ECS Newsletter no. 1

THE EUROPEAN CETACEAN SOCIETY
REPORT OF THE 1987 MEETING
HIRTSHALS, DENMARK

EDITORS

J.W. BROEKEMA C. SMEENK

26-28 January 1987

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Editors: J.W. Broekema & C. Smeenk
Design: John Pedersen
Printed by: The North Sea Museum, Hirtshals, DK
Published by: The North Sea Museum, Hirtshals, DK
August 1987

ISBN 87-7249-031-4

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Foundation of the European Cetacean Society

(by the rapporteur)

Introduction

During a meeting at Bremerhaven, West Germany, of marine mammalogists studying the harbour porpoise *Phocoena phocoena*, it was suggested that the needs of European cetologists might best be served by the formation of a society devoted to the study and conservation of cetaceans in European waters.

To study the feasibility and, if the result proved positive, to found such a society, a meeting was held at the North Sea Museum, Hirtshals, Denmark, 26-28 January, 1987.

The Hirtshals meeting

The meeting at Hirtshals was visited by 80 cetologists, students of biology and others concerned with the study and protection of cetaceans from 10 European countries. The North Sea Museum provided not only a splendid environment in its conference hall, but also took care of the meals and social gatherings.

The proceedings

The conference was welcomed by P. Krabbe, chairman of the board, the North Sea Museum, Hirtshals. The following meeting was divided into three separate parts: the scientific papers, the foundation of the European Cetacean Society, and the progress reports of the Bremerhaven meeting. The conference was followed by a meeting of the working group on the harbour porpoise, the report of which is included here. These proceedings are divided along the same lines, following the chronological order of the meeting.

The scientific papers, sent in by the various authors, may for editorial reasons have been adapted slightly. The name of the person who presented the paper is printed boldface. The discussions following the papers have been condensed to the bare essentials.

Rapporteur of the meeting was Jan Willem Broekema; editors of the proceedings were Jan Willem Broekema and Chris Smeenk.

Part I: The Scientific Papers

NORD-VAL: Planned research on killer whales *Orcinus orca* in Møre, Norway, 1987

Anna Bisther, D. Vongraven, U.Dreijer, P. Berggren, A. Lund, J. Martinez, P. Lønstad and H. Enkvist

An initial investigation of free-living killer whales is planned off central Norway by late fall 1987. This research project with the name NORD-VAL will be carried out by a group of nordic biologists. The planning started september 1986 and till January 1987 work has been concentrated on setting up a research programme, establishing contacts with the universities of Gothenburg, Stockholm, Linkøping and Trondheim, preparing applications for financial support, and informing the appropriate authorities, such as the Norwegian Institute of Marine Research.

The killer whale stock in the Northeast Atlantic is thought to be stationary along the Norwegian coast and mainly concentrated in two areas: in the Møre region in the central part and Lofoten in the north of Norway (Christensen, 1982). The killer whale feeds mostly on fish, and one of its main food resources in these areas is the North Atlantic herring. This has generated conflicts with fisheries, and for this reason killer whale catches have been conducted to protect the herring stocks. Such "protective" hunting of killer whales was carried out until 1982, when the Norwegian government decided to follow a recommendation put forward by the International Whaling Commission's scientific committee: to temporarily stop this hunt till 1990, when the species' situation should be evaluated again. In the meantime one should assess the stocks in these areas.

A major part of the previous research on killer whales has been the collecting of anatomical and physiological data from captured animals. However, research on living animals, based on photographic identification, has with success been conducted for over a decade in Vancouver, Canada, by Michael Bigg (Bigg, 1982), and a similar long-term project has been set up in Lofoten, Norway, by Thomas Lyrholm and coworkers.

NORD-VAL consists of eight biologists and biology students who, as mentioned, intend to start killer whale research in the Møre area, using a 75-ft sailing vessel. The use of this vessel, which has a crew of five, will enhance the possibilities of successfully completing the project.

The research programme mainly consists of three parts: photographic identification, acoustical registration, and behavioural observations.

Due to its wide scientific potential, major emphasis will be laid on photographic identification. Photographs of individual specimens will be taken from two fast-going zodiacs. To produce optimal results with this method, it is the intention to develop all photographs on board so as to be able to directly make the necessary complements. Results from this programme will be used in the stock assessment and studies concerning migration and population dynamics. These are all long-term studies, which need follow-up studies in subsequent years.

The basis of the acoustical programme will be a three-dimensional recording device set up on board the ship. Once analysed the sound recordings will, in combination with photographs, give broad information on pod structure. The absence or presence of dialects will thus be revealed and other questions may be investigated, such as the

use of acoustical shocks for paralysing prey, the so-called "big-bang" theory. This can be studied by measuring absolute sound pressure by means of calibrated acoustical instruments.

The behavioural observations will be made from the main mast of the vessel and will primarily concern the killer whales' hunting strategy and social behaviour. Such a more or less continuous look-out is crucial when observing whale movements from a ship, and will be utilized for the benefit of all participants. Part of the behavioural studies will make use of the standarized codes prepared by Balcomb and coworkers (Balcomb et al., 1980).

Throughout the field work, all results of the investigations will be put together in order to make the work more efficient and to obtain optimal scientific and practical results.

Apart from the scientific objectives of the research programme, NORD-VAL has other major intentions, namely introducing biologists to benign research on cetaceans. Continuation of this work will hopefully provide a basis from which further studies on living cetaceans can be conducted in Møre as well as in other areas.

Literature

Balcomb, K.C., J.R. Boren, R.W. Osborne & N.J. Haenel. 1980. Observations of killer whales (*Orcinus orca*) in Greater Puget Sound, State of Washington. – NTIS PB80-224728, U.S. Dept. of Comm., Spring field, Virginia.

Bigg, M.A.. 1982. Assessment of killer whale (*Orcinus orca*) stocks off Vancouver Island, British Columbia. – Rep. Int. Whal. Comm. 32: 655-666.

Christensen, I. , 1982. Killer whales in Norwegian coastal waters. – Rep. Int. Whal. Comm. 32: 633-641.

Discussion

Questions concerned the results to be expected. There is no or little evidence of migration and there may be a migratory and a stationary part of the population.

Some observations on a sociable resident bottle-nosed dolphin *Tursiops truncatus* off Pembrokeshire, Wales

Christina Lockyer, Margaret Klinowska, Bob Martins

A juvenile male bottle-nosed dolphin, known locally as "Simo", was resident in a coastal area of approximately $25km^2$ off Pembrokeshire, Wales, 51°51' – 51°52.5'N, 5°07' – 5°12'W, between January 1984 and autumn 1985. This home range extended along a coastal strip of ca. 10 km.

Between August 1984 and October 1985, growth in length and girth was monitored regularly by simply holding measurement tapes against the dolphin's body while the animal was quite still. These measurements indicated a linear growth rate of approximately 3.2 cm/month, and an overall length increase from 2.286–2.709 m over 396 days. Girth measured in front of (G1) and behind (G2) the dorsal fin also showed an increase over time, as well as a temporary fattening in June–July 1985. Derivation of weight (W in kg) from a formula incorporating total length (L) and girths (G1, G2) in meters, using data collected from captive bottle-nosed dolphins:

$$W = 34.67 \times L^{1.23} \times G1^{1.36} \times G2^{0.39}$$

indicated a growth in weight from just under 200 kg to ca. 295 kg throughout the period, with a temporary peak in June–July of 307 kg.

Observations on a total of 136 free-ranging dives (generally defined as periods exceeding 20 sec.) of different types (e.g. feeding, on passage) showed a mean and standard error (s.e.) of 55.32 ± 2.48 sec., with a mean number of 3.50 ± 0.18 blows between dives and a mean interblow interval (excluding dives) of 10.46 ± 0.40 sec. There was no consistent correlation between blow number and dive duration. However, there was a significant negative correlation between blow interval and number of blows with $p < .05, d.f. = 104, r = -0.225$. It appears that there is a minimum threshold interval which cannot be reduced, perhaps related to physical and anatomical constraints.

Observations on sustained swimming speeds indicated a significant relationship between maximum speed and duration for which it can be maintained. Up to 4 min., the relation is highly significant with $p < .01, d.f. = 4, r = -0.952$. The maximum sustained speed (V in km/hr) followed a linear decline:

$$V = 57.16 - 11.81 \times T$$

where T = the duration for which the speed was maintained in min., between 0-4 min. inclusive. Thereafter, sustained speed fell to a plateau level of around 4 km/hr for periods exceeding 20 min. Observed maximum peak brief effort achieved was 54 km/hr for 8 min. None of the observed sustained swimming speeds were influenced by bow-riding behaviour or slip-streaming in the wake of boats. The majority were observations from distant vantage points on shore where distances could de subsequently derived from charts.

All these observations depended on voluntary participation by the dolphin and involved no restraints whatsoever. The observations are unique for one individual, but are also probably unique for wild *Tursiops truncatus* in U.K. waters.

Discussion

Questions mainly concerned the way in which measurements were taken. For the weight of the animal a predictive formula has been used.

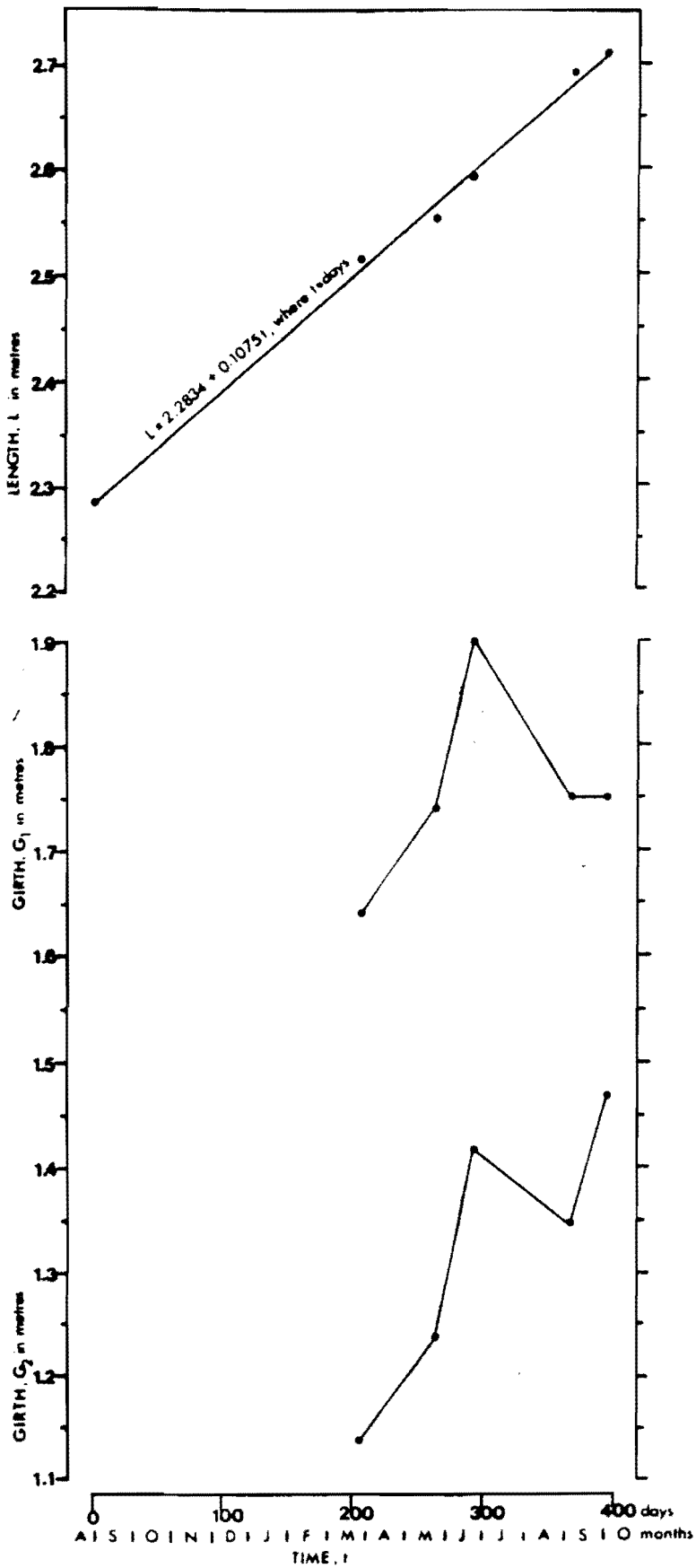
LENGTH, L in metres
2.7
2.6
2.5
2.4
2.3
2.2
L = 2.2834 + 0.10751, where t=days
GIRTH, G1 in metres
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
GIRTH, G2 in metres
0
100
200
300
400 days
A I S I O I N I D I J I F I M I A I M I J I J I A I S I O months
TIME, t

Fig. 1

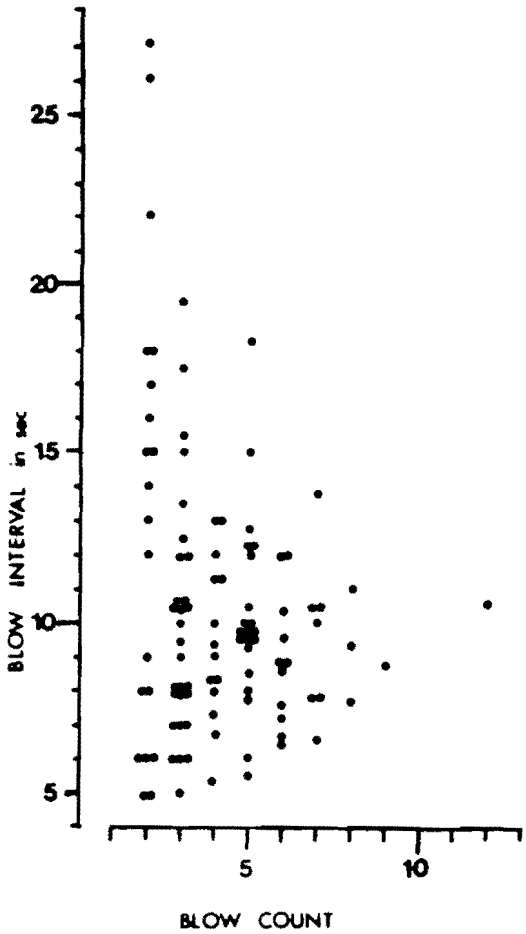
BLOW INTERVAL in sec
25
20
15
10
5
5
10
BLOW COUNT

Fig. 2

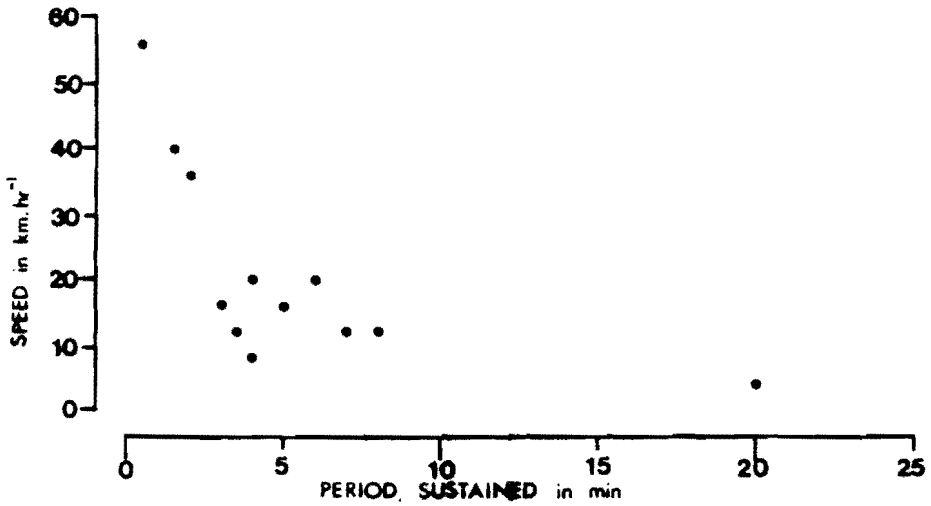
SPEED in km.hr⁻¹
60
50
40
30
20
10
0
0
5
10
15
20
25
PERIOD SUSTAINED in min

Fig. 3

Chemoreception in wild and captive dolphins

Margaret Klinowska, Christina Lockyer, Robert J. Morris

Introduction

Although Odontocetes appear to lack a sense of smell because the olfactory bulbs are not present or vestigial, there is increasing evidence that their sense of taste is well developed (recent reviews by Brown, 1985; Lowell & Flanigan, 1980; Norris & Dohl, 1980; Nachtigall, 1986). The four basic tastes of sour, bitter, salt and sweet can be detected, as well as a variety of other substances. It has been suggested that body secretions may provide social cues, particularly about reproductive status, but there is no experimental evidence for this. There is also anecdotal information on the role of taste in the relationship between human swimmers and dolphins, mainly relating to the aggressive or amorous reactions of captive dolphins to menstruating swimmers.

