NESTING BEHAVIOR OF THE SOUTHERN HOUSE WREN IN SURINAM

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The range of the Southern House Wren (*Troglodytes musculus*) is very large, as the species occurs from the tropical coastal zone of eastern México and the Lesser Antilles southward to Argentina, Chile, and the Falkland Islands. In Surinam the bird is well known as the Gado fowroe (God bird). It is one of the commonest birds in the cultivated area of the coastal region and is present everywhere in gardens of the town and smaller settlements. This wren is also found in the extensive "parwa," the woods of *Avicennia nitida* bordering the sea coast, in the coffee plantations, and on the dry sandy savannas in the interior of the country. It is lacking, however, in the midst of dense forests, but an abandoned shed in a clearing will almost certainly harbor a couple of these birds.

This house wren is somewhat larger than the European Wren (*Troglodytes troglodytes*). The weight of two males was 12.2 and 12.6 grams, of two females 11.7 and 13.4 grams. The sexes are indistinguishable in appearance, but only the male sings.

Display.—The display seen most commonly is one in which both members of a pair vibrate their wings like begging nestlings, the male singing loudly, the female uttering a chirupping sound. This display was seen when there were nestlings seven days old in the nest belonging to the displaying couple.

A few times I observed another kind of display which may be considered as a threatening display. On March 24, 1946, two wrens were seen together, one of them singing and drooping its wings. It kept its head and bill turned upward, the other bird sitting near by but taking no notice whatever of the displaying bird and keeping silent. Both birds moved through the shrubbery, keeping each other's company, the male singing continuously and displaying in the manner described. It looked as if it was showing its white throat and breast to the other bird.

On May 30, 1946, two birds were fighting and chasing each other while a third one remained on the spot and sang all the time with its head and bill pointed upward in a stiff way and the wings trembling. Again on June 16, 1946, three wrens were chasing each other, two of them singing and trembling the wings, but this time the pointing upward of the head and bill was not seen.

Courtship feeding was never seen, although in the common display in which both sexes sit with trembling wings near each other, the male singing and female uttering a chirupping sound, I often expected it. It is indeed apparently absent in the Troglodytidae (Lack, Auk, 57, 1940:169-178).

Breeding season.—Nests with eggs may be found in all months of the year. In the large oological collection assembled in Surinam for the Penard brothers, there are sets of eggs for every month of the year. However, most sets were taken in January and July (Hellebrekers, Zool. Medeelingen, 24, 1942:274).

Certainly at least two broods are reared in a season; presumably even more are raised but this can only be ascertained with certainty by color marking of individual birds. A pair in my garden reared two broods in the same nest. On December 24, 1948, the nest contained four eggs and the young left on January 23 and 24, 1949. On February 10, 1949, the nest seemed to be lined again with white feathers, but the second brood was not started until April. On April 25 there were four eggs. The interval between the first and second broods was therefore 92 days.

Nest building.—This wren is not conservative in its choice of a place to build its

nest. In the town and in settlements the nest is very often found on rafters under houses, but also in sheds, in all kinds of crevices, and in holes of trees.

The nest itself is an open one and a rather rough affair of dry sticks of different lengths protruding in all directions, with a nest cup in the middle of it. The cup is lined with soft material, such as feathers, but I have also found pieces of soft paper and even a wing of a cockroach.

Both sexes take part in the building of the nest, a fact which can be ascertained easily as the male often sings when coming to the nest with a stick in its bill. Many nests which are started are never completed. The building itself goes on in a rather leisurely way, and a long time may elapse before the nest is ready for eggs. On December 1, 1948, I found a nest which was not yet lined with feathers; the first egg was not laid until December 25.

When the same nest is used again for the second brood, it is probably cleaned. On May 18, 1947, I watched a female wren (the male was singing near by) taking feathers from a nest to let them drop at some distance. It returned to the nest about a dozen times, each time taking a white feather from the nestcup. On June 29 this nest contained a clutch of three eggs.

Clutch size.—In the Penard oological collection, the majority of sets of this wren consist of three and four eggs. As to the measurements of the eggs I refer the reader to the paper by Hellebrekers (1942, *op. cit.*). The weights of three fresh eggs (April 24, 1949) were 1.68, 1.78 and 1.92 grams.

Incubation.—Incubation is performed by only one bird and in all cases the non-singing one, that is, the female. Only once could I establish the incubation period. The last egg of a clutch of four was laid on April 29, 1949. On May 12 at 12:30 a.m., one nestling hatched, following by two others at 3:45 p.m. The last one was out of the shell in the early morning of May 13. This gives an incubation period of 14 days. Skutch (Auk, 62, 1945:22) reported incubation periods of 15 and 16 days for *T. m. inquietus* in Panamá and 16 and 17 days for *T. m. intermedius* in Costa Rica.

