this record may be of interest to the readers of *Bird-Banding*. White-throat 36-118397, banded September 15, 1936, and taken as a repeat several times up to October 7, staged a return on May 1, 1937, at the same trap site where it had been banded. No repeats were taken that year, nor was this bird trapped in any subsequent year. Although it is possible that 36-118397 may have nested in this region, such nestings are so rare as to make it appear not improbable that the bird was a migrant.

It would be interesting to know if other banders outside of the summer and winter ranges of the White-throat have secured returns of this species.—William P. Wharton, Groton, Mass.

RECENT LITERATURE

Reviews by Donald S. Farner and others

BANDING AND MIGRATION

1. Report of the Bird-Ringing Committee: Progress for 1944. A. Landsborough Thomson. 1945. *British Birds*, 38: 290-294. A total of 6,496 birds were ringed in 1944 in Great Britain, of which 5,313 were nestlings. "Among the recoveries are two of Rooks ringed eleven years before, one as an adult and one as a nestling. A Sandwich Tern over thirteen years old was recovered in northern Spain, and another was found after eleven years in the ternery where it was hatched. A Tufted Duck ringed in St. James's Park in February, 1942, was shot in Novaya Zemlya in the following May: this is by far the highest latitude from which a recovery has ever been reported." Species ringed in the largest numbers since 1909 are: Starling, Song-Thrush, Blackbird, Barn Swallow, Lapwing, Chaffinch, Robin, Manx Shearwater, and Common Tern.—M. M. Nice.

2. Do Birds Cross the Gulf of Mexico in Spring? George G. Williams. 1945. *Auk*, 62(1): 98-111. Very frequently in science a theory proposed by a dynamic leader is accepted without question and remains unchallenged and largely uninvestigated for many years. The author believes that the theory of trans-Gulf migration should be challenged. The late W. W. Cooke, who first proposed the theory, based it on three lines of evidence, none of which, according to the author, stand up under critical scrutiny. First, the author can find no really reliable reports of large numbers of land birds actually seen migrating or on ships more than fifty miles off shore; birds seen closer might have been blown off shore by storms, especially since resident birds are often included. Secondly, recent study of migration on the Texas coast indicates that the same species occur there in spring as on the Louisiana coast. Finally, the reputed simultaneous arrival of birds along the Gulf Coast is not considered sufficiently proven. While the author thus shows that direct evidence for trans-Gulf migration is much weaker than generally supposed and that many individuals of species supposed to cross the Gulf apparently migrate around the Gulf (or at least touch at points around the periphery), it should be noted that the evidence presented is not sufficient to cause an immediate or complete abandonment of the trans-Gulf theory. In many ways the author seems too dogmatic in some of his statements. Someone needs to park astride the supposed route over the Gulf and see if birds actually fly over in large numbers. Contrary evidence, such as presented by Lowery and Van Tyne, needs to be further amplified. It seems not unreasonable to suppose that large numbers of individuals may take both routes, or some individuals may cross the Gulf in one hop under favorable conditions, and others land on the periphery to continue their journey *via* land. This paper will indeed stimulate discussions and observations.—E. P. Odum.

3. Trans-Gulf Migration of Birds and the Coastal Hiatus. George H. Lowery, Jr. 1945. *Wilson Bulletin*, 57(2): 92-121. The rarity of migration records for many transient species from a broad zone along the north coast of the Gulf of Mexico indicates that spring migrants normally pass on, without stopping, to inland localities in the latitude of Memphis, Tennessee. Spectacular concentrations of transients may, however, appear in the groves and marshes immediately bordering the Gulf during and immediately following storms. Spring storms in this area are precipitated by cold northerly winds meeting and sweeping under warm moisture laden air masses of the Gulf. Trans-Gulf migrants encountering such storms are thought to drop to low altitudes and seek refuge on the first land they encounter. Here they remain only until the advent of good weather, usually within a few days. Again the coastal zone is bypassed as the birds move on to inland localities in a single flight.

Data are presented which indicate that stormy weather along the south coast of the Gulf delays the departure of trans-Gulf migrants causing interruptions in the northbound stream of migration. This and the storm-caused delays on the north coast are thought to account for the uneven flow or "waves" characteristic of the spring migration in the Mississippi valley.

In this paper the author has accepted the assumption proposed by W. W. Cooke in 1888 that migrants arriving on the coast strip or at inland localities have moved in across the Gulf. Since Mr. Lowery's paper was submitted, an article by G. G. Williams has appeared in the (*Auk*, 62(1): 98) which attempts to disprove this basic assumption and demonstrate a narrow coastwise migration route from which northbound flights branch at various points. It will be interesting to read the accounts of further observations on trans-Gulf migration which Mr. Lowery is reported to be making.—J. T. EMLEN, JR.