In 1985 we were studying a young male wild bottle-nosed dolphin *Tursiops truncatus* at Solva, in South Wales. This animal had taken up residence in early 1984 and became accustomed to interacting with swimmers and boats. We were interested in exploring the anecdotes about the role of taste in a controlled manner, and devised a simple double-blind test system. We also had access to a captive male bottle-nosed dolphin (Samson) who had been kept alone for almost a year, after his two female companions had died.

Methods

Cotton wool tampons were impregnated with the test substance, or with tap water as a control. They were packed into black plastic squares, together with weights and an identity number. The squares were closed with string, and a knot was made in the string 1 m from the sample. When all the samples were packed, they were mixed up and randomly placed in numbered bags. For presentation, the numbered bags were used in order. The packed sample was removed, the plastic pierced in several places, and the package lowered into the water until the 1 m marking knot was at the surface. The package was kept in the water for 1 min. and the reactions of the animal were noted. The sample was then removed and replaced in the numbered plastic bag. Samples were presented more than once, if conditions permitted. When all tests were completed (or on return to base) the packages were opened and the sample numbers revealed. The experimenters were therefore unaware of the nature of the sample at the time of presentation. Fifty percent of the packages contained control material. Where tests included a solid material, such as fish, the other contents of the package remained the same (tampon, weights, number). Tests were recorded on video and via a hydrophone (B& K 8104) and a Nagra IVSJ tape recorder.

Results and discussion

The tests with the Solva dolphin were curtailed by bad weather on the second two visits, and could not be extended because the animal moved elsewhere. The tests with Samson were terminated by the arrival of a new female dolphin. Analysis of the video records and notes showed that animals making a positive reaction would stop whatever they were doing (including interacting with swimmers) and move quickly towards the sample, until the beak was within a few cm of the sample. Usually no sounds were recorded, although a few samples were explored by echo-location,

apparently at random. Negative reactions were marked by continuation of current activity. Initially some longer sample exposures were tested, but it was found that if no reaction occurred within 1 min., there would be no interest. Most positive reactions occurred within 30 sec. of exposure.

Because of the limitations on testing time, insufficient trials were made to provide results amenable to statistical testing. However, it does appear that there is something in human menstrual blood which attracts male bottle-nosed dolphins, and that this substance is probably destroyed by freezing and thawing. The low level of interest in the controls, where a large number of trials was accumulated, does seem to show that it is the taste of the sample which is important and not any other feature of the package. The lack of exploration by echo-location tends to confirm this conclusion.

The above two projects were funded by the Nuffield Foundation to R. Morris. The work has been published as two papers:

Lockyer, C., & R. Morris , 1987. Observed growth rate in a wild juvenile *Tursiops truncatus.* – Aquatic Mammals, 13: 27-30.

Lockyer, C., & R. Morris , 1987. Observations on diving behaviour and swimming speeds in a wild juvenile *Tursiops truncatus.* – Aquatic Mammals, 13: 31-35.

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Lowell, W.R., & W.R. Flanigan , 1980. Marine mammal chemoreception. – Mammal Review 10: 53-59.

Nachtigall, P.E. , 1986. Vision, audition and chemoreception in dolphin and other marine mammals. – In: Schusterman, R.J., J.A. Thomas & F.G. Wood, eds. Dolphin Cognition and Behaviour: A Comparative Approach. Lawrence Erlbaum Ass., New Jersey and London.

Norris, K.S., & T.P. Dohl , 1980. The structure and functions of cetacean schools. – In: Herman, L.M., ed. Cetacean Behaviour: Mechanisms and Functions. John Wiley and Sons, New York.

Discussion

Questions concerned the techniques and statistics of the experiment. Unfortunately, there are not enough data for thorough statistical analysis.

Table 1. **Taste tests on single male bottle-nosed dolphins in the wild (Solva) and in captivity (Samson).**
Samples (represented in random order): MT = menstrual blood; LA2 = Laura Ashley No 2 perfume; C1 and C2 = controls, tap water; MTF = menstrual blood, frozen and thawed. Samples were weighted with uneven, but similar lumps of bismuth. A positive reaction was counted if an animal approached the sample within 1 minute of the time it was placed in the water.

SAMPLE	SOLVA			SAMSON		RESULTS		
	1	2	3	1	2	N	+ve	% +ve
MT	+	−	−		+			
	+	+			+			
	+					8	6	75
MTF				−	+			
				−	−			
				+				
				−		6	2	33
LA2	−	+	−	+	−			
		−		+	−			
				+		9	4	46
C1	−	−	−	+	−			
	−	−		−	−			
				+				
				−		11	2	18
C2	+	−	+	−	−			
		+		−	−			
				−	−			
				−		11	3	27
TOTAL C						22	5	23

Fish otoliths in the stomachs of white-beaked dolphins *Lagenorhynchus albirostris*

Chris Smeenk, Pieter A.M. Gaemers

The white-beaked dolphin *Lagenorhynchus albirostris* has greatly increased in numbers in Dutch waters during the second half of this century. It is now the most common dolphin species sighted off the Dutch coast; every year between five and ten animals are reported stranded.

The specimens discussed here were collected by the National Museum of Natural History at Leiden. Most animals appeared to be in good condition; the cause of death could not be determined. The specimens were quite fresh and their stomachs in most cases were full of fish bones; some even contained nearly complete fishes as if the animals had died while feeding. In view of the state of the carcasses, and of the fact that the white-beaked dolphin is regularly observed in Dutch waters, it is assumed that the dolphins had been feeding not far from the coast.

The stomachs of five stranded specimens were examined carefully; all fish otoliths (and skulls of fresh fishes) were collected and identified. Virtually all otoliths and other bones were present in the first chamber of the stomach where the food is crushed. Owing to their solid, chalky character the otoliths remain in the stomach for some time; there always were relatively more otoliths than other fish remains. The otoliths are being studied further, in order to determine the size of the prey and the state of preservation of the otoliths.

It is evident that Gadidae dominate strongly in the diet of the Dutch specimens, whiting and cod being the main prey. Other species appear to be taken occasionally, and seem relatively unimportant as far as biomass is concerned. However, otoliths of herring, sand-eel and dab are small and quite fragile, and probably dissolve much faster during digestion than those of the gadid species. The latter therefore may be slightly overrepresented in our samples. Moreover, sand-eel and dab may have been the prey of whiting or cod rather than of the dolphins.

Since this paper was prepared, three more stranded white-beaked dolphins have been examined. The results are similar: again, whiting was the dominant prey. In two of the stomachs a few legs of hermit crabs were found.

These data indicate that the white-beaked dolphin may feed close to the bottom in shallow water, where whiting is a very common species. The sixth specimen shown in the table was brought in by a trawler. Unfortunately, its provenance could not be traced: probably it originated from the waters west of Ireland. Only this animal had taken herring, a typical pelagic species.

Finally, one white-sided dolphin *Lagenorhynchus acutus* was examined, also stranded on the Dutch coast in very fresh condition. The diet of this animal was very similar to that of the white-beaked dolphins. Both species have been observed in a large mixed school from a production platform in the Dutch section of the North Sea.

Discussion

Questions concerned the circumstances of finding dolphins with relatively fresh fish remains, and the relation of those findings with abiological factors such as prey-distribution, by-catches and pollution. Fresh remains should be recoverable from freshly stranded specimens.

Table 1. **Fish otoliths** found in the stomachs of five white-beaked dolphins and one white-sided dolphin on the Dutch coast, and of one white-beaked dolphin brought in by a trawler.

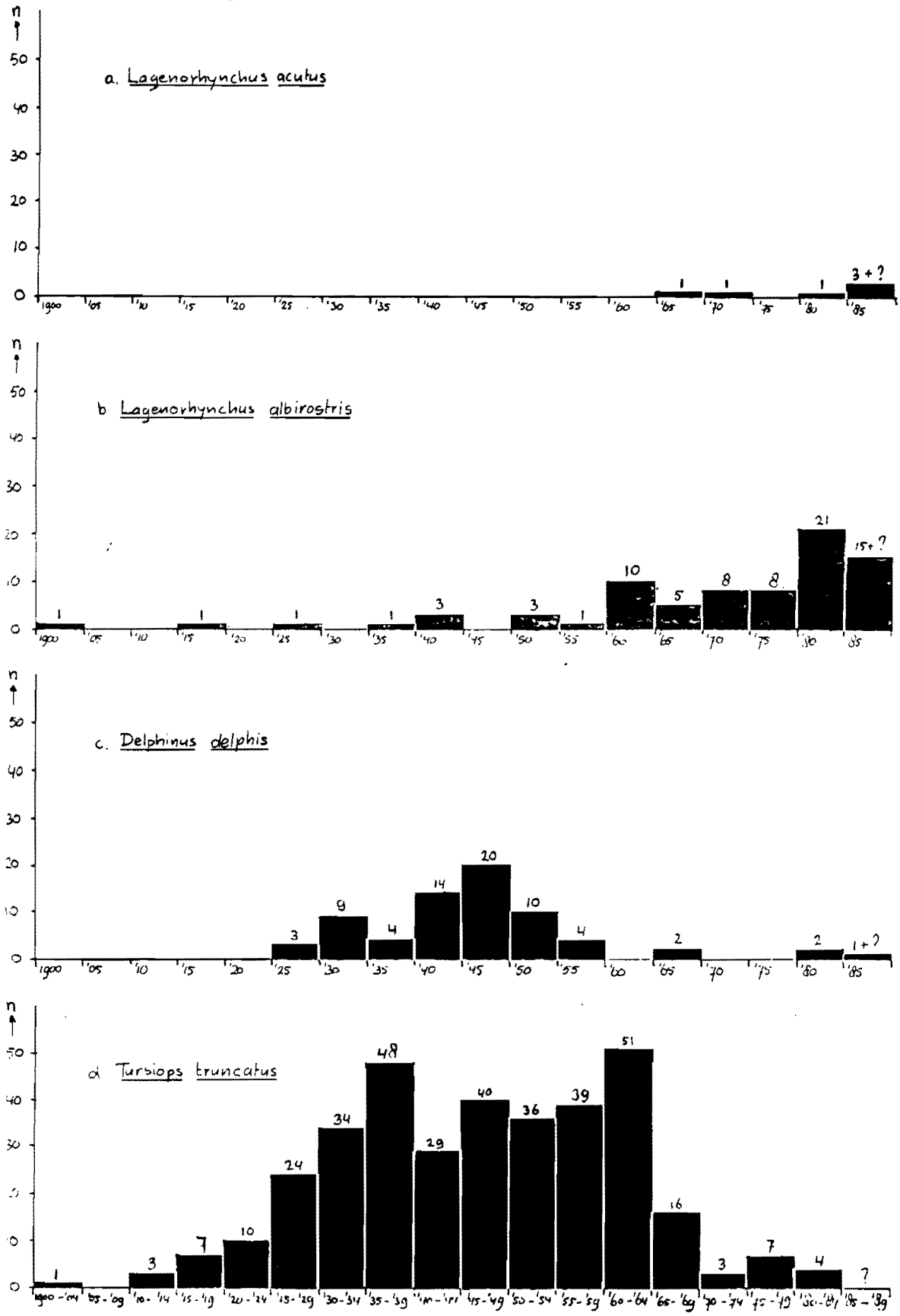
	Lagenorhynchus albirostris											*L. acutus*	
	Ameland						Wierum		Vlie-land	West of Ireland?		St. Maarten-szee	
	l	r	l	r	l	r	l	r		l	r	l	r
Gadus mor.	39	37	12	12	4	4	–	–	–	–	–	4	3
Mela. aeg.	–	1	1	2	–	–	–	–	–	–	–	–	–
Merl. merl.	57	66	21	21	2	2	9	12	30	14	16	5	8
Tris. min.	2	2	–	–	–	–	–	–	2	–	–	1	2
Tris. lusc.	–	–	–	–	–	–	–	–	16	–	–	–	–
Gadidae	–	–	–	–	–	–	–	–	–	–	–	–	2
Clup. har.	–	–	–	–	–	–	–	–	–	5	6	–	–
Hyper. lanc.	1	–	–	–	–	–	–	–	–	–	–	–	–
Lim. lim.	–	–	4	–	–	–	–	1	–	–	–	–	–

Explanation: l = left, r = right; Gadus mor.= cod *Gadus morhua*; Mela. aeg.= haddock *Melanogrammus aeglefinus*; Merl. merl.= whiting *Merlangius merlangus*; Tris. min.= poor-cod *Trisopterus minutus*; Tris. lusc.= bib *Trisopterus luscus*; Gadidae = Gadidae indet.; Clup. har.= herring *Clupeus harengus*; Hyper. lanc.= sand-eel *Hyperoplus lanceolatus*; Lim. lim.= dab *Limanda limanda.*

Table 2b. **Total explained variance in original system.**

	YEAR	YEAR T	SUMMER T	WINTER
Factor 1: 0.455 × (	0.39	0.32	0.03	–)
Factor 2: 0.181 × (	0.68	0.04	–	–)
Factor 3: 0.121 × (	0.07	0.15	–	–)
Factor 4: 0.081 × (	–	–	–	–)
Factor 5: 0.061 × (	–	–	–	0.08)
Factor 6: 0.035 × (	–	0.17	–	0.08)
Factor 7: 0.034 × (	0.15	0.19	–	–)
Factor 8: 0.020 × (	–	0.13	–	–)
Factor 9: 0.012 × (	0.11	–	–	–)
+	0.31	0.19	0.01	0.01

Fig. 1: Strandings of dolphins on the Dutch coast, in 5-year periods.



The importance of the Dolphinarium of Harderwijk as the official rehabilitation centre for stranded cetaceans on the Dutch coast

Ronald A. Kastelein, Teun Dokter

From its start in 1965 the Dolphinarium of Harderwijk has been a rehabilitation centre for stranded marine mammals on the Dutch coast. Initially treating all species of marine mammals, the Dolphinarium has now specialized in rehabilitating stranded cetaceans only. All stranded pinnipeds are now being sent to the Pinniped Rehabilitation Centre of Pieterburen, The Netherlands.

Data on strandings of cetaceans on the Dutch coast show that from 1970 to 1983 a total number of 334 strandings were recorded: nine species of toothed whales and two species of baleen whales (see literature). Most stranded cetaceans were dead and were (or should have been) sent to the Natural History Museum of Leiden or to the Zoological Museum of Amsterdam, where the skeletons or skulls are preserved. Eleven stranded animals were found alive. Most of these were sent to the Dolphinarium for rehabilitation.

Rehabilitating stranded cetaceans is a very labour-intensive process, during which the animals are monitored 24 hours a day. The treatment periods varied between 0 and 201 days. Because of the bad state of health of these animals, only two harbour porpoises recovered. One of these was examined at the site of stranding and was found healthy enough for direct release. The other animal was treated in Harderwijk for 45 days. During that period the animal was given medication and learned to eat by itself. After it had gained 5.2 kilos and the blood parameters had returned to normal values, the animal was released at the site of stranding.

Recently the Dolphinarium improved its transport equipment for stranded cetaceans which consists of: flexible transport stretchers for cetacean species of various size; buckets; jerrycans; rope; knife; spray systems; towels; sponges; overalls; grease; stomach tube; funnel; and a first-aid medical kit. All these items are packed in a polyesterized transport box with rubber foam lining. This package can be put into a transport van within minutes after a live-stranding alarm.

Forms have been made to standarize the recording of the treatment of cetaceans. This will improve comparisons between treatments.

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Bree, P.J.H. van, & A.M. Husson , 1974. Strandingen van Cetacea op de Nederlandse kust in 1972 en 1973. – Lutra 16: 1-10.

Husson, A.M., & P.J.H. van Bree , 1976. Strandingen van Cetacea op de Nederlandse kust in 1974 en 1975. – Lutra 18: 25-32.

