threatened by hunting and nest-destruction on the islands of the Windward Group. On St. Maarten bird life is endangered by the mongoose which was introduced in 1885. All species of birds of prey are seriously threatened by concerted attempts to exterminate them as "extremely harmful." Protection is urgently needed. Deplorable is the fact that the Flamingo colony of Bonaire was frightened away "by irresponsible members of the U. S. Army" in 1944. This emphasizes the really serious gap in our education insofar as the recognition of conservation values is concerned. The author proposes an extension of the protective laws to many species not now included.—D. S. F.

AVIFAUNAL DYNAMICS

(See Numbers 40 and 41.)

ZOOGEOGRAPHY

(See Numbers 40, 41, 42, and 43.)

53. Utinomi's Bibliographica Micronesica: Chordate Sections. Harvey I. Fisher. 1947. *Pacific Science*, 1(3):130-150. A genuinely valuable service has been performed in printing this bibliography together with translations of the Japanese titles. It contains references previously overlooked in vertebrate zoology.—D. S. F.

SYSTEMATICS

54. The Number of Species of Birds. Ernst Mayr. 1946. *The Auk*, 63(1):64-69. A careful tabulation reveals 8,616 species, plus or minus five percent, have been described in the world. Mayr states that "the period of new discovery is practically at its end. I doubt that in the entire world even as many as 100 new species remain to be discovered." On other hand Mayr estimates that about 28,500 valid sub-species have been described and that "this figure is increasing annually by about 200."—E. P. Odum.

55. A Study of the Gyrfalcons with Particular Reference to North America. W. E. Clyde Todd and Herbert Friedmann. 1947. *The Wilson Bulletin*, 59(3):139-150. The relationships of White and Gray Gyrfalcons, *Falco rusticolus candicans* Gmelin and *Falco rusticolus obsoletus* Gmelin, have long puzzled naturalists. Now both have been found in the same nest so we know

they are color phases that are evident even in the first plumage. Hence their recognition as separate races is no longer tenable. White phase birds predominate in Greenland and arctic America but are uncommon in Labrador. Since the gray phase birds of Labrador are darker than those of Greenland and make up most of the population, it would seem that a case exists for continuing to recognize a Labrador race, though Todd and Friedman unite it with the Greenland population. They might well have listed the percentages of the phases present in the extensive material they examined from various localities. The white phase is absent in the Old World and is believed to be a new color character, perhaps in the process of becoming established, that appeared after the species spread from the Old World to Greenland and arctic America.—D. Amadon.

56. Geographic Variations of the Black-bellied, Fulvous, and White-faced Tree-ducks. Herbert Friedmann. 1947. *The Condor*, 49(5):189-195. Aside from marine or seasonally coastal birds, apparently only two species are represented in South America and Africa by breeding populations of the same race. Both of these are tree-ducks and Friedmann agrees with earlier authors that the New and Old World populations are not subspecifically distinct. We must suppose that these ducks wandered across the South Atlantic in the not too distant past. Though the same race of the Fulvous Tree-duck, *Dendrocygna bicolor* Vieillot, occurs in India, Africa and South America, surprisingly the birds of southern United States and northern Mexico are racially separable by reason of their slightly narrower bills. A third species, the Black-bellied Tree-ducks, *Dendrocygna autumnalis* (Linnaeus) is restricted to the New World. It was named from the West Indies long ago but the original description does not agree with the plate that appeared with it. Moreover, the species is rare or perhaps only a straggler in the West Indies. To clear up this confusion and express some of his independent findings, Friedmann names two new races, one from Texas and one from Veracruz, México.—D. Amadon.

57. Cabinet Colour-Changes in Bird-Skins and their Bearing on Racial Segregation. Reginald Wagstaff and Kenneth Williamson. 1947. *British Birds*, 40(11):322-325. During the extremely bitter winter of 1946-47 many casualties were brought to the Yorkshire Museum and the authors were impressed with the differences in plumage colors of the new material from that in their cabinets; they warn against naming of new subspecies unless based on "careful comparison of entirely fresh material," and they ask field workers to forward to them all dead birds found, even the commonest species.—M. M. Nice.