4. The Homing Instinct in Pigeons. C. S. Platt and R. S. Dare. 1945. *Science*, vol. 101, no. 2626: 440-441. Despite the great quantities of observations and records which thousands of pigeon racers have made on the homing capabilities and training requirements of their birds, very little of a scientific nature has been published on the sensory basis of homing abilities in pigeons. The paper under review makes a start in this direction. A few simple experiments were conducted between two stations 80 miles apart in New Jersey. Inexperienced pigeons failed to return over this course. Pigeons trained over half the distance similarly failed. Individuals which had covered the course once or twice with a group of trained birds found their way back by themselves in six out of nine cases. The conclusions support those drawn by Whitman in 1919 that homing in pigeons is dependent on the recognition of familiar landmarks.—J. T. EMLEN, JR.

ECOLOGY AND POPULATION

5. Some Changes in the Bird Life of Churchill, Manitoba. A. A. Allen. 1945. *Auk*, 62(1): 129-134. Observations in 1944 are compared with those of Taverner and Sutton in 1934. The building of an airport and other war activity have changed the immediate vicinity of Churchill to some extent, some dwarf spruce being removed for one thing. Seven species which commonly thrive near civilization, such as House Wren, starling, cowbird, Song Sparrow, recorded in 1944 were not present in 1934. Robins have increased. Hudsonian Curlew and Dowitcher were more abundant in 1944, probably reflecting the general increase in these species. Ptarmigan, Stilt Sandpiper, Tree Sparrow, Redpoll, and others seemed to be scarcer. Smith's Longspurs have apparently increased, while Lapland Longspurs have decreased.—E. P. ODUM.

6. The Breeding Distribution, History and Population of the North Atlantic Gannet *(Sula bassana).* Part 2. The Changes in the World Numbers

of the Gannet in a Century. James Fisher and H. G. Vevers. 1944. *Jour. Animal Ecology*, 13: 49-62. In 1939 the world population of the Gannet was 165,600 ± 9,500 "In 1834 the world population was of the order of 334,000 breeding individuals, of which two-thirds (approximately) were breeding on the Bird Rocks in the Gulf of St. Lawrence. There was a steady decrease in the world population, mainly owing to the depredations of man at the Bird Rocks, until about 1894, when it was of the order of 106,000 breeding individuals." Since then, "there was a steady recovery in numbers, and an establishment of new colonies, some now large and successful. . . . The rise in the numbers of the gannet has taken place in a period in which man still exploits the gannet; protection has stopped the unplanned destruction, which, if continued, would have made an end of the gannet in some parts of its limited range; . . . and most of the 22 colonies where the gannet is now breeding are entirely protected. . . When small numbers of gannets are present at a colony, breeding is abnormally inefficient"—M. M. NICE.

7. Winter Habits of Crows in Oklahoma. Shaler E. Aldons. 1944. *Journal of Wildlife Management*, 8(4): 290-295. Crows have increased markedly in Oklahoma during the past thirty years despite control activities. This increase is attributed to increasing food supplies on the wintering range in Oklahoma and on the summer range in Canada. Twenty-four winter roosts were located varying in size from small groups to huge concentrations of 200,000 or more birds. Individual crows ranged out from their roosts for 8--12 miles and returned over the same flight lines each day as indicated by repeats of banded birds. Pellets, which were used in food habits studies, were regurgitated within two hours after the birds entered their roost.

Both the eastern and the western races *(brachyrhynchos* and *hesperis)* were represented.—J. T. EMLEN, JR.

PHYSIOLOGY

8. The Effect of Auditory Stimulation on the Spermatogenetic Cycle of the Male English Sparrow. C. S. Thornton and S. B. Cummings, Jr.; assisted by Frederick Greeley. 1945. *Auk*, 62(1): 75-79. Forty days of noise produced by an electric buzzer failed to have the slightest stimulatory effect on English Sparrow testes, while increased light caused marked enlargement as has been demonstrated previously. While these experiments are clear-cut and a good contribution to the "periodism" problem, sweeping conclusions are not yet justified. For example, in stating that previous workers "have proved without a doubt that exercise has no effect on the avian sexual cycle," the authors overlook the recent work by Wolfson (*Condor*, 43: 125-136, 1941) which indicates that activity is not yet to be ruled out. From the relatively small amount of experimental work so far reported, the reviewer is not convinced that sweeping conclusions of any sort are justified. For one thing, physiologists are often prone to speak of the condition "in birds" when experiments refer to particular species. Of course, basic physiological responses will be similar "in birds," but the "trigger" which sets off the chain of events may well vary with the species.—E. P. ODUM.

9. Some Effects of Sex Steroids on the Gonads of the Starling. J. Wendell Burger. 1945. *Endocrinology*, 37(2): 77-82. Male and female sex hormones (testosterone propionate and estradiol dipropionate) had no effect on sexually inactive ovaries of starlings. Estradiol and its propionate suppressed spermatogenesis and augmented the growth of intertubular tissue in testes. Testosterone propionate neutralized these effects of estradiol. Testosterone did not augment spermatogonial multiplication in inactive testes but appeared to sustain and reinforce the later stages of spermatogenesis.—J. T. EMLEN, JR.

