SOME OBSERVATIONS ON THE NESTING OF THE SCARLET TANAGER (*Piranga erythromelas*)

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Some Observations on the Nesting of the Scarlet Tanager

On June 25, 1940, a nest of the Scarlet Tanager, Piranga erythromelas, was discovered in Manville, University of Michigan Biological Station. On the same day a bird tower was erected. Observations were made from a canvas blind on the tower, which was placed 17 inches from the nest, and these observations were continued for nine days. At this time the nest was vacated and the young could not be found. At the time of discovery the nest contained one young bird and an egg of the Scarlet Tanager, plus a cowbird egg. A second nest which seemed very likely to be a Scarlet Tanager's was later located near Pine Point, Douglas Lake, but was vacant. This nest was brought in for comparison with the first nest.

The writer wishes to express his thanks to Dr. Olin Sewall Pettingill, Jr. who has given encouragement and help on several occasions, and to Dr. Theodora Nelson, who first suggested the possibilities for study on the Scarlet Tanager, and who, in fact, pointed out the nest that was used during the period of ovservation. Thanks are due also to members of the Advanced Ornithology class who were very kind in attempting to locate nests, and to tell of any observations made on this bird.

RANGE AND HABITAT

The Scarlet Tanager is primarily a bird of the Alleghanian and Carolinian zones, nesting throughout the north-

central and eastern parts of the United States. It seems to be primarily a bird of the woodlands, although it occasionally nests in orchards and in trees bordering village streets. Forbush (1929:132) says, "They seem to prefer white oak woods, but may be found anywhere in deciduous woods, and in mixed growths, especially in a well-watered country." Todd (1940:592) says that the Scarlet Tanager is pre-eminently a bird of the forest and is especially partial to hemlock and beech woodlands, and Commons (cf. Roberts 1932:332) says that it is found in pine and tamarack swamps in the northern part of its range and also in pine woods.

The nests located near Douglas Lake, Michigan, were in an aspen association with scattered oak, maple, and pine trees, and although the nests examined were found in the Northern Red Oak, Quercus borealis, in Manville, and in the Red Maple, Acer rubra, at Pine Point, nests have also been recorded in such trees as: pine, tamarack, hemlock, chestnut, and redbud. Birds found in close association with the Scarlet Tanager in Manville include the Red-eyed Vireo, Hummingbird, Goldfinch, Redstart, Cedar Waxwing, and Purple Martins. Other nesting birds in this area include the Robin, Chipping Sparrow, Kingbird, Blue Jay and others.

NEST

The nest of the Scarlet Tanager seems to be characteristically built on a horizontal limb several feet from the trunk of the tree and averaging less than twenty feet above ground. The positions of the nests observed by the writer apparently are typical for this species and were placed as follows:

	Nest "A"	Nest "B"
Tree	Quercus borealis	Acer rubra
Height above ground	15' 11"	16' 3"
Distance from trunk	17' 3½"	8' 8"
Distance from end of limb	5'	3'
Position on limb	Three forks	Main branch with smaller side branches
Size of limbs	1"; ½"; ¼"	¼"; ¼"; ½"
Circumference of tree	61"	31"

Barrows (1912:539) says, "The nest----is usually placed on the horizontal branch of a forest tree at some distance from the trunk, but ordinarily less than 20 feet from the ground. Occasionally it is placed close against the trunk, and more rarely still in the upright fork of a small tree." Chapman (1932:495) says the nest is located generally near the end of a horizontal limb, seven to twenty feet up.

The nest is rather flimsily built and so thin on the bottom that by looking from below, the outlines of the eggs can be seen. The nests observed were not attached to the limbs, but were rather insecurely resting on or between them. The building materials and the measurements of the nests observed by the writer are summarized below:

Material	Nest "A"	Nest "B"
lining	Fine rootlets	Clusters of fruit stems of wild cherry, etc., a few Pteris leaflets, rootlets
bulk	Sticks, grass stems large tendrils	Sticks, tendrils, grass stems, spruce twiglets
trimming	Flower stems with dried flower heads intact	Flower heads with their stalks, dried

Measurements	Nest "A"	Nest "B"
inside diameter	7 cm.	6 cm.
outside diameter	13 cm.	13 cm.
inside depth	3 cm.	2.6 cm.
outside depth	------	5.2 cm.

