

THE CANADA PORCUPINE: A STUDY OF THE LEARNING PROCESS.
By Leroy Walter Sackett. Behavior Monographs. Volume 2,
Number 2. Pp. iii: 84.

The introductory chapter of this monograph is a very interesting "biological and naturalistic study" of the porcupine. The following quotations from this chapter show that the porcupine is well adapted for experimental purposes: "The greatest assets of the experimenter are the porcupines' appetite and persistence while on duty. Little difficulty is experienced in the way of diminished effort or activity as the animals approach satiety during feeding." "Although they are somewhat slow, they seldom pause in their activity, almost never give up a task, and work with an independence of effort which leads one to suspect that their survival has depended on the individual far more than on the groups."

The remaining chapters contain reports of experiments with the porcupine in the following fields: (1) manual dexterity; (2) reactions to the puzzle-box situations; (3) discrimination of form, size and color; and (4) treading the maze. Sixteen porcupines were used. Of these eight were males, four were females, and in the case of four the sex was not determined. From May 26 to October 20, the porcupines were kept in an open-wire cage, eight feet by twenty feet and seven feet high. On October 21, the transfer was made to a large well-lighted room with a ground floor. In each case the experiments were carried on within the cage.

The first investigation was that of manual dexterity. This phase of activity presented itself since "the forefoot of the porcupine is freely used as a hand and is well-formed for that adaptation." During these tests the animal was required "to mount a box about eight inches high and to stand or to sit tripod fashion on his hind feet and tail near the edge of the box, so that nothing could interfere with the free use of his hands." The experimenter, standing directly in front of the animal, offered small pieces of cabbage, "care being taken to place it always in the same manner as nearly as possible directly before the animal's nose." Fourteen animals were tested. "In seven cases feeding was done with the experimenter's right hand and in six of them the animals became right-handed. Of the seven instances in which the food was presented with the left hand, six developed left-handedness." These habits in the use of the hand could be almost entirely broken up in a few days, hence the author concludes that porcupines have very little tendency to be either right-handed or left-handed.

The attempt was made to teach the porcupine to reach for cabbage with his right hand and for carrot with his left hand, the experimenter using the right hand and reaching the food to him in the same manner each time. After nearly five thousand trials, and one hundred and sixty errors, the porcupine (Number 3) always used the correct hand in reaching for the food "whenever, wherever and by whomsoever it was offered." After thirty days he was still able to make the discrimination. Six other porcupines were used in the same experiment and displayed equal skill.

In experiments with the puzzle-box, the door was supplied with the following locks: (1) simple pushdown lever; (2) plug adjusted in the top of the door; (3) horizontal thumb button; and (4) ordinary screen-door hook. The locks could be used either singly or in combinations. In this study no attempt was made to obtain definite quantitative results. The porcupine readily learned to operate each lock separately and also the four locks in series. In an hundred-day memory test, "the behavior of the animal gave four experienced observers the impression that the porcupine had retained the association, but had lost chiefly in dexterity."

The porcupine's ability to discriminate a circle from various other forms was tested. The forms used were circular, square, rectangular, etc., openings through blocks of wood nine inches square. These were presented in pairs or in series of six. Back of the forms were food-boxes. The food was always placed in the box behind the circular opening. In order to eliminate the sense of smell as a factor, each food-box contained a secret pocket filled with the food being used. The porcupine was able to distinguish the circle from other forms when it was presented either "pair-wise" or "six-wise."

Using Nendel's series of gray papers, the threshold of brightness discrimination for the porcupine was found to be about ten shades.

The apparatus used in the experiments on color discrimination was somewhat similar to that of the form study. Colored papers of the Bradley series were used as stimuli. Under these conditions the porcupine failed to react appropriately.

The porcupine was found to be very expert in treading the Hampton Court maze. The author suggests that this may be due to "the natural instinct of the porcupines to lay out runways in the fall of the year to particular clumps of trees which they use as feeding grounds in winter."

When the floor of the maze was sloped ten degrees from the horizontal, rotating the maze through ninety degrees confused

the animal, but the relearning after each rotation was more rapid. After one hundred days absence from the maze, the porcupine's ability to traverse it was not materially lessened.

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