10. Color Vision and Brightness Discrimination in the Little Owl. (Farbensehen und Helligkeitsunterscheidung beim Steinkauz (*Athene noctua vidalii* A. E. Brehm)). J. T. V. Meijknecht. 1941. *Ardea* 30: 129-173. Also published separately, E. J. Brill, Leiden. It has been found that three diurnal birds have excellent color vision and light discrimination—the Song Thrush, domestic fowl, and Shell Parakeet. Nocturnal birds have relatively more rods and fewer cones in their retinas than diurnal birds, and also color could not play the large role in their lives that it does with the latter. A series of careful and convincing experiments with nine Little Owls are described: these birds were found to distinguish red, yellow, green and blue, and also to be extraordinarily sensitive in distinguishing shades of gray. Three Song Thrushes were then tested on shades of gray; they were found less sensitive than the owls, but more sensitive than human beings. The author concludes that since no explanation can be found for the Little Owl's color vision in its mode of life, that color vision cannot be a recent adaptation, but must be characteristic of a larger taxonomic group.—M. M. NICE.

11. Molt in Flight Feathers of Flickers. Frederick H. Test. 1945. *Condor*, 47(2): 63-72. The annual fall and postjuvenal molt of primary feathers proceeds in sequence from primary one. Postjuvenal molt of the secondaries is generally omitted, but the annual fall molt proceeds from two centers of initiation at secondaries eight and one. This double origin of the molt sequence is thought to be related to the double embryonic origin of the secondaries demonstrated by Steiner. Measurements of growing feathers show growth rates of 5 to 7 millimeters per day for primaries, 4 to 5 millimeters per day for secondaries.—J. T. EMLEN, JR.

ANATOMY

12. Flying Ability and the Anterior Intermuscular Line on the Coracoid. Harvey I. Fisher. 1945. *Auk*, 62(1): 125-129. A study of the relative position of the supracoracoideus and coracobrachialis posterior muscles as indicated by the line between the origins of these muscles on the coracoid of species of widely different flight abilities indicates that this intermuscular line is not an index to the ability to fly. Hence, this bone marking cannot be used to indicate flight ability of fossil specimens.—E. P. ODUM.

BEHAVIOR

13. An Objectivistic Study of the Innate Behaviour of Animals. N. Tinbergen. 1942. *Bibliotheca Biotheoretica*, Ser. D. Vol. I—Pars 2: 39-98. An excellent presentation of problems of animal behavior, emphasizing many of the views of Heinroth, Lorenz and the author with examples from birds, fish, mammals and insects. "Objectivistic Ethology . . . is applying *physiological methods* to the *objects* of animal Psychology" (p. 40). In "Objectivistic Comparative Ethology . . . there is a need for ever *increasing detailedness* . . . consideration of the *whole* behaviour pattern of a species is necessary . . . *comparison* of behaviour patterns of many different species is needed" (p. 43). In discussing the "casual analysis of innate behaviour," Dr. Tinbergen states that: "most activities are released by internal and external factors in cooperation" (p. 52) and "intensive internal stimulation (at the end of the season) compensates for low external stimulation; in the beginning of the season, the low intensity of the internal factor can only be compensated by a high temperature" (p. 54). An interesting diagram is given showing the "hierarchy of drives" in a male Stickleback: on the lowest level is the reproductive drive; on the next come fighting, building, courting, care for offspring; and finally the instinctive actions (inherited

coordinations), as biting, chasing, threatening, etc.; digging, testing of materials, and so on. An illuminating discussion of taxis, signals, releasers, etc., is given.

Under "Some Remarks on Learning Process," we learn that: "The learning achievements of Honey-Bees and of digger wasps during their 'locality studies' are almost unbelievable. . . . At the same time, the whole chain of activities leading to the capture of the prey, an entirely innate behaviour pattern, is never changed nor guided by experience." A Herring Gull that lays "blue" eggs does not know these from normal ones, but learns to distinguish its own chicks in five days. Hence, in studying learning, we should "know which of the animal's activities have to be chosen when its best achievements in this line must be found and used for comparison" (p. 82). The last section is on "Functions of Behaviour." "The function of an activity is always the attainment of a certain end with the aid of certain morphological structures" (p. 85). "The performance of the instinctive activity in itself is the animal's goal" (p. 84). A most valuable paper, a boon for all of us, interested in animal (and bird) behavior, who can better understand theories presented in English rather than German or Dutch.—M. M. NICE.

14. Substitute Activities. (Die Uebersprungbewegung.) N. Tinbergen. 1940. *Zeitschrift für Tierpsychologie*, 4: 1-40. A detailed analysis and discussion with many examples drawn from birds and fishes. Substitute activity occurs when a drive is inhibited; this may take place when antagonistic drives are stimulated at the same time; when a goal is too suddenly reached; and when the necessary stimulus in a chain of activities is lacking. Substitute activity in birds may take the form of pretense of feeding, preening, bathing, nest-building, etc., in primates there may be grooming of the fur, and in man head scratching (innate), taking out the watch, lighting a cigarette (acquired). Substitute activities have often evolved into signals that release behavior in other individuals of the species. Many of these have become ritualized, and recognition of the origin of the movement is only possible through homologisation based upon comparison with other species. A paper that deserves careful study.—M. M. NICE.