Forbush (1929:129), in describing the nest says it is a rather large, flat, thin structure of twigs, fine bark strips or weed stems, grasses, and lined with fine rootlets. He, too, remarks that it is loosely built so that eggs may be seen from below. G. M. Sutton (cf. Todd 1940:593) says, "The nest is neither compact, strong, nor particularly neat. It is composed of slender weed stalks and stems of leaves and is lined with dry grasses and fine rootlets."

NESTBUILDING AND COURTSHIP

Nestbuilding was not observed by the writer, and since the young had already hatched at the time of discovery of the nest, it was not possible to determine the incubation period, although thirteen days is given by Bergtold (1917:593), who took his information from Dugmore's Bird Homes. George M. Sutton (cf. Todd 1940:593) says of the Scarlet Tanager's nest building and courtship habits: "The male, reaching his nesting ground somewhat in advance of his dull-colored mate, usually does not sing volubly on the day of his arrival---. Nestbuilding begins promptly after courtship and mating are finished. The female does all the work of construction and a nest may be built in a remarkably short time, frequently in little more than a day. She may work feverishly for periods of fifteen minutes or more, then apparently forget parental duties and devote herself to preening, bathing, or feeding. All the while, the male sings loudly, as if announcing repeatedly to his mate that he is ready

to give battle the moment an enemy invades their chosen nesting grounds."

Marie Andrews Commons, writing for Roberts (1932:332) says, speaking of the actions of the male, "He is not, however, unmindful of his duties, for later, during the period of incubation, he tempts her to leave the nest by venturing near at frequent intervals with food, which she eagerly accepts with partly open, quivering wings, in the manner of a young bird being fed by the parent."

Forbush (1928:132) says that the males allow their wings to droop and they cock their tail up in hot weather. This posture is exaggerated during courtship by dragging the wings and fluffing up the scarlet plumage. Quoting, "The female attends to the duties of nest building and incubation. But she is not lonely, for while the male does not assist her, his part of the domestic duties at this time consists of furnishing the entertainment."

Barrows (1912:540) in discussing the nesting time and broods raised says that they are most often found during the first two weeks of June, but records are on file of nests in [illegible] Michigan as early as May 29. He also tells of R. H. Wolcott [illegible] recording a nest as early as May 12. Quoting, "No doubt a second brood is reared occasionally, since young just able to fly are frequently seen late in July or early in August, and occasionally males, still in their scarlet plumage, are found singing until the very last of August." This is the only reference found to a second brood, although Sutton (cf. Todd, 1940:594) says, "So far as I have been able to determine, only one brood is reared in a season, although a new nest is built and a second set of

eggs laid if the first eggs are destroyed." The writer observed copulation on June 30, five days before the young bird left the nest. The female, resting on a limb about 20 feet from the nest, fluttered her wings and emitted a soft chee chee chee. The male hovered over her, beating his wings rapidly during copulation. This action might relate to a second nesting.

EGGS

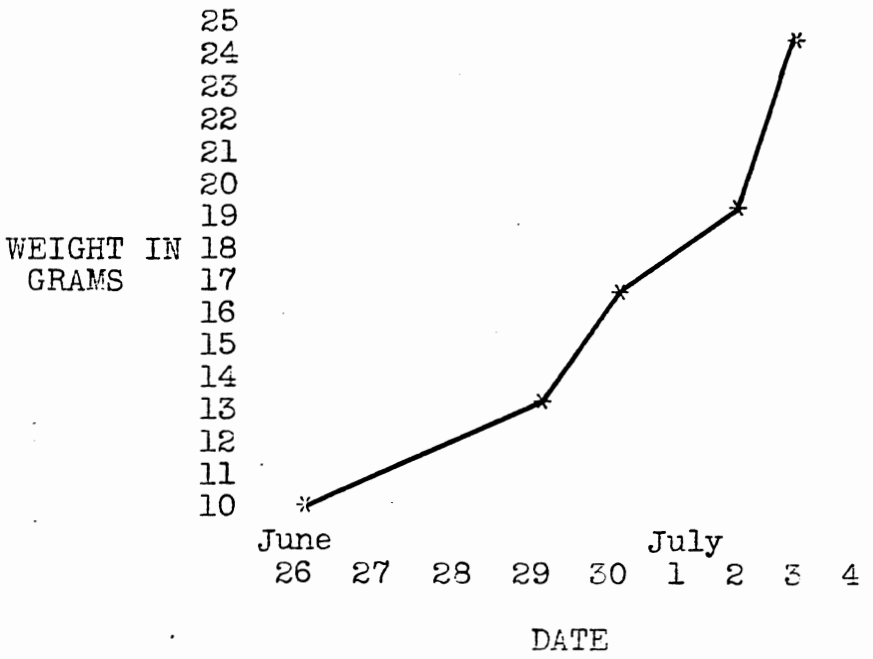
The egg of the Scarlet Tanager which was in the nest at the time of discovery, was observed to be bluish-green with brownish spots of varying sizes and shapes clustered more heavily on the larger end, and measured 2.5 cm. by 1.8 cm. The weight was not taken because the egg had been punctured in three places with very small holes, and the contents had dried. Measurements of eggs made by various authors indicate size ranges in inches of 0.85 to 1.02 by 0.62 to 0.70. Eggs number from three to five.

