THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

DOLPHINS AND WHALES IN CAPTIVITY

Report by the

Senate Select Committee on Animal Welfare

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* From 1 July 1985
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8.9 The Committee RECOMMENDS that no further facilities for keeping captive cetacea be permitted to be established in Australia and that no further permits be issued for the capture of cetacea in Australian Commonwealth or State waters. It further RECOMMENDS that importation of cetacea from overseas be banned.

8.10 The Committee also RECOMMENDS that existing oceanaria be allowed to continue keeping cetacea for the time being but that the keeping of cetacea should eventually be phased out unless further research justifies their continuance.

8.12 The Committee RECOMMENDS that existing oceanaria be required to submit to more stringent assessments of educational and research functions by supplying detailed information similar to that required for applicants for scientific and educational permits in current Commonwealth guidelines and to be able to show that education and research constitute a significant component of the oceanarium's activities.

8.13 In keeping with the accepted policy of presenting animals in a manner which improves public awareness and understanding of cetacea, the Committee RECOMMENDS that display programmes in oceanaria be designed in such a way as to present only natural forms of behaviour and the facility to approximate more closely the cetacean's natural environment.

8.15 The Committee RECOMMENDS that national standards for the maintenance and care of captive cetacea be drawn up by the ANPWS in consultation with the State Government authorities, members of the captive cetacean industry and other people with knowledge of cetacean welfare for use by authorities responsible for captive cetacea in each State. The Committee further RECOMMENDS that national standards include standards for assessments of financial viability, natural display and educational and research components of captive cetacean display as well as covering all aspects of maintenance, handling and care of captive cetacea. These standards would replace guidelines for permit applications.

8.16 The Committee supports the proposal for a licensing system for owners and managers of oceanaria in addition to the existing provisions for licensing the oceanarium facility and RECOMMENDS that such a system be implemented.

8.18 The Committee RECOMMENDS that authorities responsible for captive cetacea in each State assess any oceanaria within that State against the established national standards and, where it is found that the captive cetacean facility is unable to comply with these standards, a specified time be allocated for improvements, and if, after this period, the facility is still unable to comply with these standards, it be closed down.

8.20 The Committee RECOMMENDS that a national advisory body be established comprising representatives from Federal and State Government authorities, non-government organisations and oceanaria, which would advise the Federal and State Governments on matters relating to cetacea, both captive and in the wild and to encourage and monitor research in this area.

8.21 The Committee, recognising the role played by some oceanaria in the rescue and rehabilitation of sick and stranded animals, RECOMMENDS that oceanaria continue this work provided that it is directed towards returning the animals to their natural environment, where possible, and that the cetacea are not rescued with the ultimate intention of rehabilitating the animal for the purposes of display and of circumventing the directive that no more wild cetacea be captured.

(Note: the Committee's conclusions and recommendations are contained in Chapter 8)

PREFACE

All the public evidence on dolphins in captivity in this inquiry was taken by Senators G. Georges, Jack Evans, J.M. Hearn and the Hon. D.B. Scott, before the retirement of three of the members from the Senate on 30 June 1985. These former Committee members assisted the present Committee in the preparation of this report.

I pay tribute to the three former members for their dedication and spirit of co-operation in this and other areas of the inquiry investigated by the Committee. I also thank the staff of the Committee for their work in support of the Committee.

G. Georges

CHAPTER 1

INTRODUCTION

1.1 The Senate appointed the Committee on 16 November 1983 and reappointed it on 22 February 1985 in the new Parliament to inquire into and report upon:

> 'the question of animal welfare in Australia, with particular reference to:
>
> (a) interstate and overseas commerce in animals;
>
> (b) wildlife protection and harvesting;
>
> (c) animal experimentation;
>
> (d) codes of practice of animal husbandry for all species; and
>
> (e) the use of animals in sport.'

1.2 After preliminary hearings in mid 1984, the Committee decided to concentrate initially on two areas of animal welfare - the export of live sheep from Australia and kangaroo welfare and management. The Committee reported on live sheep exports on 13 August 1985.

1.3 After representations were made to the Committee by animal welfare organisations about the welfare of cetacea (dolphins and whales) held in captivity and the proposed establishment of an oceanarium at Springvale, Victoria, the Committee held a public hearing in July 1984 to take evidence from Project Jonah, the Australian Conservation Foundation and the Australian Federation of Animal Societies. It held a further

hearing in September 1984 to take evidence from the management of the proposed Victorian oceanarium. That meeting was curtailed and the taking of further evidence was postponed until after the Federal election.

1.4 In October 1984, the Minister for Home Affairs and the Environment refused the application of Marine World, Victoria for a permit to capture cetacea in Commonwealth waters for the proposed Victorian oceanarium. He indicated, however, that the matter might be reconsidered later in the light of any recommendations on captive cetacea from this Select Committee. The Victorian Government, noting that the question of captive cetacea was being considered by the Committee, decided to defer a decision on the keeping of cetacea in captivity in Victoria until the Committee had reported its findings to the Senate.

1.5 The Committee decided, in view of the circumstances, to give priority to the examination of captive cetacea. This meant that consideration was given to one species of captive animals out of the context of the general issue of holding animals in captivity, such as in zoos, circuses or even other marine animals in marine parks.

1.6 Most captive cetacea are kept in establishments in which other marine animals are also kept. The Committee has used the term 'oceanaria' to describe such establishments. This term is synonymous with 'marine parks', a term which the oceanarium industry often uses to describe their establishments. The term 'dolphinarium' or 'dolphinaria' is used occasionally where an establishment maintains only cetacea and the Committee wishes to emphasise that fact. The Committee also uses the phrase 'captive cetacean facility' or a similar phrase where it wishes to identify that part of an oceanarium in which cetacea are kept.

1.7 Representatives from Government departments, marine mammal specialists and scientists gave evidence and made submissions together with other interested individuals and concerned groups from both sides of the debate. In addition, Dr Paul Spong and Professor Kenneth Norris were brought to Australia by animal welfare organisations and marine parks respectively to represent their respective interests.

1.8 The Committee found that, while there were some marine mammal experts in Australia, little scientific study had been done on cetacea in captivity in Australia. It was necessary therefore to look further for documented evidence in scientific and other papers published overseas.

1.9 However, a heated and often acrimonious debate both in Australia and overseas has developed over the findings and interpretations of much of the evidence put forward. Each side has denounced the findings of the other and frequently called into question the qualifications and integrity of particular people.

1.10 This forum of debate has made objective study of the material difficult and highlights the problems faced by the Committee in trying to establish whether cetacea should be kept in captivity.

1.11 There has also been much debate about the nature of cetacea. Available evidence points to the probability that cetacea have complex social behaviours and are highly intelligent. In the absence of any strong evidence to the contrary, the Committee has given cetacea the benefit when assessing the impact of captivity on them.