15. Song-Thrush Song. Noble Rollin. 1945. *British Birds*, 38: 262-270. Observations on several Song-Thrushes *(Turdus e. ericetorum)*, illustrated with 5 graphs. An unmated bird on April 9 spent ten hours singing (41% of the 24-hour day), nine hours in roosting (38%) and five hours (21%) in feeding, etc. (My unmated Song Sparrow *(Melospiza melodia)* on May 11 spent nine hours in singing and nine hours sleeping, which left six hours (24%) for other occupations.) "The unmated Song-Thrush averaged about 38 seconds of song for every minute it was occupied in singing"; thus on April 9 there were 377 minutes of actual song. Another bird on June 13, "apparently pairing," gave 217 minutes of song, while a third, feeding young on June 12, gave 33 minutes." (The Song Sparrow spends something like twelve seconds in actual singing during each minute he devotes to song; this would bring the output on May 11 to 96 minutes.) The first song of Song-Thrushes "varied from a mean of 52 minutes before sunrise in March to a mean of 71 minutes in the first half of June."—M. M. NICE.

16. Singing of Breeding Female Chaffinch. M. D. England. 1945. *British Birds*, 38: 274. A female *Fringilla coelebs gengleri* near Tring "sang persistently." "The song was very similar to that of the Lesser Whitethroat *(Sylvia curruca)* and was usually delivered from the tree in which the nest was built, or one near it. . . . The song appeared to puzzle the male and the nuptial chasing often started as a battle. He would fly to the tree in which his mate was singing, in a very belligerent way, with much 'spink, spink-ing,' and apparently attack her." She stopped singing after laying her third egg, but started again "in a desultory way" after the nest was robbed. The second attempt at nesting was successful

and the female's behavior normal, "except that the cock did the major share of feeding and nest-cleaning. He spent a lot of his time chasing her to her duties." —M. M. NICE.

17. The Breeding of Black-winged Stilts in Nottinghamshire in 1945. J. Staton. 1945. *British Birds*, 38: 322-328. In 1945 there was a notable immigration of *Himantopus h. himantopus* into the British Isles, where before it had been known only as a rare vagrant; the raising of three young by two pairs is reported in the present paper, which is illustrated with photographs of nest and eggs and a two-week-old chick found dead, and a sketch of a remarkable wing-flapping display. The four adults were "very aggressive to other birds, notably Carrion-Crows and Black-headed Gulls, passing through the area, and continually mobbing human intruders." The young flew when a month old. "The wing-flapping display consisted of any individual bird prancing up and down in one spot, with the body in a curious, almost vertical position, and the wings extended forward and beating slowly and rhythmically. It was almost an exact parallel of the wing-waving of unmated Starlings, and though it doubtless occurred earlier, was seen by observers chiefly in the late stages of incubation and during the early days after the chicks were hatched, particularly when nest-site or vicinity of chicks were approached."—M. M. NICE.

18. On the Nuptial Display of the Redstart. E. J. M. Buxton. 1945. *British Birds*, 38: 282-287. Interesting and detailed observations made while the author was a prisoner in Germany. The red tails of *Phoenicurus ph. phoenicurus*, especially when seen from below with the sun shining through them, are very conspicuous in the nuptial displays. "Beginning with chases in and about the trees where the future nest is to be built, the elaborate display, without which coition is not even attempted, was not seen until after nest-building had started. . . . The displaying male, with his bright tail fanned and pressed down onto the branch, his rosy body flattened, his black face and white cap thrust toward the hen; with his wings held straight up to show their shimmering pink undersides as he excitedly quivers them; his wild, darting flight after the act, accompanied by a sweet warbling song as he flies—all combine to make one of the most strikingly lovely scenes I have ever watched in the lives of birds."—M. M. NICE.

19. Notes on the Roosting of Certain Birds. Christopher M. Swaine. 1945. *British Birds*, 38: 329-332. Notes on 23 species, dealing "mainly with unusual or unrecorded roosting-sites or with species whose roosting habits are but little known."—M. M. NICE.

20. Observations on a Tame Robin. M. Brooks-King. 1944. *British Birds*, 38: 130-132. A young *Erithacus rubecula melophilus* became so addicted to taking meals in the author's house that in the fall when two adult robins took up territory around the house, the young bird, called C, retreated into the house, where he was saved from his rivals by the family closing the windows. When he completed his molt and attained full voice, he took over the house as his territory and defended it from the outsiders. In spring he got a mate and they nested near the house; C fed his mate and young with butter and margarine.—M. M. NICE.

