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OBSERVATIONS ON THE MOTHER AND YOUNG INTERACTIONS IN CAPTIVE CAPE FUR SEALS *(Arctocephalus pusillus pusillus)*.

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Abstract

The behaviours of a newborn pup and dam Cape fur seal were observed from May 24, 1977 (the day after birth) to June 27, 1977. The observations were done on a opportunistic basis and recorded in a diary format. The observers focused on nursing, nipple use, separation and coming together.

The nursing sessions consisted of a series of short suckling bouts. The average nursing session was 16.3 minutes and the suckling bouts varied from 5 to 90 seconds. All four nipples were used by the nursing pup.

The number of separations as well as the separation distances of the pup increased after the first week of birth. At this time the female also seemed more willing to separate greater distances from the pup. The dam consistently approached the pup more often than he approached her. She was also instrumental in getting the pup into the pupping pool, but she did not "teach" him to swim.

Introduction & methods

The Cape fur seal *(Arctocephalus pusillus pusillus)* pups from September to December in its South African rookeries (RAND, 1955). Those at the Metro Toronto Zoo pupped from March to May, six months out-of-phase with their wild counterparts. The first birth occurred on May 23, 1977 to a primiparous female, Chinney. Previous experience with primiparious mammals at the zoo indicated that some of these females were poorer mothers than more experienced females. This fact, which has since been reported to occur in Northern elephant seals (REITER *et al*, 1981), caused concern for the well being of the pup and led to increased observation.

The staff working in the area were asked to record the behaviour of the pup and dam whenever possible, as there is a lack of such information for this species.

The frequency and duration of interactions were recorded in a diary format. The interactions focused on were: 1) nursing, 2) nipples used, 3) separation, and 4) coming together. The pups first attempts at swimming were also recorded.

The observations had to be done on an opportunistic basis during the period from May 24, 1977 (day 1) to June 27, 1977 (day 35). A total of 35.4 hours of observations was recorded in the five week period, with the first, second and fifth weeks having over 500 minutes each, and the third and fourth weeks around 200 minutes each. There were five days in which no observations were recorded.

The pup and dam were housed in two stalls, 2.74 m square, with a concrete floor, a sliding door connecting them, and doors out to a centre aisle that allowed access to the outside. A more detailed description of the house and the management of the seals is given elsewhere (Carnio *et al*, in press). Mother and young were confined in the two inside stalls from the day of birth until June 17 (day 25), when they were given access to the newly-constructed pupping pool.

Results and discussion

Nursing:

RAND (1955) found that wild Cape fur seals commenced nursing almost immediately after birth and the pup sucked almost continuously during the time the dam was present, except for sleeping and some play. Based on this information, there was some concern for the pup because suckling was not continuous.

Rather, it included many breaks when the pup changed nipples or called between short sucks. The time from the beginning of nursing, including all of the short suckling bouts, to the termination of nursing was called a "nursing session". All of the observed nursing sessions followed the same pattern. This pattern was similar to that which FOGDEN (1971) described as secondary suckling in Grey seals, and consisted of numerous suckling bouts with breaks of a few seconds between suckles. Subsequent births at the Metro Toronto Zoo have also demonstrated this nursing pattern.

From day 3 to day 35, twenty-one nursing sessions were observed. The average duration of these sessions was 16.3 minutes (S.D. 6.9 minutes); the longest was 30 minutes on day 13, and the shortest was 6 minutes on day 3.

During each nursing session the pup repeatedly broke away from the nipple, paused or called, and often changed nipple. The total amount of time actually suckling was therefore not the same as the nursing session time.

Six of the twenty-one observed nursing sessions were analyzed in detail. During these six sessions, the time the pup actually sucked varied from 67% to 24%, with the average being 45% (Table 1). The longest-sustained suckle lasted 90 seconds and the shortest 5 seconds. The average time per suckle was 23.5 seconds. The number of suckles varied according to the length of the nursing session and the duration of the suckles, and averaged 19.4 suckles per session or 1.6 suckles per minute.