Bree, P.J.H. van, & C. Smeenk , 1978. Strandingen van Cetacea op de Nederlandse kust in 1976 en 1977. – Lutra 20: 13-18.

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Smeenk, C. , 1986. Strandingen van Cetacea op de Nederlandse kust in 1981, 1982 en 1983. – Lutra 29: 268-281.

Discussion

Some doubts were cast on the usefulness of this kind of recuperation programs, but it was found an interesting line of research.

Date	Phoc phoc	Lag albi	Turs trun	Glob mela	Lag acu	Delph delph	Mes bid	Gramp grise	Phys macr	Bal bor	Bal acu
1970	17	1		1				2	1		
1971	13*										
1972	18*	1	1							1	
1973	26	4			1						
1974	7	3	2								1
1975	16	3	1	1							
1976	14	3	1#				1				
1977	22#		2				1				
1978	26**	1	2								
1979	15	1	1	1					1		
1980	13*	3	1								
1981	33*	5				2					
1982	20*#	5*#	2	1							
1983	26	6	1	2	1						
Total	266	36	14	6	2	2	2	2	2	1	1

Total strandings (1970-1983) : 334
Total live strandings ,, : 11
Total successful rehabilitations ,, : 2

* live stranding treated by the Dolfinarium of Harderwijk.
\# live stranding treated by other institutions.

Table 1: Strandings of cetaceans on the Dutch coast between 1970 and 1983.

year	location	species	date of stranding/ arrival park	date of death	date of release	total days treatm.	remarks
1971	Schier-monnik-oog (H)	Ph.ph	26 Feb	16 Mar	-	18	
1972	Colijns-plaat (H)	Ph.ph	-	22 Aug	-	0	died during transp.
1973	Middel-kerke(B)	Ph.ph	-	28 Nov	-	0	died before transp.
1973	Paesens (H)	La.al.	7 April	7 April	-	0	died during transp.
1978	Callants-oog (H)	Ph.ph.	11 June	7 Aug	-	57	
1978	Texel(H)	Ph.ph.	6 Nov'78	26May79	-	201	
1980	Ouddorp (H)	Ph.ph.	27 Dec	30 Dec	-	3	
1981	Egmond aan zee (H)	Ph.ph.	12 June	-	27 July	45	
1982	Zeeland (H)	Ph.ph.	27 Apr.	28 June	-	62	
1982	Schier-monnik-oog (H)	La.al.	13 Aug.	22 Aug.	-	9	
1984	Island Förh (W.G.)	Ph.ph.	28 June	2 July	-	5	
1985	Harlin-gen (H)	Ph.ph.	16 Mar.	-	16 Mar.	0	direct release
1985	Griend (H)	Ph.ph.	17 July	18 July	-	2	
1985	Texel (H)	La.ac.	24 Dec	30 Dec	-	6	

Table 2. **Beached cetaceans treated by the Dolphinarium of Harderwijk between 1970 and 1986.** H=Holland, B=Belgium, W.G:=West Germany.

date	loca-tion	weight (kg)	medium	swim quali-ity	resque from drow-ning	massage	breathing rate per min.	faeces	injuries	medical assistance	feeding (pounds)		
											force	suck	self
June12	Egmond aan zee	44.0	water	bad			4-5			grease on skin	0		
June13	Dol. Ha.		wa/air	,,					tail bld.	bl.sampl.+ antibiot.	6		
June14	,,		air/wa air	,,	yes	yes			tail bld	mouth to blowhole	3	3	
June15	,,		air/wa air	,,	yes			good	slime blh.	antibiotics		3	
June16	,,		air/wa	,,	yes	yes	5-7	,,	coughing	,,		2	
June17	,,		water				7	black greeny	,,	,,		3	
June18	,,		,,	good			5-7	good		,,+water+paraf.		6	
June19	,,		,,	,,			5	,,		antibiotics+water		5	
June20	,,		,,	,,				,,		,,		4	
June21	,,		,,	,,			4-6	,,		antibiotics		4	
June22	,,		,,	,,				,,		,,+ Vit B compl.		6	
June23	,,	46.1	,,	,,				,,		,,+ ,,		6	
June24	,,		,,	,,				,,		,,+ ,,		6	
June25	,,		,,	,,				,,		,,+ ,,		6	
June26	,,		,,	,,			4	,,		,,+ ,,		6	
June27	,,		,,	,,				,,					6
June28	,,		,,	,,				,,					6
June29	,,		,,	,,			4-7	,,					6
June30	,,		,,	,,			4	,,					6
July13	,,	49.2	,,	,,				,,		blood sample			6
July29	Egmond aan zee		wa/air water	,,				,,					

Table 3. The successful rehabilitation of the Harbour porpoise "Kwing-kwanker" in 1981 at the Dolphinarium of Harderwijk.

Whale research in the Faroes

Dorete Bloch, Geneviève Desportes
(by the rapporteur)

Dorete Bloch and her co-workers showed a video of the work that is being done on pilot whales *Globicephala melaena* driven ashore in the Faroes by local hunters. It showed the way in which the research by cetologists from the Faroes, the United Kingdom, France and Denmark has been presented to the public in the Faroes through television.

In this case a good presentation is of great importance to obtain the help and support from the local hunters. The way in which all those involved presented their particular field of research, in their own tongue, was interesting.

Discussion

The questions concerned two subjects: the possibility of using an implanted transmitter to track an individual by satellite, and the DNA-technique used to separate possible stocks and their genetic relations.

The "Centre for Cetacean Studies" of the Italian Society of Natural Sciences: its founding and activities

Michela Podestà, Giuseppe Notarbartolo di Sciara

The "Centro Studi Cetacei", a branch of the Italian Society for Natural Sciences, was established in 1985 as a result of the First Italian Cetacean Conference held in Riccione. Its aims are to gather within one organization all Italian scientists who are directly or partially involved in cetacean research and protection, to serve as a reference point and consulting body for all matters concerning cetaceans in Italy, and to encourage marine mammal research in this country. At present about 30 scientists and graduate students, belonging to a wide array of research institutions, co-operate with the centre. These include, among others, the zoological museums of Firenze, Genova, Milano, Pescara, Roma and Venezia, the departments of zoology of the universities of Parma, Pisa, Roma and Siena, the department of animal biology and marine ecology of the university of Messina, the departments of parasitology of the universities of Milano and Roma, the zooprophylactic institute of Genova, the marine-biological laboratories of Ancona, Bari and Fano, and the faculty of veterinary medicine of Milano. The activities of the "Centro Studi Cetacei" are under the auspices of the Ministry of Merchant Marine and Fisheries. Among the several projects fostered and co-ordinated by the centre are assembling a computerized bibliography on Italian cetaceans, establishing a data base on the same subject including strandings, incidental captures and all material deposited in Italian museums and collections, and establishing a centralized national stranding alert network. The network has been in operation from 15 May 1986 and is structured as follows:

- All coastal authorities and private citizens have been alerted, both through the official channels and all available media, to immediately report the stranding of a cetacean (or a sea turtle) to a round-the-clock answering service in Milano, sponsored by the insurance company "Europ Assistance Italia".
- The information is transmitted to a team of scientists based in Milano (members of the Centre for Cetacean Studies) who then co-ordinate the operations by phone.
- The Italian coastline is divided into several zones, each under the jurisdiction of a "zone correspondent" (also a member of the Centre for Cetacean Studies), who is organizing his own peripheral network. The stranding information is relayed from Milano to the appropriate zone correspondent, who then proceeds to organize and carry out the collecting expedition.

If the strandings concern dead animals, material and data are collected for scientific purposes only. If live animals are involved, the Adriatic Sea World of Riccione is also alerted in order to provide specialized advice or even the intervention of trained personnel for the correct handling or rescue of the animals.

Stranding statistics are published collectively on a yearly basis, and appear in the "Atti della Società Italiana di Scienze Naturali". Specific data as well as specimen material from each stranding are treated by the zone correspondent who organized the expedition. Each zone correspondent, however, is in possession of an updated list of desiderata (concerning the collecting of specific organs or specific information on stranded animals) from all colleagues of the Centro Studi Cetacei.

In the first six months of activity data were collected on the strandings of about 40 cetacean specimens (six species: *Balaenoptera physalus*, *Physeter macrocephalus*, *Grampus griseus*, *Ziphius cavirostris*, *Tursiops truncatus* and *Stenella coeruleoalba*) and 30 sea turtles (two species: *Caretta caretta* and *Dermochelys coriacea*).

Discussion

The audience was impressed by the progress the Italian group has made in such a brief span of time; no discussion followed.

Distribution of seabirds and cetaceans in the NE. Atlantic and Arctic oceans

Claude Joiris, Jacques Tahon

During the 71th trip of the German RV METEOR (29 June - 21 August 1985) seabirds and cetaceans were counted during 247 one-hour standard periods. In order to integrate these data into broader oceanological and ecological interpretations (Joiris, 1978), three main water masses were defined on the basis of salinity and temperature: Atlantic, Arctic, and Norwegian waters.

As an example the results are shown for stations 1-104 (from 67°N till 71°N: from Bodø till Jan Mayen).

For both pelagic seabirds and cetaceans, the density is clearly dependent on water type: cetaceans and the main seabird species (skuas, kittiwake and alcids - but not the fulmar) are more abundant in Norwegian than in Atlantic and Arctic water.

In order to allow a better ecological interpretation, it is suggested to integrate such countings into broader oceanological cruises. On the other hand, due to the low number of cetaceans encountered, it is suggested to carry out simultaneous countings of seabirds and marine mammals (as well as the basking shark *Cetorhinus maximus*).

Table 1. **Counting results** (mean number per one-hour station)

Water type Number of stations:	Norwegian 36	Atlantic 45	Arctic 23
Fulmar *Fulmarus glacialis*	28.4	24.0	25.1
Gannet *Sula bassana*	0.19	0.09	25.1
Skuas 4 species	1.0	0.13	0.04
Arctic tern *Sterna paradisaea*	0.5	0.07	0.04
Kittiwake *Rissa tridactyla*	16.1	5.2	4.2
Alcids 5 species	51.0	1.8	6.8
Cetaceans	1.33	0.18	0.13

The cetaceans encountered were:

Killer whale	*Orcinus orca*	34 (in 3 groups)
Fin whale	*Balaenoptera physalus*	11
Sperm whale	*Physeter macrocephalus*	6
Pilot whale	*Globicephala melaena*	2
Unidentified large whales		8

Literature

Joiris, C. , 1978. Seabirds recorded in the northern North Sea in July; the ecological implications of their distribution. – Gerfaut 68: 419-440.

Discussion

The main issue was the probable differences between the various waters in terms of food and productivity. More research has to be done on the factors responsible for the differences in distribution.

A second point was the co-operation between the well-organized groups of bird-watchers in The Netherlands and the Marine Mammal Working Group in that country, a practice to be followed in other countries.

Contamination by stable pollutants (organochlorines and heavy metals) of a common dolphin *Delphinus delphis* found dying in Belgium

Claude Joiris, J.M. Bouquegneau, K. Delbeke, W. Overloop

A common dolphin *Delphinus delphis* was found alive in the harbour of Zeebrugge (Belgium) on January 10, 1986, died later the same day, and was collected. It was a male, 205 cm long, not entirely adult (teeth not abraded) (J. van Gompel).

Samples of muscle, liver and fat (blubber) were deep-frozen immediate ly and analysed later: for organochlorines and mercury in Brussels, for heavy metals (including mercury) in Liè ge.

Table 1 shows the results for the heavy metals, table 2a and b for the organochlorines (expressed on a fresh weight and a lipid weight basis, respectively).

Table 1. **Heavy metals** ($\mu g \times g^{-1}$ **wet weight**)

	Zn(1)	Cu(1)	Cd(1)	Pb(1)	Hg(1/2)
Muscle	21.8	1.5	0.2	0.7	2.7/5.7
Liver	27.7	4.0	3.3	1.2	30.0/29.8
Fat	53.3	0.4	0.0	0.3	0.8/–

(1): Liège; (2): Brussels

Table 2a. **Organochlorine residues** ($\mu g \times g^{-1}$ **wet weight**)

	Muscle	Liver	Fat
PCB's ("1254")	9.7	5.5	390.
DDE	.022	.026	–
DDD	.045	.132	–
$\sum$ DDT	.067	.158	–
Heptachlor. epox.	.018	.065	1.342
Dieldrin	.042	.121	.145
(% water)	(69)	(72)	(11)

Table 2b. **Organochlorine residues** ($\mu g \times g^{-1}$ **lipids**)

	Muscle	Liver	Fat
PCB's	320.	222.	526.
DDE	.79	1.09	–
DDD	1.51	5.44	–
$\sum$ DDT	2.30	6.53	–
Heptachlor. epox.	.63	2.70	1.78
Dieldrin	1.4	4.99	.20
(% fat)	(3)	(2.5)	(75)

The level of heavy metals may be considered low for Cu to normal for Zn and Pb.

The values are relatively high for Cd, much of which is bound to metallothioneins in the liver. As far as total Hg is concerned, levels are high (note the good agreement

between the two laboratories). In the liver only very little is bound to metallothioneins, which we know to be present, however: this means that most of the mercury is probably represented by an organic (methyl?) form. The high concentrations detected in the liver as compared with muscle and fat suggest an acute poisoning.

When compared with data from the literature (Wagemann & Muir, 1984), it seems that the levels of organochlorines in this dolphin are not abnormally high.

All things considered, the most striking values concern mercury; these results could suggest an acute poisoning by organic mercury as the cause of death.

Literature

Wagemann, R., & D.C.G. Muir , 1984. Concentrations of heavy metals and organochlorines in marine mammals of northern waters; overview and evaluation. – Can. Techn. Rep. Fish. Aquat. Sci. 1279: i–v, 1–97.

Discussion

The discussion centered on the mercury level, its possible lethal effect and its source. It is not stated that the animal died of poisoning but it cannot be excluded. Furthermore, animals or samples, of which at least 10 grams are necessary, to be examined should not be stored in alcohol or plastics. Deep-freezing is the best way of conservation.

Results of research on the pilot whale *Globicephala melaena* in the Faroes

Geneviève Desportes, Kjartan Hoydal
(by the rapporteur)

A summary was not received.

A short summary was given of the studies performed in the Faroes as they are to be presented at the IWC'87 meeting. All data were collected from animals driven ashore by local fishermen. In June 1987 field studies are planned in the northern Atlantic Ocean, by scientists from Iceland, Norway and the Faroes.

All interested scientists were invited to participate.

Discussion

The main discussion focussed upon the problems related to countings in the open ocean in general.

The echolocation system in the harbour porpoise *Phocoena phocoena*

Günther Behrmann

In diesem Vortrag möchte ich mich weitgehendst auf Befunde von Schweinswalen *Phocoena phocoena* beschränken. Da sie in Küstennähe und Flussmündungen leben, vermutete ich, dass ihr Orientierungssystem, bedingt durch den Aufenthalt in trüben Gewässern, besonders gut ausgebildet sein müsste.

Für die Untersuchungen standen mir 14 gestrandete Schweinswale zur Verfügung. Neun konnten auf Grund ihres slechten Erhaltungszustandes nur für allgemeine Voruntersuchungen verwendet werden, fünf standen für detaillierte, morphologische Sektionen zur Verfügung. Je ein Kopf wurde tiefgefroren, längs, quer und horizontal geschnitten. Vom vierten wurde der Kehlkopf mit seinem Derivaten total fixiert. Der fünfte Kopf wurde für histologische Schnitte verwendet; diese erbrachten aber nur unbefriedigende Ergebnisse, weil die Epithele bis auf kleine Reste abmaseriert waren. Alle Organteile, die bei den Untersuchungen gewonnen wurden, stehen als Dauerpräparate für weitere Studien zur Verfügung.

Dass die Wale sich durch Echolokation orientieren, ist seit langer Zeit bekannt. Doch wie das System im einzelnen funktioniert, wurde bisher ohne befriedigende Ergebnisse theoretisch erörtert. Purves & Pilleri (1983) gingen davon aus, dass die verschiedenen Geräusche durch Ventilation der Luft zwischen den Laryngalsäcken und den Nebenhöhlen des Blasloches erzeugt werden. Bei allen Zahnwalen sind aber die Laryngalsäcke sehr klein, ihr Volumen reicht nicht aus, um Quietsch- und Pfeiftöne oder gar Sonarwellen zu erzeugen. Blasloch und Larynx bleiben unter Wasser fest verschlossen, und die Nebenhöhlen des Blasrohres dienen ausschliesslig der Muskelbewegung und nicht der bewussten Lauterzeugung (Behrmann, 1983).

Bei der überprüfung der von Purves & Pilleri (1983) aufgestellten Theorie fand ich Lufttuben, die bisher übersehen wurden (Behrmann, 1984). Sie verbinden die Laryngalsäcke mit den Luftsäcken unterhalb des Schädels. Durch diese Lufttuben kann nun die Luft bei geschlossenen Atemwegen zwischen der Lunge und den voluminöseren Luftsäcken hin und her ventilieren. Zur Geräuscherzeugung stehen also nun viel grössere Luftmengen zur Verfügung. Die morphologischen Untersuchungen, verbunden mit Experimenten und Modellversuchen, ergaben neue Erkentnisse über das Funktionieren der Echolokation.

Morphologische Befunde

Der Schweinswal hat eine mobile, langgestreckte Laryngaltube, die bei verschlossenen Atemwegen rostral im Nasenhof (Choana) liegt. Dort wird sie von einem Ringmuskel (M. sphincter choanaris) hermetisch verschlossen. Caudal-lateral der Epiglottis liegen in der Kehlkopfmuskulatur die Laryngalsäcke (Hunter, 1787). Von ihnen zweigen dorsal die neuentdeckten Lufttuben ab. Sie ziehen zwischen dem Thyreoidknorpel (Cart. thyreoidea) und der Oesophagusmuskulatur dorsal bis in die Bulla tympanica. Kurz bevor sie in die Bulla einmünden, teilen sich die Tuben. Der voluminösere, medial liegende Zweig mündet unterhalb des Porus acusticus int. in die Spalte (Orificium tympanicum; Boenninghaus, 1904) zwischen Bulla und Perioticum. Durch die Bulla wird dann die Luft in die Luftsäcke (Sinus pterygoides) geleitet.

Der dünnere Zweig zieht caudal der Bulla zur Fissura periotica (Boenninghaus, 1904), durch die der Luftstrom in das Mittelohr (Cavum tympanicum) geleitet wird.

Von dort gelangt die Luft in die Eustachischen Tuben. Sie ziehen von der Bulla medial durch die Luftsäcke und durch die Schallmembrane (Membrana pterygoidea) im Fenster des Pflugscharbeines und münden im Nasenhof. Die sich verjüngenden Eustachischen Tuben haben vor ihrer Einmündung in den Nasenhof einen Innendurchmesser von etwa 0,1 mm (Boenninghaus, 1904).

Diskussion

Schweinswale können ihre rostral verlängerte Laryngaltube in den Nasenhof schieben. Durch den Vorschub werden im Kehlkopf die Pforten zu den Laryngalsäcken geöffnet, von denen die zu den Ohrkapseln führenden Lufttuben abzweigen; Abb. 1, 2, 3. Von den Ohrkapseln gelangt die Luft in die Luftsäcke oder über die dünneren Lufttuben in die Eustachischen Tuben.

Durch die Ventilation der Luft zwischen Lunge und Luftsäcken können in den Lufttuben Quietsch- und Pfeiftöne erzeugt werden, ohne dass Luft verlorengeht. Durch Bewegungen der Kehlkopfmuskulatur können die in den Lufttuben erzeugten Töne moduliert werden.

Die Funktion der Lufttuben wurde experimentell überprüft. Durch Einleitung von Luft in die Luftröhre entstanden die Pfeiftöne in den Lufttuben, indem die Luft über "Stimmlippen" gleitet. Die Quietschtöne wurden im Bereich hörbar, in dem die mediale Lufttube in die Bulla mündet. Dies deckt sich mit den Angaben von Purves (1966), der über Richtmikrophone die Quelle der Töne geortet hatte.

Die zur Orientierung erzeugten Sonarwellen entstehen im Bereich des Nasenhofes. Purves & Pilleri (1983) haben ebenfalls über Richtmikrophone die Quelle der Sonartöne im Nasen-Rachenraum ermittelt. Die Druckluft von 5–6 Atü, die durch den dünneren Zweig der Lufttube geblasen wurde, erzeugte Sonartöne.

Die sich trichterförmig verengende Eustachische Tube zieht durch die Schallmembrane im Pflugscharbein zum Nasenhof. Wird nun Luft dadurch geleitet, entweicht diese sehr langsam, weil die Mündung der Eustachischen Tube sehr eng ist. Wird nun die Membrane etwas angespannt, also sanfter Druck auf die Eustachische Tube ausgeübt, wird die Luft periodisch gestaut. Dadurch entstehen Schwingungen. An der Membrane setzt ein kleiner Muskel an, der sie in vito spannt, so wie es im Experiment von Hand ausgeführt wurde. Die Schwingungen der Membrane werden im Rachenraum direkt auf den Wasserkörper übertragen, wo die Sonarwellen durch das öffnen des Maules fokusiert werden.

Für die Modellversuche standen mir leider keine Luftschläuche zur Verfügung, die die Masse der Eustachischen Tuben erreichten. Aber auch mit mobilen Släuchen von 1–3 mm Durchmesser konnten Schwingungen erzeugt werden, indem sanfter Druck auf die Schlauchenden ausgeübt wurde.

Bei der Erzeugung von hochfrequentem Ultraschall muss das innere Ohr vor überdruck geschützt werden. Dieser Schutz wird durch den Stapes erreicht, der bei allen Zahnwalen das Fenestra vestibuli fast vollständig ausfüllt, so dass er hier die Funktion eines Rückschlagventils hat, das sich bei geringstem überdruck verschliesst.

Laryngalsäcke besitzen auch viele terrestrisch lebende Säugetiere, sodass die Wale keine Ausnahme bilden. Die Laryngalsäcke der Schweinswale sind sehr klein, ihr Luftvolumen reicht für Lauterzeugung so wie es Purves & Pilleri (1983) beschrieben haben, nicht aus.

Lufttuben wurden bisher bei *Delphinus delphis*, *Tursiops truncatus*, *Lagenorhynchus albirostris* und *acutus*, *Globicephala melaena* und *Grampus griseus* nachgewiesen.

Bei allen liegt in der Anlage ein Grundschema vor, von dem auch der Schweinswal nicht abweicht. Durch die Verbindung von Laryngalsäcken und den Luftsäcken (Saccus pterygoidis) steht nun genügend Luft zur Lauterzeugung zur Verfügung.

Negus (1949) unterscheidet zwei Arten von Laryngalsäcken, die einen zweigen von den Stimmritzen (Ventriculus laryngalis) ab. Aus diesen könnten sich bei den Zahnwalen die Laryngalsäcke (Saccus laryngalis) gebildet haben. Die anderen, nicht ventrikulären Laryngalsäcke, von Negus (1949) "Subthyreoid air sack" genannt, findet man ebenfalls bei Landsäugern. Aus ihnen könnten sich die Lufttuben entwickelt haben.

Alle diese luftführenden Organe können von Krankheitskeimen und Parasiten befallen werden, die das Orientierungssystem behindern oder gar ausschalten können, was dann zu Strandungen führt.

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Discussion

The highly original presentation was greatly appreciated by the audience. The discussion focussed on how to locate with certainty the origin of sound-production externally in living animals.

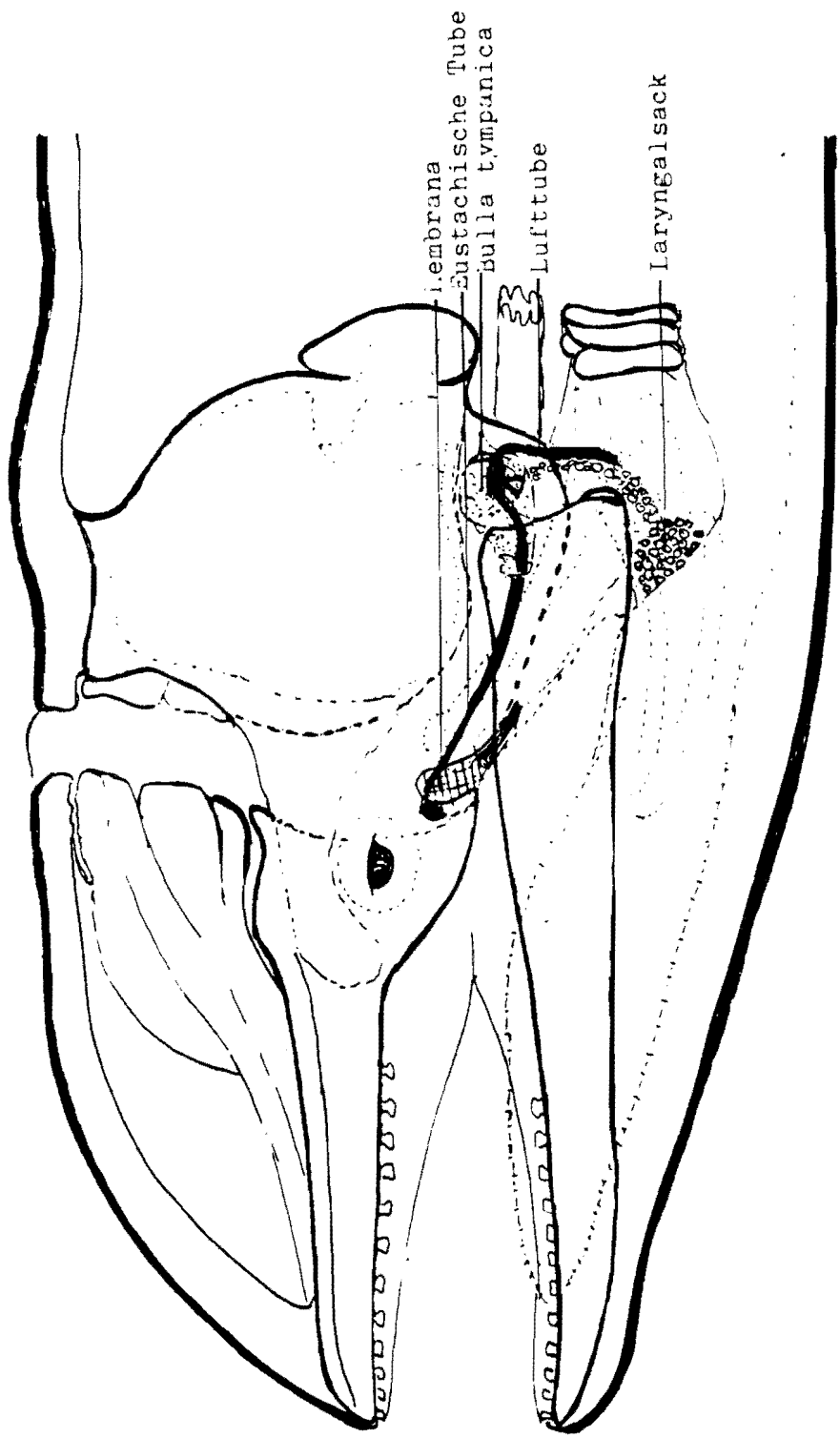


Abb. 1a: Kopf eines Schweinswals

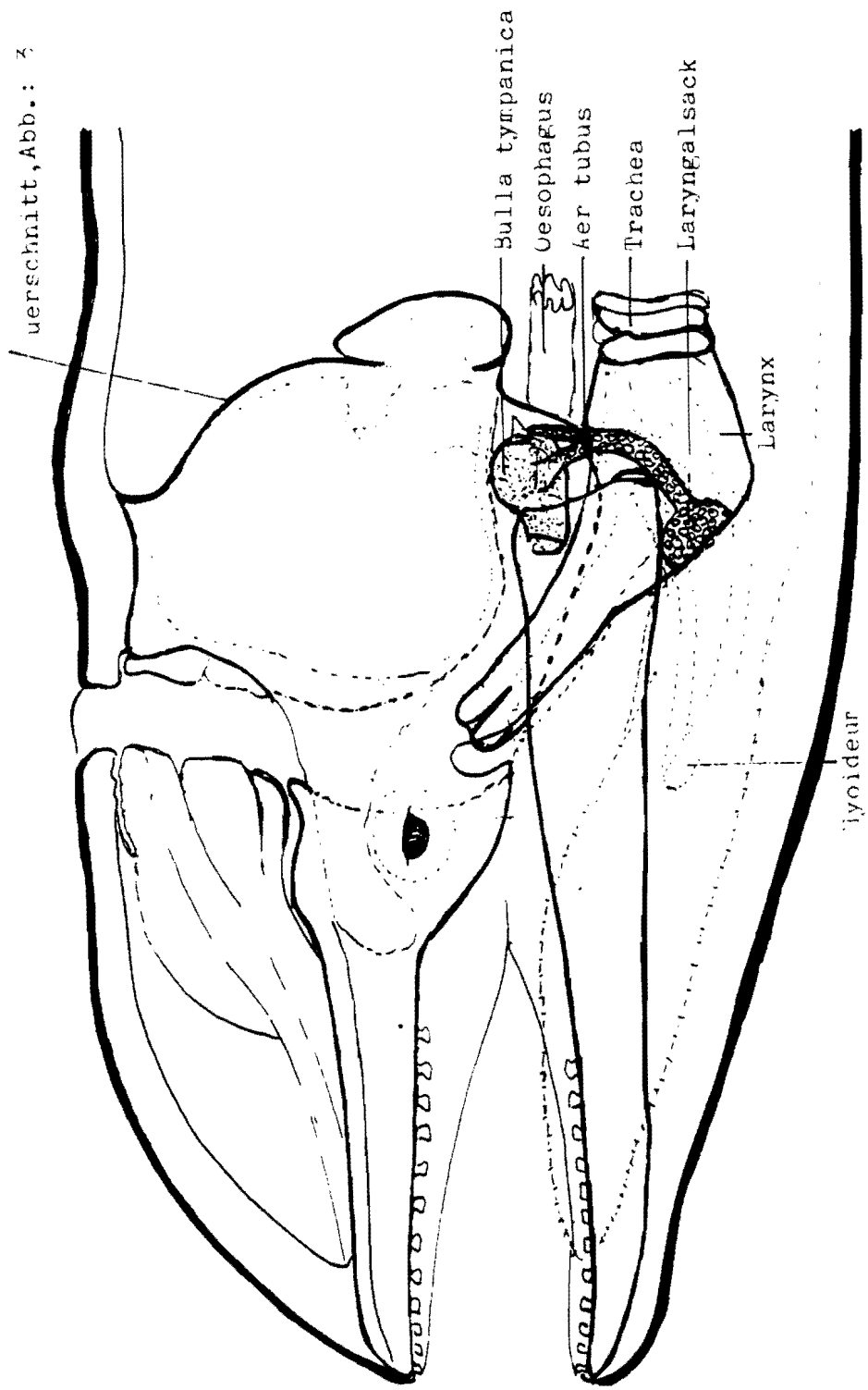

Querschnitt, Abb.: 2
Bulla tympanica
Oesophagus
Ner tubus
Trachea
Laryngalsack
Larynx
Hyoideur

Abb. 1b:

