

NATURAL PARTURITION OF A PORCUPINE AND FIRST REACTIONS OF THE PORCUPETTE¹

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Direct observations of natural parturition in a porcupine are so rare that the following notes, taken during the birth of a porcupette (Shadle, 1950a) in the Vivarium at the University of Buffalo, were considered to be sufficiently valuable as to be recorded in detail. All previous porcupine parturitions at the Vivarium have occurred during the night or early morning, and so have escaped observation.

On May 4, 1952, three male porcupines, (*Erethizon d. dorsatum*) and two pregnant females were obtained from Allegany State Park, N. Y., and brought back to the colony at the Vivarium. Four days later, at 4:00 P.M., May 8, cries of an adult porcupine were heard in the porcupine room and one of the recently caught pregnant females was found in labor. The female was promptly placed in a separate cage where she completed the birth process, during which timed notes were made of the parturition and the early reactions of the newborn.

Since all times cited are in the afternoon, the designation P.M. is intentionally omitted, but is to be understood throughout.

At 4:05 the pregnant female was complaining a good deal, she was in advanced labor, and the birth was already under way, for the nose of the young was visible in the vulva. Five minutes later, the struggles of the young tore the extra-embryonic membranes. The head of the porcupette, still covered by the torn membrane, protruded from the mother's vagina, and the young was struggling and crying lustily. The expulsion of the young porcupine was rather rapid.

The male porcupette was born at 4:13, the completely collapsed extra-embryonic membranes were partially discharged, and the young continued to call quite loudly. It lay struggling on the cage floor with the umbilical cord still attached to its belly, and to the placenta, which had not yet been discharged. The porcupette staggered up on all four feet, but when the female moved off to one side, it was immediately drawn over flat upon its left side by the unbroken umbilical cord.

At 4:16, as the porcupette lurched about while still attached by the umbilical cord, the mother happened to step on the umbilical cord with her right hind foot, and as the porcupette staggered away from her right side, a tug by the young broke off its umbilical cord about three-quarters of an inch from the porcupette's belly. The young was now free and able to move about as it chose, so the mother followed the young, keeping quite close to it. The protruding extra-embryonic membranes dragged behind the female as she walked about the cage. Very little blood, probably not more than a half cc, was lost by the breaking of the umbilical cord.

Five minutes after birth, at 4:18, the mother continued to follow the young, and when it stopped she sat on her haunches with the anterior part of her body hunched over above it, in a protective position. Although she assumed a nursing attitude, the porcupette did not attempt to nurse.

Ten minutes after birth, the porcupette uttered a low cry and the mother immediately walked up in front of it and again assumed the nursing position holding

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her fore limbs loosely in front of her and at her sides. She reached down once and touched the young lightly with her right front paw, but did not attempt to take hold of it, nor draw it to her. She followed every move of the young and repeatedly assumed the nursing position, but she made no audible sounds after having been taken away from the other porcupines with which she had been confined.

An elm twig was put into the cage at 4:28 and the mother began to feed on the fresh leaves. The porcupette soon changed its location slightly and the mother immediately left her food and hurried over to the young. Eighteen minutes after the birth (4:31) the extra-embryonic membranes and placenta were discharged. The mother immediately turned around and began to sniff at the placenta, and then nibbled at it momentarily. The placenta with the attached membranes weighed approximately 55 gr and the little male porcupette weighed 400 gr.

Twenty minutes after birth the porcupette showed its first real defensive reaction, viz., the erection of its quills. The eyes of the porcupette were wide open at birth, the four incisors, and four pre-molars were ready to function. At 4:37 he bit the finger of the diener who was carrying him from the scales back to the cage. The porcupette struck feebly with the tail, but when he was picked up by placing one hand directly under his belly, he showed only very slight objection to being handled.

When he was 29 minutes old the mother approached him touching his guard hairs with her nose. To this tactile stimulus he reacted immediately by striking at her with his tail.

