THE DEVELOPMENT OF SOCIAL BEHAVIOR PATTERNS IN THE MOUSE, IN RELATION TO NATURAL PERIODS

by

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(With 2 figures)
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INTRODUCTION

This study of the normal behavioral development of undisturbed mice raised under the usual laboratory conditions was undertaken with a twofold intent. The mouse as an experimental animal has proven its value for psychological as well as biological research. Despite the current attempts to establish a science of behavior there is a minimum of literature which can be referred to for information on the normal development of the particular behavior patterns of many experimental animals including the mouse. In his article on “Innate Behavior Patterns” (1950) LORENZ has stressed the importance of a thorough familiarity with the facts of development before any systematization or generalizing from the behavior of an animal can be undertaken. The present paper might be considered, in his words, as a preliminary study of “morphology of behavior by ... observation and description of all the behavior patterns at the disposal of the species,” particularly considered from the viewpoint of development.

An attempt has also been made to classify the developmental data into natural periods based on major changes in social relationships as SCOTT (1950) did with the development of puppies. Such a classification may indicate the possible existence of various critical periods in the development of normal social relationships, and the whole organized body of data provides needed background information for experimental studies on the effect of early experience.

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METHODS

Ten litters of mice, averaging six animals per litter, were observed over a period of eleven months. Observations on each litter were started as soon after birth as possible and, with a few exceptions (weekends, etc.), as ten minute observation was made daily until the litter reached about 30 days of age. The male and female parents were left with the litters in all cases until after the animals had reached this age. Nine of these litters were raised in transparent plastic boxes, 11 × 5 × 5 inches, in a small heated room containing no more than four boxes of mice at one time. The room was entered only by the observer. Purina fox chow checkers and water were given as needed to keep a supply of both available at all times. The living boxes were changed weekly, and clean wood shavings placed to cover the bottom.

In order to investigate the possible effect of a more complex environment, the tenth litter was raised and observed in a large elevated wooden box, 5 × 13½ × 2 feet in size. One entire end was wire; the other end and the two sides were wood. At the wooden end four small nesting boxes were placed, each one filled with a different nesting material: straw, excelsior, and soft waxed paper strips. Shavings four inches deep covered the bottom of the large box, and a water tube and two hoppers of food were placed along one side. 1½ inch strips of screen wire were tacked along one of the sides to form an irregular wire path and small strips of wood were arranged on the opposite side to form an irregular ramp. A small platform was placed on one of the walls several inches above the shaving floor near the nest boxes. A hinged wire top covered the box; the litter was observed through this. Disturbance of this litter during the month of observations consisted only of refilling the food hoppers occasionally.

The room in which most of the litters were observed was lighted from 6 P.M. to 6 A.M. and kept dark the rest of the time in order to reverse the activity cycle which usually reaches its peak about three hours after the surroundings are dark (Calhoun, 1945). Observations were made usually between 9 and 11 A.M. Litters from the following highly inbred strains were observed: BALB/c Scott, C57BL/10 Scott, DBA/2, A/He, representing 4 widely different genotypes.

DEVELOPMENT OF BEHAVIOR IN MICE:
DESCRIPTION BY PERIODS

The periods into which the observational material is divided below are based on important changes in social relationships. These in turn are based