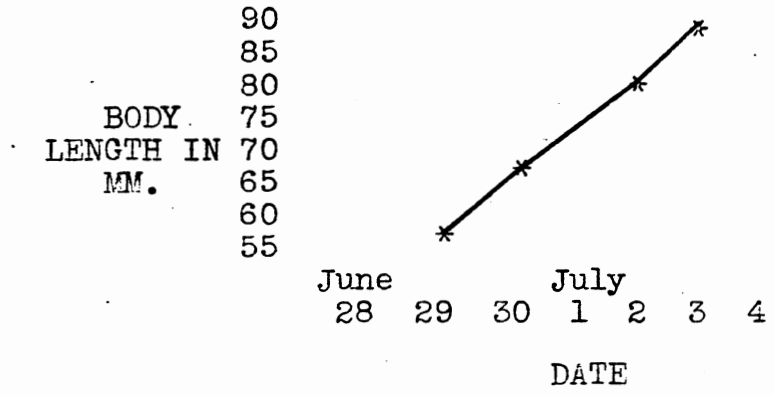
DESCRIPTION AND GROWTH

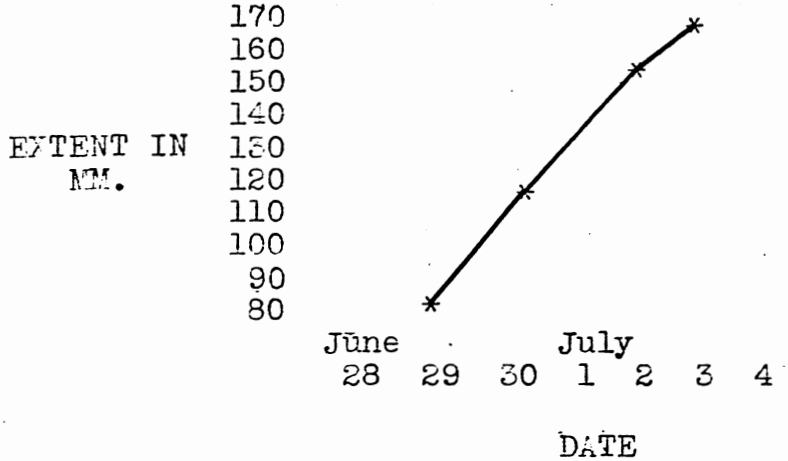
At the time of discovery of the nest the age of the young Scarlet Tanager was not known, but the bird was evidently only a day or two old because the eyes were not open and there was only a slight amount of grayish down, although the pin feathers could be seen under the skin. The naked bird was very helpless and sprawling. The skin was a pinkish-yellow, the bill yellowish-orange, and the inside of the mouth orange. Although weights were not taken during the first day or two, the charts of weights and measurements given below include observations between 7:30 and 8:00 P.M. on each subsequent day. Weight is recorded in grams and measurements in millimeters.

Date	Weight	Length	Extent	Wing	Tail	Bill	Tarsus
6-26	10.39 g.	------	------	----	----	----	------
6-27	------	------	------	----	----	----	------
6-28	------	------	------	----	----	----	------
6-29	13.45 g.	57 mm.	80 mm.	20 mm.	0 mm.	7 mm.	15 mm.
6-30	16.04 g.	66 mm.	112 mm.	27 mm.	2 mm.	7 mm.	16 mm.
7- 1	------	------	------	----	----	----	------
7- 2	19.98 g.	80 mm.	150 mm.	38 mm.	6 mm.	8 mm.	18 mm.
7- 3	24.14 g.	87 mm.	166 mm.	43 mm.	7 mm.	8 mm.	18 mm.
7- 4	Bird left nest before measurements were taken.						

