

MANAGEMENT OF SEA COWS (*Trichechus manatus*) IN THE
DUISBURG ZOO

by Dr. W. Bartmann, Zoo Duisburg, Germany.

Summary

If sea cows are recorded as being "rare animals" by the International Union for the Conservation of Nature and Natural Resources, this matter of fact holds even more true for our zoological gardens, e.g. zoos. According to the International Zoo Yearbook no. 11 of 1970 there are only 8 sea cows - and those are of the most common kind the Amazonas sea cow also called manatee (*Trichechus manatus*) - in 7 zoological gardens on exhibit. Only two are maintained at European zoos and one of them is at Duisburg Zoo. Obtained in September 1967 it was the first post-war import of a representative of this ancient species of mammals. A male with a length of over 9 ft and a weight of 0.3 t. He was put into a heated pool inside our Aquatorium. The length of the square basin was 13.12 ft with the water 2 ft deep. There he spent his first year in very fine condition, until near the end of 1968 the first signs of a skin disease were reported.

Case report

At first his keeper noticed during his routine skin care - our manatee then lies on the bottom of the emptied pool for about an hour being scrubbed - some sporadic, punctiform skin swellings, under light pressure discharging a yellowish-white secretion reminiscent of the so-called "blackheads". In the beginning this was not paid much attention to since the swellings appeared sporadically and were only very isolated. Yet within a few weeks they appeared quite numerous until they were spread out over the whole skin on the back and flanks. Now these boils could even be seen from the border of the pool by our visitors.

Taking a closer look at the matter, we found the furuncles mainly on places where hair grew, e.g. where hair had been growing. The body of the manatee shows particularly on the back and the flanks some single, very thin, and long hairs, normally not noticeable on the wet animal. So what appeared on the exterior of our animal as an abscess, was really an infection and

inflammation of the hair-follicle-glands. In the advanced stage the boils opened to secrete pus, blood and tissue fluid. The remaining sores kept on oozing pus and fluid so that the skin looked corroded-like in places and started to peel off. When the disease reached its peak, the animal was completely covered with furuncles and large epidermal defects.

Examination and medication

Even at the beginning of this furuncular dermatitis we tried to stop the disease and to avoid its expansion to non-infected areas with the common methods known to the field of dermatology. To be applied externally, we used a whole series of antibiotica as both ointments and sprays, which - to try their effectiveness were applied in part at the same time on different spots - proved more or less ineffective. In no case did we notice a satisfying successful treatment. This might have resulted from the fact that the therapeutical methods applied had to be restricted to one hour daily, the time the pool was cleaned. After the cleaning the pool had to be flooded again and a longer lasting effect of the externally applied medications remained questionable in the water. Very soon we realized that this was not the way to cure the animal.

In the meantime a bacteriological examination of smears from the infected manatee skin by Dr. Blessing at the Department of Pathology of the University Düsseldorf revealed that besides haemolytic streptococcus and staphylococcus the infection was mainly caused by *Pseudomonas morgani*. The only therapy promising some success seemed to be an intensive treatment with an injectable wide-spectrum antibiotic. We decided on chloramphenicol, e.g. Chloromycetin-suspension 20%. At first, we thought about injections of concentrations as high as 40 mg/KgW applied locally, e.g. subcutaneous around each infected area. Yet the treatment with such huge amounts of Chloramphenicol - it would have meant an injection of 60 ml. daily calculated from an estimated weight of 300 Kg, a dose of 40 mg/Kg/KgW using the 20% suspension - raises some rather serious problems. It is a well known fact that marine mammals have a thick, wide spread vascular subcutaneous connective tissue, in which many medications remain ineffective being absorbed at a high rate and, therefore, eliminated too fast. This may be an advantage, yet may also be a disadvantage too. Prof. Kraft at the medical animal hospital of the University of Munich made the suggestion to apply small doses of Chloramphenicol into the vicinity of the animal's front extremities.

ies and tail muscles by intramuscular injection. We agreed on 26.5 mg/Kg. of Chloromycetin-suspension 20% injected daily for 16 days in the body areas mentioned. We still applied Chloromycetin-spray externally as done before and also put some vulnerary tincture on the sores. To the pool water, measuring about 10 m³, we added immediately 100 grams of a disinfectant called Halamid recommended to us by the Amsterdam Zoo.

