

# territoriality in birds

## PART II

by Rae Anderson

**t**erritorial boundaries established by birds are sometimes remarkably sharp, even in homogeneous areas such as Horned Lark territories in Grasslands or desert. At certain times territorial boundaries may be relaxed. For example, when some predator attacks one member of a pair the alarm calls of the resident birds will bring neighboring birds into their territory. The neighbors are tolerated until the alarm subsides, then the residents chase the now unwelcome visitors out.

It is probable that birds do not have a mental picture of their territory and its boundaries the way humans do. Instead, judging from what is known about the workings of the avian mind it seems likely that the boundary of a territory is actually determined by several factors. One of these is what might be called the response distance. That is the minimum distance to which a bird on territory will permit

another of its species to approach before the resident bird is stimulated to respond by a territorial display. This critical distance will depend upon the physiological state of the birds involved such as whether they are breeding, molting, or wintering. Also influencing are the sexes of the birds involved and sometimes such factors as time of day and weather conditions. Since the response to distance is remarkably uniform, the boundaries of the territory seem sharp to the human observer. Other factors which will limit territorial boundaries are the extent of the habitat, the presence of adjacent pairs and sheer distance.

One of the most intensive studies of a single species of bird is that of David Lack on the English Robin. His investigations of territorial behavior of this bird very well illustrate the principles of the territorial concept.

Although the English Robin (*Erthacus rubecula*) is a member of the thrush family (*Turdidae*), as is our American Robin, it is a very different bird. The English Robin is about the size of a small sparrow with uniform brownish upper parts, an orange-red breast and white abdomen. In build, it is between a thrush and a warbler.

Mr. Lack studied the English Robin intensively over a period of four years beginning in January 1935. The 20 acre site of the study area was near Dartington in South Devon, England. Colored plastic bands were used so that individual birds could be identified. The following is a summary of the annual cycle of the English Robin:

"Adult birds molt in July and August.

During the molt they are retiring in habit but following the molt in late August they begin to sing and fight, each bird defending a territory. Young birds of the year also take up territories and they also sing and defend their areas. Both males and females hold territories during the fall and winter. After territories are once established in the early fall, the amount of singing and fighting gradually declines until late December or early January when there is a marked increase in male song. Pairs are formed

between late December and early March and after the pair-bond is established, members of pairs share a territory. About mid-March the female builds a nest, courtship follows, then egg laying, incubation and feeding of the young. Successive broods are raised until June when the adults again go into the annual molt. There may be considerable change in territorial boundaries throughout the year."

David Lack's observations on the English Robin also illustrate other aspects of territorial behavior.

The spring song of the male begins late in December and lasts to the middle of June. There is no singing during the molt. The autumn song, thinner and less melodious, is heard from late August to December. Females only sing in the fall, from late August gradually decreasing to January.

The occurrence of autumn song shows the connection between song and territory since courtship does not occur in the fall. Females which wing in the fall also defend territories. In our Mockingbird the females also sing and defend territories in the fall.

A male English Robin, confined in an aviary, actually "drove" a free male away from the outside of the aviary by song alone.

In the spring a loudly singing male English Robin is an unmated bird. Females apparently recognize an unmated male by the intensity of his singing. Mated males sing with less intensity except during a fight with another male. During fights high volume songs are sung between attacks. The best singing of the year seems to occur when one male is trying to encroach on the territory of another.

Males were found to sing only in their own territories. In an aviary where two pairs were confined, both males sang while the territory was in dispute, but after one male established dominance and claimed the entire aviary, only he sang.

The invasion of territory by an intruder stimulates not only song, but a particular posture or display from the resident male. In the English Robin this aggressive display is associated with the red breast.



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The maximum area of red is always presented to the intruder. If the intruder is below the displaying resident the latter extends his head and lowers the red breast, thereby exposing the maximum amount of red. If the intruder is above the owner of the territory, the resident bird throws its head back and puffs the feathers of the breast. The function of display is to intimidate the intruder and thereby not necessitate fighting, which is detrimental to the species if the individuals are injured or killed.