21. Possible Life-Pairing of Nuthatch. David Lack. 1945. *British Birds*, 38: 297. A pair of *Sitta europea affinis*, banded in the winter of 1939-40, was found alive and in the same territory in April, 1945. "Steinfatt (*Beitr. z. Fortpfl. d. Vögel*, Vol. 14, p. 86, 1938) considers that the Nuthatch probably pairs for life." —M. M. NICE.

22. Black-headed Gull Feeding Independent Young. J. A. G. Barnes. 1945. *British Birds*, 38:299-300. A young *Larus r. ridibundus*, apparently physi-

cally normal, was fed by an adult from the end of August until it was last seen on Feb. 18, although it got some food for itself. "The young bird would recognize its 'parent' in flight and begin bowing and whistling before the adult alighted. . . . The parent occasionally brought food in its bill, . . . but feeding by regurgitation either on land or water was much more frequent. . . . It regularly drove off other Black-headed and Common Gulls near the juvenile."—M. M. NICE.

23. Herring-Gulls Robbing Lapwings. F. J. Johnston. 1945. *British Birds*, 38:278. On Jan. 23, 1945, seven *Larus a. argentatus* were standing on upland grassland with 35 *Vanellus vanellus;* the latter were busily seeking food while the former stood watching, but whenever a Lapwing found something, it was attacked by one or more Gulls. "Such behaviour is well known in the case of Black-headed Gulls *(Larus ridibundus)* . . . but not mentioned in *The Handbook* in other species."—M. M. NICE.

24. Observations on the Birds of Wake Island. Charles Vaughn. 1945. *Migrant*, 16: 26-28. A delightful account of the Flightless Rail *(Rallus wakensis)* in 1938; now without doubt it has been exterminated. These birds "travel around with, and even eat from the same dish with, the small vegetation-eating rats that infest the island. Long unacquainted with human beings and therefore unafraid, they have become very friendly with our men during the three years the Pacific Airways have occupied the island. They stand by dozens on the steps of the hotel kitchen door, peering through the screen at the staff and going crazy with delight when one of the Chinamore kitchen boys comes out with scraps for them. They walk over his shoes and jump high in the air, just like young chickens at feeding time. During the heat of the day, they get under the hotel or go down into the rat burrows to keep cool; at night. they go foraging abroad with the rats. . . . They nest on bare sand at the base of the scrubby beech magnolias, laying a clutch of four or five eggs."—M. M. NICE.

LIFE HISTORY

25. Incubation and Nestling Periods of Central American Birds. Alexander F. Skutch. 1945. *Auk*, 62(1): 8-37. The author tabulates egg measurements, incubation and nestling periods of several hundred nestings, involving over a hundred species of 44 families of Central American birds,—indeed an impressive array of data, especially valuable because they were gathered by one observer. A rather rambling but very interesting discussion of factors which may affect length of incubation periods follows. The author believes his data support Bergtold's contention that taxonomic position affects the length of incubation, birds of "higher" groups having shorter periods. Flycatchers, for example, have considerably longer incubation periods than tanagers, honey creepers, and thrushes, even though egg sizes and nesting habits are comparable between these groups. Exceptions appear, however, as many doves have very short periods (only ten days in the Ruddy Quail Dove) despite "low" taxonomic position. Correlation with mortality rate (or "ecological factors") seems to be indicated within the flycatcher group, since species building hanging nests less accessible to predators have longer incubation periods than those building more conventional nests, even though a number of the latter lay larger eggs. Interestingly enough, this may be the result of a behaviour difference rather than an inherent difference in the egg since the hanging nest species appear to incubate less constantly. Size of the egg is, of course, a third major factor to be considered. While a rough relation is granted, data on flycatchers and thrushes show a lack of correlation between egg size and the length of incubation. Nestling periods, with the exception of hole nesters and long-winged species, are generally the same length as incubation periods.

As the author points out, more accurate information is needed, since it is apparent that many factors influence the length of incubation. In this paper, the author does not consider experimental work such as that of Kendeigh and Romanoff which does throw light on factors governing incubation length. With a problem as complicated as this, it is obvious that both sound observation and critical experiments on the physiology of development are necessary. General observation can only suggest hypotheses; experiments or critical observations must be used to test them. This paper is important in the former respect.—E. P. Odum.

26. A Study of the Northern Raven. W. Bryant Tyrrell. 1945. *Auk*, 62(1): 1-7. Observations made on seventeen week-end visits to three raven nests in the Shenandoah National Park (Va.) are discussed. The raven may be increasing in the Park as a result of protection. Three to seven eggs were laid early in March, incubation period about three weeks, nestling period about five weeks. One pair was bold, another shy when the nest was approached, but neither would visit the nest while under observation, so that little concerning nest behaviour or food habits could be observed. Recently hatched nestlings remained warm, possibly indicating an early development of temperature regulation.—E. P. Odum.

