

Of ninety-three trapped immature birds two were returns-1 and one a return-2. Song Sparrow B105907 was our prize, Banded October 23, 1931, as an adult, it was handled thirty-seven times in four years. His movements were erratic. He was present the first winter, absent the next summer, but was back that fall and winter and remained all of the next year with us, again away for the winter, but back again for the spring and summer.—HAROLD B. WOOD, Harrisburg, Pa.

Notes from Sault Ste. Marie, Michigan.—This year to date, May 26th, has been a rather disappointing period. Practically no birds appeared at my station throughout the winter. A few Eastern Evening Grosbeaks (*Hesperiphona v. vespertina*) were reported in the vicinity and in the Canadian Soo across the river, the largest flock numbering about twenty-five. Several times a few were seen in the trees near the station, but none came down to feed. The first one trapped, on March 16th, was an adult male, and was banded by Dr. K. Christofferson at Blaney Park, about ninety miles westerly from my station, May 16, 1934. This is the first year since I started banding that no birds were trapped during January and February. Since trapping this Grosbeak, sixty others have been trapped. The most interesting record for this year is an adult male Evening Grosbeak banded by G. D. Chamberlain at Presque Isle, Maine, March 22, 1934, which was trapped by me April 8, 1935, an example showing the easterly and westerly movement of these birds during the winter season. (See my paper, in this Journal, for December, 1934, Vol. V, pages 175-181.)

Very few White-throated Sparrows (*Zonotrichia albicollis*) and Slate-colored Juncos (*Junco h. hyemalis*) have visited the station, and other birds, barring Robins (*Turdus m. migratorius*), Eastern Purple Finches (*Carpodacus p. purpureus*), and Evening Grosbeaks, have been almost absent.

Every year the first bird trapped in the case of several species is a banded bird. Last year a banded Purple Finch, Robin, Eastern Chipping Sparrow (*Spizella p. passerina*), and Eastern Vesper Sparrow (*Poæetes g. gramineus*) were first to return, and this year the first six to return were the Yellow Warbler (*Dendroica æ. æstiva*), Evening Grosbeak, Robin, Chipping Sparrow, Eastern Savannah Sparrow (*Passerculus sandwichensis savanna*), and a Veery (*Hylocichla f. fuscescens*) banded in June, 1933, and returned May 27, 1935.

I have so far banded six Song Sparrows and have trapped seven that were banded last year. Song Sparrows are almost a nuisance, as some of them are in the traps about all the time during the day; two of them repeated over fifty times each, and last Friday one dropped an egg in one of the traps.

This year the first Purple Finch was trapped March 26th, and I have banded so far this year 541. My record for Purple Finches since I started banding is now 16,501. Purple Finch returns so far this year total sixty-two. The two oldest of the lot, a male and a female, were both adults when banded in the spring of 1930. The female has been trapped every year since. Both are at least in their sixth year. The first Eastern Yellow Warbler trapped was an adult male when banded, June 1, 1932. It was trapped in both 1933 and 1934 (a return-3 at least four years old).—M. J. MAGEE, Sault Ste. Marie, Michigan.

RECENT LITERATURE

(Reviews by Margaret M. Nice)

The articles reviewed have been selected and arranged under subjects of importance to students of the living bird and also for the purpose of suggesting problems or aspects of problems to those banders who wish to make the most of their unique opportunities.

Readings in quotation marks are the exact titles of books or articles or literal translations of such titles. Other headings refer to general subjects or are abbreviated from titles in foreign languages. References to periodicals are given in italics.

BANDING

The 28th annual report of the Vogelwarte of Rossitten¹ is full of interest. Dr. Schüz tells of the many educational activities—the museum, lectures, conducted trips, and also a most valuable week's course of bird-study in October, where the participants watched migration flights, saw birds trapped in large numbers and heard lectures on many phases of the study of the living bird. A total of 94,817 birds were ringed during the year, 5000 by the Vogelwarte and, his staff, the rest by coöperators. A special study is being made of the White Stork some of which are being marked with special large rings, so that the numbers can be read without the capture of the bird. Attempts are being made to reintroduce this fine bird into western Germany by sending young there from East Prussia to be raised by hand. Three thousand young Starlings were caught during the early spring migration and sent to Breslau and Dresden to see whether they would go to their ancestral winter quarters or follow the flocks of local birds; a few have behaved in the first manner, the majority in the second. Another experiment involved giving 240 eggs of the Common Gull (*Larus canus*) from the island of Hiddensee to nesting Black-headed Gulls (*Larus ridibundus*) near Rossitten; at least fifty young were fledged.

