

## References

- BEMMEL, A. C. V. van, 1956. Planning a census of the harbour seal (*Phoca vitulina L*) on the coasts of the Netherlands. — *Beaufortia* 5(54) : 121-132.
- BOULVA, J., 1974. The harbour seal, *Phoca vitulina concolor*, in eastern Canada. — Dalhousie University, National Library. Ottawa, Canada (thesis).
- GERACI, J. R., 1975. Pinniped nutrition-Rapp. P.-v.Réun. Cons. Int. Explor. Mer., 169: 312-323.
- HAAFTEN, J. L. van, 1974. Zeehonden langs de Nederlandse kust. — R.I.N. Mededeling 104 (in Dutch).
- HAVINGA, B., 1933. Der Seehund in den Holländischen Gewässern. — *Tijdschrift. Ned. Dierk. Vereen.* 3 : 79-111.
- MOHR, E., 1952. Die Robben der Europäischen Gewässer. — P. Schöpfs, Frankfurt/Main.
- PATTON, S., 1969. Milk — *Scientific American* 221 : 59-68.
- REIJNDERS, P. J. H., 1975. A simple field method for age-class determination in the harbour seal (*Phoca vitulina L*) — Paper presented at the 12th Congress of the International Union of Game Biologists, Lisboa.
- REIJNDERS, P. J. H., 1976. The harbour seal (*Phoca vitulina*) population in the Dutch Wadden Sea: size and composition. — *Neth. J. Sea Res.* 10(2) : 223-235.
- REINECK, Marianne, & H. E. REINECK, 1956. Ein Heuler wird aufgezogen. — *Natur und Volk* 86(12) : 397-407.
- RIDGWAY, S. H., 1972. Homeostasis in the aquatic environment. pp. 590-747. — *In: Mammals of the Sea: biology and medicine.* Ed. by S. H. Ridgway. Thomas, Springfield, Ill.



## EXPERIENCES AND PROBLEMS WITH CALIFORNIA SEA LION (*ZALOPHUS CALIFORNIANUS*) — REPRODUCTION IN OUWEHAND ZOO.

A. W. van Foreest, D.V.M., veterinarian Ouwehand Zoo, Rhenen, The Netherlands.

### Introduction

In the Ouwehand Zoo in Rhenen, the Netherlands, there has been, since May 1972, a small group of California sea lions (*Zalophus Californianus*), consisting of one male and two females, then estimated at about 2 years old.

It is clear that breeding of animals in Ouwehand Zoo, as in other zoos, is of great importance, but the lack of well educated and interested animal keepers is one of the main problems. With Ouwehand Zoo being privately owned it is difficult to pay the high salaries real top-people want.

In the daily zoo reports up till April 1976 there were no signs of any mating behaviour. The three animals live together in a fresh water pool, oval in shape with a length of twenty meters and a width of seven meters, containing app. 14,000 l of water. The tap is turned on all night to refresh the water. In summertime, with high temperatures, during the day too. The water leaves the pool again by running over the ledge in front. Twice weekly the pool is cleaned with 'Vim' and water under high pressure and is filled up again with fresh water from the tap. Twice a month it is cleaned with concentrated chlorine against algae, and there is no further chlorine or salt added to the water.

The pool was constructed with a concrete ledge behind it, 1,5 m wide and 5 m long. At one end there are stairs leading to a 'rock'-plateau app. 1,3 m<sup>2</sup> and 1,5 m above the water level of the pool. In front of the pool there is a low ledge to allow the water to leave the pool, then a  $\frac{3}{4}$  m wide gutter filled with water over the whole length and in front of this is another concrete deck the same size as the one in the back and leading up to the wall, behind which the public can watch the animals. Behind the pool there is also an entrance for the animal keeper to be able to feed the animals (the public is not allowed to give the animals anything to eat) and to clean the pool. In addition there are two small rooms app. 6 m<sup>2</sup> each, where the animals were meant to sleep (which they never did).

#### *Report of first birth*

On april 10th 1976 I got a call from Ouwehand Zoo.

One of the female sea lions had stopped eating in the morning, and when I arrived the animal was lying on the deck in front of the pool. She showed no interest at all and was very easy to touch. Nobody could explain her quiet behaviour and until this morning there had never been any trouble with these animals.

It was my first case of a sick sea lion and I thought the best I could do in spite of lack of a diagnosis was to give her some injections (antibiotics-corticosteroids-vit. B complex). The next day her behaviour was normal and she ate her normal quantity of fish. Two days later she totally unexpectedly had a premature birth but the mother showed no signs at all of mothercare and her behaviour and food-intake was as usual.

It is a wellknown fact in different kinds of animals that an injection with corticosteroids can induce a birth in late pregnancy, but it is also not unlikely that the dead baby was causing her trouble and pain and that this was the cause of her apathy two days earlier.