Graphs for weight, length and extent follow:




BODY LENGTH IN MM.
90
85
80
75
70
65
60
55
June
July
28 29 30 1 2 3 4
DATE


EXTENT IN MM.
170
160
150
140
130
120
110
100
90
80
June
July
28 29 30 1 2 3 4
DATE

On Wednesday, June 26, the second day after the discovery of the nest, the eyes of the bird were barely opened in the afternoon. The next day, Thursday, the egg tooth was noticed to be still intact, and the pin feathers of the primaries were 4 mm. long. The tail feathers were not noticed to be through the skin until Sunday when they were 2 mm. long. The sheaths of the primaries were broken and the feathers protruded 2 mm. on Tuesday, July 2.

FEEDING AND BROODING

The first observations on feeding habits were made on Thursday, June 27, during a period of $2\frac{1}{2}$ hours in the morning and 2 hours in the afternoon from a place on the ground from which the nest could be seen easily. The female was gone from the nest for periods averaging 7 minutes and the brooding periods on the nest averaged 11 minutes. During the day of observations the female did all the feeding and the male appeared once and stayed for 4 minutes. At no time did the male assist in feeding the young bird, nor did he bring food for the female. During the whole period of nine days the female did all the feeding and brooding, and the male did not even approach within 20 feet of the nest, as far as was observed.

On Friday, June 28, observations were made from the blind. The male did not once appear within the writer's range of vision. Food brought in included two green caterpillars, one mayfly, and two large dragonflies. In the case of the dragonflies, both times the bird had removed the head and wings and had crushed the thorax. She then pushed the dragonfly into the mouth of the young bird, thorax first, then ate the fecal sac which was deposited as the young bird tried to swallow the insect. Once, the female

got on the nest to brood the young even before one of the insects was completely swallowed, and after a short interval, when the bird was frightened off the nest, the end of the abdomen of the dragonfly could still be seen sticking out of the young bird's mouth.

The feeding following the eating of one of the dragonflies, the female brought in a black mass of material, part of which clung to the young bird's bill. This was examined, and it seemed to be humus material that was thoroughly mixed with sand grains. The mayfly given the young bird still had the bristles at the end of the abdomen and the wings intact. Food was not regurgitated at any feeding.

Other foods eaten by the Scarlet Tanager, as selected from various authors include: gypsy moths, adults and caterpillars, luna moths, cecropia moths, roller caterpillars, potato beetles, bark beetles, grasshoppers, weevils, click beetles, leaf-eating beetles, leaf-roller caterpillars, ants, ichneumon flies, larvae of gall insects, crane flies, spiders, earthworms, and various fruits such as wild cherries, wild berries, and seeds.

Concerning feeding habits, most authors indicate the bird fed in trees or bushes and seldom obtained its food on the ground. An interesting instance of feeding habits is taken from Forbush (1913:212). "Distinctly an arboreal bird, it seeks its food mainly among foliage of trees..... ." Later in this same book appears this statement, "Nor is this bird confined to trees, for during the cooler weather of early spring it goes to the ground, and on plowed lands follows the plow like the Blackbird or Robin, picking up earthworms, grubs, ants, and ground beetles. Grasshoppers, locusts, and a few bugs are taken, largely from the

ground, grass, or shrubbery."

Several writers record the fact that the male Scarlet Tanager feeds the young. Forbush (1929:132) writes of Mr. Henry Hale of Ridgway, New Jersey, who tells of a male Scarlet Tanager -----"that spied a nest of Chipping Sparrows whose young hatched before his own appeared, and who began feeding them, much to the disquiet of their own parents, who meanwhile, hovered about with food in their mouths which the little ones were too full to take, having been very liberally fed by their foster father who continued to feed them for several days. When his own precious brood broke the shell, however, he left the young Chippies to the care of their rightful parents, and paid as faithful attention to his own family." Marie Andrews Commons, writing in Roberts (1932:332), says the male may take part in the care of the young and may rarely be found on the nest. Mr. Fred Goodell, a member of our Ornithology class, told me of a Scarlet Tanager's nest which he observed on several occasions, and in this case the female did all the incubating, but the male assisted in the feeding, and even fed more often than did the female.