Banding Technique.²—An interesting article on the precautions to be exercised in banding young birds and the proper age at which this should be done for each group of birds. A useful hint is given in regard to hole-nesting birds, either old or young, namely to release them by letting them escape *into* their hole. For such birds it is less disturbing if the banding is done at night, or if the bird is put in a dark paper bag.

"Communication between Ornithological Stations."³—A new feature in *Vogelzug* is this section devoted to "discussion between the ornithological stations," published in German, English, and French. In this number M. Chappellier and Dr. Drost discuss the question of the best materials for rings. The Vogelwarte Helgoland has found that "soft pure aluminium" rings "have been worn for 25 years by gulls and terns." Lately he has been experimenting with rings of hard copper for Guillemots.

Finnish Banding.—Banding in Finland is under the direction of the University at Helsingfors. Each year a report is published giving the names of the coöperators and number of birds ringed by each, the numbers ringed of each species, and finally a detailed account of all returns and recoveries. In the latest report⁴ 6439 birds of 115 species are reported as ringed in 1932, the Black-headed Gull accounting for nearly a fifth of the records; a special study is being made of its migration.

Striking results have been obtained with several hawks. Two Sparrow Hawks (*Accipiter nisus*) were banded in the same nest; one was killed eleven months later eighteen miles west, the other eight months later one hundred and fifty miles southwest. Two Peregrine Falcons (*Falco p. peregrinus*) were banded in the same nest; one was killed two months later in Sweden 234 miles southwest, the other nine months later in Germany 1044 miles southwest. Two other nest-mates met the following fate: one was shot in France 3 months and 24 days after banding, 1368 miles from home; the other shot in Germany, 3 months and 27 days after banding, 702 miles from home.⁵ Two other Peregrine Falcons (again nest-mates) lived much longer: one was killed in November in Germany seven and one third years after banding, 756 miles from home; the other in October, 15 years and 3 months after banding, 160 miles northeast.⁴ This is a most exceptional age for a member of this persecuted race.

Banding of Bank Swallows.—Special efforts to capture and ring *Riparia r. riparia* (which ranges over Europe as well as America) have been carried on in Germany for seven years.⁶ Unfortunately statistics are not given as to numbers of adults and young banded, but interesting results have been obtained as to returns to the place of birth and of nesting. Three birds ringed as nestlings were

found breeding in the home colony the following year, while four others were captured from two and one half to ten miles distant. As to adults, thirty were taken in the same colony the following year and twenty were taken there two years later, one individual being captured for three successive years. Sixteen other adults were taken in other colonies from a third of a mile to nine miles distant, eleven of them the next year after banding, five of them for two successive years. Sometimes a change of colony was found in one season, presumably owing to disturbances of the former nesting-place.

In America, Bank Swallows have been banded in Iowa,⁷ 1176 birds from 1923 to the "beginning of the 1926 season" and of these only 14 were recovered. One young bird returned to breed in the home colony, three were found in places from fifty to one hundred and fifty yards from their birthplaces, and five from two and one half to nine miles distant. Two adults were captured in the same place as banded, one one hundred and fifty yards distant, one three quarters of a mile and one eight miles distant.

"**Banding Notes from Sault Ste. Marie, Michigan.**"⁸—Since Mr. Magee "started banding in 1921 to end of 1934, birds banded total 24,290 and over 23,000 of them were trapped in a space less than 75 feet square. The yearly returns total 2,235." These returns involve 1584 birds, the records being distributed thus (each bird being counted only once): 4 returned the same year as banded, 1230 returned only the first year after banding, 264 the second year at the latest, 51 the third, 27 the fourth, 6 the fifth, 5 the sixth, and one the eighth. The article contains many interesting records of recoveries and returns, and data on longevity, which will be treated below.

¹ Schüz, E. 1935. XXVIII. Bericht (1934) der Vogelwarte Rossitten der Kaiser Wilhelm-Gesellschaft zur Förderung der Wissenschaften, *Der Vogelzug*, 6, 53-66.

² Vogelwarte Helgoland & Rossitten. 1935. Beringungs-Technik. Merkblatt über das Beringen nichtflügger Vögel. *Der Vogelzug*, 6, 85-92.

³ 1935. *Der Vogelzug*, 6, 107-11.

⁴ Välikangas, I., and Hytönen, O. 1934. Die Vogelberingung in Finnland im Jahre 1932. *Mem. Soc. Fauna et Flora Fennica* 10, 99-137.

⁵ Välikangas, I., and Hytönen, O. 1932. Die Vogelberingung in Finnland im Jahre 1930. *Mem. Soc. Fauna et Flora Fennica* 8, 100-136.

⁶ Sunkel, W. 1933. Uferschwaben-Forschung. *Vogelring*, 5, 2/3, 9-41.

⁷ Stoner, D. 1926. *The Auk*, 43, 196-213. 1928. *The Auk*, 45, 41-45.

⁸ Magee, M. J. 1935. *Inland Bird Banding News*, 7, No. 1, pp. 3-6, 11.

LONGEVITY

Many records are given in the article by Magee just cited:⁹ two Robins (*Turdus m. migratorius*) of five years, a Yellow Warbler (*Dendroica æ. æstiva*) of seven years; Purple Finches (*Carpodacus p. purpureus*) as follows: one of five years, two of six years, one of seven years, and two of eight years; and Evening Grosbeaks (*Hesperiphona v. vespertina*) as follows: three at least six years old, one at least seven years old, and one at least eight years old.

A Starling (*Sturnus v. vulgaris*) banded in Czechoslovakia in May, 1921, was captured in Poland in January, 1934, at the age of twelve years and eight months.⁹

For other notes on longevity see Peregrine Falcons from Finland⁴ and Mocking-birds.¹³

⁹ Jirák, J. 1934. An Interesting Result of our Ringing and some Foreign Ringed Birds Caught in Czechoslovakia. *Sborník zool. odd. Nar. Musea v Praze*. I. 18, 52-53.

TERRITORY

"**Bernard Altum and the Territory Theory.**"¹⁰—Dr. Mayr has done English-speaking bird-students a distinct service in translating those portions of Altum's book "Der Vogel und sein Leben," published in 1868, which treat of territory. Altum was the true father of the territory theory; he believed firmly in the food-value of territory for the young and in the use of song both to attract the female and to repel other males, but he pointed out the fact that many species

do not hold territory. He says: "The expression, 'fighting of the males over females' is false. The males fight to fix the size of the territory."

Dr. Mayr continues with some important reflections on the subject of territory. He writes: "Much as there has been written on territory and many detailed descriptions as have been given, so far as I know, there has been no attempt to give a strict definition of the term. It is, however, very much needed in order to prevent generalizations on the subject. After much consideration, I propose the following formulation: '*Territory is an area occupied by one male of a species which it defends against intrusions of other males of the same species and in which it makes itself conspicuous.*'"

He then points out that this definition says nothing as to the "purpose" of territory, nor does it include "winter-territories" in which the individuals show no intolerance, nor cases where females hold territories (such birds "apparently belong always to species of highly unsocial character and fighting disposition.")

His definition does include nest-territories of certain social birds (herons, for instance) and not merely what might be called "typical territory."

As to the "Evolution of Territory," the author, after discussing the "food-value" and "sex-jealousy" questions, makes the following sane suggestion: "*Territory was originally developed only in connection with the mating, but it has acquired in certain passerine species a secondary significance as the food providing area.*"

This paper, giving as it does Altum's statements and some of the author's own views, is one of the most significant contributions yet made to the territory question.

"On the Meaning of Territory in the Life of Birds."¹¹—Dr. Tinbergen considers territory of rather minor importance. He describes the fighting of Snow Buntings on their nesting-grounds in Greenland—male against male and female against female—and says that the latter do not know nor regard the boundaries of their mates' territories. "Fighting is a sexual function" arising from sex jealousy and has nothing directly to do with boundaries. "The defense of territory is, psychologically speaking, fighting against members of the same species of the same sex." Song is "an expression of sexual desire," and is defined as "the sound which through its attracting influence on the other sex effects the finding of a partner for reproduction." "The 'love-call' of a heron is thus as much song as the music of the nightingale."