Yet the Chloramphenicol injections by which the manatee retained hardened swellings for months, did not have the anticipated striking success. In the middle of February 1969 and then too only very hesitantly a small improvement in the condition of the skin was noticed. Fewer boils appeared and already infected areas as well as skin lesions started to heal up. The healing process was favourably supported by an additional remedy also used in the elephant care and also quite effective on sea cows distantly related to elephants: the sick spots were covered daily with a loam-pulp which dried up quickly and also stayed on the animal when lying in the water. At the end of April 1969 - hence almost six months after the outbreak of this skin disease - the furuncular dermatitis was healed up so far that the import of a second specimen could be arranged without fearing an infection of the second manatee. Unfortunately on May 5th, 1969, we received straight from South America a pair instead of one female manatee, and so had to house a male destined for another Zoo for the time being because we could not let him to die at the airport. Yet the imported male drowned our bull and died at the same time of a heart attack, leaving us again with one single specimen. The post mortem findings also showed - yet not in original context with his violent death - a chronically scared over furuncular dermatitis.

Second case report

The skin of the new manatee was watched closely right from the beginning. Like our old male no signs of skin changes were reported for one year and the animal was doing rather fine. But in April 1970 this manatee too suddenly had some sporadic furuncles, just as we had experienced with our former animal. And even though the treatment talked about was applied as before, we could not manage to prevent the infection from spreading over the back and flanks - also the same

parts infected on our previous bull. In that case too we had to deal with an inflammation of the hair follicle glands developing into a suppuration of them and we even found the same causative organisms in smears taken from the infected areas. Yet at that point the slow healing process could be speeded up by a very simple method indeed, and that was by just adding common salt (NaCl) to the pool water. Thus causing a change of the osmotic pressure and stimulating the cow's skin metabolism and hence the healing process. Contrary to the very slow advancing cure of our first manatee the second one was free of acute infections within five weeks. We attach great importance to the salt solution for its influence on the well-being of the manatee's skin, and to date salt is still added to every pool filling. Two years after the completely cured disease only some scars on the back and flanks of our manatee give proof of the original furuncular dermatitis.

SOME REMARKS ON THE BEHAVIOUR AND HANDLING OF WHITE WHALES (*Delphinapterus leucas*) IN CAPTIVITY

by Dr. W. Bartmann, Zoo Duisburg, Germany.

Summary

It is now more than four years since Dr. Gewalt - in quite an exciting manner - caught two white whales (*Delphinapterus leucas*) by hand in the Canadian Hudson Bay and brought them safe and sound to Duisburg. Many a critic's voice among experts had doubts at that time about keeping these huge marine mammals alive for a length of time at inland facilities. Well, in seeing our animals today, swimming about in their pool quite gay and in fine condition, even the greatest sceptic has to realize that all the pre-requisites for their existence in captivity are totally given. I do not want to go into the technical requirements needed to keep our white whales, these data are already published (Zool. Garten 38/5). What seems more likely to be of interest - after four years of keeping Belugas - is an up to date summary of our experiences in feeding, handling and treatment, and observations of behaviour, bearing great importance on the daily care of and leading to better understanding of these aquatic mammals. For example, during their

actual capture and even for a long time afterwards, we believed we had a pair. Yet today - after taking a closer look at the animals, from the diver's view too - we know that we imported two females and are, therefore, on the lookout for a male. Not all of our observations brought such illuminating facts, though in time we believe to have maintained a clear idea of proper whale handling.