While his first reactions seemed almost entirely involved in crying out and struggling to free himself during the process of birth, these reactions were followed by a period involving efforts to right himself to a normal position on all four feet, with active efforts to coordinate its leg movements and maintain the normal standing or walking position. These efforts resulted in an upright position and a fairly stable equilibrium within the first hour. The strength, sureness, and coordination of his muscular activity improved rapidly.

His early respiratory reactions were quite rapid and shallow. When 42 minutes old his respiratory movements occurred at a rate of 75-77 per minute. He soon lay down and rested momentarily while near him, his mother lay stretched out on her belly, on the floor. Two minutes later when his mother walked up to him and assumed the nursing posture, the porcupette struck at her twice with its tail. At five o'clock the mother was sitting hunched over him, and from time to time she lowered her nose and touched the hairs of his back.

The few quills which had been driven into the observer by the strokes of the tail were all approximately one-half inch long, and they were already partly dry and stiff enough to penetrate the skin readily. The scalecovered quills held fast in the human skin and the roots of the quills pulled out of the porcupette readily. Many of these dislodged quills were still in the growing stage, for the quill roots were wide open, like the actively growing base of a pinfeather.

Now for the first time, at 5:05 he "presented his rear end to the enemy" in a protective "avoiding or defense reaction" (Shadle, 1943, 1944). He showed this reaction toward both the observer and also towards his mother whenever he saw either one move. As the mother sat in the nursing position, the porcupette, when one hour old, approached her and pushed his head into the dark shadow area beneath her body. This was his first demonstration of the "head hiding reaction" which is such a typical defensive reaction of all wild porcupines of any age. The mother chattered or clicked her teeth to her offspring. This is a type of communication used by porcupines of all ages, and its vigor, volume, and intensity express various degrees and types of individual reactions, from simple quiet recognition between mother and young, through annoyance, fear, anger and noisy, vicious defiance during fighting (Shadle, 1950b). Even when he was one hour old,

he had not yet made any attempt to nurse. At this point, it was necessary to discontinue the observations.

At 10:45, when approximately six and a half hours old, the porcupette was found nursing actively. He and his mother were in the typical nursing positions, and his mouth and lips were making the characteristic sucking and smacking sounds which often accompany the nursing reaction. During the nursing, the mother sat hunched forward with her fore limbs hanging limply toward her front and sides.

By eleven o'clock the porcupette was mouthing the elm twigs from which its mother had stripped the leaves. He made no definite effort to gnaw the bark, for his reactions seemed more like a baby putting something into its mouth and shutting down on it, rather than a real gnawing action. The porcupette was again picked up and handled quite tenderly but the mother was still somewhat solicitous and remained quite close by, but she made no active defense of the young when it was picked up or handled. When the observer imitated a porcupine call, the mother came towards him as if she thought it was the porcupette, or another porcupine calling. It may have been on her part a mild defense reaction to protect the young, for she repeated several times her response to the frequent imitations of the porcupine call. At no time did she attempt to attack or bite the observer, but evidenced interest in the imitated call.

When seven hours old, the porcupette was breathing much more slowly, (52-55 respirations per minute) almost one-third fewer respirations than had been observed during the first hour. At this time his muscle coordination enabled him to scratch his nose quite deftly with his right front paw.

The following day, May 9, 1952, the porcupette weighed 15 gr less, (385 gr), than his birth weight. He was active, moved around freely and when handled carefully he was much more tractible than the day before, but would still strike lightly with his tail when picked up, or when touched.

LITERATURE CITED

- Shadle, A. R. 1943. An unusual porcupine parturition and development of the young. Jour. Mamm., 24: 492-496.
- Shadle, A. R. 1944. The play of the American porcupines (*Erethizon d. dorsatum* and *E. epixanthum*). J. Compar. Psychol., 37: 145-150.
- Shadle, A. R. 1950a. The North American porcupine up-to-date. Ward's Nat. Sci. Bull., 24: 5, 6, 11.
- Shadle, A. R. 1950b. Feeding, care and handling of captive porcupines. Jour. Mamm., 31: 411-416.
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