STIMULUS DETERMINANTS OF SEXUAL AND AGGRESSIVE BEHAVIOR IN MALE DOMESTIC FOWL

by

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Importance of the external stimulus situation in controlling behavior has been stressed by many investigators (BREED, 1911; LASHLEY, 1938; BEACH, 1942; TINBERGEN, 1951; HARLOW, 1953). These students of behavior have emphasized, each in his unique way, the need for systematic variation of all properties of a stimulus situation in the analysis of innate mechanisms. The study of the effects of physiological intervention is of course equally vital, but a logical sequence of investigation must proceed from a search for precise stimulus factors to which the internal mechanisms are sensitive. Otherwise, control of stimulus conditions is so fortuitous that effects of anatomical, physiological or experiential variables are obscured.

In the present paper emphasis is placed on the stimulus factors eliciting sexual and aggressive behavior patterns in several breeds of male domestic fowl. Taxidermic models were used as a major testing tool to assure greater control of external stimulus factors.

BIRDS AND BEHAVIOR PATTERNS

In terms of their experience three classes of males were tested at various times. These were: (1) 22 New Hampshire and 22 Barred Plymouth Rock cocks, age 13 mos., housed in all male, single-breed pens, but with contact with other breeds and females prior to sexual maturity and occasional contact thereafter. (2) One pen of 77 New Hampshire males and another pen of 50 placed in all male flocks at approximately ten weeks of age with no further contact with females or other breeds after that time. (3) Two New

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Hampshire and four Barred Plymouth Rock males reared in visual and physical isolation from other birds but having contact with man (caretaker). During the experiment all birds were housed indoors and fed a standard poultry ration.

The isolated males were placed in a special brooder unit within the first 24 hours after hatching. Each individual cubicle was 18 x 11 x 6 inches. During the third month the birds were transferred to larger cubicles measuring 18 x 16 x 14 inches and maintained in these very restricted quarters until 8 months old. Some birds showed abnormal anatomical development of the legs and were not used for behavior studies since normal structure would be essential for the highly coordinated patterns of sexual and aggressive behavior.

Behavior Patterns. For the present paper, parts of the sexual pattern of the male will be classified as follows: (1) Waltzing (including the several varieties listed by DOMM and DAVIS, 1948). (2) Comb-grabbing before or after a female responds with the sexual crouch. (3) Mounting a crouching female or mounting in the process of forcing a female to crouch. (4) Treading the back of the female preparatory to assuming the copulatory position. The female responds at this stage by raising her tail to one side. (5) Copulation with contact of the vents and insemination of the female. (6) After-reaction. The male dismounts immediately and both birds may fluff their feathers. This behavior is practically universal in the female following treading or simulated treading movement regardless of completeness of sexual union.

Patterns of aggressive behavior will be treated under the following categories: (1) Waltzing. Not distinguished from that directed toward the female. (2) Hackle raising may be seen as a response to waltzing or may be preliminary to fighting in the absence of waltzing. (3) Fighting. The fight proper may represent a single contact or last for more than an hour. The cocks face each other with hackles raised and heads lowered. Each tiny feinting movement of the head is apparently followed precisely by the other bird. The attack includes jumping with feet and beak forward.

Displacement behavior (TINBERGEN, 1951) in the form of sham eating is sometimes seen in the presence of a non-receptive female and is typical in fighting as a male waits for the other to attack.

PROCEDURE

Stimulus objects. White Leghorn skins were used to prepare taxidermic models as follows: