A TYPICAL CASE HISTORY OF THE NET-CAUGHT HARBOUR PORPOISE, *Phocoena phocoena*, FROM DANISH WATERS

by S. H. Andersen, Mag., Bio-acoustic Investigations, Odense University, Denmark.

Summary

The harbour porpoise and all other cetaceans are totally protected in Danish waters but not in the waters around Greenland and the Faroe Islands. This means that it is forbidden to catch, transport and purchase cetaceans. As a university laboratory we have received the permission for a yearly maximal „take" of four animals. Since the Baltic Sea population of harbour porpoises has disappeared it is no longer possible now to organize catching of the animals while they are migrating in schools through the Danish waters to the North Sea during the wintermonths. We have given up attempts to catch the animals ourselves after an unsuccessful catching project – resulting in only three animals.

Therefore our laboratory animals are those which have caught themselves in different kinds of nets set for fish. The types of nets involved are described and attempts are made to explain why the animals are caught in them. Most of the animals we get from these nets are sick ones, and typical autopsy findings are: heavy attack from parasites in lungs, pneumonia, parasites in liver, stomach, intestines and middle-ear cavities, oesophagal abrasions and skin lesions. Before we can use the animals for our bio-acoustic and behavioural studies we try to cure them and therefore our laboratory also acts as a hospital for harbour porpoises.

A change in geographical distribution

The distribution of harbour porpoises in Danish waters has changed in the last century. During the months November, December and January of the late 19th century, porpoises migrated in schools of great numbers from the Baltic Sea northward through the narrow sounds between Jutland, Fionia, Sealand and Sweden. Then in the spring time a return migration of smaller schools to the Baltic took place. This seasonal migration has since decreased steadily. Porpoises are now seen almost all year long but most abundantly in summertime while breeding in coastal waters around Denmark but rarely in the Baltic Sea. The causes of this were treated in ANDERSEN, 1972, but it can also be mentioned here that changes in the ecology of the Baltic Sea from climatic or pollutional causes are potential factors. Since the migration through the Danish waters has ceased it is not possible to organize catching of porpoises without great economical investments, and so we have to work with animals that have caught themselves in different nets set for fish.

Types of nets

Danish fishers have developed the pondnet (Fig. 1), which is especially suited for our type of coast and sea floor. A row of poles perpendicular to the coastline carry a net that leads to a „pond", a circular net with a narrow entrance, which is open only shorewards. When the fish and porpoises meet the „stopping" net and follow it outward they get trapped in the pond. The diameter of the pond ranges from 5–10 metres and the height of the circular net ranges from 4–8 metres. Since the net is well stretched and stiff from tarring harbour porpoises can swin freely in the pond