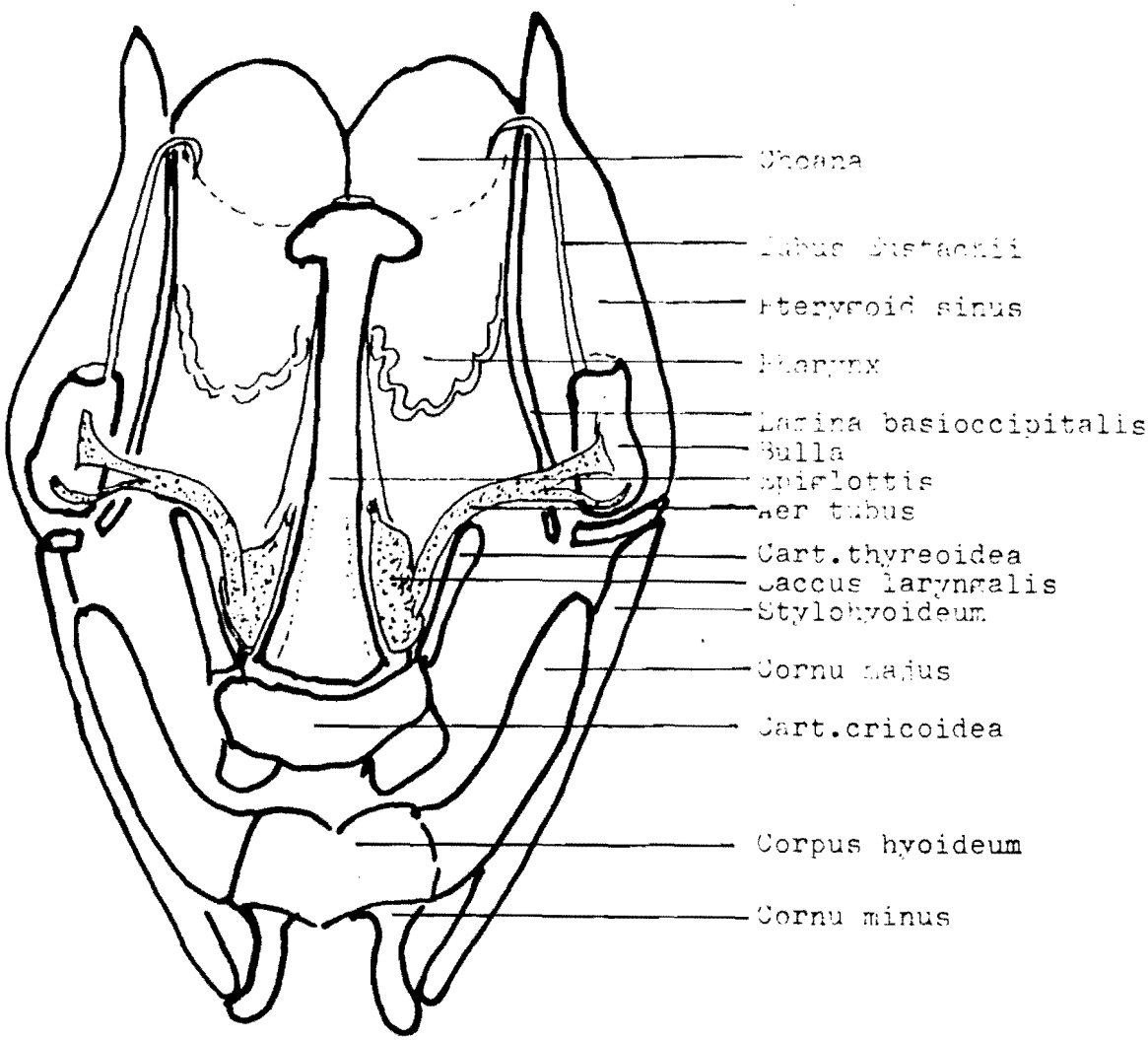


Abb. 2: Ventralansicht der Luftwege

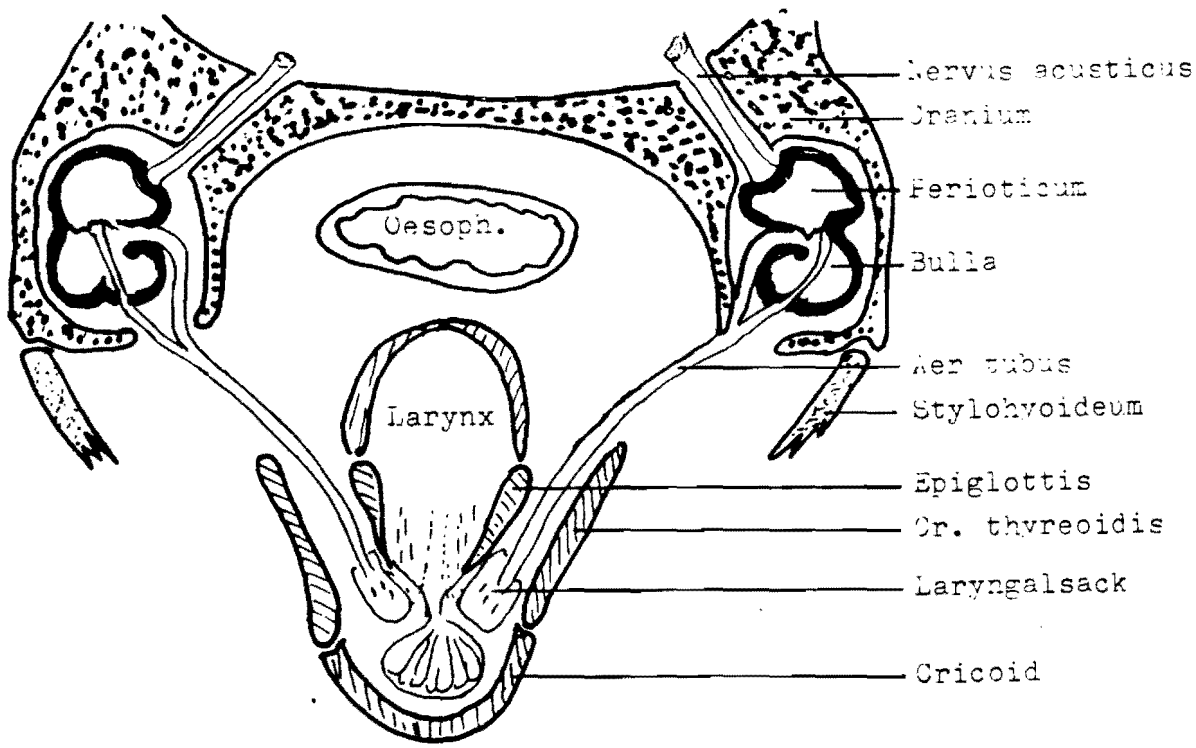
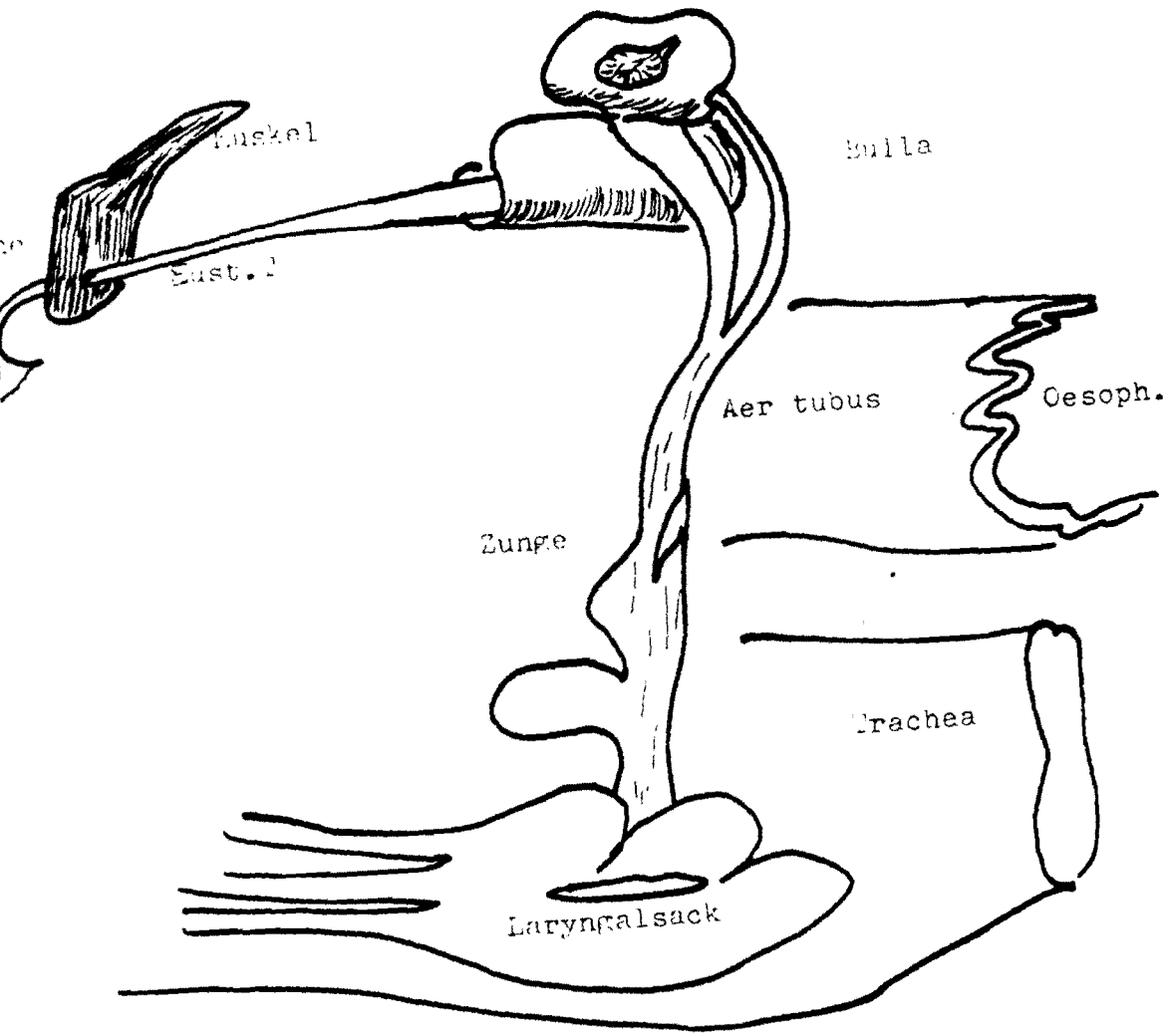


Abb. 3: Querschnitt durch Bulla und Larynx, s. Abb. 1



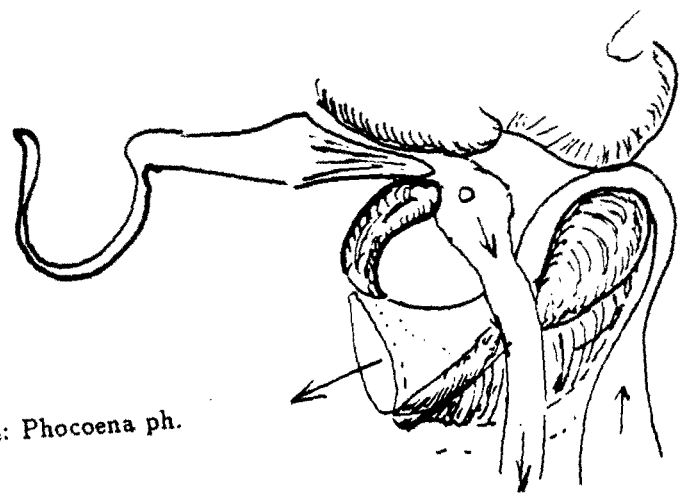


Abb. 4: Phocoena ph.

French research on cetaceans

Anne Collet, R. Duguy

Our knowledge of cetaceans off the French coast originated mainly with the works published during the late 19th century, which provided basic data, especially on faunistics and anatomy. Up to recently, French scientists have shown little interest in marine mammals: publications were scarce, and reflected no real progress. During the late sixties, the museum of La Rochelle carried out some research on strandings in the area. Later, jointly with the National Museum of Natural History in Paris, the Centre National d'Etude des Mammifères Marins (CNEMM) was founded. The programme started in 1972 and ten years later, in May 1982, the Centre set up a new building, the Musée Océanographique de La Rochelle. The aim of the laboratory is to gather all data on sightings and strandings of marine mammals, and to carry out further scientific exploration of this field.

The first step was to provide the observers with a standard form for recording their observations: on one side is a sketch of a dolphin indicating the measurements that should be taken; on the other side there is space for biological data and other information on the stranding. Moreover, a field guide to the marine mammals of France was produced in 1973. For sightings two forms are circulated, one for the Atlantic and one for the Mediterranean. Both show sketches of the most common species to help in their identification and leave space for details of the event at the back. In 1980, the Ministry of the Environment supported the publication of a booklet with more details on the main species, and a wide information campaign among sailors, especially yachtsmen. Then a new regulation was proclaimed by the same ministry, by which full co-operation with the CNEMM was required. This ensured a prompt recording of any stranding by the French Administration (Police & Customs). A lot of people are interested in this programme and, despite some irregularities in a few areas, the network of observers is now pretty good.

The basic part of the research is devoted to a faunistic review. The references from the literature have been collated and were published in 1983. Since 1970, complete information on strandings has been recorded by the CNEMM at La Rochelle, using dBase III on an IBM/PC microcomputer. All stranding locations are also on the mainframe computer at the Secrétariat Faune-Flore, National Museum of Natural History (Paris). Up to now, almost 2000 records of strandings show that 27 cetacean species (6 Mysticeti, 21 Odontoceti) have been identified along the French coasts (table 1).

Records of sightings – several hundreds per year – are collected from various types of boats, mainly yachts. These data are filed in their original form at the CNEMM at La Rochelle. For the Mediterranean, a data base of marine mammal sightings has been created by a special working group of the International Commission for the Scientific Exploration of the Mediterranean Sea (CIESM). A standard recording form has been adopted for storage of the data using dBase III on an IBM/PC at the Musée Océanographique in Monaco.

The combined stranding and sighting records provide up-to-date information on every species, with indications of time and space frequencies of their occurrence, showing possible variations.

Biological data are collected from carcasses provided by strandings and incidental catches. If possible, skeletons (or at least skulls and pelvic bones) are preserved. Studies on morphometry and taxonomy, biomechanics, physiology and pathology are

Table 1. **Cetaceans stranded and captured in France**, mainly since 1970.

Species	< 1970	70	71	72	73	74	75	76	77	78	79
Cetacea indet.	–	–	–	2	–	–	3	1	–	–	–
Mysticeti indet.	–	–	–	–	–	–	–	–	–	–	–
Balaenopteridae	–	–	–	–	–	1	–	1	–	1	–
B. acutorostrata	–	–	–	1	–	–	–	–	1	1	–
B. physalus	–	–	–	2	1	1	4	2	1	1	2
M. novaeangliae	–	–	–	–	–	–	–	–	–	–	1
Mysticeti	–	–	–	3	1	2	4	3	2	3	3
Odontoceti indet.	–	–	–	6	3	4	–	1	–	1	2
Delphinidae ind.	–	–	–	3	12	12	10	12	12	6	23
T. truncatus	2	–	–	1	7	4	4	2	7	6	6
S. coeruleoalba	1	–	–	3	6	10	11	17	16	10	32
D. delphis	1	–	–	7	11	11	7	14	16	25	32
L. hosei	–	–	–	–	–	–	–	–	–	–	–
L. albirostris	–	–	–	–	–	–	–	–	–	–	–
L. acutus	–	–	–	–	–	–	–	–	2	1	1
G. griseus	–	–	–	1	4	–	1	4	2	5	1
G. melaena	–	–	1	7	3	2	1	3	15	12	26
G. macrorhynchus	1	–	–	–	–	–	–	–	–	–	–
P. phocoena	2	–	1	2	–	2	–	1	2	4	7
Hybrid	–	–	–	–	–	–	–	1	–	–	–
Delphinidae	7	–	2	24	43	41	34	54	72	69	128
P. macrocephalus	–	–	–	2	1	2	1	2	–	–	1
K. breviceps	–	–	1	–	–	–	–	–	–	–	–
K. simus	–	–	–	–	–	–	–	–	–	–	–
Physeteridae	–	–	1	2	1	2	1	2	–	–	1
Ziphiidae indet.	–	–	–	–	–	–	–	–	–	1	–
Z. cavirostris	–	–	2	2	–	6	1	–	1	–	8
H. ampullatus	–	–	–	–	–	–	–	–	–	–	1
M. bidens	–	–	–	1	–	–	2	–	–	–	–
Ziphiidae	–	–	2	3	–	6	3	–	1	1	9
Odontoceti	7	–	5	35	47	53	38	57	73	71	140
Cetacea	7	–	5	40	48	55	45	61	75	74	143

Not included: ***Balaena glacialis*** – a few strandings late 19th century, ***Balaenoptera musculus*** – a few strandings early 20th century, *B. borealis* – three strandings in the 19th century, *Steno bredanensis* – two strandings, early 20th century, *Pseudorca crassidens* – two strandings, in 1948 and 1951, *Orcinus orca* – about ten strandings since 1900, *Delphinapterus leucas* – one stranding in 1948, and *Mesoplodon europaeus* (the holotype, stranded in the Channel by 1840).