Perhaps the Snow Bunting is not a favorable subject for the study of territorial behavior. E. M. Nicholson reported from his experience in Greenland with this species that "territory was always lax."¹² It is not possible to evaluate the rôle of territory in the life of a bird unless observations are made from the first arrival, at which time territorial ardor is at its height.

With my Song Sparrows I believe that the purpose of territory is primarily to prevent interference in the family life—in short, it probably arose from sex jealousy. But territory has come to mean something very definite to the male; he must have a piece of land of a certain size and there are special ceremonies connected with procuring and defending territory that are never used in any other connection.

Controversies over territory will never be settled until we know a great deal more than we do now. Dr. Mayr sets a high goal for the bird students of the world: "What is now left to be done is a wide-spread study of territorial phenomena in all species of birds, and their ultimate classification and interpretation."

"Mockingbirds, their Territories and Individualities."¹³—A fascinating tale of experiences with a number of *Mimus polyglottos leucopterus*, all marked with colored bands and all living on the bounty of the Micheners, who have made their home in Pasadena, California, a paradise for Mockingbirds, with berry-bearing shrubs and trees, bathing pools, and unfailing supplies of raisins for each pair. The study started with four males (one five years old), their mates, and one unmated female; it ended thirteen months later with three of these four males and three of the five females—a very high record of survival. On the other hand the four pairs raised only five young (two broods being reared).

These birds 'have two general types of territories, summer territories and winter territories.' "The winter territory centers about the food supply and is defended by both the male and the female, in case the pair remain together, or by the lone male or female occupant. . . . The defense of the winter territories seems much more vigorous than that of the summer territories. . . . The female rarely takes part in the defense of the summer territory."

"A male trying to steal a territory from another male has a characteristic song which he sings from low in the shrubbery. . . . At first this song is rather faint, but if not driven out, he sings with increased loudness and from higher in the shrubbery until finally he is singing the typical territory song from high perches."

The males sing "during spring and summer, stop during the molt, sing again during the fall, gradually decreasing as winter advances," while the females sing "comparatively little and only in the fall and winter." "The young birds sing a faint, soft song quite without imitations of other bird songs but distinctly a mockingbird song." Some immature birds "sing before, during, and after the molt."

"The immatures that want to take up a territory begin, about this time, a monotonous, seemingly everlasting series of slow, separated chips, always given from the same place. If the ownership of the territory is successfully established, the immature, even though it may be a female, takes up the rapid chips, harsh squawks and loud songs about the same time that the adult birds do so."

A ceremony that perhaps marked territorial lines was observed, consisting of bobbing and bowing, while the birds advanced and retreated.

There was a great deal of individuality shown by the different birds. One pair lived in harmony throughout the year, while the male of the other chased his former mate constantly during the fall but by December they were friends once more.

The paper finishes with an analysis of the trapping records of 421 Mockingbirds banded during nine years, citing seven birds that were trapped at the latest three years after banding; six, four years after banding; seven, five years; one, six years; and one, nine years, making this last bird at least ten years old.

This paper is full of important detailed observation on the subject of territory, only a little of which has been quoted here. It is a splendid example of what can be done by an intensive study of a strongly territorial and individualistic species when the birds are distinguished by colored bands.

¹⁰ Mayr, E. 1935. *Proceedings, Linnaean Society of New York*, Nos. 45, 46, 15 p.

¹¹ Tinbergen, N. Over de betekenis van "Territorium" in het leven der vogels. *Vakblad voor Biologen*, 16, No. 6, 95-106.

¹² Field-notes on Greenland Birds. 1930. Part I. *Ibis*, Ser. 12, 6, 280-313.

¹³ Michener, H. and J. R. 1935. *The Condor*, 37, 97-140.

LIFE-HISTORY

"The Hungarian Partridge in the Great Lakes Region."¹⁴—One hundred and forty-three nests of *Perdix perdix* were found in three years; of these only 32 per cent were successful. Farming operations caused the greatest number of losses, with predators coming next, the house cat being the worst enemy of the birds. Winter losses amounted to 5 per cent per month, except when cover was deficient, in which case they rose to 11 per cent. The author concludes that this species is "better adapted to conditions existing in intensively farmed areas than either of our native game birds or the introduced pheasant. It is filling an ecological niche at present unoccupied by native game species and does not appear to compete seriously with native birds."