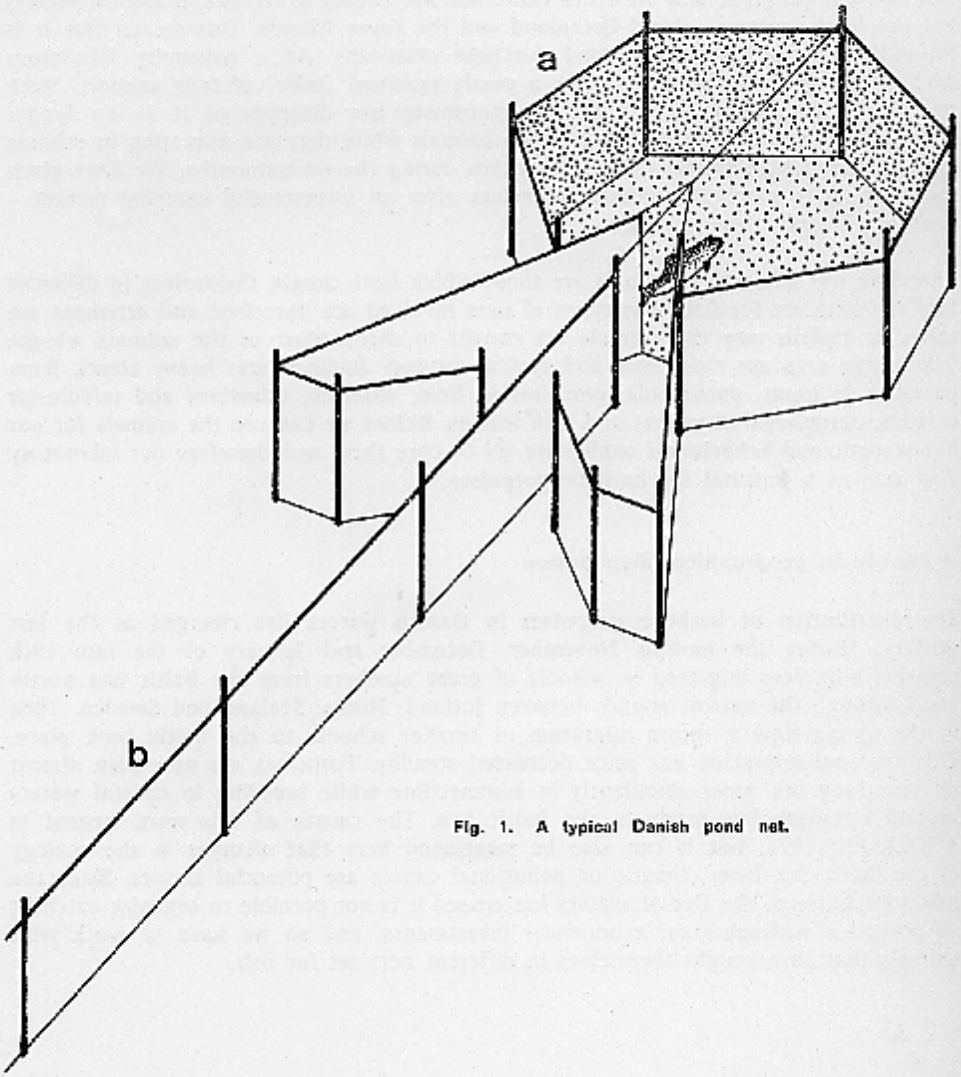

Fig. 1. A typical Danish pond net.

net and not get entangled in it. The opening in the meshes are only a few inches. When fishermen empty their nets the entrance is first closed and the bottom is lifted to the surface so the fish can be taken aboard.
There are two seasons when the pond nets are in use. They are set for herring, cod and eel in early spring. In July and August there are only a few nets in the water because of the abundance of jellyfisch and algae growth. During these months we are not offered porpoises. In September the nets are set again for eel an salmon in particular and left there until the ice comes.

Two other types of nets are the drift net and the set net. These types are more internationally known and differ in that the former type is a drifting net and thus does not reach the bottom. The latter type is fixed to the bottom with weights. Both of them are made of thin artificial fibres and are often seen set in long rows. These nets are used to catch salmon, plaice, flounder, lumpsucker, herring, cod and coalfish and are therefore in use as long as the water is icefree. Furthermore the set nets are easily handled and can be used by amateurs and semi-professional fishermen to a great extent.

Why do the animals catch themselves in the nets?

Since the drift nets and set nets are made of thin, mono-filament or twisted artificial fibres they give only a faint – if any – echo, when the porpoises are using their echolocation. Therefore porpoises easily get entangled in the nets and often drown. Lateron they are washed ashore with typical markings made by the relatively open nets. Although we have received a few animals from these nets we have had no success in keeping them alive. After having tried to lift the net and the weights to the surface they are frequently too exhausted to recover. Usually only animals of 1 – 2 years get entangled in these nets.

In the case of the pondnets we must still use our imagination. The fishermen say that the pondnet is a very effective fishing gear and its construction takes into consideration that this may be an explanation. A modified type of pond net with extra long catching arms had been used for catching porpoises in Denmark during the nineteenth century (MØLLER, 1964) in combination with boats which drove the porpoises toward the nets. This is consistent with the fact that animals are most often caught in pond nets during gales when the water has a low visibility. Another factor which is not known yet, either in the harbour porpoise or the bottle-nosed dolphin, in whether the use of echolocation in cetaceans is compulsory or occasional. Neither has it been proven that use of echolocation can save the animal from being trapped in nets of any material or construction. When porpoises are chasing fish they may fail to avoid the nets. The use of echolocation is developed during the first year of the porpoise's life. This latter aspect is consistent with the fact that many newborn animals are trapped in the pond nets. In three cases we have been called by fishermen who had two animals in the same pond net. This substantiates the argument that the pond net is a very effective catching gear.

Another explanation often heard is that the animals caught in pond nets are sick ones which have difficulty catching fish themselves. To our experience this is not very likely since sick animals seldom eat, but this depends on the kind of sickness. Another fact is that about 90 per cent of the animals (approximately 50 animals have been offered to us during the past 12 years) caught in pond nets are actually sick ones. Lungworms and adjacent infections have detrimentally affected the lung tissue. Therefore, if porpoises use air for the production of echolocation signals, it is likely that the affected lungs will no longer be an efficient pump to controll air movements in the nasal passage or wherever a dolphin produces its sounds.