MORPHOLOGY AND ANATOMY

58. A Comparative Study of the Brain in Birds. (Études sur la cérébration chez les oiseaux I.) Adolph Portmann. 1946. *Alauda*, 14(1):2-20. Various measurements of the brain of birds have been used in the past as indicators of the degree of cerebral development. In a study of the brains of 892 birds of 219 species the author of this paper finds none of the old techniques satisfactory. He accordingly adopts a new procedure in which the cerebral hemispheres, the cerebellum and the optic lobes are removed, and all parts, including the remaining brain stem, weighed separately. Cerebral indices were derived by relating hemisphere weights (higher brain centers), brain stem (minus optic lobes) weights (lower brain centers), and body weights. Measurements showed that brain weights were related exponentially to body weights, but that considerable variation existed among the different groups of birds. The brain stem in grebes, for instance, was equal to the body weight to the 0.40 power, whereas in woodpeckers it equalled the 0.82 power of the body weight. The hemispheres were slightly more variable than the brain stem. In comparing the cerebral index in

different birds, the author groups the various orders represented in his series under three subdivisions as defined by Gadow, which he believes to be natural phylogenetic groups. In the first group *Pelargomorphae*, the grebes and loons possess the lowest cerebral index, with progressively larger indices in the ducks, flamingos, totipalmates, herons, penguins and hawks. In the second group, *Alectoromorphae*, the gallinaceous birds and the ostriches represent the lowest level, followed by pigeons, shorebirds and gulls and, relatively far advanced, the rails. Except for the swifts, the third group, *Coraciomorphae*, all possess high cerebral indices, mounting progressively through the cuckoos, hoopoes, kingfishers, owls, passerines to the woodpeckers and parrots. An interesting correlation is drawn between cerebral advancement and the development of the young. Nidifugous species in which the young are physically advanced at hatching have low cerebral indices. Nidicolous species, characterized by a long period of dependency in the nest, have, with a few exceptions (swifts, pigeons), high cerebral indices. These exceptions suggest that nidicolous ontogeny evolved before cerebral development and is a necessary condition for advanced cerebral development. This paper represents much work and constitutes an important contribution. A tabular presentation of the raw data would have been very desirable but would obviously have been costly of space. Figures and measures of the variability within a species and within a group would have been valuable.—John T. Emlen.

59. Plumage and Soft-part Variations in the Herring Gull. Hustace H. Poor. 1946. *The Auk*, 63(2):135-150. The presence of a large number of Herring Gulls, *Larus argentatus* Pontoppidan, color banded as nestlings in a cooperative project by the Linnaean Society of New York has provided an unusual opportunity for observing in the field the plumages of birds of definitely known ages (a different color combination being used for each year of banding). Field observations of the author and others are summarized and results compared with descriptions of Dwight and Forbush which were based on study of museum specimens. Four years (or longer in a few individuals) with two molts a year (pre-nuptial being partial) are required before completely adult plumage is attained. Immature birds, especially second and third year birds, were found to vary so greatly that author concludes that it is "impossible to determine accurately the age of Herring Gull either in the field or as a museum specimen, by pattern and color of plumage and soft parts, since practically every normal combination of these characters can be assumed in two different years." Color of the upper tail coverts may prove to be one of the more reliable age criteria since brown barred feathers are gradually replaced by white, the amount of white thus being a rough indicator of age provided the observer can get close enough clearly to distinguish between coverts and rectrices. The author suggests that it would be very desirable to collect color-banded individuals in order that sex could be determined and plumage characters studied in more detail.—E. P. Odum.

EVOLUTION

60. Effectiveness of Selection by Owls of Deer-Mice (*Peromyscus maniculatus*) which Contrast in Color with their Background. Lee R. Dice. 1947. *Contributions from the Laboratory of Vertebrate Biology*, No. 34:1-20. In experiments with the Barn Owl and Long-eared Owl, concealingly colored deer-mice "enjoyed more than a 20 percent advantage over the conspicuous animals in escaping capture." "From the very high possible rates of selection indicated by these experiments, it is concluded that natural selection can theoretically produce very rapid evolution whenever a genetically variable population is exposed to its action."—M. M. Nice.