CHAPTER 2

HISTORICAL BACKGROUND

Overseas

2.1 While many historical accounts and tales refer, over centuries, to relationships between humans and cetacea, the keeping of captive cetacea for display or for research has a relatively recent history.

2.2 The first attempts at keeping cetacea in captivity date back at least to the 1860s. Dolphins were displayed at London's Westminster Aquarium in 1860 and the Zoological Gardens in Regents Park in 1865. White whales and Atlantic bottlenose dolphins were displayed together at the Aquarial Gardens in New York in 1863 as part of Barnum's Museum. Six white whales had been captured in the Saint Lawrence River and transported to New York during 1861 and 1862 but only one survived. The white whale at Aquarial Gardens may have been the first cetacean to be trained in captivity.[1]

2.3 A harbour porpoise was kept at Brighton Aquarium, England, in the 1860s and, in the 1870s, white whales were shipped to England and displayed at Westminster Aquarium and at shows in Manchester and Blackpool.[2] In 1877 and 1878, white whales were captured and held in ponds at Labrador for shipment overseas.

2.4 Several early attempts at keeping captive cetacea were also made in Europe. At the end of the nineteenth century, bottlenose dolphins were kept at the Arcachon Biological Station near Bordeaux in France and at an aquarium in Copenhagen.[3]

White whales were captured in the St Lawrence River and delivered to cities in Western Europe during the late nineteenth and early twentieth centuries. In these cases, the whales were shipped over long distances and the only precautions taken against drying and dehydration were to pour buckets of water periodically over the whales and to place moist seaweed on the bottom of the shipping crate.[4]

2.5 During the same period, white whales were captured and shipped to cities in eastern North America for display. In 1912 several bottlenose dolphins were transported for display at the New York Aquarium from the porpoise fishery at Cape Hatteras in North Carolina which had been taking bottlenose dolphins for oil for over one hundred years. All died on the journey. On the second attempt, six dolphins were kept moist under a tarpaulin but four died before arrival and the other two soon after. In 1913, six dolphins were transported using special boxes containing water and five reached the New York Aquarium. However, none survived beyond 21 months.

2.6 These early, isolated attempts appear to have been short-lived and ill-informed and the captive cetacea usually did not survive long. However, by the 1940s, the notion that cetacea could be trained for display, rather than just kept as exhibits, led to the establishment of institutions specialising in keeping cetacea. The first dolphinarium was opened in Florida in 1938. Marine Studies Aquarium at Marineland in Florida was originally established as an aquatic movie set and eventually became involved in the display and training of captive cetacea for public viewing. Staff pioneered techniques of cetacean capture, transport, husbandry and medicine.[5] The establishment of Marineland of the Pacific, south of Los Angeles, in 1954, heralded the rapid growth in popularity of keeping live cetacea (mainly dolphins). Other oceanaria were soon established in several large towns in the U.S.A.

2.7 Dolphinaria began to be established in other countries about a decade later. In New Zealand, three oceanaria have held small cetacea in captivity for display since 1964.[6] Port Elizabeth Oceanarium, the first to be built in South Africa, has maintained dolphins continuously since 1961.[7] One of the first dolphinaria in Europe was the Duisburg Dolphinarium in Western Germany which was established in 1965. Other countries in Europe such as Sweden, Holland, France, Italy and Romania soon followed the trend. England began operating dolphinaria in 1964, the first being established at Morecambe.

2.8 Experiments in keeping captive killer whales for display were made in the 1960s. A killer whale was first used as an exhibit in an oceanarium in the U.S.A. in 1961 when Marineland of the Pacific netted an adult female in Newport harbour, California, but it only lived one and a half days. In 1962, the same oceanarium attempted to capture a whale but it died in the process. Vancouver Public Aquarium in British Columbia created much interest when it kept a small whale alive for three months. In 1965, the Seattle Marine Aquarium purchased a large male killer whale which had been netted accidentally. It lived in a floating pen for a year where it responded to training and was a major attraction.[8]

2.9 Travelling shows with improvised pools also became popular in the 1950s and 1960s. Dolphins and other small cetacea were transported from place to place in trucks to perform tricks at popular holiday resorts and large towns.[9]

Australia

2.10 Information on the keeping of captive cetacea in Australia is fragmentary. It is thought that the first dolphinarium was established in Australia as a result of the accidental netting of a dolphin by fishermen in the Tweed River

in the early 1950s. It was placed overnight in the public swimming pool. The ensuing publicity led the pool operator to consider the commercial possibilities and the porpoise pool at Tweed Heads was established. Other dolphinaria established subsequently were not always as successful as this original venture. Taronga Park Zoo in Sydney established an oceanarium but drained it when many animals died from foreign objects being thrown into the pool. Marineland in Surfers Paradise was a successful oceanarium until, under pressure of competition from Sea World, it was forced to close down. Currently there are seven facilities housing captive cetacea in Australia.

2.11 The number and species of cetacea held in these facilities are given in Table 1.

2.12 An application was made on 6 December 1983 for the establishment of a further oceanarium for keeping captive cetacea and other marine animals at Keysborough, Victoria.

Public Opinion and Changing Attitudes towards Captive Cetacea

Overseas

2.13 Before the middle of this century, the intermittent and usually short-term displays of captive cetacea paid scant attention to the welfare of the animal. It was kept mainly as an object for show and entertainment and to satisfy the curiosity of people. Owners had little knowledge of the cetacean's biological needs for such things as space, social interaction and appropriate diet. There was little information on the injuries, illnesses and diseases suffered by cetacea and their treatment.

2.14 Concern about cetacean welfare started to develop in the 1960s as the public realised that numbers of species of large whales had declined to the extent that some were

threatened with extinction by commercial whaling. A worldwide campaign against whaling was mounted by conservationists who expressed concern about depletion of populations, the possibility of extinction of certain species, the cruelty of killing methods, the possibility that some cetacea might be very intelligent and the ethical considerations of killing whales for commercial purposes.

2.15 At the same time the public had been finding out more about small cetacea through seeing them in oceanaria, which were becoming increasingly numerous in the 1960s. Scientific studies of small captive cetacea were probably first carried out on the behaviour and physiology of dolphins by the United States Navy in San Diego. These finding were augmented by research on cetacea in oceanaria which contributed to knowledge about behaviour, nutritional requirements, physiology, communication and reproduction.

2.16 Other developments which also contributed to increased knowledge of and concern with small cetacea included the proliferation of high quality nature films documenting the life of wild cetacea and observations of wild cetacea by whale watching enthusiasts. As well, by the mid 1970s, the resurgance of the humane movement and the publication of several philosophical treatises on the limits of moral concern, individual rights, including the rights of other species, were focussing attention on the issue of animal welfare and, in particular, on the experience of suffering in animals.