One could object that the animals are not sick when caught in the pond net, but they cannot stand the transport between the net and our lab. I am very aware that transport can be stressing to dolphins but the time in transit has never exceeded 7 hours and is usually 2 hours. The fishermen hold the animals in small nets or well-boxes awaiting our arrival for approximately 2 hours. Most of these animals die after about 1 hour in transit or after one or two days in the laboratory. Autopsies of these animals reveal very often the same characteristic picture:

The characteristic autopsy picture in net-caught animals

1. Heavy attack of lungworms i.e. the major bronchii are filled with the 10–15 cm long nematode *Pseudalius inflexus* and the smaller *Stenurus minor*. Embedded in

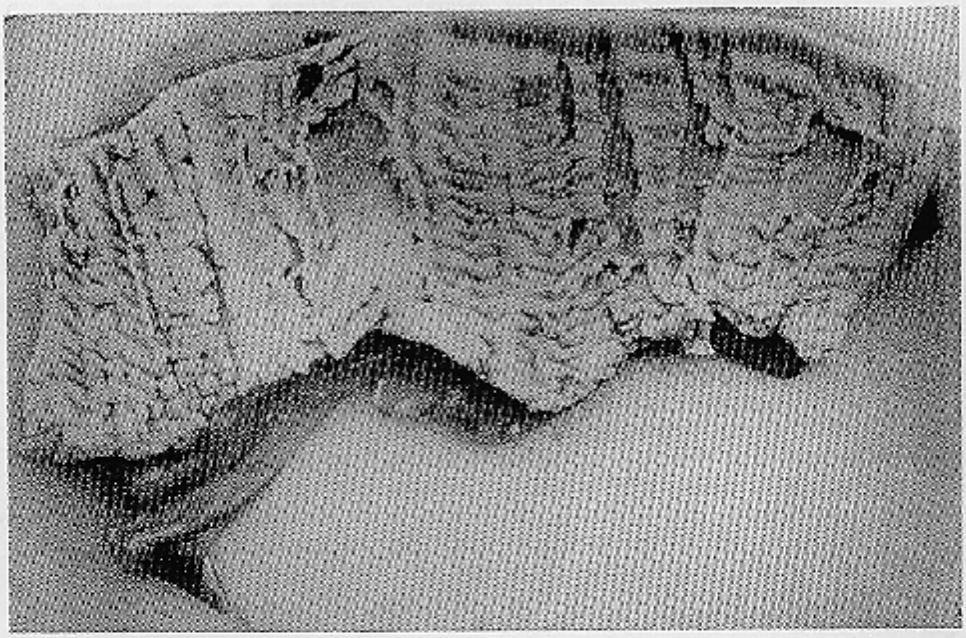

Fig. 2. Epithelial abrasions in oesophagus of a harbour porpoise.

small cysts of 3-4 mm are numerous specimens of another nematode *Halocercus invaginatus* (WESENBERG - LUND, 1947 and BAYLIS, DAUBNEY, 1925). These infections cause the development of fibrosis and emphyzema. Thus the gas exchange over the lung tissue is decreased and resistance in the pulmonary circuit is increased which causes a strain on the heart. Very often we see that these animals have a distended right side of the heart as a result of the increased resistance in the pulmonary bloodcircuit. Animals with this syndrome are less able to stand transportation stress. The animals which survive transportation do not behave normally when put into the pool. They rest on the surface in a corner of the pool with little to no tail movement and show a very shallow respiration. They hardly react to touch or acoustic stimuli and we consider them more of less unconsious due to oxygen deficiency during transportation.

2. Autopsies also reveal attack of the liver fluke *Campula oblonga* with hyperplasia of the bile ducts, which are sometimes totally obstructed.
3. Stomach worms (ascarids) and a tape worm *(Bothriocephalus sp.)* are frequently found.
4. The oesophagus from pharynx to oesophagal stomach inclusive often shows epithelial abrasions of rectangular form mixed with small tubercles of the epithelium. Attempts to diagnose this symptom have hitherto failed (Fig. 2).
5. Lesions: in most of the animals we have found one or two different skin lesions. The first is seen in Fig. 3 (1) and this lesion has also been found in animals in captivity. The development of the lesion is from a sudden eruption of small greyish-asbestos-like spots. The grey colour disappears and these spots develop