27. Observations of the Loon in the Cariboo Parklands, British Columbia. J. A. Munro. 1945. *Auk*, 62(1): 38-49. The Loon *(Gavia immer)* population in interior British Columbia seems relatively constant, large lakes having about the same number of pairs every year and the same small lakes having single pairs. The presence of fish is not necessary since 28 (out of 107) adults occupied small fishless lakes. From May to mid-August, pairs spend all their time on a definite circumscribed territory which is usually defended early in the season, except against non-breeding individuals; pairs unsuccessful in nesting defend territories longer than those which are successful. Nests may be placed on old muskrat houses, floating vegetation or on shore, but a deep escape channel is always nearby. Males perform spectacularly and fearlessly when nest or young are approached (photographs included), creating a great commotion in the water or "standing nearly upright with neck curved back, chest outthrust, wings half opened and curved forward," accompanied by vigorous calling. Territory defense behaviour is similar but not so vigorous. Most eggs hatch, but many young seem not to survive, since the number of young seen in late summer is small. There is also apparently a large percentage of non-breeding pairs and single birds. Of five birds collected, the stomach of only one held fish; amphipods, mollusca, and aquatic insects were found in the others. Fish probably constitute a good part of the diet on some lakes, however.—E. P. Odum.

28. The Nestling of the Sooty Shearwater. L. E. Richdale. 1945. *Condor*, 47(2): 45-62. The average incubation period for this species was confirmed as eight weeks. Eggs on Whero Island hatched between January 17 and February 4 (88 records in four seasons). Hatching, from first chipping until emergence, took at least four days. The down-covered chicks developed slowly and remained ashore for at least 95 days. They were parasitized with fleas and ticks. Parent shearwaters apparently ranged widely and returned to feed their young irregularly. The times of feeding and the approximate sizes of meals delivered were determined by weighing individual chicks at 9 a.m. and 9 p.m. each day. Eleven chicks so studied were fed on 192 nights and remained unfed on 215 nights. Fasting periods were commonly five days and on one occasion extended for ten days. Single meals ranged up to 300 grams in weight and on several occasions nearly equalled the weight of the bird receiving them.

Growth curves based on body weight were highly irregular and quite meaningless. Bill, wing, toe, and claw measurements increased regularly during the first seven weeks (after which regular observations were discontinued), and had ap-

proached the adult condition by May. The exact dates of departure of the birds from nesting islands were not determined.—J. T. EMLEN, JR.

29. On the Habits and Nest of the Ant-Thrush Formicarius analis. Alexander F. Skutch. 1945. *Wilson Bulletin*, 57(2): 122-128. Observations on this strictly terrestrial ant-bird were made in Panamá and Costa Rica. It nests in tree cavities. Two eggs are laid and both sexes incubate. Of special interest is the observation that the nestlings at hatching are covered with down.—J. T. EMLEN, JR.

30. Nesting of the Allen Hummingbird. Elmer C. Aldrich. 1945. *Condor*, 47(4): 137-148. Information on nesting sites, nest construction, eggs and incubation are presented on the basis of observations on about 50 nests. Nest building may occupy eight to eleven days before the eggs are laid and is continued until the young leave. Two eggs are laid, generally about two days apart. Incubation begins with the laying of the first egg and lasts from 17 to 22 days. Tabular presentation of data would have increased the usefulness of this paper. —J. T. EMLEN, JR.

31. The Nesting of the Long-tailed Tit. J. H. Owen. 1945. *British Birds*, 38: 271-273. Five years' observations on the elaborate nests constructed by *Aegithalos caudatus;* materials for the outside of the nest are found in the vicinity, but the birds will go far for feathers, at least a quarter of a mile. In six nests the number of feathers ranged from 985 to 2,084, averaging 1,558. About 21 days are spent in building the nest. "In three cases in 1943 three birds were interested in the nests." The average number of eggs is about eleven. "Soon after the outer nest is completed the two birds use it as a dormitory and continue to do so until the young are fledged." Incubation lasts at least fourteen days; fledging at least sixteen days. "The rearing of the young is extremely successful. This can be seen to a great extent by the count of the families seen in autumn and winter, for the family keeps together after leaving the nest."—M. M. NICE.

32. Fertility and Mortality in the Nest of Continental Great Tits. E. J. M. Buxton. 1945. *British Birds*, 38: 288-289. In 1944 while a prisoner in Bavaria, the author marked with colored bands, supplied by Dr. E. Stresemann, a number of pairs of *Parus m. major;* 87 eggs were laid in nine nestings; 68 hatched and 51 young were fledged, 59 per cent success. The sets ranged from 7 to 16 eggs. In one, all nine eggs were infertile, the female incubating them for at least 24 days; if this set is omitted, fledging success came to 65 per cent, which is typical of hole-nesting species. Nesting was two or three weeks later than in 1943 owing to cold, wet weather; only one pair attempted a second brood. —M. M. NICE.

33. Nesting of Western Bluebird. Kenneth Racey. 1945. *Canadian Field-Naturalist*, 59: 43. Two weeks before the second brood of *Sialia mexicana* "left their nesting box in early July, a second pair of adult bluebirds joined forces with the nesting birds, and together they fed the young until fledged."—M. M. NICE.