2.17 In the 1970s, legislation was passed in many countries regulating the capture of cetacea and their care in oceanaria or other facilities, usually through the issue of a permit for display, education or scientific study. In the U.S.A., for instance, the Marine Mammal Protection Act, passed in 1972, requires permits to be issued to United States facilities maintaining marine mammals in captivity and export permits for

animals being transported to overseas facilities. The United States Department of Agriculture issues regulations for the humane care, treatment and transportation of marine mammals, which are incorporated into the permit system, and also imposes strict conditions on overseas facilities importing marine mammals from the U.S.A.

2.18 While legislation reflected an increasing concern with the welfare of cetacea in captivity, attitudes towards the display of animals in captivity had also been changing. Criticism of oceanaria began as an extension of the whale campaign and because some scientific research had indicated that cetacea had high intelligence and sophisticated behaviour patterns. Oceanaria were criticised for painful and stressful capture techniques, the high mortality rate of captive cetacea and a captive environment which was not able to provide for the cetacean's social or biological needs. The critics argued that, not only were oceanaria detrimental to the cetacean's welfare, but that the behaviour displayed by these captive animals was so different from their natural behaviour that there was now little scientific or educational justification for keeping them captive. They also questioned the ethics of capturing such an intelligent species.[10]

2.19 Whereas animals had previously been considered as mere curiosities for the purpose of display, the effect of the reappraisal of moral concern for animals was that institutions started to present them as integrated communities in natural settings which were also designed to educate and inform. Against pressure to abandon captive facilities in favour of experiencing animals in their natural state or through the media, zoos and oceanaria emphasised their contribution to scientific knowledge of the natural world and preservation of various species, together with their promotion of greater understanding of and responsibility towards animals.

2.20 As well as emphasising their scientific and educational contribution, proponents of oceanaria stated, however, that poor conditions and high mortalities in the past were the result of lack of information and knowledge about cetacea. In the last four or five years, the managements of oceanaria claim to have come together to: exchange information, draw up standards of care and treatment, change capture methods, improve conditions and develop captive breeding programmes to avoid depleting cetacean stocks.[11]

2.21 The changing attitude towards cetacea is reflected in the recent action taken by some governments to provide greater protection for these animals. The European Parliament passed legislation in 1984 banning the importation of orcas for display. The United States is presently considering a bill to prohibit the capture and display of orcas. Argentina has banned the use of dolphins for captive display. In the United Kingdom the Department of the Environment has not granted permits to import dolphins or killer whales since 1983. An adviser has recently been appointed to consider whether the educational, research and breeding benefits of dolphinaria and similar establishments in the United Kingdom are of sufficient value to justify the import and display of live cetacea.[12]

Australia

2.22 In the 1970s in a climate of growing awareness of the environment and of the need to conserve previously exploited species, concern was expressed in Australia, as in other countries, about the effects of commercial whaling. As a result of the findings of a Government inquiry into whales and whaling, in 1978, chaired by Sir Sydney Frost, the Federal Government banned commercial whaling in Australian waters.

2.23 In 1980 the Federal Parliament enacted the Whale Protection Act, which was based on the recommendations of the Frost Report. Although the Report dealt with the commercial harvesting of cetacea, the legislation protects all cetacea in Commonwealth waters. The Act does allow, however, for permits to be issued by the appropriate Federal Minister for the capture of cetacea for display, educational or research purposes. This legislation complements State legislation covering the capture, care and treatment of cetacea in captivity.

2.24 The campaign to end whaling increased public awareness about the need to protect cetacea. Improved legislative provisions for the protection of cetacea were only one result. In 1981, volunteers rescued about 70 stranded whales on Victorian and Tasmanian coastlines and returned them to the sea. Since then volunteers have formed groups which may be called on at any time to assist stranded whales. A national whale stranding contingency plan has been established and some State plans drafted.

2.25 Recently there has been increased interest in observing and interacting with cetacea in their natural environment. Numbers of visitors to Monkey Mia, in Western Australia, to see the dolphins, have grown considerably. Dolphins are common along the East Victorian coastline and are regularly observed in Port Phillip Bay. Four dolphins were trapped in Lake Tyers, near Lakes Entrance for nearly four years. Whales can be observed in bays and caves on the coast, mainly during the migratory months. At Lady Bay at Warrnambool in Victoria, visitors come to see the Southern Right Whales calve.

2.26 After the cessation of whaling, groups which had figured prominently in the campaign, such as Greenpeace and Project Jonah (both established in Australia in 1975), began to focus their attention on captive cetacea.

TABLE 1

CETACEA IN CAPTIVITY IN AUSTRALIAN OCEANARIA

OCEANARIUM	SPECIES	NUMBER
Atlantis Marine Park Yanchep Sun City W.A. (Est. 1981)	Tursiops truncatus	7
King Neptune's Park Port Macquarie N.S.W. (Est. 1973)	Tursiops truncatus	3
Marineland of South Australia, Adelaide S.A. (Est. 1969)	Tursiops truncatus	5
Pet Porpoise Pool Coffs Harbour N.S.W. (Est. 1970)	Tursiops truncatus	5
Sea World Surfers Paradise Queensland (Est. 1971)	Tursiops truncatus Sousa chinensis Pseudorca crassidens	20 1 2
African Lion Safari Warragamba N.S.W. (Est. 1973)	Tursiops truncatus	3
Hamilton Island (Est. 1984)	Tursiops truncatus	3

CHAPTER 3

APPLICATION TO ESTABLISH AN OCEANARIUM IN VICTORIA

Legal Requirements

3.1 The capture and keeping of captive cetacea in Australia are regulated both through Commonwealth and State legislation.

3.2 The Whale Protection Act 1980, framed in accordance with the findings and recommendations of the Frost Report is designed to afford protection to all cetacea. The legislation has the effect of giving the Commonwealth indirect control over captive cetacean facilities, which are regulated by State legislation, by requiring a permit for the taking of cetacea in any Australian sea waters other than the coastal waters of a State or Territory. The Act prohibits killing, injuring, taking or interfering with whales unless specific conditions apply. The term 'whales' is defined as any member of the sub-order Mysticeti or Odontoceti of the order Cetacea and thus the Act includes dolphins. A person with a permit may, under section 11(1)(a) of the Act, 'take whales for live display or kill or take whales for scientific or educational purposes'. Application for a permit to take cetacea from Commonwealth waters must be made pursuant to section 18 of the Act which requires that the particulars of the application be published and that interested persons be invited to make written comments on the application to the Minister responsible. Ownership of a cetacean taken in Commonwealth waters is vested in the Commonwealth under section 36 of the Act and not in the person or organisation which captures or keeps it. No permit has yet been issued under this Act.