Table 1 continued

Species	1980	81	82	83	84	85	86	Total
Cetacea indet.	–	–	–	–	–	1	–	7
Mysticeti indet.	–	–	–	1	–	–	1	2
Balaenopteridae	1	–	3	2	1	2	–	12
B. acutorostrata	1	–	2	–	1	–	1	8
B. physalus	2	1	1	1	5	1	2	27
M. novaeangliae	–	–	–	1	–	–	–	2
Mysticeti	4	1	6	5	7	3	4	51
Odontoceti indet.	2	2	4	2	1	1	2	31
Delphinidae ind.	12	21	11	23	17	27	39	240
T. truncatus	5	3	5	8	7	6	8	81
S. coeruleoalba	29	18	16	22	30	17	47	285
D. delphis	41	56	26	43	42	76	93	501
L. hosei	–	–	–	–	11	–	–	11
L. albirostris	–	1	–	1	–	–	3	5
L. acutus	–	–	–	1	2	–	3	10
G. griseus	4	1	2	2	5	5	4	41
G. melaena	17	24	14	28	13	7	15	181
G. macrorhynchus	–	–	–	–	–	–	–	1
P. phocoena	3	3	8	10	6	2	1	54
Hybrid	–	–	–	–	–	–	–	1
Delphinidae	111	127	82	138	133	140	213	1418
P. macrocephalus	–	1	1	2	1	2	1	17
K. breviceps	1	–	–	–	1	–	–	3
K. simus	–	–	–	–	–	–	1	1
Physeteridae	1	1	1	2	2	2	2	21
Ziphiidae indet.	–	–	–	–	–	–	–	1
Z. cavirostris	6	1	7	2	4	1	1	42
H. ampullatus	1	–	1	–	–	–	–	3
M. bidens	–	–	–	–	–	–	1	4
Ziphiidae	7	1	8	2	4	1	2	50
Odontoceti	121	131	95	144	140	144	219	1520
Cetacea	125	132	101	149	147	148	223	1578

carried out. Stomach contents have been examined to study the prey in terms of species, age classes and impact on the ecosystem. Particular research has been devoted to reproduction, with a study of male and female sexual cycles.

Post-mortem examinations provide information on possible mortality factors. At least an external examination of organs is carried out; whenever possible, samples for pathological studies are taken. The study of parasites has revealed which species are connected with the various hosts, the pathology of each and, moreover, the possibility that parasites may serve as biological indicators of cetacean migrations. Tissues and organs are sampled to assess pollution levels by heavy metals and organochlorine compounds. The burden of pollutants has been described for most species from the French coast, and for some species contamination levels in different areas are being compared. A more thorough study is now going on with the aim of synthesizing the data, looking upon each contaminant as a tracer in ecotoxicology.

Another part of the programme is carried out by the overseas department of the CNEMM, in the Laboratory of Comparative Anatomy of the National Museum of Natural History. The west coast of Africa was studied some years ago, and now research focuses on the western Indian Ocean. The areas explored are Djibouti, Madgascar and the Kerguelen Islands. There is a specific programme on the ecology and biology of *Cephalorhynchus commersonii*, including a comparison of the Kerguelen population with South American animals.

Finally, attention should be drawn to the good co-operation between the two departments of the CNEMM, the Institut Français de Recherches et d'Exploitation de la Mer (IFREMER) and other laboratories. Such a co-operation also exists at an international level, among others with the IWC, ICES and CIESM.

Discussion

As in many other discussions, the problem of being dependent on a network of observers was put forward. Also publication of the data was discussed.

Cetaceans in U.K. waters

Peter G.H. Evans

Since 1973, the Cetacean Group of the U.K. Mammal Society has organized a network of observers in Britain and Ireland to provide sightings records of cetaceans. The scheme operates on a network at present numbering ca. 350 observers, and comprising both amateur and professional personnel. Aided by standardized recording forms, an identification guide and often using photography, they have now provided ten thousand cetacean records (comprising ca. 100,000 individuals), nearly 80% of which are specifically identified. All records, together with environmental parameters (weather and sea conditions, surface temperature, salinity and water depth) are coded onto computer file. Analytical programs (in Fortran) are used to perform preliminary analyses and for distribution mapping (direct plots and using ICES grid squares).

The results to date provide some idea on the status, distribution, seasonal movements, breeding seasons and feeding areas for most of the 23 cetacean species recorded by the scheme in the U.K. in the last 20 years. The commonest species, both in terms of numbers of sightings and total number of individuals, is the harbour porpoise *Phocoena phocoena*, followed by the pilot whale *Globicephala melaena*, common dolphin *Delphinus delphis*, and white-beaked dolphin *Lagenorhynchus albirostris*. The relative importance of particular species has changed between the periods 1958–72, 1973–79 and 1980–86.

For example, bottle-nosed dolphin *Tursiops truncatus* and northern bottle-nosed whale *Hyperoodon ampullatus* have declined in relative importance, whereas pilot whale, sperm whale *Physeter macrocephalus*, and white-beaked dolphin have increased. Further species recorded relatively common in U.K. waters include minke whale *Balaenoptera acutorostrata*, killer whale *Orcinus orca*, Risso's dolphin *Grampus griseus*, and white-sided dolphin *Lagenorhynchus acutus*, and all of these have been recorded regularly in the North Sea (some species extending southward to near the Yorkshire coast).

Rarer species recorded since 1965 in U.K. waters include fin whale *Balaenoptera physalus*, sei whale *Balaenoptera borealis*, blue whale *Balaenoptera musculus*, humpback *Megaptera novaeangliae*, right whale *Eubalaena glacialis*, pygmy sperm whale *Kogia breviceps*, false killer whale *Pseudorca crassidens*, Sowerby's whale *Mesoplodon bidens*, True's beaked whale *Mesoplodon mirus*, Cuvier's whale *Ziphius cavirostris*, white whale *Delphinapterus leucas*, and striped dolphin *Stenella coeruleoalba*. All of these species have been reported primarily from the Atlantic coasts of Britain and Ireland, although striped dolphins have recently been recorded from the southwest approaches to the English Channel and the southern North Sea.

Most species show seasonal onshore-offshore movements, the timing of which appears to relate to coastal feeding and offshore breeding. Further knowledge of parturition seasons comes from observations of small young for a number of species.

Biases still exist in the geographical and temporal distribution of coverage, and to overcome these limitations, twenty sites/observers operate with quantified effort. Data from some of these exist over the last 15 years and provide some of the best evidence for changes in abundance for various species. Pilot whales, for example, show a marked increase in numbers between the 1950s and 1970s–80s, although in the last four years there is some indication of a decline. The harbour porpoise, on the other hand, is present at very low numbers in the southern North Sea, English Channel and Irish Sea, where in the 1950s–60s it was much more commonly recorded.

A further recent decline (during the 1980s) is indicated for the harbour porpoise in the northern North Sea.

Many cetaceans are concentrated in one or two particularly rich areas, such as along the coasts of western Ireland, around the Outer Hebrides and in the waters of eastern Shetland. These represent important feeding areas for several species during summer months, whilst segments of the harbour porpoise population are resident there. Some coastal bays are important for resident bottle-nosed dolphins. These include the inner Moray Firth in northeast Scotland, Cardigan Bay in Dyfed, and Galway and Clew Bays in western Ireland. However, coastal small cetaceans (bottle-nosed dolphins and harbour porpoises) are thought to have disappeared from many regions of the U.K. where once they occurred. Information from older residents of coastal resorts who have kept diaries indicate that the regular sightings of those species in summer in the 1940s–50s no longer occur at many resorts in the southern North Sea, English Channel and Irish Sea.

Discussion

The questions concerned mainly the crucial problems of all sighting and stranding recordings: correction for time, observer-effort, weather and reliability. It was noted that the pattern of numbers of observed species agrees with the results of the analysis of stranded animals on the Dutch coast.

Danish strandings and sightings 1977–1985

Carl Chr. Kinze, H.J. Baagøe, B. Jensen

Eighteen species of Cetacea have been recorded for Danish waters up to 1976 (Bondensen, 1977). From 1977 to 1985 a total of 22 strandings (excluding *P. phocoena*) and 20 sightings (excluding *P. phocoena*) have been recorded. No new species were added to the list of Danish whales (Baagøe, 1984; Kinze, 1985).

The harbour porpoise *Phocoena phocoena* is by far the most common cetacean in all Danish waters. Along the north-western coast of Jutland, also white-beaked dolphins *Lagenorhynchus albirostris*, killer whales *Orcinus orca*, pilot whales *Globicephala melaena*, and minke whales *Balaenoptera acutorostrata* occur rather frequently. All other species appear to be stragglers. During the last 8 years, however, common dolphin *Delphinus delphis* and white whale *Delphinapterus leucas* have been observed on several occasions.

Whale sightings and strandings are only recorded sporadically as no whale recording scheme exists. An unknown number of smaller cetaceans have been misidentified as harbour porpoises, and hence have never been recorded.

Danish whale strandings 1977–1985

Lagenorhynchus albirostris

1. 3/12/1979. Fanø. Sex and total length unknown. ZMC CN 93.
2. 31/3/1981. Hou, south of Saeby, Northern Jutland. Sex unknown. Length 250 cm. Natural History Museum Aarhus.
3. 20/11/1981. Blaavands Huk, Western Jutland. Female. 253 cm. Midtsønderjyllands Museum Gram. A second specimen was successfully brought back to sea.
4. 14/1/1984. 2 specimens. Blokhus, Northern Jutland. Sex unknown. Length app. 250 cm.
5. 15/4/1984. Fanø. Sex and total length unknown. Not collected.
6. 12/11/1984. Blaavands Huk, Western Jutland. Female. 260 cm. Midtsønderjyllands Museum Gram.
7. -/7/1984. Hirsholmene, off Frederikshavn, Northern Jutland. Male. Length unknown. ZMC CN 258.
8. 8/9/1985. Blokhus, Northern Jutland. Male. 230 cm. ZMC CN 259.

Tursiops truncatus

1. 4/4/1984. Hals, eastern mouth of Limfjorden. Sex unknown. 250 cm. Natural History Museum Aarhus.

Delphinus delphis

1. 3/4/1978. Helnaes, Funen, Little Belt. Sex unknown. 196 cm. Not collected.

Globicephala melaena

1. 17/12/1982. Trans Strand, Northern Jutland. Male. 570 cm. Natural History Museum Aarhus.
2. -/1/1983. Fanø. Sex and total length unknown. Not collected.

Orcinus orca

1. 2/6/1980. Tannis Bugt, Northern Jutland. Female. 322 cm. ZMC CN 89.

Hyperoodon ampullatus

1. 20/7/1978. Rømø. Female. 728 cm. ZMC CN 257.

Physeter macrocephalus

1. February 1979. Tversted, Northern Jutland. Male. 1340 cm. ZMC CN 91.
2. 23/1/1984. Henne Strand, Western Jutland. 2 specimens, both male. 1400 and 1380 cm. ZMC CN 248 and CN 249.
3. 16/9/1984. Brunbjerg, Western Jutland. Sex and total length unknown. Only parts of the vertebral column stranded. Not collected.

Balaenoptera acutorostrata

1. 3/8/1980. Knebel Vig near Aarhus. Sex unknown. 400 cm. Natural History Museum Aarhus.
2. 8/8/1982. Aalbaek Bugt south of Frederikshavn. Female. 505 cm. ZMC CN 247.

Balaenoptera borealis

1. 30/8/1980. Pøl Sand, Als. Female. 1000 cm. ZMC CN 90.

Danish whale sightings 1977–1985

Delphinus delphis

1. 9/10/1979. Aalsgaarde, Northern Sealand. One individual.
2. Summer 1982. Great Belt. Observed from ferry line Nyborg-Korsør. One individual.

Globicephala melaena

1. 31/7/1977. Between Rubjerg Knude and Hirtshals, Northern Jutland. Two individuals.
2. 20/8/1977. Between Rubjerg Knude and Hirtshals, Northern Jutland. Two individuals.

3. 7/3/1978. Between Rubjerg Knude and Hirtshals, Northern Jutland. One individual.

4. 26/6/1978. Between Rubjerg Knude and Hirtshals, Northern Jutland. Two individuals.

5. 21/7/1978. Between Rubjerg Knude and Hirtshals, Northern Jutland. Two individuals.

6. 6/9/1979. Between Rubjerg Knude and Hirtshals, Northern Jutland. One individual.

Orcinus orca

1. 21/3/1983. South of Skagen, Skagerrak coast. School of seven.

2. 19/8/1985. Off Lundeborg, Southern Funen. Single individual. A school of killer whales observed in the same period.

Delphinapterus leucas

One or two individuals observed from May 1983 to January 1985 in various parts of the Danish waters, particularly in Limfjorden. For further details, see sightings map.

Physeter macrocephalus

1. 7/8/1982. Off Rømø (55°04'N, 07°16'E). One specimen. Ref.: MARSWIN 4 (2): 193.

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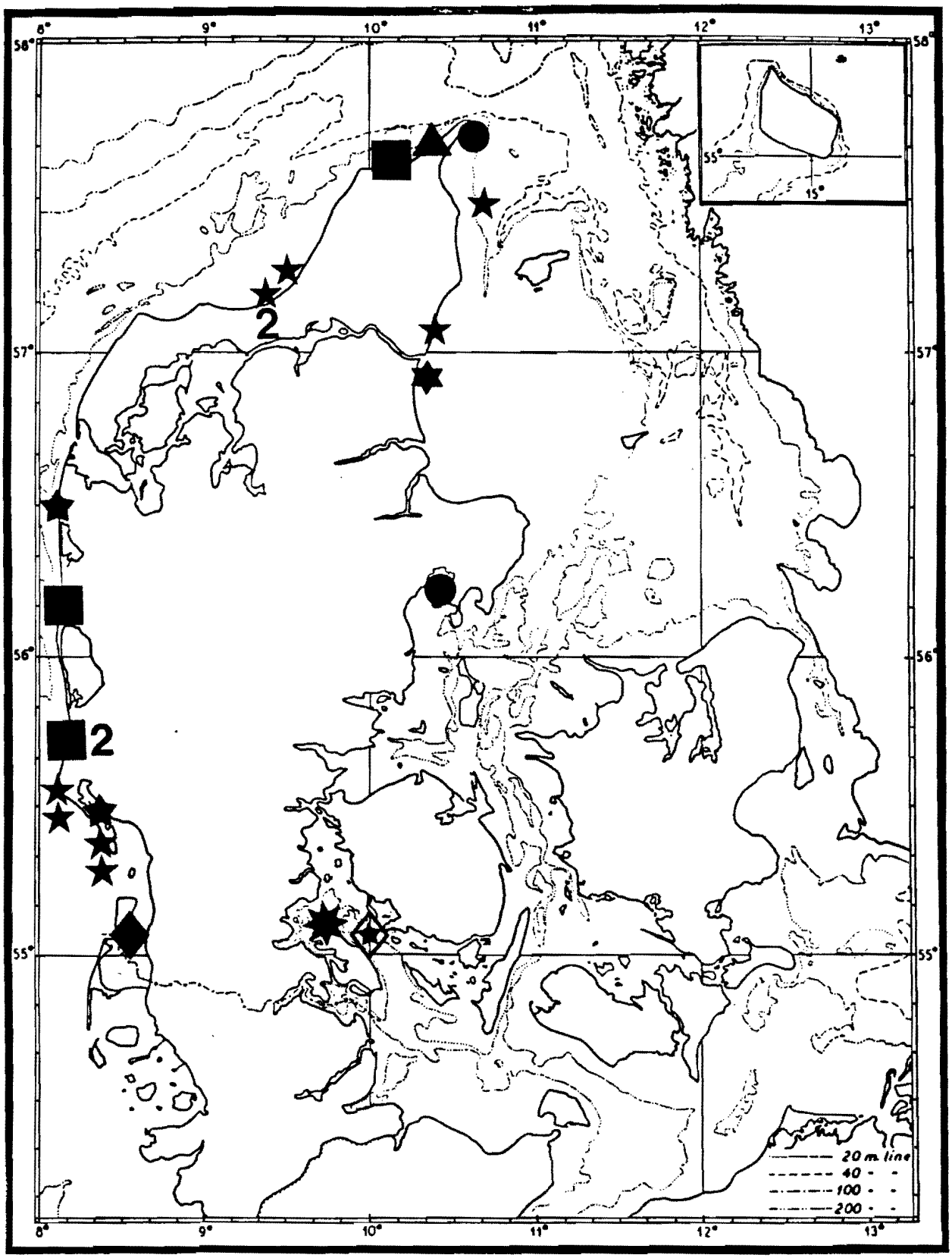
Discussion