"The Natural History of the Long-billed Marsh Wren."¹⁵—Male *Telmatoedya palustris* defend territories of thirteen to fifteen thousand square feet near Ithaca, New York, but territorial zeal weakens after incubation starts and vanishes when the young leave the nest. Polygamy occurs to some extent, but the females are hostile to one another. The male builds shells of nests as soon as he settles on his territory, but the female builds the real nest. The incubation

period is thirteen days, while fledging takes fourteen days. The female does all the incubating and all the feeding of the young until they leave the nest, when the male assists in their care. Two broods are raised. The young begin to sing in late August with songs "entirely different from those of the adult."

Mates for Three Years in Succession.¹⁶—A pair of resident Cardinals (*Richmondia c. cardinalis*) and a pair of resident Mockingbirds (*Mimus p. polyglottos*) in Nashville, Tennessee, mated for three seasons. "The Cardinal mates associate with each other during winter, but the pair of Mockingbirds assume an attitude of aloofness toward one another and occupy separate territories between mating seasons."

"Evening Drill of Chimney Swifts during the Late Summer."—A. L. Pickens. 1935. *The Auk*, 52, 149-153. A description of remarkable aerial evolutions of migrating *Chaturia pelagica* before going to roost.

"Observations on Ringed Storks (*C. c. ciconia*) in the Breeding Season."¹⁷—An exciting and complicated tale of Stork happenings at Rossitten during the past year. A male and female that had been brought as young birds three years ago from sixty miles distant and raised at Rossitten both returned, the former to breed, while the latter did not. Another three-year-old male came back to the nest in which he had been reared, but was driven off by the owners. The dry year was very unfavorable for the young Storks; a young bird that died at six days was eaten by its father, while another that died at eleven days was thrown out of the nest.

Storks in Austria.¹⁸—Storks have increased here as elsewhere in the last few years. Statistics are given on forty-five nests: seven broods were destroyed through fights with other Storks, two by storms, one by children; from thirty-five nests eighty-seven young were raised—an average of 2.5 for the successful nests, but only 1.9 if all the nests are taken into account.

"Stork Nest Census in Pommerania in 1934."¹⁹—The census in 1934 showed 3419 nests in contrast to 2194 in 1931. No young were raised in 419 of these nests; 413 eggs and 1089 young were thrown out by the parents. Owing in large measure to the drought, the average number raised per nest was only 2.2 birds. At one nest the male had two mates, one of which was driven off by the other when incubation began; at another two males and one female lived together in peaceful companionship!

¹⁴ Yeatter, R. A. 1934. Univ. Mich. School of Forestry and Conservation. *Bull.* No. 5. 92 p. 35c.

¹⁵ Welter, W. A. 1935. *Wilson Bulletin*, 47, 3-34.

¹⁶ Laskey, Mrs. F. C. 1935. *Bird Banding Brevities. The Migrant*, 6, 10-11.

¹⁷ Schüz, E. 1935. Beobachtungen an beringten Störchen (*C. c. ciconia*) zur Brutzeit. *Bei. Fortpflanzungsbiologie der Vögel*, 11, 61-68.

¹⁸ Seitz, A. 1935. Einige Mitteilungen über den Hausstorch als Brutvogel in Oesterreich 1934. *Bei. Fortpflanzungsbiologie der Vögel*, 11, 85-92.

¹⁹ Holzfuß, E. 1935. Storchnestzählung in Pommern 1934. *Dohrniana, Abhandlungen und Berichte der Pommerschen Naturforschenden Gesellschaft*, 14, p. 53.

PHYSIOLOGICAL EXPERIMENTS

Secondary Sex Characters in the English Sparrow.—In chickens, ducks, and pheasants it has been found that plumage characters are under the influence of the gonads, but this has not proved true of the House Sparrow;²⁰ with this species it is only the color of the bill that is influenced by the male sex hormone. Further experiments²¹ showed the gonads of both sexes to respond in a remarkable manner to injections of anterior lobe of horse pituitary, the authors concluding, "The sexual cycle seems to be entirely and one-sidedly directed by seasonal changes in hypophyseal functions."