3.3 The granting of a permit is contingent upon meeting set standards in guidelines for the capture and care of cetacea. Draft 'Guidelines for the Maintenance, Handling and Care of Live Cetaceans', for applicants under the Whale Protection Act were drawn up by Australian National Parks and Wildlife Service (ANPWS) in October 1984. These established minimum conditions for the maintenance of cetacea in captivity. They are:

> '... based on the best available information on the biological requirements of captive cetaceans. It is recognised that there are significant intra- and inter-specific differences in the biological and behavioural characteristics of cetaceans in their natural habitats and in their requirements in captivity which have to be taken into account ... In all cases, the goal is the welfare of the individual captive cetacean.'[1]

3.4 The guidelines cover such areas as space requirements (including pool size and water volume), construction materials, temperature, lighting, noise, water quality, food and feeding, special facilities, veterinary care, training, handling, inspections and maintenance of records.

3.5 The draft 'Guidelines for Techniques of Live Capture and Transport of Cetaceans', drawn up at the same time by ANPWS, deal with methods of capture which '... must be designed to minimise physical harm, discomfort and shock'.[2] Sections deal with transportation, containers, carriage, care and food requirements in transit, duration of trip and terminal handling facilities.

3.6 The States have jurisdiction over cetacea caught within the three mile territorial sea limit. Some complement the cetacean capture provisions of the Whale Protection Act by legislating in respect of the display and education facilities

for captive cetacea. In Victoria, the Wildlife Act 1975 as amended by the Wildlife (Protection of Whales) Act 1981 provides, under section 78(1)(a), that a permit may be issued authorising the possession of cetacea for specific purposes connected with live display or scientific or educational purposes. Publication of the particulars of the application, together with an invitation for interested people to lodge written comments, is provided for under section 82 of the Act. In New South Wales, cetacea are protected by the National Parks and Wildlife Act 1974 which requires that a licence be issued under section 121. South Australia and Queensland protect cetacea under the general provisions of their respective Fisheries Acts. Tasmania is currently considering new legislation to be called The Whale Protection Act. In Western Australia, application must be made under the provisions of its Wildlife Conservation Act.

3.7 Some States require applicants to satisfy criteria before an oceanarium may be established and cetacea captured. Atlantis Marine Park, which was established in 1981, was granted a permit by the Director of Fisheries and Wildlife under the Western Australian Wildlife Conservation Act, and is subject to the conditions set out in its 'License Conditions and Guidelines relating to the Care and Maintenance of Marine Mammals'. Atlantis was not subject to the provisions of the Whale Protection Act because it applied for a permit to capture its cetacea in Western Australian waters.

3.8 In 1983, an application for a permit to establish and operate an oceanarium in Victoria resulted in the publication of 'Guidelines for the Capture, Transport and Care of Cetaceans 1984', compiled by the Fisheries and Wildlife Service of the Department of Conservation, Forests and Lands. At the same time ANPWS drafted its guidelines for applications under the Commonwealth Whale Protection Act. A draft code of conduct for

marine mammals, for applications made under N.S.W. legislation, governing 'The Physical Conditions for the Acquisition, Transportation, Maintenance in Captivity and Disposal of Smaller Whales, Dolphins, Seals, Sea Lions and Fur Seals' was also drawn up.

3.9 The draft guidelines were based on the specifications for the 'Humane Handling, Care, Treatment and Transportation of Marine Mammals' under the United States Marine Mammal Protection Act. These were regarded as the most progressive and up-to-date guidelines available. However Fuller contended that:

> 'In recent years it has become increasingly obvious that regulations governing the dimensions of dolphin tanks, in force at the time establishments such as Atlantis Marine Park were proposed, were woefully inadequate. Controlling bodies in some countries are now insisting on very large tanks for the housing of dolphins.'[3]

ANPWS thought that:

> '... it would be fair to say that now there is some contention over even the standards that have been recommended within the U.S. at the moment.'[4]

Oceanarium proprietors have also commented on deficiencies in existing guidelines and suggested improvements. It has been noted that guidelines would continually become outdated as new information about cetacea was discovered and that they would therefore always need periodic revision.

3.10 The other Australian oceanaria were established before the Whale Protection Act was passed and have not had to conform to its guidelines for minimum standards for the welfare of cetacea. However, if any of these wishes to capture more cetacea for its facility, it may have to apply under either State or Commonwealth legislation and a permit could be refused if the

facility or standard of care was not considered to be adequate. Recently, in New Zealand, Napier Marineland, with a high record of cetacean mortalities, was granted a permit to capture more cetacea only after it had undertaken significant improvements in the facility.

3.11 Restrictions and controls under State legislation vary considerably. While Victoria, New South Wales and Western Australia have established comprehensive guidelines, South Australia and Queensland have none.

3.12 Problems exist with the enforcement of the legislation. Although there is provision for the inspection of facilities it is questionable whether they can be adequately monitored because of time and staffing constraints. It is also possible that capture jurisdiction cannot be properly policed. Those wishing to circumvent Commonwealth legislation could capture cetacea in Commonwealth waters but maintain that they had caught them within State limits.[5]

3.13 The RSPCA has expressed concern that a captive cetacean facility, which satisfied all criteria specified in guidelines, may be viable initially but may, in the longer term, lose profitability. As a result, cetacean welfare may suffer.[6] Abel has proposed that oceanarium proprietors or managers be licensed rather than, or, as well as, the facility itself. It would then be necessary for any prospective owner or manager to undergo a stringent assessment before obtaining a licence to run an oceanarium.

3.14 As well as regulating the capture and keeping of cetacea through Commonwealth and State legislation, Australia, as a signatory to certain international instruments, has an obligation to comply with their conditions regarding captive cetacea.

3.15 Australia is one of the original signatories to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) which was negotiated by more than 70 countries in 1973. A regulation of the European Council, which came into force at the beginning of 1984, added dolphins and killer whales to Appendix I of the Convention, which requires ratifying nations not to trade these cetacea for primarily commercial purposes. Trade in cetacea, which are listed in Appendix II of the Convention, is regulated through a permit system.

3.16 Initially, Australia gave effect to the provisions of CITES through a variety of legislative actions. In 1982 these were consolidated under the Wildlife Protection (Regulation of Exports and Imports) Act 1982. Schedules 1-3 list wildlife to which strict export and import controls apply. Schedule 3 contains all species of the order Cetacea.

3.17 In 1982, Australia signed, but has not yet ratified, the Law of the Sea Convention and the final Act of the Law of the Sea Conference. Australia is also a signatory to the International Convention for the Regulation of Whaling 1946, which established the International Whaling Commission (IWC).