SEX RATIOS

34. Sex Ratios of Ducks in Southwestern Washington. James R. Beer. 1945. *Auk*, 62(1): 117-124. This contribution to the sex ratio problem in ducks is especially interesting because all observations were made directly in the field, some 10,180 ducks of fifteen species being counted as to sex. As indicated elsewhere (see *Bird-Banding*, 16: 109), banding traps and perhaps hunters' bags may

not be a fair sample, as males may be more vulnerable to these sample methods. In this study the sex differential favoring males is only 1.18 to 1. Among the Anatinae the ratio was practically even, while among the diving ducks ratios were more unbalanced in favor of males. There seemed to be little difference in ratios in fall, winter, and spring, with only a slight tendency for males to leave wintering areas first. The author believes the cause of unbalanced ratios will be found on the nesting ground, as no factor causing a difference was noted on the wintering ground.—E. P. Odum.

35. Sex and Age Ratios Among Bobwhite Quail in Southern Missouri. A. Starker Leopold. 1945. *Journal of Wildlife Management*, 9(1): 30-34. This paper presents records on the sexes of 45,452, and the ages of 7,700 Bobwhite Quail shot in Missouri during the hunting seasons of 1939-1943. Young of the year constituted from 72 to 83 per cent of total; the proportion of young was greater in agricultural than in wooded areas. Age ratios in one county fluctuated from year to year between 72 and 82 per cent; these changes are attributed to the effects of spring weather on reproductive success. The total sex ratio of 53.1 per cent males agrees well with published reports from other areas. Males and females were equally represented among young of the year, but males predominated in the adults. The differential loss of adult females is thought to occur during the breeding season. The average weight of 166 quail was 186 grams, 21 grams more than the average weight given by Stoddard for Georgia birds.—J. T. Emlen, Jr.

CONSERVATION AND WILDLIFE MANAGEMENT

36. Bird Geography in the Southwest Pacific. Bird Habitats of the Southwest Pacific. Bird Conservation Problems in the Southwest Pacific. Ernst Mayr. 1945. *Audubon Magazine*, 47: 159-165; 207-211; 279-282. Very fine articles, illustrated with picture-maps and sketches. The last is an eloquent presentation of the desperate situation of these island faunas, where "More kinds of birds have become extinct on the islands of the Pacific than in all the rest of the world put together." A few simple rules are recommended: "No needless destruction of trees. No deliberate starting of brush and grass fires. No indiscriminate shooting or killing. No introduction of cats, goats, or other non-indigenous mammals or birds. Rigid control of rats. No random scattering of DDT or other poisons." "If the existing conservation organizations are not in a position to meet this emergency, I suggest that a new organization be formed for the preservation of the fauna of the Pacific. The time has come to act."—M. M. Nice.

37. An Improved Game Bird Trap. H. L. Kutz. 1945. *Journal of Wildlife Management*, 9(1): 35-38. A collapsible and portable funnel type trap measuring 6′ x 6′ x 3′ is described and figured. The sides are constructed of welded wire fabric and the top of fish seine netting in order to avert injury to captured birds. A "predator skirt" reduces losses by ground predators. The trap has been used successfully for pheasants and waterfowl in New York State.—J. T. Emlen, Jr.

38. The Kettleman Hills Quail Project. B. Glading, R. W. Enderlin and H. A. Hjersman. 1945. *California Fish and Game*, 31(3): 139-156. An area of approximately 75 square miles in the arid Kettleman Hills of California was the locality selected for three experiments on increasing quail by environmental manipulation.

In the first experiment supplementary food in the form of grain was broadcast three times per week in two large plots while two other plots were kept as con-

trols. Quail increased significantly in the fed plots, but the gains were not considered adequate to warrant the expense in practical management programs. Song birds, rabbits and rodents also responded to the feeding program in varying degrees, but predators showed no increase during the two-year study period.

The second experiment was designed to test the value of stocking new quail range around isolated watering installations with introduced birds. Marked quail released at two such stations in October, directly or after a period of adjustment in confinement, all disappeared within a few days. These stations and an unstocked "control" station were all utilized by quail (but not the marked birds) during the two following summers. From this it was concluded that the stocking of such areas (within two miles of quail range) is quite useless.

The third experiment involved all-round development of the land for quail, including, especially, water and roosting cover improvements. Preliminary results suggest that the area can be successfully developed as a "natural game farm" from which an annual trappable surplus of birds may be taken for transplanting. —J. T. EMLEN, JR.

FOOD HABITS

39. Food Habits of the Barn Owl. Albert C. Hawbecker. 1945. *Condor*, 47(4): 161-166. This study is based on the analysis of 480 pellets collected during the nesting season from eleven nests or roosting sites in central California. The occurrence of prey species in the pellets could, in a general way, be correlated with abundance and accessibility (ease of approach) in a collecting locality. The absence in one collection of rodents known to be common one-fourth of a mile from the collecting site suggests a restricted foraging range.—J. T. EMLEN, JR.