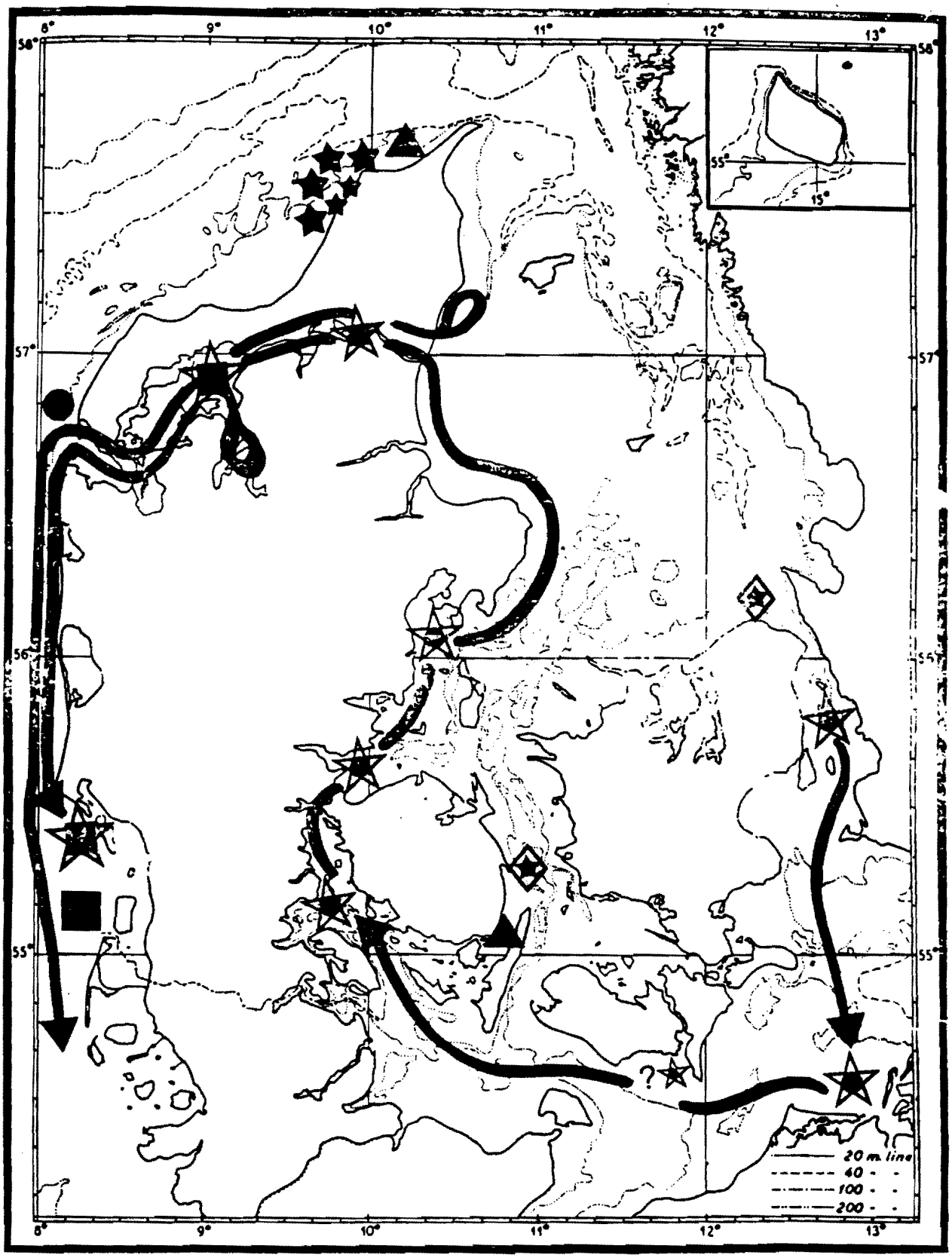
The central point was the sighting of the white whales, which seemed to have travelled south to Germany and even appeared in Dutch waters.

Danish whale strandings 1977–1985



L. albirostris
G. melaena
O. orca
P. macrocephalus
B. acutorostrata
B. borealis
H. ampullatus
T. truncatus
D. delphis

Danish whale sightings 1977–1985



D. leucas 1984/85

D. leucas 1983/84 and 1984/85

other symbols as stranding map

Computers in cetacean research

Jan Willem Broekema

All those interested in the populations of wild cetaceans have to deal from time to time with information obtained from sighted or stranded animals. The **exchange of relevant and reliable information** is of the utmost importance for the study of cetacean populations and their dynamics.

Information can be stored, exchanged and processed in many ways. Having to use information from many sources may be a great handicap. It seems obvious that an accepted standard relieves the task of the scientist.

One of the tasks this Society should undertake is setting a **standard for the storage and exchange of information** on strandings and sightings of cetaceans. This would imply that the institutes, societies and persons assembled here should adopt this standard as soon as possible, and convert existing data. Only then will we at last be able to exchange information in a form that is easy to use. This society should set two standards: what has to be gathered, and how can it be exchanged (on paper as well as by electronic means). The more personal touch is the way in which this kind of information is processed further. This depends, among other things, on the questions to be answered.

A standard way of processing may curb scientific freedom. This implies that, specifically in electronic data-processing, the storage and exchange techniques should not lead to the exclusion of certain ways of processing. The introduction of a standard computer language, for example, may lead to just that. If, e.g., FORTRAN-77 is adopted as a standard, one excludes from further participation all owners of personal and home computers, which for the greater part rely on BASIC. The problem is NOT in the standardisation of the language, but in the data to be exchanged.

Much information is available from a variety of periodicals. Some information is passed on by personal communication between cetologists or other interested persons. While the price of data-processing equipment is decreasing, it may be worthwhile to investigate the possibilities of direct exchange from system to system. Unfortunately there appears to be no standard in this respect either. By far the cheapest way, besides the use of paper, seems to be the exchange of the magnetic storage device itself: the floppy disk or diskette.

The third way of information exchange is by direct system to system link. Information can be sent and received through the regular telecommunication network: the telephone. There is, however, even less uniformity in this respect. One or a few standards have to be discussed which can be used by everybody. This may eventually lead to the installation of a database open to anyone, using any system. This database could store information on cetaceans from all over Europe.

The Society should standarize what information is to be considered essential in the case of stranded (and sighted) cetaceans. One has to fix the way in which essential data are to be accepted; e.g., not "Pilot whale", but "Globicephala" and "melaena", not "Hirtshals", but "57°07'N 09°08'E".

Besides the publication and further exchange by means of paper, some standards are to be set for electronic data exchange. This will include the information itself as well as the way in which it is exchanged. The programs used to collect, store and process the information do not need a standard. If the need to exchange programs arises, an extensive description (with flow diagram) may be enough to allow adaptation to any language.

It is proposed to set up a working group, which will serve as a supporting body to scientists and students. The working group should set standards for the exchange of information and possibly collect programs for processing the data.

If one wishes to exchange the program itself, one should choose a language that any computer can use. Only BASIC, in all its versions, can be considered for this purpose. Many owners and users of computers are not in the opportunity to obtain other languages, with the possible exception of PASCAL.

Discussion

The main problem concerning a central databank might be the unwillingness of scientists to send in data before they have been processed. In fact all published data could be stored in the file, but if there would be a long period between stranding/sighting and publication, a great deal of recent data could not be processed by those interested.

Benign techniques for studying sperm whales *Physeter macrocephalus* using small sailing vessels

Vassili Papastavrou, J.C.D. Gordon, H.P. Whitehead

This paper is a summary of the techniques used in two projects, the WWF Indian Ocean Sperm Whale Project and the Galapagos Sperm Whale Project. Some of the techniques used were described by Whitehead & Gordon (1986). A 10 metre Bermuda-rigged sloop with auxiliary engine was used as a research vessel and was crewed by a small group of sailor-scientists. This approach has a number of advantages. Small boats are cheap and relatively simple to run. The combination of sail and power provides a double element of safety, an ability to heave-to in comfort and the potential to manoeuvre silently if necessary. The range of a sailing boat is considerable; long distances can be covered cheaply and it is possible to conduct research at sea for long periods. In contrast, the range of a small motor boat is usually very limited. Sailing yachts are stable and relatively comfortable research platforms as they are steadied both by the keel and the sails. Also, there is a good vantage point up the mast. Finally, a sailing boat is very suitable for acoustic work: it is quiet and easy to stop by heaving-to, thus allowing hydrophones to be lowered. We also noted that sperm whales seemed less frightened of our quiet low-revving diesel engine than the high-pitched scream of an outboard engine. Sperm whales usually swim slowly, at speeds of two to four knots, well within the capabilities of a sailing boat.

A number of techniques were developed. Groups of sperm whales were located acoustically by using a directional hydrophone to obtain a bearing on their characteristic clicks. In this way sperm whales could be both found and followed. The use of acoustic techniques was important as sperm whales spend a large proportion of their time beneath the water and make loud noises that are easy to locate. It was also possible to listen at night, thus doubling the search effort. Individual sperm whales were photo-identified using photographs showing marks on flukes and dorsal fins. The presence of calluses on dorsal fins allowed females to be recognized. Sperm whales were measured by means of photogrammetric techniques using photographs, taken from a known height, of whales lying parallel to the horizon (Gordon, 1985). Faeces samples containing squid beaks were collected using a net. Some squid remains thought to have been regurgitated by sperm whales were also collected. This allowed the sperm whale's diet to be investigated. Dive traces were obtained on a chart-recording echo-sounder; the boat was manoeuvred onto the slick of turbulence left by the diving whale, and on some occasions kept above the diving whale using acoustic tracking techniques. From the echo-sounder record both the dive rate and the depth at which the trace became level could be calculated. Regular high-quality acoustic recordings were made allowing sperm whale vocal behaviour to be investigated.

The principal aim of the two projects was to investigate the social behaviour of sperm whales. This is poorly understood, even though it is of crucial significance to management. Traditionally, whale scientists have used material made available by whaling operations to study whales. Social behaviour cannot be adequately studied using the destructive and synoptic sampling of the whaling industry. Moreover, most of the recent sperm-whaling has been concentrated on less social adult males in higher latitudes.

Preliminary results have suggested that the composition of mixed schools are stable, both within one season and from one year to the next (in Sri Lanka). Associations

between large males and mixed schools observed off the Galapagos were of very short duration, for periods of only a few hours, and on occasions a mixed school would be attended by more than one male. These observations are not compatible with the "harem-defence" breeding strategy assumed in the sperm whale management model. It is more likely that males may employ a "searching strategy" to maximize their reproductive potential (Whitehead & Arnbom, in press; Gordon, in press).

The sperm whale work has only just started. It will take many more years of careful observation before the intricacies of the species' social behaviour will be understood. Research is currently being undertaken in the Galapagos (by H. Whitehead) and research is also planned for the Azores (by J. Gordon with IFAW). Our experience during these studies has emphasized the importance of acoustics in the life of sperm whales and its value as a research tool for studying them. Acoustic surveying promises to be an effective technique for censusing sperm whale populations.

In conclusion, this approach has yielded valuable new information on the biology of a previously inaccessible animal. There is also a great deal of potential for applying these same techniques to study other marine animals.

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Discussion

The main issues of the discussion were the directional hydrophone, the vocalizations and the possible effect of the echo-sounder on behaviour.

Some data on parasites of the harbour porpoise *Phocoena phocoena* IN French Atlantic waters

J.A. Balbuena, J.A. Raga, R. Duguy

(paper presented in writing)

Introduction

The harbour porpoise *Phocoena phocoena* occurs in all European coastal Atlantic waters. In the French Atlantic region this used to be the most common cetacean in shallow waters. However, due to environmental deterioration and human activities, its numbers have decreased since 1950 (Duguy et al., 1982). In these waters the most frequent sightings and strandings are from the eastern part of the Channel, southern Brittany and Charente-Maritime, whereas the species is uncommon south of the Bay of Biscay (Duguy et al., 1982; Duguy, 1983).

The harbour porpoise's parasitic fauna is relatively well known in comparison with that of other odontocete species. Several papers dealing with harbour porpoise parasites in European Atlantic waters are available: Wesenberg-Lund (1947) reported on some lungworm species from Danish waters; Arnold & Gaskin (1975) recorded some species of nematodes from the North Sea. Likewise Gibson & Harris (1979) collected helminthological data from cetaceans in the European Atlantic, especially in British waters. Finally, Clausen & Andersen (1985) carried out a study on the health status of harbour porpoises in Danish waters and reported on some helminth species, their prevalence and pathology.

Despite the great number of data from the European Atlantic region, the harbour porpoise's helminth fauna has been poorly studied in French waters. To the authors' knowledge, only one record of two species of pseudaliid nematodes recovered from a porpoise has been reported so far (Abeloos, 1932). Therefore it was considered worthwhile to study the helminth fauna of the harbour porpoise in this area, in order to compare data from different European populations.

Materials and methods

The helminths reported in this paper were recovered from eight harbour porpoises stranded on the French Atlantic coast and deposited in the collection of the Musée Océanographique, La Rochelle. Classical techniques in parasitology were performed to determine their specific identities.

Results and discussion

One trematode and four nematode species were recovered from the porpoises.

Trematodes of the species *Campula oblonga* occurred in the bile ducts of a male. These flukes belong to the family Campulidae whose members are restricted to marine mammals. *C. oblonga* has been previously reported from the liver, and the bile and pancreatic ducts of harbour porpoises in British and Danish waters (Gibson & Harris, 1979; Clausen & Andersen, 1985). This is the first record of this fluke in the French Atlantic region.

It has been observed that the presence of these worms in the bile and pancreatic ducts cause fibrosis and inflamed areas. In some cases, these lesions may lead to the

death of the host, and it is presumed that they are a significant cause of natural mortality (Geraci & St. Aubin, 1986).

One of the nematode species collected was *Anisakis simplex* (Ascaridoidea: Anisakidae). The roundworms were recovered from the stomach of three of the eight porpoises surveyed. *A. simplex* is a rather unspecific nematode occurring in a wide variety of marine mammals, both cetaceans and pinnipeds, and ranging from temperate to cold waters (Davey, 1971).

Larval stages of *Anisakis* spp. cause ulcerations in the stomach wall which can lead to peritonitis and even to the host's death (Smith & Wootten, 1978). Other reports state that such ulcers do not seem to have a significant influence on the porpoise's health status, though they may cause considerable pain and discomfort (Clausen & Andersen, 1985).

Three species of nematodes belonging to the family Pseudaliidae were found, namely *Pseudalius inflexus*, *Torynurus convolutus* and *Stenurus minor*. This family almost exclusively consists of parasitic worms in the respiratory tract and circulatory system of odontocetes.

P. inflexus was recovered from three of the eight porpoises: from the bronchi, lungs and, in one case, from the heart. This nematode has been recorded in cold European waters, parasitizing harbour porpoises and white-sided dolphins *Lagenorhynchus acutus* (Delyamure, 1955; Gibson & Harris, 1979).

T. convolutus was found in the bronchi of two porpoises. This lungworm is widely distributed in the seas of the northern hemisphere, and well represented in the European Atlantic (Delamure, 1955; Gibson & Harris, 1979). However, this pseudaliid has been reported only once from the Baltic (Gibson & Harris, 1979). Furthermore, Clausen & Andersen (1985) did not record it in a survey of 159 harbour porpoises caught off Denmark. In our study *T. convolutus* was recorded twice; it was also previously cited from this region (Abeloos, 1932). Therefore it may be assumed that *T. convolutus* occurs more frequently in the French Atlantic region than in the Baltic and adjacent areas.

T. convolutus occurred in association with *P. inflexus* in the same host, and there is a similar case reported from the French Atlantic (Abeloos, 1932). The combined effect of both lungworm species on the host is unknown. However, it may be presumed that being parasitised by two lungworms sharing the same microhabitat should be a heavy burden on diving mammals such as the harbour porpoise.

Finally *S. minor* was recovered from the cranial sinuses of two porpoises. This species occurs in northern seas, parasitizing small and medium-sized odontocetes. In the European Atlantic *S. minor* has been reported from Danish waters (Wesenberg-Lund, 1947) and the North Sea (Arnold & Gaskin, 1975). This helminth is now for the first time reported from French waters.

Although in many cases no histological or pathological changes were observed, damage caused by this nematode has been described as consisting of small haemorrhages and tissue-thickening, which may lead to purulent sinusitis. It has been hypothesized that these lesions may interfere with echolocation and hearing, resulting in single or mass strandings or easy capture (Delyamure, 1955; Clausen & Andersen, 1985) though there is no conclusive evidence to support this (Geraci & St. Aubin, 1986).