The Application by Marine World Victoria

3.18 On 19 December 1983, the City of Springvale Council granted a permit which approved, in terms of landuse, the establishment of an oceanarium.

3.19 The applicant was Marine World Victoria, incorporated on 11 October 1983 which would be trading as Sequana Marine Garden, Keysborough, Victoria. The cost of the project was determined to be $18 million. It was planned that the oceanarium would occupy 10 hectares of land with 18.9 hectares for parking, landscaping and other ancillary services.

3.20 In August 1984, application was made under the Victorian Wildlife Act 1975, as amended by the Wildlife (Protection of Whales) Act 1981, to the Director of the Fisheries and Wildlife Service for a permit to enable the transportation and keeping, for live display and educational purposes, of the cetacea.

3.21 Application was also made in August 1984 under the Commonwealth Whale Protection Act 1980, to the Minister for Home Affairs and the Environment, for a permit to enable the collection, for live display and educational purposes, of 11 (seven female and four male) sub-adult bottlenose dolphins (Tursiops truncatus) and two (one female and one male) sub-adult false killer whales (Pseudorca crassidens).

3.22 The cetacea were to be collected at periods between September 1985 and September 1986 by the Breakaway Hoop Net method in Commonwealth waters in Bass Strait.

3.23 The Commonwealth application was made in accordance with the 'Guidelines for the Preparation of Applications for Permits for Live Display, Scientific or Educational Purposes', drawn up by ANPWS in October 1982. The applicant was required to furnish detailed information on, amongst other things, transport, display facilities, water supply, diet, sanitation practices, qualifications and experience of staff, veterinary certification, display practices, number of displays daily, previous experience and cetacean mortalities. The guidelines stated that the Minister would consider, in relation to the permit application, the information provided by the applicant, whether the proposal was consistent with the objects and provisions of the Act, whether substantial public benefit would be gained and the effect of the proposal on cetacea and the marine ecosystem, the applicants qualifications, comments from other persons, and other factors relevant to the preservation, conservation and protection of cetacea.

3.24 In accordance with Commonwealth and Victorian legislation, public notices were issued inviting public comment on the application. The ANPWS received 298 submissions and the Victorian Government received 317. About three-quarters of the submissions, 223 to the Commonwealth and 236 to Victoria, expressed opposition to the establishment of the oceanarium.

3.25 The most comprehensive representation of this opposition has been made by three organisations: Project Jonah, Greenpeace and the Australian Conservation Foundation. Project Jonah communicated its opposition to the Springvale Municipal Council on 8 March 1984. The Council in reply found that:

> '(i) to keep, train and display dolphins in a well-run oceanarium is an acceptable way of keeping such animals;
>
> (ii) oceanaria make a substantial contribution to community understanding of sea life and respect for the animals concerned as well as providing entertainment and employment for people; and
>
> (iii) the operators of oceanaria commonly provide substantial support for conservation of marine wild-life, especially cetaceans, because of the knowledge and facilities which they establish in an area.'[7]

Accordingly it issued the necessary town planning permits.

3.26 However, the application for a permit to collect the cetacea from Commonwealth waters was refused by the Minister for Home Affairs and the Environment on 24 October 1984 'due to the extent and nature of public opposition to the proposal'. The Minister indicated that the application might be reconsidered at a later date in the light of any recommendations on captive

display of cetacea from the Senate Select Committee on Animal Welfare.[8] The Victorian Government, which was also considering the application, decided to make no decision on the proposed oceanarium until the Senate Committee reported.

3.27 In refusing the application the Minister for Home Affairs and the Environment gave no consideration to the information required by the Guidelines for Preparation of Applications regarding adequacy of the facilities or to the provision for the welfare of the cetacea. Marine World, Victoria, was informed that the decision to refuse the application was based solely on the extent and nature of public opposition. It should be noted that Marine World, Victoria, did comply with all Victorian legislation and guidelines regarding capture, transport, handling, maintenance and display of live cetacea and that the Minister was informed by ANPWS that 'the proposed methods of transport and capture of the cetaceans, appear to be in accordance with accepted practice for these activities'.[9]

3.28 The Committee considers that is very difficult to gauge the extent of public opposition to an issue such as the keeping of cetacea in captivity. While Friends of Marine World and Project Jonah in Victoria and Sea World in Queensland have all collected thousands of signatures for petitions either for or against captive cetacea, the Committee is of the opinion that they cannot be used a reliable indicator of public opinion.

3.29 Project Jonah told the Committee that about three-quarters of the submissions received by the Victorian Government and ANPWS were opposed to the proposed oceanarium at Keysborough in Victoria. This, too, cannot be regarded as an indicator of general public opinion. Many of these submissions were written either by members of Project Jonah or other animal welfare organisations campaigning against the oceanarium or by

people connected with these organisations. In addition, advertisements calling for comments on proposals more often attract opponents rather than supporters of those proposals.

CHAPTER 4

EDUCATION

Public Awareness about Cetacea

4.1 Proprietors of oceanaria claim that they play a significant role in developing awareness of cetacean welfare. Mr R. Abel, who has applied for a permit to establish an oceanarium in Victoria, has stated that oceanaria are needed:

> '... to continually expose the public to the animals to develop concern and awareness of their welfare and environment [and] to develop our knowledge and understanding of the animals and their needs to better protect them in the wild.'[1]

4.2 It is commonly accepted that oceanaria have made a significant contribution to the current high level of awareness and concern about cetacea.

4.3 Oceanaria seem to have been the first to provide the opportunity for large numbers of people to see cetacea. The initial realisation that people were fascinated by cetacea frequently seems to have been accidental. Once realised, however, specialised facilities were developed to cater for this interest. In Japan, for instance, dolphins had first been exhibited in 1930. In 1953, however, a number of dolphins were captured in a small natural bay of roughly one hectare in Mito for studies on age. The dolphins, mainly Stenella coeruleoalba, attracted a great many interested spectators. It is claimed that many people, who were not able to distinguish dolphins from fish when the Mito dolphins were first captured, were later able to

recognise different species of dolphins and porpoises and their behaviour. The number of oceanaria increased from two in 1960 to five in 1965, 13 in 1970, 16 in 1976 and 27 in 1982.[2]

4.4 In Australia in the early 1950s, a dolphin was caught in a fishing net at the mouth of the Tweed River and was placed, as a joke, in the local public swimming pool. The pool operator noticed that many people were coming to the pool, not to swim but to see the dolphin. He started to charge sixpence a look. Realising the potential of displaying dolphins, he established the Tweed Heads Porpoise Pool.[3]

