AGONISTIC BEHAVIOUR AMONG BLUE TITS AT A WINTER FEEDING STATION

by

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INTRODUCTION

This paper presents a quantitative approach to the study of agonistic behaviour and the analysis of its motivation. The objectives were to 1) describe the individual elements of behaviour of birds at a feeding station; 2) relate these elements to subsequent attack, escape, or staying put by the bird; 3) observe changes in behaviour with season; and 4) determine the effect of one bird’s behaviour upon other birds present at the feeder.

During winter, birds that encounter other birds at a feeding station may behave in several ways. Two birds may feed compatibly. At other times an encounter between two birds ends with one attacking and the other escaping. Frequently one or both birds display for a short period before actual attack and escape occurs, or threat display may cause another bird to escape without attack occurring. Previous analyses have suggested that threat postures depend on varying degrees of balance between tendencies to attack, escape, or to stay put (Tinbergen, 1952; Hinde, 1953; Moynihan, 1955; Marler, 1956; and others). In particular, it has been suggested that, in finches, (Hinde, 1955/1956) the different elements of the postures, i.e. raised crest, horizontal body, etc., are linked with one or the other of these tendencies. Hinde (1955) has defined “tendency” as

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the probability that an animal will behave in a particular way: "If an animal is likely to behave in a certain fashion, then causal factors (which may be as yet unanalysed) for the behaviour in question must be acting. . . . The animal has an attacking tendency thus becomes equivalent to 'Certain (as yet unanalysed) causal factors for attacking are present'."

However, precise quantitative relationships between a particular element of a posture and the subsequent action of a bird have not been worked out. It is with this purpose in mind that this study was undertaken. The first step has been to describe the different elements of behaviour. These elements have then been compared with the bird's subsequent actions to see which elements are most closely associated with attack, with escape, or with staying (Moynihan, 1955). Finally, the signal value of the several elements has been determined by observing the response to these elements in the second bird.

This study was made in Madingley Wood, 5 miles west of Cambridge, England. It is a 40-acre mixed hardwood with mature oak (Quercus), ash (Fraxinus), elm (Ulmus), and occasional spruce (Picea) predominating among the taller trees and with an understory of hawthorn (Crataegus), maple (Acer), and hazelnut (Corylus). Four species of tits came regularly to the feeding station: Great Tit (Parus major), Blue Tit (P. caeruleus), Marsh Tit (P. palustris), and Coal Tit (P. ater). This paper deals entirely with the Blue Tit. A comparison of the behaviour of the four species of titmice coming to the feeder will appear in another paper. The feeding station was a single board 10 inches wide and 32 inches long placed horizontally on a 4-foot post. Overhanging branches and other nearby cover provided safe retreats and access routes for the birds. The feeder was kept well supplied with a variety of seeds from late September 1958 through March 1959. Sunflower (Helianthus) and hemp (Cannabis sativa) were preferred. The tits generally carried these seeds off before eating them. Under these circumstances it was not always possible to tell if a bird had left the feeding station of its own accord or because of the display of a second bird. So beginning on January 26 the feed was changed: during observation periods all seed was removed from the table, and in its place was a U-shaped wire on which were placed whole peanuts and chunks of coconut. The wire was firmly fixed in the center of the table. Birds took several minutes before they could open the peanut far enough to carry off an individual nut. Generally they fed on the nuts through half-opened shells and might continue feeding for several minutes if undisturbed by other birds. Birds could break off only small bits of coconut at a time and usually fed several minutes at a time if undisturbed. Hence it was almost always