Prolactin and Follicle-Stimulating Hormone.—Dr. Riddle and his associates are producing more valuable papers on the physiology of reproduction in birds. They discuss the opposite effects of two hormones elaborated by the anterior pituitary; follicle-stimulating hormone increased the size of gonads and

of combs and space between the pubic bones in fowls, while prolactin had the contrary effect.²² Prolactin was found to induce broodiness in hens, and even to set roosters to clucking.²³

²² Keck, W. N. 1934. The Control of the Secondary Sex Characters in the English Sparrow, *Passer domesticus* (Linnaeus). *J. Exp. Zool.* 67, 315-341.

²³ Witschi, E. and W. N. Keck. 1935. Differential Effect of some Gonadotropic Substances on Development of Cyclical Sex Characters in the English Sparrow. *Pro. Soc. Exp. Biol. & Med.* 32, 598-603.

²⁴ Bates, R. W., E. L. Lahr, & O. Riddle. 1935. The Gross Action of Prolactin and Follicle-stimulating Hormone on the Mature Ovary and Sex Accessories of Fowl. *Am. J. Physiology*, 111, 361-368.

²⁵ Riddle, O., R. W. Bates & E. L. Lahr. 1935. Prolactin Induces Broodiness in Fowl. *Am. J. Physiology*, 111, 352-360.

BIRD BEHAVIOR

"The Kumpan in the Bird's World. The Fellow-Member of the Species as Releasing Factor of Social Behavior."²⁴—In his home at Altenburg near Vienna, Konrad Lorenz has raised a large number of birds, keeping them tame, yet allowing them their liberty. His subjects have comprised 50 Herons of 3 species, 9 Storks of 2 species, a great many Ducks of 4 species, 2 Grey Geese, 13 Hawks of 4 species, 7 Cormorants, 12 Golden Pheasants, a Gull, 2 Terns, 10 Parrots of 3 species, 20 Ravens, 5 Crows, 7 Magpies, over 100 Jackdaws, 2 Jays, 2 Grey Cardinals, and 3 Bullfinches. He has avoided domesticated birds, for these have lost some of their instincts.

Dr. Lorenz contends that comparative psychology should be a *biological* science and that experiment without a thoroughgoing knowledge of natural behavior is worthless. In regard to maze experiments he points out that the more intelligent birds are greatly frightened by changes in the environment, that a new vocabulary is needed that avoids the words used in connection with human emotions, also that new terms must be coined and always used in the same sense. And this Dr. Lorenz proceeds to do.

"The peculiar rôle that the fellow-member of the species (*Artgenosse*) plays in the life of the bird has been strikingly designated by Jakob von Uexkull as the *Kumpan* (companion)" (page 145). We perceive objects as *things*, for we combine the different stimuli from the same object, but animals react to *one* stimulus from an object. Instinctive behavior, directed towards an object, is released through a very small choice of the stimuli coming from that object. When several functions have the same thing for an object, each function corresponds to a different stimulus coming from the same object. Thus it is possible to get the animal to respond to two different things instead of one (to an oil-lamp as the Warmth-Kumpan, and a person as the Leader-Kumpan), or for one thing to give contradictory stimuli that normally come from two different sources. (For instance, a mother Muscovy Duck (*Cairina*) will defend a Mallard duckling that she hears peeping, but the next minute she will kill it, as its down pattern is different from that of her ducklings; her defending instinct was released by the distress cry, but her hovering instinct is released only by a definite pattern of down on the back of the ducklings.)

The functioning of the specific instinctive actions does not lie in the subject, but in the object. Characters that bring definite instinctive responses in a member of the species, Lorenz calls "Releasers" (*Auslöser*). These may be bodily organs (as plumes with herons), or striking behavior, or a combination of both; they are compromises between simplicity and general improbability (*Unwahrscheinlichkeit*).

In contrast to mammals, birds of most species, if raised in isolation, do not recognize the members of their species, but turn their instinctive reactions towards man. This is not true of Curlews and Godwits, which, if hatched out in an incubator, will have nothing to do with human caretakers; they possess an inborn pattern (*Schema*) of the parent and their instincts respond only to adults of their own species.