BOOKS AND MONOGRAPHS

61. Ornithology Laboratory Notebook. 5th Edition. Arthur A. Allen. 1947. Comstock Publishing Company, Ithaca, New York. ix + 256 pp. \$4.00. In the fifth edition of this manual the author has adapted it for general use in all parts of the country hence enlarging its usefulness. The frontispiece is a reproduction of the Fourth Provisional Zone Map of North America by C. Hart Merriam, Vernon Bailey, E. W. Nelson, and E. A. Preble. Although this represents a static rather than dynamic approach to distributional phenomena, it is nevertheless a useful device particularly for the beginner. Unfortunately the reproduction is not in color, thus making it difficult to use, particularly for mountainous regions. Following a general list of reference works there are plates, to be labelled by the student, illustrating topography of the bird, feather tracts, parts of the feather, and the skeleton. The keys to the families and orders of North American birds are well illustrated and constitute one of the most valuable assets of the book. However, it appears to be poor pedagogy (pp. 23-33) to insist that the student select always three characteristics for each family and order in the exercises that follow. The seven pages of keys to bird nests are excellently illustrated with photographs and appear to be usable although obviously in general restricted to eastern North America as indicated by the author. The "Summer and Winter Ranges of North American Birds" (pp. 45-57) is obviously useful although to a considerable extent duplicates the material which the student will find in his field guide. The bulk of the book (pp. 63-192) consists of life history charts each with an outline drawing of the species and map of the western hemisphere in which the student is to sketch the winter and summer ranges. There is also space for notes in migration, habitat, song, call notes, food, economic status, nest, recognition marks, distinctive habits, confusing species, other plumages and eggs. Although much of the student's work will be the transfer of the information from standard references to the life history chart, nevertheless with proper direction the life history charts should be a valuable teaching aid. There are 23 blank check lists of "Birds of Eastern North America" of a conventional type using common names arranged by families. However, the manual is cumbersome in size (8 1/8 x 10 3/4 inches) for use in the field. For teaching bird identification and the rudiments of life history, distribution, and migration, particularly for students for whom ornithology will be primarily a hobby, this manual should be highly successful.—D. S. F.

62. Endocrines and Constitution in Doves and Pigeons. Oscar Riddle. 1947. *Carnegie Institution of Washington Publication* 572. xi + 306 pp. Paper cover, \$3.00; cloth binding, \$4.00. This monumental treatise is based on the data obtained over the course of 24 years in the study of certain physiologic and constitutional characteristics of "races" or strains of Ring Doves and their hybrids as well as those of certain standard pigeon races, special types of pigeon races, and their hybrids. Most emphasis is placed on the Ring Dove stocks which were of a heterogeneous origin. In general terms the stocks fell into four groups: (1) Mostly a Blond Ring Dove, *Streptopelia risoria* (Linnaeus), but with a slight admixture of the Oriental Turtle Dove, *Turtur orientalis* (Latham), (2) A mixture of *Turtur orientalis* [= *Streptopelia orientalis* (Latham)], *Streptopelia risoria*, and, in addition the Japanese Ring Dove, *Streptopelia douraca* Hodgson. (3) A mixture of *risoria* and *douraca* only, (4) stocks with *risoria* only. Using such races the author feels that genetically the mongrelness of the human population of an American city can be approximated. The fancier's races of pigeons, it is pointed out, are the result of artificial selection by man extending far back into prehistoric times; they are analogous to the breeds of dogs. Constant analogies and comparisons are drawn between the data derived from Ring Doves and corresponding situations in the human species. In a general way, and if not pursued too far into detail, such an approach seems adequately sound. However,

there are adequately profound differences in physiology of mammals and birds to prevent too intimate an application of such reasoning. The data and conclusions in this treatise are, of course, tremendously in excess of any sort of summary which could be included in a review of this length. From a general biological standpoint this treatise is monumental both in its attempt and its degree of success in probing the inheritance of constitutional and physiologic characteristics via the endocrine glands and their activities on a population basis. From the standpoint of modern avian biology this treatise is monumental additionally because its tremendous fund of information in the field of avian genetics and physiology; this will be an important source of exemplary and comparative material for many years to come. Among the important sets of data are those concerning weight in dove and pigeon races and in hybrids; the establishment of "large thyroid" and "small thyroid" races in which it is concluded that, with some exceptions, small thyroids are thyroids of high activity; unequal responses to prolactin, the lactogenic hormone of the anterior lobe of the pituitary; unequal pituitary size and possibly implications thereof; dove races with unequal intestinal length; liver size; age at sexual maturity; weight of testis as a racial character; egg weight as a racial character; weights of heart, skeleton, and plumage in certain races and hybrids; the roles of race, season and temperature, sex, age and certain organs in heat production. Of great interest, genetically and physiologically is chapter 10 (pp. 149-157) which deals with a hermaphrodite-producing race of pigeons. The treatise is well presented, its usability enhanced by 68 tables and 187 figures, and in general, well documented although references to a number of pertinent papers, both American and foreign, are lacking. However, in no instance does this seriously affect the value of the treatise. In summary, this is first a major biological contribution integrating genetics and endocrinology and providing another example of the importance of birds as experimental animals in establishing biological principles, and secondly, an important contribution of empirical information for avian physiology and avian genetics.—D. S. F.