#### *The second birth*

Knowing that a pregnancy was possible in this group of sea lions I told the people to pay more attention to the sexual behaviour of the sea lions. Some matings were observed the week after the premature birth, so we hoped to get a sea lion birth in summer 1977. We discussed with Dr. Taylor and Dr. Greenwood what we could do to make a succes of the birth this time, and because it was difficult in our circumstances and maybe not even necessary to separate the mother and baby from the rest of the group, we decided to leave all of them together in the pool.

We did take some precautions, though, by starting to feed the animals in the corridor and the small rooms to get them used to this housing (they never came there much before) and so the mother could give birth in one of the rooms. In one of them we put a raised wooden platform on the floor so that the mother could have the baby on the wood instead of on the cold floor.

A wooden barrier was made, so that the animal keeper could close the opening between the corridor and the pool as it was safer not to allow the baby to get into the pool the first week of life.

The two first precautions worked out well as we saw when one of the animal keepers found a newborn sea lion in one of the rooms lying on the wooden platform. The mother nursed the baby 6-7 times a day and got her food as usual with the other animals in the pool.

There were no problems at all the first days: the baby was drinking fine, the mother kept the other sea lions at a safe distance away from the young, and when she ate or went swimming herself, the baby stayed quietly in its room.

On the 16th of June we placed a wooden barrier, so that mother and baby could not get into the water, and on the 18th, 5 days after birth, the baby walked around in the room on her own. At the end of that afternoon the mother did not want to get into the corridor, being afraid to get closed in. But in the evening, when she fed the baby, we closed the barrier again and for 3 days there were no problems.

The weight of the baby, a male, was by now, after a week, 5 kilo and 200 grams, and it was 50 cm long.

Tuesday the 21th of June we took the chance of leaving mother and baby without barrier in the corridor so the way to the water was free. They went lying on the 'rock' plateau and suddenly the mother pushed the young into the water and followed him herself. The baby was immediately able to swim (the water was app. 1,5 m deep) and although the mother kept pushing his head under water there seemed to be no problems at all. After a while the mother left the water and brought the baby to the plateau where after a while he started drinking.

After this they were moving everywhere together, on the rock, in the pool or in the room, and very often the baby was lying on the plateau with the mother swimming about on her own in the pool.

After a couple of days the other sea lions did not pay any attention at all to the young, whose weight by now, monday the 27th, was 3 kilo and 900 grams, 1300 grams less than a week before. But still everything seemed well and there was no reason to be upset, as the baby was very lively, drinking fine and swimming about without any problems. Still, the next day, the 28th, he stayed more inside than usual, the care of the mother seemed a bit less and the bull started mating activities with her.

Wednesday the 29th the baby kept sleeping and in the afternoon he seemed to drink a lot. At night he stayed in the room again and the male was with the mother. It went on like this for 2 days with the baby sleeping a lot till on the second of July he was found dead, 20 days old.

The only thing autopsy told us was, that the animal had an empty stomach and nearly empty intestines with a simple haemorrhagic enteritis.

There were no special bacteriological agents.

The cause of death has to be found either in a bad intake of food, or an insufficient milkproduction of the mother, maybe in combination with environmental problems like very cold weather or the disturbance caused by letting the bull get into contact with the mother. The reason that we did not interfere before it was too late is that we did not want to disturb the animals, as everything seemed all right except for the fact, that the baby started sleeping more than it used to. But there could have been a lot of reasons for that, and as it still seemed to drink, nothing looked alarming to us.

### *Future planning*

As we have seen in some zoos and marine mammals stations in U.S.A. last autumn, there don't seem to be any real problems in breeding sea lions in a group, and it is not always necessary to make any great change in the pool or additional housing. Some precautions we have decided to take under our circumstances beside the ones already described are however:

1. Taking care of a better insulation of floor and walls, so that the future baby does not lose too many calories after having left the water.
2. Keeping a better control of the weight of the baby by making a daily record. The risks we run by disturbing the mother and baby we consider smaller than the ones by leaving them alone like we did.
3. Although the baby coped fantastically in the water and the autopsy showed no signs of any trouble in the respiratory organs, it might have been better to keep it from swimming till it was two weeks old.
4. If the mating activities of the mother and the bull are disturbing the mothercare, it may be necessary to isolate mother and baby from the bull.

My opinion is, that Ouwehand Zoo has a good chance of breeding sea lions successfully. The important thing here is, like in other places I have visited, to observe the animals daily, especially the newborn animal and keep a daily record of the weight of the young, so that it, if necessary, can be handreared.

### *Literature and references:*

DINNES, M. R., 1977. Pinniped acquisition; methods, husbandry and medical management. — Ann. Proc. AAZV (in press).

MARTIN, R. M., 1977. Mammals of the sea. B.T. Batsfield LIM.

OTTEN, T. and B. ANDREWS, 1976. Report on the successful rearing of a California Sea lion pup. Aquatic Mammals 4(1): 21-25.

Ouwehand Zoo, 1977. Observation report young California Sea lion Pup.

SWEENEY, J. C., 1972, 1973. Management of Pinniped diseases. — Ann. Proc. AAZV.

SWEENEY, J. C., 1977. Managing the problem neonate. — Ann. Proc. AAZV (in press).

— — —