Nursing was initiated or solicited by either partner. Generally the pup solicited nursing by calling, approaching the female, searching for the nipples and trying to suck. The female solicited nursing by approaching the pup, calling, nuzzling the pup and presenting her nipples. A typical pup-soliciting encounter would start with the pup calling and the female answering. The pup would then search and the female would roll over and expose her nipples.

Not all of the pup's nursing attempts were straightforward. A number of times, when the female refused to co-operate, the pup bit her near the nipple area until she presented. At other times the female simply refused to allow the pup to nurse. On days 33, 34, and 35 the pup was unsuccessful in attempting to nurse because the female kept moving away, apparently trying to get him to follow her into the pupping pool. Other unsuccessful attempts occurred when strange people were present in the holding pen or when the female was interested in the fish being prepared by the keeper. On one occasion, when the female solicited and the pup showed little interest, she directed him to the nipples using her flipper. Most of the observed attempts to nurse resulted in successful nursing sessions with the pup initiating 13 and the dam 8.

Termination of the nursing sessions seemed to rest mainly with the pup, it stopped 12 out of 15. When the pup stopped nursing he would normally roll over and rest. The female stopped the nursing session by moving away or rolling over and covering her nipples.

The pup was mainly responsible for starting and stopping the suckling bouts. The female initiated only 8 of 90 suckling bouts and stopped 11 of 91. The suckling bouts initiated by the dam primarily occurred either because the pup bit and hurt her or because of some external interference, such as a strange noise. When the pup stopped a suckling bout he would normally pause, call or nuzzle the female and then change nipples or return to the

Table 3. Aproaches and separations by dam and pup.

week	Total observ. time (min)	Total number of approaches by		Number of separations by				
		dam	pup	dam			pup	
				Total	-1m	1-2m +2m	Total	-1m 1-2m +2m
1	523	18	6	18	10	7 1	4	2 1 1
2	585	15	6	16	5	4 7	12	4 5 3
3	207	5	2	6	0	0 6	5	1 0 4

The data for the second week showed a more even distribution of separations in the three categories for both animals. The pup was observed to move away from the dam 12 times. The three times that the pup moved more than 2 metres away from the dam he was wandering about, trying to get into the next pen. The female prevented him from doing so each time. The female was observed to separate from the pup 16 times. Four of the seven separations of greater than 2 metres occurred when the pup was asleep, and another two were to obtain fish from the keeper.

In the third week, four of the five separations observed for the pup were greater than 2 metres, and all six of the dam's observed separations were greater than 2 metres. During the pup's four greater than 2 metre separations, he wandered into the next pen and the female retrieved him three times. On the fourth occasion (day 15) she did not go to him but kept him in sight. Four of the dam's six separations of greater than 2 metres occurred when the pup was asleep. Total observation time for the first and second weeks was similar (over 500 minutes). For the pup there was a large increase in separations after the first week (Table 3). This increase could have been due to the increased co-ordination of the pup as he grew. The dam separated approximately the same number of times during the first and second weeks. Throughout the first week the dam never went far from the pup and never stayed away for any length of time. In the second week she seemed more willing to leave the pup when he was asleep and her distances away from the pup also increased (Table 3). This difference between the first and second weeks seems to be in accordance with what RAND (1955) reported for wild Cape fur seals. Although the results for the third week were very different from those for the first and second weeks, they may be misleading as only 207 minutes of observations were logged, compared to 523 minutes for the first week and 585 minutes for the second.

Swimming:

Mother and pup interactions during the pup's first encounters with large bodies of water have been described for other pinnipeds. BARTHOLOMEW (1959) reported that Alaskan

fur seal pups receive no parental instructions or help in swimming, and that the young were able to swim almost from birth. Similarly, KNUDTSON (1977) found newborn Harbour seal pups were precocious and entered shallow water about 10 minutes post-partum and swam independently in deep water at 20 minutes post-partum. On the other hand, van FOREEST (1978) reported that a captive female California sea lion actually pushed her pup into the water and followed him in. In the present study, even though swimming behaviour was not emphasized, a number of interactions between the female and pup were recorded when the two had access to the pupping pool.

