

The Eighteenth Symposium of the European Association for Aquatic Mammals—Conny-Land, Lipperswil, Switzerland—23rd to 26th March, 1990

The 18th symposium was held this year in Switzerland, the first time it has visited that country. It took place at the Drachenburg Hotel, Gottlieben, on the shores of the Rhine and opposite to Konstanz, and at Conny-Land, Lipperswil. Newcomers this year included delegates from Eastern Europe, as well as from the U.S.A. and Cuba. Nearly 100 persons were present and over 30 papers were given together with a number of poster presentations—an increasing trend at our meetings but only a recent innovation. This year, due to the forethought of the programme organizer—Dr Cees Kamminga, President-Elect of the Association—a printed copy of the abstracts of all the papers was handed out to delegates on arrival. There are several copies still available and anyone interested in obtaining one should contact Dr Kamminga at:

Delft University of Technology, Faculty E, P.O. Box 5031, 2600 GA Delft, The Netherlands.

The President, Mr R. C. Bennett, welcomed everyone to the meeting and paid particular thanks to the host for this year, Mr Conny Gasser, whom he warmly thanked for the part he had played in organising this symposium—the first to be held in Switzerland. He then handed the meeting over to the first Chairman—**Manuel E. dos Santos**—for the first session which was entitled 'The Wild'.

Stephen Harzen summarized his observations on the occurrence of bottlenose dolphins in the Sado Estuary. He had observed 13 pairings between the 14 'residents' in the Estuary and noted that patterns of temporary absence were a common finding. The individuals were identified by natural markings on the dorsal fin—a total of 42 animals were positively recorded by this method.

Stephen Harzen,
Department of Ethology, University of Bielefeld, Postfach 8640, D-4800 Bielefeld 1, West Germany.

Peter Bloom gave a fascinating account of the '1989 diary' of a wild bottlenose dolphin off the North East Coast of England. This animal was recorded on 257 days in the year between 6th April and 14th December. Each recording contained a minimum of

6 sightings per day. He reported on two aggressive incidents, one preventing a male swimmer entering the water and a more serious occasion concerning a girl swimmer in the water. He felt that because of the attention given this animal by well intentioned members of the public, someone was bound to be hurt, possibly this year. He felt the animal to be over 20 years of age and was amazed that the animal should remain in such polluted water—around a sewer outflow.

P. Bloom,
Dolphin Services (Bloom UK), Dolphinarium, Flamingoland, Kirby Misperton, Malton, North Yorkshire YO17 0UX.

Patricia S. John continued the story of human-animal contact by relating her experiences in 'Educating a wild dolphin'. At the request of Club Med., she visited the West Indies resort of Turquoise where trouble was being caused to the holiday makers in the water by a 6 ft 7-9 year old male dolphin. Resulting from a careful assessment of the situation, a programme was set up to educate both animal and the islanders. Notices were used to warn people that they were intruding onto a wild animal's territory and how they should behave.

P. St John,
P.O. Box 11, Route 133, Bridgewater, California 06752, USA.

Stephen Harzen returned to the podium to describe, with the use of a theodolite, the way groups of dolphins—in the Sado Estuary—joined up, split up, and rejoined. He monitored the timing of these movements and the speeds of the animals performing them. With this instrument he was able to calculate the areas covered by different groups—from 660 to 480 000 m².

Stephen Harzen,
Department of Ethology, University of Bielefeld, Postfach 8640, D-4800 Bielefeld 1, West Germany.

Alison Seacat then briefly summarized the two opposing points of view about the causation of the mass strandings of dolphins on the East coast of the United States, resulting in 750 recorded deaths

between June 1987 and September 1988. She summarized the purported role that brevetoxins played and reported the high levels of PCB's found.

Alison Seacat,
Zoo de la Casa de Campo, 28011 Madrid, Spain.

After a short coffee break, **Dr Margaret Klinowska** took the Chair for the second session which was entitled 'Physiology/Behaviour'.

Dr Ron Kastelein reviewed the differences between the suckling parameters of a Grey Seal pup born and reared outside, compared to the one born to the same dam the previous year and moved indoors for rearing. The main differences resulted from disturbances and changing weather patterns.

Dr R. A. Kastelein,
Dierenpark Harderwijk, Strandboulevard-Oost 1, 3841 Harderwijk, The Netherlands.