NEST SANITATION

It was noticed that the young bird deposited a fecal sac immediately after taking food into the mouth, except on two occasions. Once, when the bird was picked up and weighed it deposited a fecal sac, and later one was deposited in the nest when the female had been gone from the nest for almost an hour. The female ate the fecal sac until July 2, and on this day two were deposited at one feeding. She ate one, then picked up the other and flew to a limb and dropped it.

HABITS

It was noticed by the writer that when the female

approached the nest she always flew to a lower limb, then hopped up to the nest, entering the nest from the same place. On one occasion when a small twig bearing leaves had been broken and had fallen across the pathway taken by the female, two attempts were made to get into the nest, but she would not pass through the leaves nor try to enter from a different way, although she had food in her mouth for the young bird. On this occasion the female retired to a nearby limb, ate the food, and then gave her very characteristic chip-churr which was so often given at the times she was disturbed. The only other note given by the female was a very sharp chip which was often given when she flew into the tree and as she approached the nest. If the female was in the tree and a person ran down the road which was below the nest, she was frightened and flew about excitedly. If she happened to be on the nest she did not seem to notice either cars or individuals on the road. Neither the male nor the female seemed to be disturbed by a noisy baby cowbird that was being cared for by a red-eyed vireo some fifty feet away. The young tanager made only faint noises when being fed.

PARASITISM AND MORTALITY

As was mentioned earlier in this paper, one cowbird egg was found in the nest observed. The egg was removed from the nest and was found to be infertile. In general, the Scarlet Tanager is frequently parasitized by the cowbird. George M. Sutton (cf. Todd, 1940:594) says he recalls finding a Scarlet Tanager's nest in which there were two tanager eggs and three cowbird eggs, with two more cowbird eggs buried in the lining. A nest collected by Mr. Todd contained three tanager eggs and four cowbird eggs.

On mortality, Marie Andrews Commons, (cf. Roberts, 1932:

332) says, "it would seem that the destruction of the eggs and young in the case of the Tanager is exceptionally great, for the University Museum records show that very many nests are broken up and that very frequently only one or two young survive to leave the nest." A. A. Allen tells of a wren that broke up a Scarlet Tanager's nest.

YOUNG

On Thursday morning, July 4, the young bird was observed to be perched on the edge of the nest, and in the afternoon had left the nest. The bird was later located on the ground approximately twent-five feet from a point below the nest. While the bird was on the ground the male was observed to feed it twice, although he had done no feeding while the bird was in the nest. The young bird was put back into the nest, but after almost two hours had elapsed and the parents did not go to the bird, it was placed back on the ground where it was soon fed again by the agitated parents. Later, at weighing time, the young bird could not be found, and has not been seen since that day. At the time of leaving the nest, the young bird was greenish-brown above, yellowish on the flanks, and streaked on the breast. It is thought that the bird left the nest prematurely because the day before leaving the nest the fifth primary of the right wing, which was 28 mm. long, had the feather extending from its sheath only 4 mm.

Almost a week later the Scarlet Tanager's nest was found on the ground torn to pieces. No explanations can be offered.

The male Scarlet Tanager was last seen July 28, and was still in breeding plumage. He was last heard singing on August 5.

SUMMARY AND CONCLUSIONS

1. The Scarlet Tanager is primarily a bird of the deciduous growths, though not exclusevely so.

2. Nests are characteristically placed on a horizontal limb of a tree, usually several feet away from the trunk, and averaging under 20 feet from the ground. They are flimsy structures.

3. In this study the female was observed to do all the feeding and brooding while the young bird was in the nest; the male helped feed it after it left the nest.

4. The female did not regurgitate food for the young, but brought it freshly obtained food.

5. The female very likely obtained some of the food very near the lake as might be indicated by the mayflies and dragonflies brought in.

6. The female ate the fecal sacs until two days before the young left the nest.

7. Copulation occurred on June 30th, five days before the young left the nest, which might be related to a second brood, although knowledge of a second brood has not been recorded.

8. The Scarlet Tanager is parasitized by the cowbird.

9. The last weight of the bird before it left the nest was 24.14 grams.

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