summer and return. I call attention to this as a "neighborhood group" not as a proposition proved, but to suggest it as probable, and something which may be proved by this method of study.

Chipping Sparrows (*Spizella passerina passerina*). After having Myrtle Warblers return after three years, I did hope for one or two Chipping Sparrows but did not get a single one though I had banded 266 of them in the three years, 1915 to 1917. Among the new Chipping Sparrows only eight of the 110 banded had swollen toes, but it is probably only by chance that this does not equal the ten per cent, found in former years. But why do Chipping Sparrows have so great a proportion of diseased toes, while the condition seems never to be found in other birds?

Individuality in Birds.—The behavior of the individual when handled is interesting. The Cardinal nearly always screams and squeals and fights with energy, yet four of the twenty-nine handled in 1920 are marked to have squealed very little. This is not an accident of the moment, for the same bird will act the same way every time it is handled. Myrtle Warbler (45490) taken six times squealed every time, though no other Myrtle Warbler of nearly 200 handled has squealed in my hands. Of the hundred or more Chipping Sparrows handled this year five only have squealed in handling.

Of about the 730 birds trapped in February and March only six were killed, and these by shrikes or hawks, but many more would have been destroyed if we had not watched the neighborhood with a gun.

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THE MARRIAGE RELATIONS OF THE HOUSE WREN (TROGLODYTES A. AEDON).

BY S. PRENTISS BALDWIN

INTRODUCTION.

The belief that most birds mate for life and each year return to the site of the previous nest to rear their young, is very old, and in the popular mind it is probably more or less generally accepted. The following data will have a bearing on this matter

and will also throw additional light on the interesting subject of incubation periods.

It was in the spring of 1915 that I began the use of trap nest boxes and numbered bands for the house wrens on my farm near Cleveland, Ohio, and made the interesting discovery of my first 'wren divorce.'[1] This pair, having successfully raised one brood together, separated, and each secured a new mate for the second brood of the same season. The question that was immediately presented by this action was: is this exceptional or is it a matter of regular occurrence with this species?

Since then I have used increasing care to take the adults of each season and to band both them and their young, with the result that my suggested need of a geneological tree, seems warranted. When it is realized that in one case, I have an accurate record from the original parent stock to the third generation in direct line, with numerous uncles, aunts, cousins, brothers and sisters, it is apparent that the services of a trained genealogist may be needed to continue the record.

In trapping the occupants of my nest boxes, I have found it advisable to wait until the adults are actively engaged in bringing food to the young. There is then no question as to the mates for the nest under observation and there is less danger of the birds deserting. I have at times trapped one or both adults before the eggs were hatched or even laid, but they will almost invariably abandon the nest if interfered with at that time. I have also found it advisable to carry an account with the nest boxes since the resulting data provide interesting information relative to incubation periods and time from hatching to flight, as well as the choice of the birds for the different locations of the nest boxes.

In the paper previously referred to, I gave a summary of the first "wren divorce case" that came to my attention. In the following paragraphs this case is reviewed in addition to the family histories of four additional cases that I have studied. Although the term "divorce" may not be just the technical word that fits the case, their apparent love of change in marriage relations seems to fully justify its use. It has been suggested that poly-

[1] 'Bird-Banding by Means of Systematic Trapping' S Prentiss Baldwin, Abstract Proc. Linn. Soc. of N. Y., No. 31, 1919, p. 49.

gamy may enter into the consideration and that two families may be raised at once, but if this is ever true, there has been no evidence of it among the wrens that have been under my observation.

THE "A" GROUP.

My first case was provided by the pair of wrens that carried bands numbered 27739 and 27740 and reared their brood in box No. 9 on the greenhouse. These birds were banded on June 19, 1915 and after the young had flown I was absent from the farm for about six weeks. Upon my return on August 15, I was surprised to find another brood in this same box ready to fly. When the adults were trapped I was further surprised to find that while one parent was No. 27740, the other was unbanded. I gave this new mate band No. 27782 presuming at the time that No. 27739 had met with an accident.

But upon making the rounds of the other boxes I discovered that instead of being a casualty, this bird was the proud father (or mother) of another brood by another mate in a box only 100 feet distant on the pumphouse. I was unable to capture this mate but it was not a banded bird. Here was a clear case of divorce both birds remating with new mates and raising second broods the same season.

Number 27740 has not been heard from since, but the following year (June 23, 1916) No. 27739 was back in the box on the pumphouse where its second brood of 1915 had been raised. This year I succeeded in trapping the mate, banding it as No. 38491, but I do not, of course, know whether or not this was the second mate of 1915.

THE "B" GROUP.