Jorge Reynolds presented a video of the inside of a heart, taken from a Beaked Whale that had stranded on San Andres Island, and in which he simulated contractions by manual manipulation in water. He noted that, by passing the endoscope into the aorta, one point of calcification on the intima could be seen.

The same author then presented the results of continuous monitoring of the heart of a Humpback Whale after an ultrasonic transmitter, fitted inside a crossbow dart, had been fired into the animal. He noted that the heart rate diminished by 50% when the whale dived to a depth of 80 meters.

J. Reynolds,
ICPE, Apartado Aereo 8036, Bogota, Colombia.

Dr Cees Kamminga exposed the lack of knowledge in published literature about the level of noise accepted by Cetaceans and pointed out the fallacy of trying to legislate for acceptable levels without first defining the methods of measurement—not only must the sounds be within the hearing range of the animal, but the particular sound pressure level (in decibels relative to 1 micropascal) must be expressed as related to the existing acceptable background noises in the wild.

Dr Cees Kamminga,
Delft University of Technology, Faculty E, Mekelweg 4, 2628 CD Delft, The Netherlands.

After a welcome break for lunch, **Dr Kamminga** then took the chair for the third session, entitled 'Physiology'.

The first paper was given by **Bo Andrea** on a comparison between the use of computer tomography by

X-ray and magnetic resonance images. The latter technique was now finding favour in medical circles and its advantages were extolled due to the non invasive nature of the technique which could lead to 3D automated models of the complete dolphin head.

B. Andrea
Delft University of Technology, Faculty E, Mekelweg 4, 2628 CD Delft, The Netherlands.

Ted Cranford gave a very well illustrated paper on the internal anatomy of the dolphin head—in particular paying attention to those structures which were, or could be, linked to the production of sonar signals. The anatomical variations between species were linked to differing signal composition and structure.

T. W. Cranford,
University of California, Santa Cruz, California 95064, USA.

Karl Zbinden reported on his 1976 visit to a lagoon of the Rio Mamore in Bolivia where there was a population of *Inia boliviensis*—now isolated—and explained in detail the echolocation signals he had obtained and which he was still analysing. He compared them to click trains from other cetaceans and observed that the shorter click trains were used for short range echolocation and the longer trains for longer ranges.

K. Zbinden,
Garbenweg 3, 3027 Bern, Switzerland.

Frans Engelsma demonstrated the ultra high frequencies of a lone Harbour Porpoise in captivity, where it had been since no more than two days of age. Despite this it produced sonar clicks similar to those obtained from adults specimens. By slowing the recordings down 32 times, he was able to show these high frequencies to the audience. The sounds he played from *Phocoenoides dalli* were demonstrated very different.

F. J. Engelsma,
Ouwehands Dierenpark, P.O. Box 9, 3910 AA Rhenen, The Netherlands.

Dr Paul Nachtigall reported the results of experiments on target recognition by an echolocating dolphin and by a counter-propagation neural network. Results achieved between 94.5% and 100% accuracy.

Dr Paul E. Nachtigall,
Naval Ocean Systems Center, P.O. Box 997, Kailua, Hawaii, USA.

Dr Margaret Klinowska fascinated the audience with further work on sound reception, postulating that the unique structure of the teeth play an important

part in enabling a dolphin accurately to pinpoint a target. She pointed out that the teeth of one side of the lower jaw were positioned exactly opposite the gaps between the teeth on the other side—which theoretically would yield the best reception. She noted the size of the trigeminal as opposed to the auditory nerve and linked the development of homo- and poly-donty with the development of sonar in the evolutionary process.

Dr Margaret Klinowska,
*Physiological Laboratory, Downing Street,
Cambridge, UK.*

After this session the delegates left for a boat trip on the Bodensee—at which, not only was a typical Swiss fondu buffet served, but old friendships renewed and new ones forged.

For the first session on Sunday, the chair was taken by **Professor J. L. van Haften**. This was on 'Behaviour/Rehabilitation'.