Initial feeding problems

To keep wild animals in captivity always raises nutritional problems which was even more so the case with our belugas, for in regard to their natural prey many and varied opinions exist. One school of thought believes the prey to be fishes, crustaceans, molluscs etc., and we knew, in keeping them at inland facilities, we had to keep them right from the beginning on an imbalanced fish diet; only herrings and mackerels, the same as the food for our dolphins. Both whales had to be forcefed in the beginning, which was connected with some stress: for every feeding the pool had to be emptied to a point where the belugas laid on the bottom with their backs coming out of the water. Fortunately, the animals remained calm and did not show any signs of panic when approached. Initial experiments to get the white whales to eat by themselves in just presenting the prey remained unsuccessful. The best method experienced, was to sit on the animals back, the body jammed between the knees, a second person standing over the head to push the fish down the throat. The animal's only defensive movement in that position is the shaking of the head sideways. The man in front has to open the jaws and push the fish as far down into the throat as possible. Very important indeed proved the necessity to keep the whale's mouth closed for a moment afterwards, because otherwise the fish was likely to be brought up and spat out immediately. This feeding procedure is very good too for administering fishes prepared with vitamins and medicine.

After some weeks of forcefeeding our animals were willingly eating once and awhile by themselves when presenting the fish without force. We found out pretty soon that they preferred the mackerels to the herrings and we, therefore, offered only this type of fish. Yet it still took more than four months until our animals willingly came at feeding times - with the pool filled - to the border to take their prey.

They stick their front body out of the water and open their mouths wide, just waiting for the keeper to insert the fishes. A snapping at the mackerels like it is noticed in dolphins has not been observed, neither competition nor jealousy during feeding time by either of the animals. Even during the quite voluntary food uptake the keeper has to let the fish glide deep into the animal's throats. If one lets go of the fish too soon the animal may lose it and will not pick it up from the bottom or out of the water either. While Alua takes up a couple of fishes at a time, our Moby swims a small circle under water after every single fish to aid the transport of the food into the stomach and then returns for another one.

Our belugas are quite sensitive and great connoisseurs in regard to the quality and size of the fish. You may not believe it, yet they only take mackerels of about 40 cm. length and with the adequate bulk. If we have only fishes 10 cm less in length they refuse them. Firmness and freshness are of great importance too. Cut up prey will be always refused. Today we are only giving deep-frozen mackerels, thawed shortly, two to three times daily. The food uptake is also depending very much so on the seasons and in addition our animals differ from each other in regard to their eating habits as well as their quantitative food uptake. Alua obviously does have the greater appetite; her average comes to 8.6 Kg per day, while Moby consumes 6.1 Kg. Yet both values are still below the average food uptake of the white whales at the New York Seaworld. The belugas there consume according to information given us by Director Nigrelli daily more than 20 Kg per animal. But in regard to the daily rations one other observation is quite of interest. We were very worried when in one year our animals during the months of August and September reduced their daily portions up to 50% and we seriously were thinking of some health problem. Yet the following year the same phenomenon was reported, especially in the case of Moby. In 1973 it was also noticed during these hot weather months. Well, this is the period of time during which the belugas at liberty gather mainly in front of estuaries, having calved shortly before and apparently to take up less or even no food at all. Stomach contents examinations of belugas caught by Dr. Gewalt proved this fact. It seems that our specimens still keep up with that habit even in captivity. Taking the average of one year Alua did eat

about 10.2 Kg. and Moby only 7.8 Kg., totalling up to a little more than the average in 1971.

Supplements to nutrition

It is quite natural that the absolute food uptake - for example in September 1972 - may greatly differ from day to day in the case of Alua, even up to 100%. There are days during which the animals refuse their meals altogether without obvious reasons. If doing this for some days, we have found a treatment quite successful: the animals get a deep intramuscular injection of vitamins, cortisone, iron and antibiotics, using naturally the same method when force feeding the animals, with a water depth of about 50 cm. The place of injection is right beneath the dorsum into the muscles. After the application of the above mentioned drug combination, the animals started to take up their daily rations within a short time. The same combination proved also effective in dolphins.

It may happen that the whales have some sort of cough, whereby a mucous discharge comes out of the breathing hole. This might be caused by a cold or an irritation of the mucous membrane; it certainly reminds of the nasal mucous discharge by terrestrial mammals. In such cases we administer the drug Bisolvon in form of tablets and have always noticed a relief of the cough.

From the veterinary medical point of view it might be of interest to know that during the summer time whales very often are bothered with sunburn, especially on their back, for when lying in the water the back is sticking out and often exposed to the sun for a long time. This leads to skin damages, skin discolouring, and lesions which you can always diagnose as a sunburn. Huge parts of the damaged skin peel off their back. The more or less fatty lighter skin of Alua reacts more strongly. The sunburn seems to cause some itching, for the animals do scrub their backs often and like very much to be scrubbed with a soft brush by their keeper.