If we take a Grey Goose a few days old, the case is similar, but if we take the goslings as soon as hatched, they adopt us as parents and will have nothing to do with adult geese. The Grey Goose is a classic example where the pattern of the

Parent-Kumpan is not inborn; it reacts only to the specific alarm-note, but *not* to the call-note. (The reader is referred to Dr. O. Heinroth's fascinating account of the behavior of the *Anatida*.²³) In such a case the inborn pattern of the Parent-Kumpan must be very indefinite; the first object that the goslings see clearly and that moves will answer. Cases are known where a brood tried to attach themselves to a boat. Baby birds that react to the call-note of the mother (as pheasants) can be won back by a mother of their species after first adopting humans as foster parents.

The "imprinting" (*Prägung*) of the Parent-Kumpan takes place at a very definite period in life. Other Kumpan's are settled at different times. For instance, Lorenz's Jackdaw "Tschock" had all his behavior transferred to man except that of flying and caring for young. Lorenz was his Parent-Kumpan, the servant girl was his Love-Kumpan, a flock of Hooded Crows were his Flying-Kumpan's, and a baby Jackdaw served as Child-Kumpan.

Baby Mallards do not attach themselves to people, nor to any foster mother except a Mallard or a domesticated duck; Lorenz believed the reason to be that both these kinds of ducks quack constantly while caring for young, while the Muscovy mother is practically silent. So Lorenz quacked incessantly while a brood of Mallards dived in the incubator; he took them out still quacking and they followed him everywhere. He had to quack all the time, or they would start to give their "lost peeping." "Not until they grew older, was I also their Mother-Kumpan when I was silent," (page 180).

Where personal acquaintanceship plays a rôle, the fellow member of the species becomes more than a Kumpan. With Grey Geese brothers and sisters remain friendly for years although practically never mating, and with other *Anseres* children remain in friendly relationship to the parents for years, and even when they have children of their own renew in the fall the old family relationships.

The subject of the Parent-Kumpan is treated in some detail. The more undeveloped the baby bird at hatching, the simpler is the inborn pattern of the Parent-Kumpan. Young passerines have no releasing behavior for stimulating the parents to brood them; they do not begin to complain as do young herons, raptors, and all precocial young; their mere presence in the nest cavity is sufficient stimulus.

The greeting ceremony of Herons has an inhibitory effect; it is an appeasing ceremony which prevents the bird in the nest from attacking its nest-mates or its parents. Young Night Herons recognize their parents only through the fact that they give the greeting ceremony. When they leave the nest, they do not know their parents, but beg of every adult. Later they learn the territories of their parents, so know them by locality.

Reciprocal actions between the Parent-Kumpan and young are discussed. Begging of young stimulates the parents to feed; this begging reaction is released in a variety of ways: by the voice of the parent, jarring of the nest, cold when the mother leaves, hunger, sight of parent, etc. The reaction of following is released by motion in some cases, by call-notes in others.

"A very important office of the Parent-Kumpan is that of warning the young in case of danger. The reaction to the alarm notes and movements of the parents is inborn in all existing species, with the possible exception of the Mound-birds (*Megapodidae*) where there is no Parent-Kumpan." Warning is "always a true instinctive act and is not uttered with any altruistic purpose. The bird also warns when alone" (page 205). The baby bird appears to run from the alarm-note itself; they always run *from* the mother. The somewhat older bird looks around for the danger.

The second portion of this paper will appear in July and will treat of the Child-Kumpan, the Sex-Kumpan, the Social-Kumpan, and the Brother-and-Sister-Kumpan. I have not touched upon the theoretical aspects discussed by Dr. Lorenz, but have tried to indicate briefly some of the practical bearings of his researches and to give an idea of his revolutionary and illuminating viewpoint. This is a most remarkable paper of fundamental importance.

"The Behavior of Some Young Raptorial Birds," by E. L. Sumner, Jr.²⁵
The author studied in captivity five Pacific Horned Owls (*Bubo virginianus*

pacificus), two Golden Eagles (*Aquila chrysaetos canadensis*) and three Barn Owls (*Tyto alba pratincola*). He concludes:

"The initial, unmodified instincts of young raptorial birds are essentially the same as those of young passerine birds and young cuckoos, as outlined by Herrick. However, the owls are distinctly less precocious at hatching than the hawks (of which eagles may be regarded as typical), and exhibit only a gradual modification of the initial instincts, instead of the early modification shown by the hawks."