Frans Engelsma opened with some reflections on the 8th Conference on the Biology of Marine Mammals, held at Monterey in December, 1989. Over 1000 delegates were present and there were 2 or 3 parallel sessions to cover the number of papers presented. He summarized the major papers, which covered the avoidance of another Exxon Valdes disaster, the successful treatment of oiled wildlife, diving physiology, the seal plague, mass strandings of dolphins in the USA, acoustics and gill net fishing. He was delighted to report that there was evidence that Dall's porpoises were able to avoid gill nets but became entangled when their attraction to the trapped fish became too great.

F. J. Engelsma,
*Ouwehands Dierenpark, P.O. Box 9, 3910 AA Rhenen,
The Netherlands.*

Paul Terry read a joint paper by himself and **Hans Huisman** from the University of Leiden, on perceptual discrimination in *Sotalia*. The experimental subject was able to carry out discrimination between a cylinder and a sphere at nearly the 100% level. Although this study was incomplete, the results added to the sum of knowledge about this species. He emphasized that only the expenditure of time and patience would lead to success.

R. P. Terry,
*Delft University of Technology, Faculty E, Mekelweg
4, 2628 CD Delft, The Netherlands.*

Paulo Jordao observed, for 175 hours, a group of captive dolphins away from contact with humans and defined four patterns of behaviour—Resting, Quiet

stand-by, Active stand-by and Intense social interactions, including pursuits. The interrelationship of these patterns was discussed.

P. Jordao,
*Mundo Aquatico, Jardim Zoologico de Lisboa,
Estrada de Benfica 158, P-1500 Lisboa, Portugal.*

Dr Laurie Gage related in detail the efforts to maintain alive two juvenile beaked whales—the first live strandings of this Genus in 10 years. She found that these youngsters were able to swim round in a 32 ft diameter tank, unlike previous reports where adults were seen unable to swim in circles. Despite the eventual failure and loss of both these animals, much was learnt which would stand future efforts in better stead. She emphasized the importance of continual sufficient fluid therapy in such cases and emphasized the difficulty of force feeding animals with such a small mouth.

She then went on to read the paper from her colleague **Dr Diane Reiss**, from the Department of Speech and Communication Studies in San Francisco, on the 206 samples of click trains collected from these animals. It was found that the animal suffering from emphysema appeared unable to echolocate but the other one emitted sounds similar to other small toothed whales. There were both regular grouped clicks as well as ungrouped clicks.

Dr L. Gage,
*Marine World Africa USA, Vallejo, California 94589,
USA.*

Dr Paul Nachtigall reported on the sounds emitted by a female pygmy sperm whale stranded on an Hawaiian beach. She weighed 364.8 kgs and measured 269 cms in length. He presented video and concurrent sound recordings of the animal when she had been transferred to a large circular pool at Sea Life Park. He pointed out that the blowhole was further forward than one would expect and the eyes were situated further posterior than in other cetaceans.

Dr P. E. Nachtigall,
*Naval Ocean Systems Center, P.O. Box 997, Kailua,
Hawaii, USA.*

Professor van Haften then read the report from **Lenie 't Hart** and **Lise Wedder** on the successful rearing and eventual return to the wild of two newborn orphaned mediterranean monk seals found in Greek waters in 1987. Their weights increased from 12.8 and 14 to 50 and 70 kgs respectively before release.

He congratulated the authors on achieving another 'first' to add to the laurels of Pieterburen.

L. J. 't Hart,
Stichting Zeehondencreche, Hoofstraat 94a, 9968 AG Pieterburen, The Netherlands.

After a short coffee break, **Dr Andrew Greenwood** took the Chair for the session entitled 'Pathology/Disease'.

Dr John Baker opened the session, discussing how the pathology of lesions inflicted on Grey Seal pups related to the environment in which they were living. On a dirty sandy site, infections accounted for 86% of the causes of death, whereas on a clean rocky site, they only accounted for 38%. However the incidence of death caused by starvation of pups in the rocky site was much higher than on the sandy sites. Here again traumatic injuries were more common so that overall the mortality on the two sites were very similar. He could not understand why the sex ratio, of males to females, varied between 1:2.2 in the dirty sites to 1:0.5 in the clean sites.

Dr J. R. Baker,
University of Liverpool Field Station, Leahurst, The Wirral, Cheshire L64 7TE, UK.