On day 25 the door to the newly-constructed pupping pool was opened. Whenever the pup headed to the door the female herded him back and at times even lay on top of him preventing him from moving. The next day the female and the pup were locked out in the pupping pool area. Below is an account from the keepers' diary of what happened.

> "On 18.6.77 at 11:30 a.m. the female, Chinney, and the pup, Jeremy, were put out into the pupping pool. Chinney was very nervous and tried to get him back into the house but the door was closed. She then wasted no time starting to push the pup towards the pool, but he kept running away. She then tried to get him to follow her but he would not, so she forcibly pushed him in. He immediately ran out of the pool.
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> "At 11:47 a.m. Chinney went into the pool and the pup followed her to the edge and then ran away from the pool. She headed him off and tried to push him towards the pool with her head but was unsuccessful.
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> "At 11:53 a.m. Chinney went swimming. She then got out and forced the pup into the pool by getting on top of him and pushing him with her chest. Once in the pool, the female tried to prevent him from getting out. Eventually he got out".

The female continued to try and get the pup into the water until 1:00 p.m. when the pair were allowed back into the building.

For the next three days the pup and dam were kept inside without access to the pupping pool. While in the house the pup started to enter the large water bowl and the female prevented him from getting out. Then on day 30 the two were put out in the pupping pool and again the female behaved as before and kept trying to get the pup into the pool. The pup kept resisting. That evening, when they were inside, the pup again entered the water bowl, but this time the female appeared unconcerned.

On day 32 the female and pup were out in the pupping pool. The female entered the water and called to the pup, but he remained out at the pool's edge. A few minutes later the pup entered the water and put his head under water. Chinney then went and stayed beside him. The pup went in and out of the water several times on his own that day with the female always nearby. At one time the pup entered deep enough so that the water was over his head. As soon as he realized this he immediately got out. The next day the pup was hesitant about going into the water and Chinney kept trying to entice him in. By the afternoon both were in the water and the pup was seen swimming a few strokes for the first time. While in the water he would also try to climb up on her back. Later when the female got out, the pup remained in the water and swam back and forth a few times. The next day when they were allowed into the pupping pool, the pup showed no fear of the water, and entered willingly. By the end of the study period (day 35) he was swimming quite well.

It was apparent from the above observations, that the female was very intent upon and instrumental in getting the pup into the pool. Another report of such an action by a captive female seal was that of van FOREEST (1978). Once the Cape fur seal pup was in the water, the female was never seen assisting him to swim. She merely remained nearby. The pup was probably able to swim at a very early age and improved with practice. A number of other studies on other seal species by BARTHOLOMEW (1959), KNUDTSON (1977) and van FOREEST (1978) have also reported similar observations and conclusions.

Summary

A nursing session consisted of a series of short suckling bouts. The average session was 16.3 minutes (S.D. 6.9 minutes). The bouts varied from 5 to 90 seconds (average 23.5 seconds) and the time actually suckling averaged 45% of the nursing session.
Nursing was initiated by either partner, but the pup terminated most sessions (12 of 15). The pup also initiated and terminated the majority of suckling bouts.
All four nipples were used by the nursing pup.
Data for separations and approaches by the pup and dam were collected for a three week period and analyzed on a weekly basis. The dam consistently approached the pup more often than he approached her. The percentage of approaches by the dam did not vary significantly from one week to the next.
The number of separations as well as the separation distance of the pup increased after the first week, possibly due to increased co-ordination of the pup. After the first week the dam seemed more willing to separate greater distances from the pup. The results for the third week for the pup and dam are reported but are not compared with the first two weeks because of the difference in observation time.
The dam was instrumental in getting the pup into the pupping pool, but she did not "teach" him to swim.

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