4.5 It appears that public fascination with killer whales was also discovered by accident. In 1961, a large, old, female killer whale entered Newport Harbour, California and was taken to the newly established Marineland of the Pacific at Palos Verdes where the staff tried vainly to keep it alive. In 1964, a female killer whale, harpooned off Vancouver Island, was transported to Vancouver Aquarium. It lived there for three months in a temporary enclosure in the harbour, where it displayed many appealing characteristics and received much publicity. A large, male killer whale, which was caught in a salmon net, was towed in a floating pen 700 kilometres to Seattle Marine Aquarium. It lived in the pen for one year and responded well to training.[4] These animals generated so much public interest that catching of killer whales started in earnest for the ready market provided by oceanaria. Little was known about killer whales before these events. It is claimed that previously it had not been known that whales could live out of water and 'the killer about which stories were told of attacking men on iceflows, etc., etc. was shown to have gentle qualities which caused many people to reflect deeply about this beautiful creature'.[5]

4.6 Before the mid-1960s it is probable that many people would only have become aware of cetacea by seeing them in oceanaria, which were becoming more numerous and attracting larger audiences. After that time, other developments began to contribute to a wider interest in and concern about cetacea. In the late 1960s songs of the humpback whale were taped and circulated around Washington D.C. An analysis of the songs was published in Science in 1971 and a record released in 1972. It was claimed that after hearing these songs, Christine Stevens, President of the Animal Welfare Institute in the U.S.A. was moved to, 'almost singlehandedly', push a resolution for a ten year moratorium on the killing of whales through the United States Senate in 1971.[6]

4.7 In 1966 Jacques Yves Cousteau produced his first film of underwater life on American CBS television. From 1968 some of his films in the television series entitled 'The undersea world of Jacques Cousteau', documented the life of cetacea in the wild. This series was widely acclaimed and very popular. Cousteau commented:

> 'Television for me is the greatest reward there is. Making films and writing books is good but not as thrilling. With television you know that on one evening, 35 to 40 million people are going to see dolphins.'[7]

Constant improvements in underwater filming technology and the immediate popularity of wildlife underwater exploratory series led to a proliferation of high-quality nature films documenting much of what is currently known about cetacea.

4.8 In 1914, the Director of the New York Aquarium was the first person to publish extensive observations on captive cetacea, which included descriptions of swimming, feeding and play behaviours, aerial displays, social behaviour and comments

on their visual acuity. Detailed behavioural descriptions of the cetacea at Marineland, Florida, were published by McBride and Webb in the 1940s.[8]

4.9 Scientific study of cetacea had been proceeding since the middle of the nineteenth century. Initially, so little was known about the cetacea taken captive that oceanaria could not even identify the different species. Mr R. Abel asserted that 'when the Florida Marine Park opened they sent a team to California, first of all to find out whether there were such things as dolphins in the Pacific'.[9] However, research on cetacea increased from the 1950s as the numbers of captive cetacea increased. These findings were published in both scientific and popular journals. In the last two decades the United States Navy Department has conducted extensive studies of marine mammals in naval centres at Port Mugu and San Diego (California) and Kancohe and Oahu (Hawaii) providing much information on physiology, anatomy and diseases of cetacea. Early knowledge of anatomy, distribution, migration, and feeding habits had been obtained from studies of commercially harvested cetacea.

4.10 Knowledge of behaviour, physiology, nutritional requirements and diseases advanced considerably in oceanaria in the 1960s, especially where they employed veterinarians. A significant proportion of the current information on marine mammals is a result of interaction between these people and various government and university laboratories.[10]

4.11 Innovations in photographic, electronic and audio-visual technology have recently facilitated the observation of wild cetacea over extended periods. Currently, 'field studies emphasising radio tracking, static tagging and observations of naturally marked animals have provided insights into diving behaviour, movement patterns, population structure and social behaviour' of wild cetacea.[11]

4.12 Significant numbers of people were now learning about cetacea through oceanaria, audio-visual media and published studies on cetacea. At the same time, people realised that certain species of whales were threatened with extinction through commercial whaling. Oceanaria had made a significant contribution to a changed perception about cetacea. Orcas had often been considered fierce and dangerous and dolphins were, in some countries, seen as a threat to commercial fishing. In oceanaria the public found that cetacea were gentle, intelligent and sociable animals. When the campaign to save the whale began in earnest, numbers of the public were already sensitised and sympathetic to cetacea.

4.13. Saving the whale was the first step in a wider campaign to conserve and protect the environment. At the same time a new ethic was emerging which was aimed at shifting the perspective on the issue of human-animal relations to recognise the moral claims of other species.

4.14 The campaign to save the whale was very successful in raising public awareness about cetacea. In the U.S.A. it was claimed that:

> 'a survey of environmental organisations indicates that over $25 million was given to whale protection efforts in 1981 in the form of contributions and merchandise purchases from which the profits accrue to environmental organisations. Many contributors, however, are unlikely to ever see a whale alive, but their contributions nonetheless attest to the value they bestow upon knowing that whales will continue to exist.'[12]

The Endangered Species Conservation Act, which included species of whales, was passed in 1969 and the Marine Mammal Protection Act in 1972. In the same year, the United Nations Stockholm Conference called for a ten year moratorium on whaling. The Convention on International Trade in Endangered Species of Wild Fauna and Flora was negotiated by more than 70 countries in 1973.

4.15 In Australia, the passing of the Whale Protection Act, 1980 was influenced by the pressure of public opinion on the issue. At the height of the campaign, a poll conducted by Project Jonah in 1977 indicated that 69 per cent of Australian voters thought that Australia should give up the killing of whales immediately. In the report of the Inquiry into Whales and Whaling it is stated that:

> 'It is relevant to note the high degree of interest shown in the question whether whales should be killed or not. This may have been due to the widespread public interest in the whole question of Australian whaling, and whaling generally, following the meeting of the International Whaling Commission in Canberra in June 1977.'[13]

4.16 This widespread public interest in the protection and conservation of cetacea may have been partly caused and contributed to by the sympathy aroused in people having seen cetacea in oceanaria. However, evidence indicates that few oceanaria contributed directly to the conservation of whales either through active participation in the campaign to stop whaling or in informing the public visiting their facilities about the demise of certain species of whales through commercial whaling. Paul Watson of the Fund for Animals noted that, at Sea World in the U.S.A., a complex of oceanaria with an annual attendance of seven million people:

> '... there is very little mention of the political reality of whaling. When I asked a staff member the reason for this I was told that it was Sea World's policy to not be involved in the politics of whales.'[14]

4.17 However, in Australia, Hec Goodall, Proprietor of Pet Porpoise Pool in Coffs Harbour campaigned actively for the cessation of commercial whaling by writing articles, speaking at meetings, working in association with Project Jonah, making petitions available at his oceanarium and giving evidence to the Inquiry on Whales and Whaling held by Sir Sydney Frost.