Dr Arlete Sogorb summarized the universal occurrence of *Candida* spp., the expense of treating such infections and strongly advised that, prevention being better than cure, regular monitoring of the animals might indicate the onset of a problem before treatment was required. Sometimes, she pointed out, problems might be controlled or solved by changes in the methods of handling the animals—loosely lumped together under the term 'stress'.

Dr A. Sogorb,
Mundo Aquatico, Jardim Zoologico de Lisboa, Estrada de Benfica 158, P-1500 Lisboa, Portugal.

Dr Andrew Greenwood, in apologising for the unavoidable absence through illness of Professor Turner, chose to leave his subject unaddressed in the hope that he could give the paper next year. Meanwhile he felt it useful to assess the potential for reproduction of dolphins in Europe. He quoted J. Pete Schroder who advised the keeping of males separate from, but in contact with, the females and listed a number of occasions where the introduction of a new male to mature females induced breeding. He felt that sometimes it appeared that the very best way to stop breeding was to keep males and females together constantly. He pointed out that although the situation in Europe had improved, there was still a long way to go to catch up the States where 26% of the

stocks of bottlenose dolphins (90) were captive bred. He noted that there were 5 single sex groups in Europe and that 25 of 63 potential breeding females were already tied up with calves or were pregnant.

Dr A. G. Greenwood,
Moorhouse Farm, Moorhouse Lane, Oxenhope, Keighley, West Yorkshire BD22 9RX, UK.

Dr John Baker then presented his paper on pollution in Liverpool Bay and how it affected Grey Seal populations. In particular he hoped to be able to relate levels of pollutants to physiological changes in the animals themselves. He commented how useful it was to sample the aqueous humour, to assess pollutant levels, since this material was stable for up to three days after death. His initial results showed that levels of lead, mercury and copper were high, whereas nickel and zinc levels were acceptable. In the test area oiled seals had been seen, but this condition was not believed to affect the tissues. However the level of PCB's was high (up to 101.4 ppm) and he felt it was significant that three animals had been found with uterine stenosis and distal dilation of the uterine horns. He pointed out that there were up to 100 congeners of PCB's—each with varying levels of toxicity. Dieldrin was at low levels and both DDT and its derivatives were not very high. Although Lindane had been found, its levels in dead animals were unreliable since it underwent rapid changes after death.

Dr J. R. Baker,
University of Liverpool Field Station, Leahurst, Neston, The Wirral, Cheshire L64 7TE, UK.

Jorge Reynolds then discussed the results obtained from the continuous halter monitoring of the electrocardiograph of three pink dolphins (*Inia geoffrensis*) transported from the Amazon river via Bogota to Santa Marta, Colombia. Since the journey covered two days and journeys both by rubber boat and jet plane, interesting pathological changes were demonstrated, due no doubt to the varying stresses suffered by the animals.

J. Reynolds,
ICPE, Apartado Aereo 8036, Bogota, Colombia, South America.

The session was then adjourned for lunch, and a dolphin and sea lion show, at Conny-Land, Lipperswil.

On reconvening, the Chair was taken by **Peter Bloom**, who introduced the subject of 'Training/Husbandry'. He felt that the ability to keep trainable animals was most important for the mental and

physical wellbeing of the animals under our care. Specifically, such control could help the veterinary surgeon with his procedures—and this could become part of the public show. He felt all should emphasize the importance of keeping captive animals—for breeding, research and education—and, especially under the latter heading, to point out how that it was only in captivity that members of the public could get close to the living animals.

P. Bloom,
Dolphin Services (Bloom UK), Flamingoland Dolphinarium, Kirby Misperton, Malton, North Yorkshire YO17 0UX.

Martin Huigen, remembering his 25 years experience working with both dolphins and sea lions, pointed out the differences between then and now. Originally one was teaching 'tricks', now these had become 'behaviours'. Despite the opinion of some outside the business, he felt that it was not possible to put on too many shows—from the animals point of view—unless they were of a boring nature. He emphasized the importance of keeping the animals busy, and, by constant attention to detail, it was the trainer who could appreciate the earliest signs of trouble by monitoring behaviour which had changed from the usual pattern.