63. The Population of Venezuela and its Natural Resources. William Vogt. 1946. Pan-American Union, Washington, D. C. 52 pp. A masterly report on a serious and complicated situation dealing with biological, ecological, sociological, economic and educational problems. The combination of deforestation, cultivation of steep slopes, and multitudes of goats in a country with long dry summers and torrential rains in winter has resulted in an appalling state of soil-exhaustion. "There are few countries in the world, and probably none in the Hemisphere, with more exaggerated and concentrated erosion. Over vast areas *all* of the soil has been washed away, leaving bare rock exposed." (p. 3.) Sixty-one photographs by Marjorie Vogt show how the land is "going out to sea." An admirable program of restoration is outlined: a Natural Resources Board, land-use classification, scientific research, conservation of flora, protection of fauna, socio-economic remedies, and finally education.—M. M. Nice.

64. The Way Birds Live. 3rd. Edition. Edward A. Armstrong. 1947. Lindsay Drummond Limited, 2 Guilford Place, London, W. C. 1. 96 pp. 7/6. In this charming little book the author directs his inimitably expressive style and endless fund of anecdotes and observations to grammar-school children. As such it should guide many into the ornithological hobbies. There are 29 excellent photographs and many line drawings. Such chapter titles as "Showing Off," "Courtship Gifts," "Battles and Bluff," and "Dancing-Grounds" exemplify the charm of presentation. In reality the book is a small compendium of observations and facts concerning life histories and behavior of birds prepared primarily for upper grammar school children but from which any adult can learn much. The last chapter, "How to go birding," is intended to lead the reader into participating in the study of birds.—D. S. F.

65. The Feathered Ones. (Die Gefiederten). Richard Gerlach. 1946. Claassen & Coverts. Hamburg. 236 pp. A delightful little book on birds. There are brief chapters on structure and behavior, on "bird friends"—Aristotle, Pliny, Gesner, Bechstein, Naumann, Brehm and German ornithologists of the present century,—and a chronicle of the arrival and departure of birds in spring and autumn with mention of findings on migration routes and winter quarters through means of banding. Most of the book is devoted to accounts of species or families of birds, the majority of which are native to central Europe, while others are striking denizens of zoo or farm. Much of historical interest is given in regard to Jungle Fowl, Peacock, pheasants, Ostrich, and others. A good book for the beginner and layman, packed with sound information.—M. M. Nice.

66. Life Histories of North American Gulls and Terns. Arthur Cleveland Bent. Dodd, Mead and Company, New York, 1947. 333 pp. \$5.00. A reprint of Bulletin 113 of the U. S. National Museum, originally published in 1921. Ornithologists will welcome the appearance of this second reprint of Bent's "Life Histories." The Introduction has been rewritten and all illustrations are unfortunately omitted, presumably in the interests of economy. Otherwise the text appears to be unchanged. The absence of the "Explanation of Plates" changes the pagination of the "Index" and shortens the book by twelve pages. It is printed on good quality paper and attractively bound in cloth.—G. F. Hudson.

67. Flashing Wings. Richard M. Saunders. 1947. McClelland and Stewart. Toronto. 388 pp. \$4.50. A compilation from the author's nature notebooks from 1938 through 1946, arranged by months, for instance—January 1, 1944, January 1, 1945, January 19, 1941, January 21, 1940. This scheme is rather confusing and at times disappointing when one reads on June 11, 1944 of the need of a nature reserve in the Holland Marsh Area and then hears no more of it until December 1946 when one gathers that the spruce-tamarack bog had been destroyed. The book concludes with a useful Bird Migration Chart for the Toronto region, a record of 21 Christmas Censuses of the Brodie Club and an index. Terence M. Shortt's numerous illustrations are very attractive. To the reviewer this book would seem to be chiefly of local interest.—M. M. Nice.