Using stuffed specimens, Mr. Lack experimented with the responses to the red breast area. A live bird will sing, display and finally attack if a stuffed specimen is placed in its territory. One living male attacked the specimen so hard that it knocked the head off of the stuffed bird. This did not cause the attack to be lessened. Mr. Lack removed the tail from the specimen. The owner of the territory continued to attack. The wings were taken off and still the living bird attacked. Finally the only thing that was left was a bundle of red feathers with some white below. 50% of the living Robins to which these remains were presented attacked it.

When a complete specimen had the red of the breast colored brown, no living bird would attack it, but the same birds would attack a bundle of red feathers lacking head, tail, wings and legs!

Stuffed specimens stimulated different responses depending upon the physiological state of the living birds. If a stuffed bird is placed and left near a nest during the period of nest building, the specimen is attacked, but since it does not leave the nest it is eventually deserted. If the specimen is placed near a nest during incubation, the female of the live pair will come to the eggs but the male stays away. If young are in the nest, the stuffed bird is violently and continuously attacked.

When song and display fail to intimidate an invading bird, the owner of a territory is forced to fight. Usually in the wild state no real damage is done, but occasionally one bird will be injured and Lack records a few instances in which one bird killed his opponent. However, this is decidedly unusual in the wild state.

The invincibility of males in their own territory is illustrated by the following. A male English Robin entered a trap in his own territory. An adjacent male entered the trapped bird's territory and the resident bird sang from his prison, at which time the free intruder promptly left. The trap containing the bird was then moved over into the intruder's territory and the latter, now on his home ground, came to the trap, displayed and sang. The bird in the trap made no attempt to sing or display aggressive actions.

Perhaps more than any other subject, that of animal behavior points up the danger of error when we interpret the reason for the actions of animals in terms of human emotions.

As an example of the fallacies that could result from explaining animal behavior based on a human viewpoint, consider the following:

1. A man sings because he is happy.
2. Therefore when a bird sings it is happy. (This may be the case with canaries.)

If this is true, it follows from what has been described in the English Robin that whereas male Robins are happy most of the year, the females are happy only in the fall; that males are happier before than after obtaining their mates; and that they are happiest of all when they are fighting!

The truth seems to be that a human parallel to a singing bird would be a man standing in his own yard loudly threatening his neighbor with physical violence if the neighbor should so much as set foot over the property line.

I will be most appreciative if our readers will forward to me written statements of authentic observations of birds in the wild state exhibiting territorial behavior. Even though these birds are protected and not kept in our local aviaries, they may appear in aviaries in other countries. This information may then be used for articles in later issues to better help us understand the actions of our birds and thereby help us make them more comfortable.

This should also go a long way toward improving our aviary breeding results. ■

## der Vogelfanger

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Variations in genetic makeup (rate of mutation) were formerly thought to be fixed in all populations; so much variation per so many individuals. New light has been shed on this subject and it has been found that living organisms in a stable environment have greater genetic variation than those in harsher climates. Thus, animals in the tropical forest and coral reefs are more varied than those in temperate and arctic habitats.

The rate of mutation in captive animals seems to increase more than would be accounted for by the fact that when they occur, man tends to nurture them. This latter discovery helps to explain what has happened to the canary, cockatiel, budgie, zebra finch, and peach faced lovebird. Although captive birds may be kept outdoors where the weather is unstable, all of the other factors in the environment are usually very stable. Food, protection from predators, shelter, and nesting sites are all fixed parts of the environment. Given this stability, it is logical to assume that the factors that work in tropical habitats are allowed to assert themselves and the rate of variation increases.

Although knowledge of the mechanisms of inheritance and gene operation is expanding daily, the basic rules of inheritance remain the same. Every breeding program must be based on genetics to produce the best quality with the greatest predictability. ■

**REWARD! Forty Canaries, mostly red and orange factor crested, were taken from the aviaries of Frank Raleigh on November 12, 1975. Birds banded with red bands, initials: D.R. Numbers 150 to 350 year 1975. \$200.00 Reward offered for information. Contact Frank Raleigh, 13729 Ardis Ave., Bellflower, California 90706.**

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