M. Huigen,
Dolphinarium Munster GmgH, im Allwetterzoo, Sentruperstrasse 319, D-4400 Munster, West Germany.

Paul Terry, addressing the partnership of trainers and researchers, identified the mutual respect each should develop of the other. Scientists should appreciate the limitations of facilities, the impact of both animals and staff, should consider his level of communication with the trainer and must receive support from the administration. Trainers should have the opportunity to be aware of the goals, must discuss the practicality of the procedures and receive the results of the research. Any work must be to a clear timetable and not be open ended. All scientists should be aware of the training methods and understand the 'laws of shaping'.

R. Paul Terry,
Delft University of Technology, Faculty E, Meijelweg 4, 2628 CD Delft, The Netherlands.

Patrick Michelet gave a short presentation, illustrated by video, of the concept of Parc Asterix—the first European Theme Park. He explained the reasoning behind the keeping of dolphins in such a set up and offered facilities for veterinary students to study

there. An education package was available to all schools before they arrived on a visit.

P. Michelet,
Directeur des Attractions, Parc Asterix, B.P.8 - 60128 Plailly, France.

Simon Ede then reviewed the history of the six dolphins (2.4), which were about 4/5 years old at the time of capture, and which arrived at Parc Asterix in June and November 1988. His main problem was in the arrival of the animals before the dolphinarium construction was completed. This only happened 12 days before the public opening. Since the recent gales had destroyed the roof over the pool, the animals had had to spend yet another 5 months in the hospital pool—without any apparent ill effects. The pool would remain uncovered for the 1990 season.

S. Ede,
Dolphinarium, Parc Asterix, B.P.8 - 60128 Plailly, France.

Ted Cranford then showed a fascinating video, in colour, of a digitized CT scan of a dolphin head which gave the impression of the viewer moving inside the skull—in 3D.

T. W. Cranford,
University of California, Santa Cruz, California 95064, USA.

Tony Stevenson, in a paper extra to the programme, recounted the mass stranding of 114 false killer whales (*Pseudorca*) in Western Australia and the difficulties of returning them to the wild. Eventually 96 were successfully returned to the sea—this compared with 60 returned after 80 stranded in 1988 in a similar area. He felt that, since both these occasions followed heavy rain storms, the sudden chilling of areas of sea caused a reflective sonar block.

Tony Stevenson,
c/o 28, Rosedale Avenue, Penrith, New South Wales, Australia 2750.

Ron Kastelein then gave his paper on the food consumption of Steller Sea Lions, already published in *Aquatic Mammals*, Volume 15, number 4. He reminded the audience that, despite the variations in dietary levels over time, about 1000 kgs of fish was required for each animal from the moment of birth until the calf reached 6 months of age.

Dr R. A. Kastelein,
Zeedierenpark Harderwijk, Strandboulevard-Oost 1, 3841 AB Harderwijk, The Netherlands.

Geraldine Lacave recorded the difficulties associated with two births at Brugge. The first, which occurred within a maximum period of one hour, resulted in the finding of a dead calf lying on the bottom of the pool and the death of the mother from septicaemia following a ruptured uterus. The second resulted in manual removal of a dead calf, whose tail stock had been presented for over five hours, after the mother ceased to strain. A survey of other breeding establishments was then conducted on difficult labours and much variation was found. Dystocia was defined as anything between 35 minutes and 6 hours, and a difficult birth as one that took from 40 minutes to 12 hours, depending on the facility involved. She commented that, in the one birth of twins so far recorded, the first calf was delivered after 2 hours and the second, following an injection of oxytocin, after a further 4 hours. An average of 11 live births took 54 minutes while stillbirths averaged 240 minutes. Thirty-one percent of captive pregnancies resulted in stillbirths.

G. Lacave,
*Boudewijnpark Dolphinarium, A. de Baeckestraat 12,
B-8200 Brugge, Belgium.*

Unfortunately, time had by then run out and two papers, advertised in the programme, could not be given. It was hoped they could be presented next year but unfortunately the trainers workshop which was planned to follow one of them was also cancelled.

There were, in addition, a number of poster displays, including:

My time as a European student at an American Institute by C. Burki,

Pseudorca and Common dolphin in the Adriatic Sea by C. Piermacocchi,

Can dolphins 'hear' with their teeth by M. Klinowska and D. Goodson—the authors asking for details of toothless animals for study.

Geomagnetic orientation in Cetaceans by M. Klinowska,

and Plans for the new Dolphinarium at Nuremburg Zoo by Dr A. Gauckler.