PARASITOLOGY AND DISEASE

40. Maggot Infestation of Nestling Mourning Doves. Johnson A. Neff. 1945. *Condor*, 47(2): 73-76. Mourning Dove nests in the San Joaquin Valley of California were heavily infested with maggots of a previously undescribed species of blow fly (Protocalliphora). As many as 50 per cent of nests observed were infested with between 20 and 86 maggots per nest. The maggots attack nestlings at any time of day or night, attaching themselves to the ears, nostrils and among the pin-feathers on various parts of the body. Nestling doves became restless when attacked and frequently fell from their nests. These parasites are believed to be an important factor in the heavy nest mortality observed in this area between 1936 and 1940.—J. T. EMLEN, JR.

41. Effects of Lead Poisoning on Reproduction of Mallard Drakes. E. L. Cheatum and Dirck Benson. 1945. *Journ. Wildlife Management* 9(1): 26-29. Eggs fertilized by eight game-farm mallard drakes which had recovered from severe lead poisoning showed no reduction in fertility, hatchability or survival of ducklings. The effect of lowered vitality on reproduction during periods of absorption and convalescence from lead poisoning is recognized, but, it is noted, wild ducks have much less opportunity to pick up shot and become poisoned in spring than in fall.

Admittedly meager data suggest that when birds ingest three or four No. 4 shot separately, at intervals over a period of two months, mortality by lead poisoning may approximate 20 per cent.—J. T. EMLEN, JR.

DISTRIBUTION

42. The European Starling in Gaspe. Stanley C. Ball. 1945. *Auk*, 62(1): 79-97. Starlings first appearing at Gaspe in 1935 have become "cliff

dwellers" on the Forillon, nesting in limestone crevices after the manner of Guillemots. One brood is apparently raised. Until hatching in June, the adults are very secretive; the young appear in July. A few individuals remain through the winter, but most migrate southward. Nest sites on cliffs are always near fish dressing stations or fisherman's barnyards and gardens, to which adults repair for food. During one year, crows destroyed nests, constituting effective control.—E. P. ODUM.

43. The Birds of the Cariboo Parklands, British Columbia. J. A. Munro. 1945. *Canadian Journal of Research*, 23, Sect. D: 17-103. A detailed account of 212 species and subspecies of birds known to occur in the interior plateau between 51° and 53° north latitude and 120° and 126° west longitude. "Composite forests of lodgepole pine and aspen, grasslands, and shallow valleys containing numerous lakes, ponds, and marshes of various types are the principal physiographical features. Ten vertebrate habitats, each with a characteristic biota, are recognized." "The biota is in rapid process of modification as a result of various human activities." Examples of the many valuable life history observations: Barrow Golden-eye *(Glaucionetta islandica)* the most common nesting duck, does not breed until two years old; yearling females frequently attach themselves to nesting females and their broods. Three female Green-winged Teal *(Nettion carolinense)* displayed in front of the author's canoe, while their 19, three-quarters grown young, made off down the creek. The Yellow-headed Blackbird *(Xanthocephalus xanthocephalus)* is increasing, apparently at the expense of the Redwinged Blackbird *(Agelaius phoeniceus)*; numbers of the two species nesting in 14 localities in 1942 are given for future reference. A most admirable piece of work.—M. M. NICE.

SYSTEMATIC ORNITHOLOGY

44. Distribution and Taxonomy of the Black-capped Chickadees of North America. Allen J. Duvall. 1945. *Auk*, 62(1): 49-69. Nine subspecies of *Parus atricapillus*, namely *atricapillus, practicus, anamesus, frigoris, septentrionalis, nevadensis, fortuitus, occidentalis* and *turneri*, are recognized in this thorough revision based on a study of 800 specimens. An interesting problem is posed by the striking similarity of Eastern *atricapillus* and *fortuitus* of Washington, although geographically widely separated. Likewise, *nevadensis* of Great Basin and *turneri* of Alaska are very similar, exceeding in pallor all other races.—E. P. ODUM.

45. Notes on Panamanian Birds. John W. Aldrich. 1945. *Auk*, 62(1): 111-114. Specimens of *Ammodramus savannarum obscurus* and *Lochmias nematura nelsoni*, new subspecies collected by E. A. Goldman in Panamá in 1911-1912 have apparently been overlooked by subsequent workers.—E. P. ODUM.

CORRECTION

Mr. B. W. Tucker, editor of *British Birds* has called attention to a series of errors in *Bird-Banding*, Vol. 16, No. 2, p. 78, reviews 53, 54, 55 and 56. These reviews all refer to the same article on the Little Ringed Plover, of which Nos. 54, 55 and 56 are subheadings. It is said in the review that prior to 1944 there were only about a dozen breeding records for Britain, whereas it was stated in the paper that there was only about that number of records for the bird in Britain at all and but one previous breeding record, that in 1938. Furthermore,