On July 4, 1917, box No. 51, in the east garden was occupied by Nos. 44008, 44009 and their brood. Neither of these birds raised a second brood during that season (at least they did not occupy any of my boxes) but on June 19, 1918, No. 44008 was back at the same box, with a different mate No. 44100. The next year (June 17, 1919) box No. 19 on the greenhouse was occupied by these two, this being my first record of a pair of wrens that have either remained mated or have returned and remated after one season. This box is located about 200 feet from No. 51

where the 1917 and 1918 broods were raised. The broods of 1918 and 1919 were therefore full blood brothers and sisters although only step-brothers and sisters to the brood of 1917. No record of any of this family in 1920.

THE "C" GROUP.

Box No. 25 on the laundry was occupied June 17, 1919, by numbers 45302 and 45303. The brood was raised and No. 45302 then disappeared, but its mate, No. 45303, mated again and on July 10 was busily engaged in the rearing of a second brood in box No. 53, on the library, with a mate that was numbered 45349. For No. 45303 we thus have for this season a second mate and a second brood in a different box.

In 1920 (June 17) 45303 again returned and again started nest-building in box No. 25 on the laundry where the first brood of 1919 was raised. The mate this year was No. 45342, which had a curious history with 45335 and 45349 in 1919. He, 45342, had settled alone in box No. 53 on the library, on June 26, 1919, where he sang and carried on nest building by himself until driven out by 45349 and 45335. On July 29, 1920, this pair (45303 and 45342) were raising their second brood for the season, in the same box. The total record for No. 45303 is therefore; four broods in two years, or 27 young; with three mates. Three of the broods were raised in the same box. It should be further noted that in 1920 there was no divorce, as both broods were by the same mates, and in the same box.

Going back now to No. 45349, the second mate of 45303, and we have a little of his earlier history. He was taken on July 4, 1919 in box 53 on the library with 45335. These two were seen together just this one day but they seemed to be busily engaged in nest building. Number 45335 had been mated with No. 45334 in box 63 on the woodshed and their brood had only left the nest two days previous. This was apparently, only a flirtation however, as 45349 finally mated with 45303 (as above) in this box and raised a brood of seven youngsters.

In 1920, No. 45349, the second mate of 45303 in 1919, selected a new mate, No. 46006 and proceeded to nest in box No. 47 on the garage. Thus 45349 and 45303, who were mates for the second brood of 1919, both appear in 1920 with new mates.

THE "D" GROUP.

This family history started on July 14, 1918 when I banded numbers 45205 and 45206 at their nest in box No. 47 on the garage. The brood was not banded. Nothing more from this pair during 1918 and 45205 drops entirely from sight, but in 1919 (June 17) I found that 45206 had returned with a new mate, given band 45311, and was nesting in box No. 26 in the sugar house. After this brood had flown 45311 took a second partner No. 45324, and proceeded to nest in box No. 6 on the upper barn. This was on August 5, and as this second mate of 45311 was banded, I referred to my records to learn that it had already raised one brood that year (banded June 19) with No. 45332 in box No. 3 on the farmhouse.

This latter case (45324 and 45332) was the start of an interesting geneological tree. They were banded in box No. 3 on June 19, 1919, their brood receiving numbers 45325 to 45331. On June 22, 1920, I took and banded (No. 45968) a bird in box 53 on the library, where it had evidently been nest building alone, singing constantly. On July 5 a mate appeared which I captured on the 7th and my delight may be imagined when I found it was No. 45325, one of the 1919 brood of 45324 and 45332 raised in box No. 3 on the farmhouse.

These birds now moved around to the other side of the house to box No. 59, probably because I caught and handled them at No. 53 before the home ties were cemented by eggs and young. On July 27 their young were hatched and were later given bands No. 46074 to 46079. These young were therefore the grandchildren of numbers 45324 and 45332.

THE "E" GROUP

In the case of numbers 45334 and 45335, that started my record of the "E" family, there were strong indications of a serious flirtation as well as some unquestioned divorces. This pair nested in box No. 63 on the Woodshed and were banded together with their brood, on June 25, 1919. On July 4, just two days after their young had flown, No. 45335 was taken with No. 45349 in box No. 43 on the library (See "C" Family) where, after routing out No. 45342, who had been in solitary possession, they

engaged in active nest building for a day or two. The nest was then abandoned and it may be that 45335 returned to his former mate, No. 45334 in box No. 30 on the ice-house. This latter bird, with its mate, raised a second brood, the first having been in No. 63. I regret that I was unable to capture the mate, since if it was No. 45335, it would prove the suggestion of a flirtation.