Skin damages or injuries are treated with ointment or protected against infections with Vaseline. It might be mentionable that we also regularly treat the animals with Nandoral and vitamin K in form of tablets to keep their skin healthy which has proven quite effective, not to mention also the fact that in order to keep them free of parasites we administer Piperazine-citrate (60gr./whale) every 6 weeks.

Social and territorial behaviour

Besides their eating habits conditional on captivity, our belugas do show some further special features in their behaviour, like cleaning and ease movements. For their skin and body care we installed some brushes at the bottom of the pool. Both the animals use these as scrubbers in skimming over them in all body postures. Yet the brushes have to be quite soft to prevent skin injuries. Also at the surface they like very much to be massaged with a brush and even turn their backs and snouts towards the keeper.

Their social behaviour is indeed pronounced - among themselves as well as towards humans. The belugas never swim far apart and like to stay close to the border where visitors or keepers are standing. With rhythmical stretchings they move their front body back and forth on the border, which seems to be a weak point of their character; they are very nosy. They examine quite accurately what is going on outside their territory. If possible they try to get in physical contact with familiar persons, playfully snapping at their hands or touching softly the keeper's face and head. An aggressive tendency is never noticed if one is outside the water. But the same animal, calm and nosy, watching the diver to get ready, may react quite differently when the diver is entering his territory. We had to experience this often when diving into the pool was necessary. First they swim about curiously, standing in front of the diver or circling around him. Very distinctly one can see how far the head can be turned when observing the intruder. (On such occasions having a look at the animal from the diver's view, we found rather reluctantly but with certainty that the beluga caught as a male was in fact a female.). If the diver stays under water for a length of time, the circles will become smaller and they will follow him closely, if he tries to swim away. Now the nosy behaviour turns more and more into aggressive movements. The beluga then makes some series of noises like screaming and twittering, also deforming his forehead extension. The forehead is stuck out quite far in a ballshaped manner. This change of the forehead always precedes a direct attack and shows an aggressive tendency. Immediately afterwards the beluga thrusts forward against the diver in showing him his teeth. Now sounds are being made too, coming out of the breathing hole as one could see by the upcoming air bubbles. Our keepers already know that more attacks

will follow and certainly do not like to go ahead at that point with such experiments. Indeed now the belugas are snapping at his hands and legs and even though no serious injuries will occur, both whales may bring a diver into quite a distress. This can be very unpleasant if ones back is not turned towards the pool wall or a stick is not at hand. In one case our keeper was being pushed towards the bottom while Alua approached my camera to play the same game with me, so all I could do to save myself was to leave the pool rather hurriedly. Even in the channel where the whale followed us we were attacked.

This behaviour shows clearly that whales like other mammals do have a territory and in entering this territory one has to count on a whole series of aggressive behaviour until the actual attack. This applies to animals kept in captivity for a longer time and always in the same pool even more so.

Contrary to this aggressiveness stands their enormous preference for physical contact as well as their innate desire to play and invent which is a good pre-requisite for our show to be attractive to our visitors. Remarkable is, that our animals do many tricks by themselves or experiment with objects given to them. To award them by feeding in order to support their training does not play a big part, because one only has to think on their difficult eating habits.

Our white whales learned pretty fast to bring back balls in pushing them ahead with a spout of water. They hand the ball over to the keeper without waiting for an award. They also bring back hoops in balancing them skillfully on their snout, or bring back greater floats on their heads. They are able to lift their body two thirds out of the water, if asked for. Yet they may do just as well the contrary, a training habit they have learned by themselves. Another trick, which Alua picked up herself and likes it much, is spitting water well aimed at our spectators. This game was worked out into a trick by our keepers, extinguishing a flame held at the pool border. To a white whale this fast pick-up of a trick is no problem at all.

When our belugas in comparison to the quick and high jumping dolphins seem rather phlegmatic and clumsy in their movements, we have experienced that when it comes to adjustment, inventiveness and learning, they are in no way inferior to their closest relations, the dolphins.