The rearing of the young.—The second brood hatched at my house in May, 1949, permitted observations on the rearing of the young. The nest could be watched easily from behind a shutter. In table 1 data on development of the four nestlings are given

Table 1

Daily Weights of Nestlings in Grams

	Nestling			
Age in days	1	2	3	4
0	2.50	1.95	1.90	2.05
1	2.93	2.75	2.20	2.70
2	4.25	3.92	3.38	3.72
3	5.28	5.24	4.55	5.52
4	7.16	6.95	6.20	6.82
5	9.32	8.72	7.80	8.32
6	10.52	9.95	9.07	9.95
7	11.65	10.95	10.45	11.32
8	12.72	11.92	11.52	12.82
9	13.07	12.70	12.60	13.12
10	14.00	13.27	13.22	12.85
11	13.78	13.65	13.15	12.50
12	13.50	13.10	13.00	12.93
13	13.33	13.33	13.08	.....

until the 13th day. After that time I refrained from weighing them as they might have left the nest prematurely. The young were covered by the adult bird until May 16, the age of the young then being four days.

Both sexes fed the young in the nest, the male being easily recognized, as it often arrived singing with food in its bill, to leave singing again after delivering it. Often the male came with food while the female was still on the nest and then the female sometimes took the food from the male's bill to deliver it herself to the nestlings. It became clear, and I noticed no exception of this rule, that at each feeding visit all the food was given to only a single nestling.

The feces of the young were swallowed by the old birds until the nestlings were three days old and from then on they were taken away. When the young were able to stand in the nest, it was seen that a nestling about to defecate stood up with drooping wings and deliberately turned its abdomen upward to the adult bird. The latter took the fecal sac as soon as it emerged from the cloaca of the nestling.

When watching the feeding of the young, I observed another typical postfeeding behavior consisting of "probing" or "digging" among the nestlings after the food had been delivered to a single nestling. On doing this the old bird dived head first amidst the nestlings, wriggling with its wings, doing its utmost to reach something which remained invisible to me. Whatever was sought apparently lay on the very bottom of the nest, as the bird was almost standing on its head. When emerging again, the parent made disdistinct swallowing movements.

This postfeeding behavior was first described by Pullen (Brit. Birds, 38, 1945:206). Afterward an interesting discussion followed in the journal "British Birds" from which it became clear that this behavior is of common occurrence in a number of small passerine birds. Of the suggestions given in this discussion, I would support the theory that parasites are removed and eaten. I would add the idea that removal and swallowing of remnants of food just delivered to a nestling also occurs, for I often saw distinctly that the particular nestling which got all the food had difficulties in swallowing the whole lot. I must admit, however, that I never was able to discern what the old bird was actually eating after the probing. I agree with Hurrell (Brit. Birds, 38, 1945:300) that the action has nothing to do with the ordinary removal of feces. This conclusion is supported by the following observation: On May 22 at 3:52 p.m., when the young were 10 days old, an adult bird was in the act of probing among the nestlings in the matter described when it was interrupted by the defecating of one of the nestlings. The parent stopped probing immediately and, to my surprise, took the fecal sac and swallowed it, then started probing once more. When it emerged again, it was seen swallowing something.

As pointed out before the fecal sac was normally taken away from young of this age and my explanation of this exception from the rule is that the bird was suddenly interrupted in its postfeeding action of probing and that it simply could not fly away at this stage and so swallowed the feces.

In table 2 I give a list of the frequency of feeding, probing and fecal removal in one-hour periods. I was able to establish the fledging period of the young in two instances. The first brood at my house hatched on January 5, 1949, and left the nest on January 23 and 24, which gives a fledging period of 18 to 19 days. The second brood in the same nest hatched on May 12 and 13 and left the nest on May 29, which gives a fledging period of 17 to 18 days. These figures agree with those provided by Skutch (1945:22). After leaving the nest the young are fed for some time by both parents.

I marked the young of the second brood which left the nest on May 29 and so was able to recognize them. Although two of them fell victim to a cat shortly after leaving

Table 2

Frequency of Feeding, Probing and Fecal Removal in One-hour Periods

Date	Age of young in days	Time	Times fed	Probing	Fecal removal
May 17	5	2:50 p.m.–3:50 p.m.	17	5	4
May 20	8	3:15 p.m.–4:15 p.m.	11	1	4
May 22	10	9:55 a.m.–10:55 a.m.	21	8	6
		3:12 p.m.–4:12 p.m.	12	6	3
May 25	13	2:58 p.m.–3:58 p.m.	13	1	3
May 26	14	2:57 p.m.–3:57 p.m.	16	3	4

the nest, the other two were still being fed by one of the old birds in my garden on June 5, which is seven days after fledging. I did not see them afterward, so I am not able to say whether this period of dependency on the old birds is not longer.

Parasitism by cowbirds.—In Surinam the Southern House When is a common host of the Shiny Cowbird (*Molothrus bonariensis*) as reported by the Penard brothers (De vogels van Guyana, 2). I watched a female cowbird inspecting the rafters of a building where wrens were nesting regularly on March 7, 1947, and August 16, 1950, the wrens being present and scolding loudly. When the cowbird left, it was pursued in flight by one of the wrens.

Paramaribo, Surinam, South America, March 17, 1952.