Number 45335 returned in 1920 with a new mate, given number 45955, and a brood was raised in box No. 49 in the garden and banded on June 15. Following this they were divorced and with new mates they both proceeded to the raising of their second broods. Number 45335 mated with 45988 (new) and raised a second brood in box No. 63 on the woodshed, while No. 45955 mated with No. 46032 (also new) and nested in box No. 37 on the cottage. Thus after the divorce, both of the original pair secured new mates and raised second broods in the same season. Number 45335 has made a record of four broods in two seasons with at least three and possibly four mates, i. e. in case the first year's affair was only a flirtation. The second year it was a clear divorce.

It is interesting to note that in many cases, the second mates have been 'new' birds, i. e. they had not been recorded from my territory before, which would indicate that there must be considerable trading back and forth between different areas. In some other region, possibly close by my farm, there may have been several of my banded birds raising broods with mates that later moved over to my district and remated for the second brood. Such a theory could probably be proved if a well coordinated system were established. This might also explain what has become of the large number of young that I have banded, for, it will be seen from the foregoing account, only one of the young raised in my boxes has returned to nest in a succeeding season.

The successive matings of the birds in these five groups may be tabulated as follows in order to give a clearer idea of their complicated relationships. The first and second broods in each year are denoted by "a" and "b" after the year, while the "×" between two numbers indicates that the two birds represented by those numbers were paired. The device in Group "D" denotes that 45325 was the offspring of the 1919 pair with which it is connected.

		GROUP A.	
1915a.		27739 × 27740	
1915b.	00000 × 27739	27740 × 27782	
1916.	38491 × 27739		
		GROUP B.	
1917.		44008 × 44009	
1918.	44100 × 44008		
1919.	44100 × 44008		
		GROUP C.	
1919a.		45303 × 45302	
1919b.		45349* × 45303	
1920a.	46006 × 45349	45303 × 45342	
1920b.		45303 × 45342	
		GROUP D.	
1918.	45205 × 45206		
1919a.		45206 × 45311	45324 × 45332
1919b.		45311 × 45324	|
1920.			45325 × 45968
		GROUP E.	
1919a.		45334 × 45335	
1919b.		45334 × 45335*(?)	
1920a.		45335 × 45955	
1920b.	45988 ——× ——45335		45955 × 46032

In keeping an account with each nest box, I have also secured some interesting information relative to the incubation periods, length of time from hatching to flight, and various idiosyncrasies of these birds. For the sake of those who are interested in such data this is presented in the following table. I regret that it is not complete for all cases.

BOX NUMBER	NEST STARTED	NEST COMPLETED	SET COMPLETED	EGGS HATCH	YOUNG LEAVE
6	—	—	July 4 (5)	July 13	July 28
23	July 4	No progress by July 23 and the nest removed.†			
25	July 4	July 6	July 13	July 26	Aug. 10
37	—	—	July 6 (6)	July 20	—
47	—	—	July 7	July 19	—
59	July 4	—	July 15 (6)	July 27	Aug. 12
63	—	—	—	July 3	July 20

* Just prior to pairing with 45303, 45349 was nest building for one day with 45335, but both abandoned the partnership. It is thought that the latter mated again with 45334 but this is not proven.

† This box is near No. 25 and the nest was apparently built by the occupants of No. 25 as a diversion, or in the same manner that marsh wrens build their dummy nests. The building instinct seems to need exercise in some cases, while the mate is incubating.

From the above data, I conclude that the incubation period is usually about 13 or 14 days and the period from hatching to leaving the nest, not less than two weeks, generally longer.

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THE ENGLISH SPARROW (PASSER DOMESTICUS) AND THE MOTOR VEHICLE.

BY W. H. BERGTOLD.

The writer does not hesitate to express and record his conviction that there has been a very notable decrease in the number of English Sparrows in Denver, during the past few years; this decrease amounts, almost, to disappearance within the business area. It is now, unfortunately, impossible to fix the exact beginning of this decrease, but the writer feels safe in saying that it has been going on for at least three or four years.

It will be of interest, and of some importance to analyze the conditions which, probably, have been, and are, bringing about a much-to-be desired diminution in the numbers of this exotic bird.

Fifteen years ago one could see on any of the crowded business streets of Denver, dozens, nay, hundreds of English Sparrows, and the air was then resonant with their shrill notes of love, war and alarm; during the past few months the writer has taken special notice of the abundance of this sparrow in the down-town districts, often making special excursions through various streets for the express purpose of estimating such abundance. It is the plain truth when the statement is made that not even a single sparrow has been seen on the business streets during any of the walks; the writer frequently walks from his office to various places of business, a mile or more, and does not *hear* any English Sparrows, much less see them. If this change be pointed out to the average citizen, he suddenly awakens to its truth and asks "why?"

There is a well grassed and timbered area surrounding the Court House opposite the writer's office and fifteen years ago both its trees and lawn were simply alive with English Sparrows, and their dis-