The harbour porpoise's helminth fauna in French waters does not seem to differ substantially from that of the rest of the European Atlantic though *T. convolutus*

appears to occur more frequently in French Atlantic waters. The association *T. convolutus* — *P. inflexus* appears to occur occasionally in the French Atlantic region.

The role of the helminths reported here and their impact on harbour porpoise populations still has to be worked out, although they seem to be a significant cause of disease and natural mortality.

Further research on parasitism and its correlation with other factors such as age, growth, sex and pollutant levels should be carried out in the future, as well as quantitative studies of parasitic infestations, in order to compare various European populations of harbour porpoises.

Literature

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Part II: The Founding Conference

The European Cetacean Society

On 27 January 1987 the European Cetacean Society was founded. This society should bring together persons studying cetaceans in the wild from different European countries, and promote joint projects with international funding. The Society has no intention of competing with the European Association of Aquatic Mammals (EAAM), which caters primarily for cetaceans in human care; nor with the recently formed Society of Marine Mammalogy, based in the United States. For most European cetologists it is not practical to attend American meetings, and it was felt that there is an additional need for a society that would serve the regional needs of European cetologists.

The aims of the Society are to promote and co-ordinate the scientific study and conservation of cetaceans, and to gather and disseminate information to Members of the Society and the public at large. To this end six international working groups have been set up on the following subjects: stranding schemes; sightings schemes; by-catches of cetaceans in fishing gear; computer-data compatibility between countries; the harbour porpoise (a species in apparent decline in Europe, and at present causing serious concern); and an agreement for the protection of small cetaceans in Europe, relating to the Convention on the Conservation of Migratory Species of Wild Animals (CMS).

Membership of the Society is open to anyone with an interest in cetaceans, on payment of an annual subscription of (in 1987) 30 Dutch guilders (over 25 years of age) or 15 guilders (25 years or younger, full-time students, or unemployed persons in financial hardship). Each person will receive a regular newsletter that will include information on current research projects by Members, publications, abstracts, current news on cetaceans in other parts of the world, conservation issues, legislation and regional agreements, together with reports from each of the working groups. A conference will be held annually (varying where possible between northern and southern Europe) with talks and discussion sessions on various cetacean projects, and at which the annual general meeting will be held.

If you are interested in joining, please write either to

the Secretary, Dr. P.G.H. Evans,
c/o Zoology Dept., University of Oxford,
South Parks Road, Oxford 0X1 3PS, United Kingdom;
or to:
the Treasurer, Dr. C. Smeenk,
c/o Rijksmuseum van Natuurlijke Historie,
P.O. Box 9517, 2300 RA Leiden, The Netherlands.

See to this end the subscription form at the back of this issue.

Logo competition

At the founding conference it was decided that the Society should have a logo, to be used in letterheads and on other official ECS-paper, as well as in advertising materials such as stickers, buttons etc. To this end a competition is announced.

Anyone wishing to submit a design should send this to the Secretary before the end of 1987. The Council will act as a jury and select one of the proposals.

The logo should be easy to reproduce on a photocopying machine. The species depicted should be one or more (small) cetacean(s) widely distributed in European waters.

It should preferably not be the harbour porpoise *Phocoena phocoena* since this has already been used in a variety of other activities not directly related to the ECS.

Constitution of the European Cetacean Society

Article I Name.

The name of the Society is the European Cetacean Society.

Article II Aims.

The objectives of the Society are to promote and co-ordinate the scientific study and conservation of cetaceans; and to gather and disseminate information about cetaceans to Members of the Society and the public at large.

Article III Membership.

Membership is open to all on payment of an annual subscription, due on January 1st, to be approved at a General Meeting of the Society. Members will be entitled to vote, to attend meetings, participate in all Society activities, and to receive a regular newsletter from the Society. Any institution may become an Institutional Member and has all the above rights except that of entitlement to vote. A Member should only present himself/herself on behalf of the Society by approval of Council, as described in article IV. The Council shall have the right to refuse or terminate the membership of any person who is deemed to have acted in a way contrary to the aims of the Society. That person shall have the opportunity to appeal against this decision at the next General Meeting, and that person's appeal will be sustained if he or she receives a majority support at that meeting.

Article IV Government.

The business of the Society will be conducted by a Council comprising a Chairman, Secretary, Treasurer, and up to five other persons. The Treasurer may serve an indefinite period, but all other officers and Members of Council may not serve for longer than a four-year term. Subsequent re-election can occur but must follow at least one year out of membership of Council. All nominated Members of Council will be elected at a General Meeting of the membership. A majority of those casting votes at such a meeting is required for election. In the event of too many persons being proposed for membership by Council, a vote by secret ballot shall take place at the General Meeting. In the event of a vacancy occurring between periods of election, the Council shall have the right to fill it by co-option until the next General Meeting when election by the membership should take place. Any Council Member may be removed from his/her position by a two-thirds majority of the entire membership using a secret mail ballot. Such an election can be called by a petition signed by twenty percent of the voting membership (as at the last General Meeting).

Article V Working Groups.

The Council shall have the right to form Working Groups as and when required to conduct more specialist duties. This needs to be approved by the next General Meeting with a two-thirds majority. Members of such committees may serve for terms to be decided by the General Meeting.

Article VI Duties.

It shall be the duty of the Council Members and Working Groups to organize the activities of the Society. They shall report to the membership through newsletters at least once a year, and at meetings.

Article VII Annual General Meetings.

A General Meeting of the Members of the Society will be held annually. Thirty persons shall form a quorum. The Council shall report on progress during the previous calendar year and present a summary of accounts. Eligible Members shall be elected to Council if vacancies occur; otherwise Council Members shall be offered for re-election. The Secretary shall send a notice of the Annual General Meeting to all fully paid-up Members of the Society at least six weeks before the meeting, which shall include nominations for the Council and a provisional agenda. Any member wishing to make additional nominations or to have any other relevant business placed on the agenda shall send notification to reach the Secretary not later than four weeks before the meeting. A revised agenda shall be circulated if necessary, not less than two weeks before the meeting.

Article VIII Extraordinary General Meetings.

An extraordinary General Meeting may be called by the Council or on the written request to the Secretary of not less than twenty Members of the Society to discuss urgent business. The Secretary must convene the meeting as soon as is practicable with two week's notice to the membership. At such meetings the quorum shall be thirty Members.

Article IX Finances.

The Society will be supported by annual dues of the Members and Institutional Members, by the proceeds of the sale of publications, and from such property or funds it may acquire. All elected Members of Council and Working Groups shall serve gratis, although the Society may hire persons as needed. The finances of the Society shall be audited by an accredited accounting firm at least once every five years.

Article X Dissolution of the Society.

The Society may be dissolved by a two-thirds majority in favour at a properly advertised General Meeting. Any assets remaining after providing for the debts and obligations of the Society shall be distributed to a non-profit fund, foundation or corporation by two- thirds majority agreement of the membership.

Article XI Amendment of the Constitution.

This Constitution may be amended by a resolution carried by a two-thirds majority at a properly advertised General Meeting.

The foundation
(by the rapporteur)

During the meeting on the foundation and Constitution of the European Cetacean Society, many persons put forward amendments to the proposed Constitution, of which several were accepted as useful. Not mentioned specifically in the Constitution, but accepted was the use of the English language for the business of the Society, and the so-called national contacts.

The Council

For the first term the following people have been elected as Members of Council:

Carl Kinze	Co-chairman
Ronald Kröger	Co-chairman
Peter Evans	Secretary
Chris Smeenk	Treasurer
Mats Amundin	
Anne Collet	
Geneviève Desportes	
Michela Podestà	

The working groups

For the working groups the following persons have been elected as chairmen. Members of the Society are requested to contact these for further information.

Strandings	Christina Lockyer
Sightings	Peter Evans
By-catches	Simon Northridge
Harbour Porpoise	Carl Kinze
Computers	Jan Willem Broekema

All working groups basically have the aims of Society within their specific field, with the exception of the Computer Working Group. The aims of this last group are mainly support, advice and standardization.

National contacts

Members from any country may choose a person, group or institute as national contact for the Society. The national contact does not have any privileges above the other members as defined in the Constitution.

UNEP/CMS – proposal
(by the rapporteur)

On 28 January The United Nations Environment Programme was represented by Judy Johnson, co-ordinator for the secretariat of the Convention on the Conservation of Migratory Species of Wild Animals, Bonn, Western Germany. The UNEP proposes to present a CMS-agreement to governments to protect "small" cetaceans, which are considered migratory species because of the movements of populations.

A discussion followed, which proved the interest of the members of the Society in such an agreement. The discussion went into such detail that the Society decided to appoint a sixth working group to discuss matters further. Margaret Klinowska was appointed chairman.

Part III: The Harbour Porpoise

Progress reports on the harbour porpoise
(by the rapporteur)

Carl Kinze opened the final session of the meeting with a summary of the Bremerhaven meeting on the harbour porpoise, 18–20 June 1986. From the participating countries the following progress was reported:

In Sweden investigations of stranded animals and those caught as by-catches are continuing. Further study is being proposed. In Denmark the work is steadily progressing.

In Western Germany several problems have arisen due to the federate state structure. Differences in legislation and organisation in the various states cause problems in setting up a well-structured national network. Margaret Klinowska reported on strandings and by-catches from Poland, which are under study. Similar information has been received from the German Democratic Republic.

In The Netherlands strandings of cetaceans including harbour porpoises are being recorded by the National Museum of Natural History, Leiden. The records for the period 1981–1983 were published (Smeenk, 1986). Autopsies on harbour porpoises and white-beaked dolphins are carried out by C.J. van Nie and C. Smeenk. A report on the status of the harbour porpoise in the North Sea and adjacent waters was published by A. van Kreveld (1987). Aerial counts of porpoises and dolphins in the Dutch sector of the North Sea are made by H. Baptist. Sightings of porpoises and dolphins in Dutch waters are collected by the Marine Mammal Working Group of the Netherlands/Belgian Mammal Society; a central sightings registration scheme is being set up. Data on water temperature and currents in the southern North Sea were collected by Joke Bakker.

In Belgium a toxicological study of stranded specimens is beginning besides the usual collecting of material.

The United Kingdom reported on the processing of sightings data. The United Kingdom delegates made a plea for support from the Society to put pressure on the authorities of the British Museum (Natural History) in London to continue the funding of the collecting of stranded cetaceans.

In Greenland there is no collecting programme due to lack of manpower, but it was proposed to establish contacts with colleagues in this unpolluted area for the collecting of reference material.

The second part of the discussion was devoted to the problem of fund-raising. The UNEP application (1985) has been moved from 'shelf to shelf' because of the changing priorities of UNEP, as was reported by Margaret Klinowska. Carl Kinze proposed to set up a funding committee of the Society. Ronald Krōger suggested that the Society should support all those who apply for WWF-funds at a national level.

Literature

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Part IV: The Working Groups

The harbour porpoise working group

Present:

L. Andersen, L. Bondestad, B. Clausen, A. Collet, C. Joiris, C. Kinze (chairman of the WG), H. Kremer, R. Kröger, K. Lankester (rapporteur), M. Lindstedt, C. Lockyer, S. Northridge, B. Reineking, C. Smeenk, T. Sørensen, B. Thorpe.

Absent:

J. Canin, P. Evans, M. Klinowska, P. Reijnders.

Agenda:

1. ongoing projects;
2. future research plans;
3. communication between WG-members;
4. funds.

Item 1. **Ongoing projects** and contact persons
By-catches

- Incidental catches and collecting of samples from Danish waters: C. Kinze.
- Incidental catches in British waters including harbour porpoise: S. Northridge.
- Collecting of by-catches in U.K. (opportunistic): C. Lockyer.
- Collecting of by-catches in Sweden for samples: M. Lindstedt.

Sightings

- Coastal sightings scheme in U.K. waters including harbour porpoise: P. Evans.
- Aerial transects in the Dutch sector of the North Sea: H. Baptist.
- Sightings scheme from ships and platforms in the North Sea (opportunistic): Marine Mammal Working Group of the Netherlands/ Belgian Mammal Society.
- Survey scheme from ships in Danish waters: C. Kinze.

Strandings

- U.K. records: M. Sheldrick.
- U.K. samples: C. Lockyer.
- French records: A. Collet, R. Duguy.
- Belgian records: Flemish Society for the Study of Marine Mammals (VVBZ).

- Dutch records, autopsies and samples: C. Smeenk, C.J. van Nie.
- Records from the German Democratic Republic and Federal Republic of Germany: several institutes.
- Danish records, autopsies: C. Kinze, T. Sørensen.
- Swedish records, samples: M. Lindstedt.
- Spain and Portugal: several groups.

Other

- Age determination of stranded animals in the German Democratic Republic and the Federal Republic of Germany: H. Kremer.
- Intraspecific variation (between stocks from different areas): C. Kinze.
- Public awareness campaign in U.K.: J. Canin, B. Thorpe.
- Ecotoxicology of stranded cetaceans: C. Joiris.

Item 2. **Future research projects**

- Incidental catches and ecotoxicology in the North Sea: P. Reijnders, K. Lankester.
- Incidental catches in Swedish fisheries: M. Lindstedt.
- Corpora lutea analyses from Swedish strandings: A. Gnojek.
- Stomach contents of stranded specimens: L. Bondestad.
- Swedish sightings with questionnaires: P. Berggren.
- Electrophoresis: L. Andersen.
- Behaviour: B. Farkin.
- Reproductive biology of specimens from Danish by-catches and strandings: T. Sørensen.

Item 3. **Communication between WG-members**

To promote co-ordination between the groups in similar fields, it was suggested that those who initiate or plan research projects on harbour porpoises contact the chairman of the WG in order to keep the WG and other interested Society members informed.

Item 4. **Funds**

The item fund-raising was not discussed and will be dealt with at the next meeting of the WG.

The strandings working group

Christina Lockyer, as co-ordinator of the Strandings Working Group, would like to set up a communications network between all ECS-members interested and/or directly involved in cetacean strandings. In order to do this, she would like to hear from all members wishing to be involved, and, where appropriate, to receive a short article outlining their aims and the way in which their group is investigating strandings: details of the history of the group, manner in which the group is notified about strandings, the data and material which are routinely collected, and how the data are currently being collated, together with information on access to these data. A listing of personal and/or group publications, both current and historical, is particularly welcome.

It is intended that these items of information will be copied and collated to create a newspool for circulation to strandings working group participants. Perhaps, in due course, a near-complete catalogue and possibly a library of European strandings publications will be available for use by the group through the ECS.

Christina anticipates that members of the ECS will contact her as soon as possible so that the group can start to function. Please show this article to anyone interested who might not have been at the Hirtshals meeting!

Items for future discussion and evaluation could include:

1. standardization procedures for field data collecting;
2. compatibility of data collated by different groups;
3. routes for regular publication of data and analyses;
4. protection of unpublished data — rights of owner;
5. exchange of material and data;
6. international collaboration on long-term projects;
7. methods for improvement of the reporting procedures;
8. freedom of individual endeavour.

This proposed list is only tentative, but should stimulate ideas.

The computer working group

The Computer Working Group will act as a supporting group to members and other working groups within the European Cetacean Society. The working group requests ALL members of the ECS to inform the working group of the use of computers by ECS members.
Besides data like your name and address, we would like to know:

1. hardware and operating system;
2. software used for storage and processing (version);
3. type of information stored (no details);
4. communications facilities (e.g. modem, network).

Aims of the working group are:

- to give advice and uniform guidelines on electronic storage, retrieval, processing and communications of any kind of information concerning cetaceans;
- to assist and advise members and working groups of the ECS in technical matters concerning data-processing equipment;
- to build, provide and collect public domain software to process information on cetaceans;
- to collect and provide information on the use of hardware and software by members of the ECS.

Members:

- The Computer Working Group is open to all members of the ECS who may contribute to the aims of the working group.
- All members of the ECS may call upon the working group for assistance in matters concerning computers or software.
- Members of the working group will not make or exchange duplicates of copyrighted programs on behalf of the ECS without prior consent of the author or publisher of the program.

Responsibility:

- The Computer Working Group is part of the European Cetacean Society and responsible to its Council and General Meeting.

Part V: List of Participants

BELGIUM

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