4.18 In a national survey, 75 per cent of people in Victoria thought that Australia should give up whaling immediately - the second highest State percentage - while 41 per cent were 'very interested' in the debate - equal highest State percentage. Project Jonah, Victoria, has pointed out that this high degree of awareness occurred in a State which did not have an oceanarium[15], indicating that, at least for Victoria, oceanaria do not contribute to public awareness on the issue of cetacean conservation. It also pointed out that a high level of public response to and success with rescuing stranded whales has occurred in Victoria[16] and Tasmania where no oceanarium exists.

4.19 However, oceanaria's past contribution to public awareness about cetacea is generally acknowledged even among many of their strongest opponents. Paul Spong, for instance, has stated that:

> 'Oceanaria have made a huge contribution to our cause. And we must give them credit for it. I'm serious. Without the public display of cetaceans we would have almost no idea of what they are. Maybe we might have gleaned something from Greek history, but, by and large, without the oceanaria, the mass awareness of cetaceans that exists today and the resulting mass concern for their fate would not be a reality. So, please let us acknowledge this debt.'[17]

Opposition to the Educational Role of Oceanaria

4.20 Many of those who acknowledge the past contribution of oceanaria now oppose keeping cetacea captive for educational purposes. They consider that display of cetacea in a captive setting reinforces the notion that humans are entitled to dominate and exploit animals. Project Jonah, Victoria, criticised what it saw as:

> '... the tacit assumption implicit in dolphinarium displays that the capture and exploitation of a weaker animal (e.g. dolphins) by a stronger animal (e.g. man) is perfectly legitimate.'[18]

They consider that:

> 'An important development in twentieth century philosophy has been the notion that might is not of itself right, that the presence of the power to perform an action does not legitimise the action. The rights of the weak (be they children, the elderly, the handicapped or animals) are increasingly being recognised, and to continue to legitimise animal exploitation to our children in the form of public performances of captive dolphins is to miss the opportunity to take a giant philosophical stride forwards.'[19]

4.21 Australian oceanarium displays and publicity usually emphasise the subordinate relationship of cetacea to trainer in captivity and concentrate on the readiness of cetacea for and susceptibility to training rather than on their own natural attributes. Thus the publicity booklet for Sea World, Queensland states that:

> 'One important factor about Sea World aside from seeing people enjoy themselves, is encouraging children to become involved, observe and appreciate the wonderful world of

> the Sea. Since 1974 Sea World has offered Brisbane and near surrounding schools, the opportunity of organised education programmes within the park. Students are treated to a dolphin training session and from the accompanying commentary, students learn about marine mammals and training techniques.'[20]

4.22 Publicity for Atlantis Marine Park in Western Australia, produced in newspapers and on television and radio, advertises: 'Kids, how would you like to teach a dolphin to jump, to leap and to somersault? Come to Atlantis during the August school holidays and get your chance to be a dolphin trainer'. A publicity handout from Atlantis shows three people standing on the backs of four dolphins. An issue of Atlantis Dolphin Log, a quarterly newsletter for children published by Atlantis, devoted over half of its space to aspects of dolphin training. Less than one column was given to providing information about the natural history of cetacea.

4.23 Many critics, who oppose the exploitation of cetacea in oceanaria for profit, advocate the extension of facilities for viewing cetacea in the wild. However, this also has been seen as a form of exploitation. Dale Jamieson and Tom Regan have stated:

> 'similarly unacceptable, though for different reason is the fledgling whale watching industry. Whales do not exist as visual commodities in an aquatic free market, and the business of taking eager sightseers into their waters, though non-consumptive, is exploitative nonetheless, morally analogous to making a business of conducting tours of human beings who either cannot or do not give their consent to be looked at.'[21]

4.24 Whale watching in the wild has been developed into a lucrative industry. In California in 1981 it accounted for 255 730 passengers and gross revenues exceeding US$2 167 000. In New England in the same period 73 250 thousand passengers

generated a gross revenue of over US$1 million[22] At the International Marine Mammal Conference held in Bergen, Norway in 1976, it was estimated that 'the dollar importance of whale watching in the wild and in captivity, of television shows and movies about whales, of whale books, of the recorded music of whales, and of art works inspired by whale shapes and rhythms, amounts to 200 million dollars a year'.[23]

4.25 Against critics who consider that the role of oceanaria, in raising public awareness, has been superseded by the impact of the conservation movement, it has been asserted that an active educational component is offered in oceanaria which teaches viewers about cetacean welfare and preservation. It has been stated that there has been a 15-fold increase in the education staffs of zoos and aquariums in the United States since 1976 with between five and ten per cent of annual operating budgets allocated specifically for educational programmes[24] A survey of 112 institutions in the U.S.A. and Canada in 1983 indicated that:

> 'in addition to their basic display programs, [most] supported either specific education departments and staff or co-operated in in-house and out-reach classes in conjunction with local schools and universities. Many were associated with internship and special education programs and published a regular bulletin or newsletter containing natural history information.'[25]

4.26 No qualitative assessment of the aim or content of these educational programmes was undertaken by the survey. Paul Watson of Fund for Animals in the U.S.A. stated:

> 'We are not happy with the way the orcas are presented at Sea World, although it is true that 7 million people a year are able to experience the whales at Sea World. We do not believe that they are exposed to <u>Orcinus orca</u> in a way that will properly convey the natural behaviour of this particular species. Whereas the Vancouver Public Aquarium places emphasis on natural behaviour, Sea World is

> more inclined to provide entertainment than education. Sea World advertisements stress the entertainment aspect of a visit to Sea World. Not much is said about the educational benefits.'[26]

4.27 In Australia a summary of the educational programmes offered by each oceanarium is given below.

Education Programmes in Australian Oceanaria

African Lion Safari, Warragamba, N.S.W.

4.28 No educational programme is offered. Ms Fiona Smith worked as an animal trainer at Warragamba and was hired in 1983 to develop an educational centre there. She has stated:

> 'Warragamba is purely an entertainment facility. There is no educational component offered, even though the vet and various trainers have urged management since the late 70s to develop this side of the presentation. I was asked by the vet if I would be interested in developing an Educational Centre and was hired by Mr De Chellis in December 1983 on that basis. In six months, one meeting was held between Mr S. Bullen, Mr P. De Chellis and myself to discuss that matter and the proposed classroom was emptied of pinball machines, which have since been returned.'[27]

The proprietor of Warragamba stated:

> '... there is not as such, an educational programme, apart from looking at the animals. We are fixing up a small theatre at the moment where we are going to show films and slides, and it will be controlled by tape recorder ...'[28]

Final year students at the Faculty of Veterinary Science, University of Sydney, have accompanied Dr Hyne for routine checks of the animals and are involved in a preventative medicine programme using Warragamba's captive marine mammals. A Wildlife Diploma (a post-graduate qualification of the Faculty) requires access to animals in captivity.