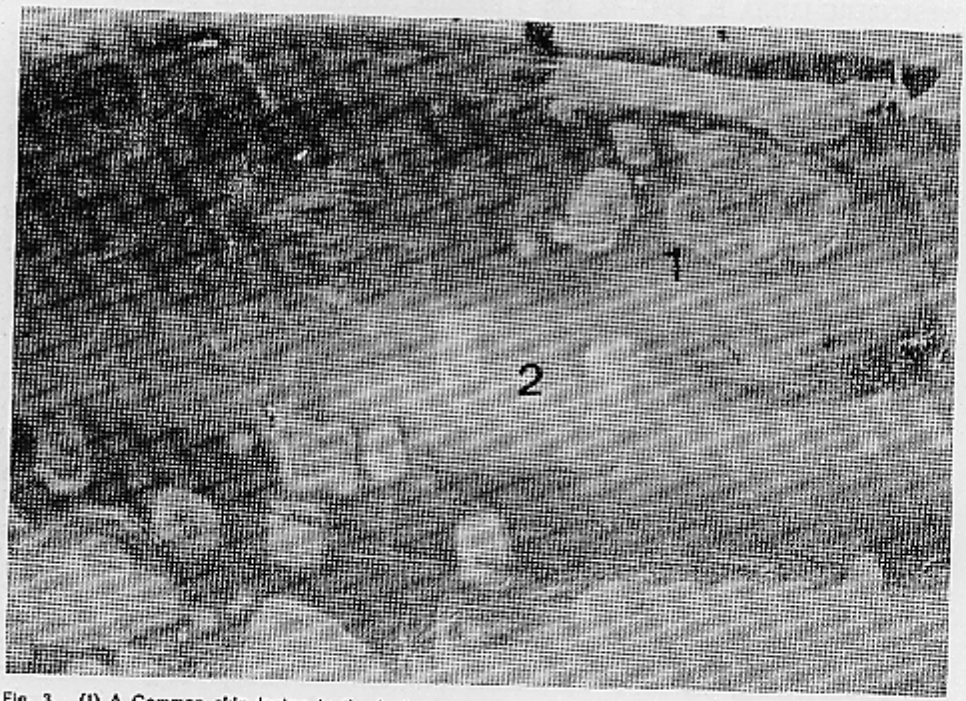

Fig. 3. (1) A Common skin lesion in the harbour porpoise, see text.
(2) Suspected erysipelas plaques, see text.

into irregular areas, having numerous small eruptions in the center and necrotic edges. The areas increase in size and can cover the entire animal. Yeasts have been cultured from the lesions but may be from a secondary infection. The other skin lesion is also shown in Fig. 3 (2). From day to day small rectangular and slightly elevated spots develop in the skin. This is also seen in animals in captivity. The spots can disappear in a few days and in one case they seemed to disappear in response to treatment with penicillin. Erysipelas has been suspected as a cause of the disease due to the characteristic shape of the spots and because of its known occurrence in other dolphins (RIDGWAY, 1972).

Rerefences

ANDERSEN, S., 1972. On the State of Stock of Common Porpoise in Danish Waters. International Council for the Exploration of the Sea. CM 1972/N : 6. Marine Mammal Committee. (Mimeographed).

BAYLIS, H. A. & DAUBNEY, R., 1925. A Revision of the Lung-worms of Cetacea. Parasitol., XVII, 2; pp. 201–216.

MØLLER, K., 1964. Marsvinefiskeriet ved de Sjællandske, Kyster. Danske Folkemål, Bd 18, tillægshefte: pp. 59–88. Institut for Dansk Dialektforskning, Copenhagen.

RIDGWAY, S. H., 1972: Mammals of the Sea. Thomas. Springfield, Illiniois.

WESENBERG-LUND, E., 1947–48. On 3 Parasitic Nematodes from Cetacea. Vidensk. Medd. Dansk Naturhist. Foren. 110: pp. 2–30.

– – –

OCCUPATIONAL THERAPY FOR HARBOUR PORPOISES, *Phocoena phocoena.*

by M. Amundin, Marine Bio-Acoustic Investigations, Odense University, Denmark.

Summary

Two harbour porpoises, a male and a female, both around 10 months old, which had to be left alone for periods between bio-acoustical investigations, developed stereotyped motor patterns and signs of boredom. Therefore, toys of different kinds were introduced to them as occupational therapy. Several kinds of toys were accepted, although some were more preferred than others. A progressively decreased approach-time to new toys was observed, ranging from hours in the inexperienced animal to a couple of minutes in the experienced one. The play activity was most intense in the hour before feeding, and one of the animals spent as much as appr. 65% of this hour in play. A female, which during an early isolation developed a „cage habit", could be partly diverted from this if provided with toys.