"Although the impulse to follow moving objects is instinctive, the ability to capture and kill prey probably is a result of learning, and therefore is not to be regarded as purely instinctive."

This interesting paper closes with a good bibliography, largely from American and English sources.

²⁴ Der Kumpan in der Umwelt des Vogels. Der Artgenosse als auslösendes Moment sozialer Verhaltensweisen. 1935. *Journal für Ornithologie*, 83, 137-213.

²⁵ Beiträge zur Biologie, namentlich Ethologie und Psychologie der Anatiden. 1910. V. Int. Orn. Kon. 589-702.

²⁶ 1934. *Univ. California Pub. Zoology*, 40, No. 8, 331-362.

BOOKS

"The Behaviour of Animals. An Introduction to its Study," by E. S. Russell. 1934. London: Edward Arnold. N. Y.: Longmans-Green. \$4.20. 184 p.—An excellent introduction to the study of animal behavior, written in good, clear English with a wealth of examples selected from the whole animal kingdom. "Emphasis has been laid on the ecological and 'natural history' aspect of behaviour, which is apt to be overlooked by the laboratory worker" (page v). The author states that "the most characteristic feature of behaviour" is "that the animal tries to or strives to do something specific, that it seeks to achieve some end, to satisfy some need" (page 3).

"To understand the acts we must put them in relation with the life of the animal, discover how they further one or other of the main purposes of its life—maintenance or reproduction" (pages 15, 16).

"In the second place we must ask, *to what exactly does the animal respond?* Or, in other words, what does it perceive? . . . even if its sense organs are similar in capacity to ours the focal points of interest in its perceptual world may be quite different from ours, and it may perceive and attend to these alone" (page 16).

There are chapters dealing with Behaviour and Ecology, Maintenance Activities, and various aspects of Instinctive Behaviour, and an excellent treatment of the subject of learning. One of the valuable features of the book is the extended bibliography from English, American, and Continental sources that follows each chapter.

"On Quiet Paths," by Walter von Sanden.²⁷—A most sympathetic account of the life on and about Lake Guja in East Prussia. The author is a true artist in his feeling for beauty, as shown both by his delightful style and by the distinguished photographs which adorn the book. He tells us of the home life of the Marsh Harrier and the Bittern, he notes the doings of shrews and crawfish and the blooming of flowers, and he describes the nesting of Swans and Nightjars. He has a fellow feeling for all nature and he gives us a bit of philosophy on occasion. "If animals will let us look into their lives, then they demand our undivided time." "Whoever will penetrate into nature, must leave much else alone." All in all, a charming book, beautifully illustrated with pictures taken by the author.

²⁷ Auf stillen Pfaden. 1934. 123 p. 105 plates. RM. 3. 75. Königsberg Pr. Gräfe und Unzer.

"The Hawks of North America," by John B. May. 1935. 140 pages. The National Association Audubon Societies. \$1.25.—This is a handsome book with fine colored plates from paintings by Allan Brooks of every species of North American Hawk, Kite, and Vulture. There are also four full plates showing outlines of Hawks in flight. These plates are so valuable that it would be a fine thing to have them reprinted as a pamphlet which could be easily carried in the field.

The emphasis in the book is primarily on conservation—on arousing interest in these splendid birds that are so rapidly diminishing in numbers. Under each species range, field-marks, and food are the subjects treated, the last topic in great detail and with entire impartiality, so that the book serves as a mine of information.

Maps are given showing the breeding-range of each species; the present range shaded, the former range in solid black. With most of the Hawks, although their numbers are much smaller than in the past, black is not used on the maps. But with both Eagles, three Kites and the California Condor, there is a tragic showing, for with all but the Golden Eagle the range is almost wholly black. This is an alarming situation and calls for the strictest measures of protection, especially for the beautiful and beneficial White-tailed, Swallow-tailed, and Mississippi Kites—all of which have been almost extirpated in our country. With the first and last species egg-collecting has undoubtedly been one important factor in the birds' decrease. The book closes with a useful list of the State laws in regard to Hawks and a ten-page bibliography.

The book is being sold below cost, and all receipts from sales will go into the Hawk and Owl Fund of The National Association of Audubon Societies. No bird-student can afford to be without this valuable book, and it would be a fine idea if individuals, bird clubs, and Audubon Societies would give copies to schools, public libraries, granges, and such institutions.