68. Man against Myth. Barrows Dunham. 1947. Little, Brown. Boston. 316 pp. \$2.50. An eloquent protest against social myths that keep the privileged in power. Professor Dunham is rightly concerned over the problems of freedom and happiness in our world, and he presents many excellent arguments against current illusions, but his book is marred in places by prejudice and more seriously by ignorance of biology and ecology. Because of an unfortunate remark in 1938 by Stuart Chase about the Spanish Civil War, he attacks with wilful misunderstanding the whole subject of General Semantics (pp. 237-265), not realizing that this movement is on his side, as its aim is to put thinking and doing on a scientific basis. It is extraordinary to read Professor Dunham's ridicule (pp. 61-67) of the modern view of the role of the predator, as ably propounded by Herbert Spencer as far back as 1888. More amazing still, he states: "No Malthus could now convince anybody that the population must necessarily outrun the food supply." (p. 20.) The truth of the matter is that the amount of arable land is inadequate to feed the present population of the world, yet this population is increasing at the rate of 50,000 people a day, while our arable land is steadily being washed out to sea. When will people who want to solve social problems study the basic facts of biology and ecology?—M. M. Nice.

69. One Day at Teton Marsh. Sally Carrighar. 1947. Illustrated by George and Patricia Mattson. Alfred A. Knopf. New York. 239 pp. \$3.50. In "One Day at Beetle Rock" Miss Carrighar related the experiences of a variety of animals in Sequoia National Park; now she has done the same thing with

creatures that live in a marsh near Jackson Hole. The setting is a beaver pond, the day is the fall equinox, and the chief event that affects every one is the breaking of the dam through the crashing down of the Osprey's dead cottonwood in the storm. The characters are a beaver, a mink, an otter, a Varying Hare, a moose; an Osprey, American Merganser and Trumpeter Swan; a trout, a frog, and even a leech, a snail, a mosquito and a scud. Miss Carrighar weaves her story skillfully; she enters into the life of each of these very different animals and without anthropomorphism depicts the interplay of instinct and learning. It is a fascinating narrative and one that adds to our knowledge and widens our sympathies. George and Patricia Mattson add much to the interest of the book with their spirited drawings.—M. M. Nice.

70. Canadian Spring. Florence Page Jacques. Illustrated by Frances Lee Jacques. 1947. Harpers. New York. 216 pp. \$3.50. Another treasure of a book from the Jacques. In her vivid, inimitable style Mrs. Jacques tells of their great journey (largely by automobile, partly by railroad) to Canada in April 1946, first to watch waterfowl at Delta on Lake Manitoba, then west across the prairies to the National Parks in the Canadian Rockies, and finally north to Fort St. John and Hudson Hope in British Columbia, with the return journey to Delta in June. It is an enthralling narrative with wonderful descriptions—the Whistling Swans and Ruddy Ducks and Western Grebes, the antelope and Mule Deer, the mountains and pines and wild flowers. Mr. Jacques' sketches give the finishing touch of perfection. In her fine closing chapter the author writes: "I had loved this earth of ours as deeply as I was capable of loving it, and I felt content, holding close what I had received in return: a clear assurance of unquenchable life and joy." We, too, can have high adventure.—M. M. Nice.

71. Spring in Washington. Louis J. Halle, Jr. 1947. Wm. Sloane Associates. New York. 227 pp. \$3.75. Our National Capital with its wild Rock Creek Park, the Potomac, Mount Vernon and the old canal at Georgetown is a wonderful place for those who have eyes to see and ears to hear. The transformation in the birds and plants traced from the first song of the Cardinal on January 22, 1945 to the sight of the last migrating Blackpoll Warbler on June 8. "Spring in Washington" is an inspiration with its keen, discriminating observation of birds and trees, its fine style, and its philosophy based on fundamental values in life. It is a joy to look at with the distinguished sketches of Mr. Jacques that accurately portray the scenes described. The spectacular changes of the seasons in this favored spot are vividly and beautifully told by Mr. Halle; his book brings us awareness of the marvel of awakening life each spring.—M. M. Nice.

NOTES AND NEWS

Mr. Seth H. Low was transferred from his position as refuge manager of the Salt Plains National Wildlife Refuge on January 5, 1948, to take charge of the bird-banding program of the Division of Wildlife Research of the Fish & Wildlife Service.

In his new position Mr. Low will direct the activities of the large group of cooperators who are scattered over the entire country as well as supervise the work of the central banding office at the Patuxent Wildlife Research Refuge, Laurel, Maryland. He will be responsible for the interpretation of the immense file of data on banded birds, and will conduct investigations on special problems relating to North American birds which may be most effectively approached through analysis of the banding records.