Atlantis Marine Park, Yanchep Sun City, W.A.

4.29 The management states that aspects of the educational programme include structural tours for school groups to enjoy a 'behind the scenes' experience of the marine mammal and aquarium facilities. At training and feeding activities for different species, a member of the marine animal staff shares information on habitat, husbandry, diet and general behaviour of each species. Educational tapes run continually at key locations and these complement information signs which describe the history and distribution of each species. Work experience programmes in the aquarium or with marine mammals have been conducted with over 40 secondary school students. Twenty veterinary students from Murdoch University have undertaken projects or gained professional experience. Senior staff of Atlantis lecture on marine mammal biology at tertiary institutions and professional associations. Atlantis has acted as host to the Wildlife and Fauna Group of the XXII World Veterinary Congress held in Perth in 1983 and staff have participated in national radio and television productions dealing with marine animals.[29]

Marineland of South Australia, Adelaide, South Australia

4.30 No educational programme is offered. The General Manager of the oceanarium stated that Marineland was primarily an entertainment venue although it has always been felt by the management that there was a place for an educational programme as 20 per cent of attendances were by structured school groups.[30]

King Neptune's Park, Port Macquarie, New South Wales

4.31 The proprietor claimed that, as this oceanarium was situated at the end of the Oxley Highway, it attracted visitors from western New South Wales, many of whom had never seen the ocean. This was also their first contact with live dolphins. Trainers gave information on the species during performances. Students from science classes in schools from within the area experienced an 'eye to eye' definition and description of the cetacea. Project sheets were distributed to schools.[31]

Pet Porpoise Pool, Coffs Harbour, New South Wales

4.32 The oceanarium provides a programme on dolphins for schools within a fifty mile radius. Lectures are offered, depending on age group. Audio-visual material includes autopsy slides, photographs of cetacea in the wild and material on diseases. Other materials are a basic essay on dolphins, posters and a question and answer sheet for school children as well as information supplied during the display. The oceanarium has a collection of marine scientific papers and books. It liaises with Australian and overseas scientific institutions and exchanges information. The management stated that the Pet Porpoise Pool has been used as a model for other programmes by ANPWS.[32]

Hamilton Island, Queensland

4.33 No educational programme is offered.

Sea World, Surfers Paradise, Queensland

4.34 Sea World provides a programme for primary and secondary schools which includes audio-visual presentations, lectures on marine mammals by staff and the veterinary

consultant, and provision of educational material for project use, including question and answer fact sheets, posters and a general essay on dolphins.[33]

4.35 Proponents of oceanaria consider that one of their most important functions is 'to continually expose the public to the animals to develop concern and awareness of their welfare and environment'. This has not always been implemented in Australian oceanaria. Three of the seven oceanaria exhibiting cetacea have no educational component at all. Programmes offered by oceanaria provide some information about cetacea both in captivity and in the wild but less opportunity is provided for the general public to learn about issues of cetacean welfare generally and about specific conservation and preservation problems facing cetacea.

4.36 Critics of oceanaria have questioned the extent to which a display in an artificial setting can teach about the animal in its natural environment. One critic has stated:

> 'A paramount goal of environmental education is to establish in its target audiences of learners an appreciation of the ecological subtleties and balances of whatever biophysical system is being taught. There is no way that the dolphinaria that I have seen elsewhere could be argued to be a reasonable approximation of the natural eco-system of dolphins.'[34]

4.37 There has been an attempt to make captive conditions simulate more closely the natural eco-system of the animal being exhibited. A workshop of the American Association of Zoological Parks reported that:

> 'Those who work with captive animals in aquariums and zoos have a special obligation to convey knowledge of the natural world to the public and to interpret the lives of animals accurately. Aquariums and zoos are obligated to portray animals as they are, to display animals under conditions that, so far

> as possible, allow them to behave naturally. and to offer them adequare social contact, ideally with others of their species ...'[35]

Conditions of display in Australian oceanaria in the majority do not simulate a natural environment. Facilities at Atlantis Marine Park, Marineland of South Australia, Pet Porpoise Pool, King Neptune's Park and African Lion Safari are unlandscaped concrete pools which bear no resemblance to the cetacean's natural marine environment. Atlantis, situated near the sea and constructed recently, could have been expected to make a more significant contribution to simulating a natural habitat. Sea World, also situated near the sea, has a landscaped shelving pool with sandy bottom which, more adequately represents a marine environment.

4.38 Saayman and Taylor have commented:

> '... while it is relatively practicable to provide many terrestial mammals with favorable seminaturalistic conditions in game reserves, it is difficult, if not impossible, for the majority of institutions to reproduce in captivity the necessary prerequisites to cater for the unique socioecological adaptations which the dolphin has made over millions of years.'[36]

4.39 Some of the tricks cetacea are trained to perform, such as jumping for balls or using sonar to locate objects, are extensions of their natural behaviour in the wild. However, other tricks, such as having people ride on the back of the dolphin, jumping through fiery hoops, or emulating human conversation out of water, are obviously devised solely for entertainment.

Viewing Cetacea in the Wild

4.40 Marine mammals appear, in their own habitat, at the Penguin Parade at Phillip Island, at Monkey Mia, where dolphins visit, and at Warrnambool, where Southern Right whales may be seen about July each year.

4.41 However, there are a number of problems associated with viewing cetacea in their own habitat as an alternative to seeing them displayed in an oceanarium. In Australia, this form of viewing of cetacea is just starting to become popular. Facilities which can sustain large attendances have not been developed for whale watching from the shore although plans are underway at Warrnambool. Watching whales from boats off the shore has not been taken up as a commercial proposition. Monkey Mia is in an isolated area of Western Australia. Attendances at oceanaria in Australia last year exceeded one and a half million and have been, on the average, increasing. The present conditions for viewing of cetacea in natural surroundings could not sustain the numbers of people who visit oceanaria. Furthermore, there is no guarantee that the cetacea will be present when people go to see them. At Monkey Mia, the dolphins often remain away from the site for three to four days. At Warrnambool, the whales may only be seen around July. Watching from the coast or even in boats has the disadvantage that what can be seen of their behaviour above the water is a small part of the activity occurring underwater and, unless feeding or breeding, they are unlikely to remain in the same position for long.

4.42 There is also the danger that watchers may, inadvertently or otherwise, harass the animals - an offence under the Whale Protection Act, 1980. This is a problem in the U.S.A. where many boats go out to sea to enable people to see cetacea. Although harassment of cetacea in the wild has not been a major problem in Australia, some incidents have been reported

at Monkey Mia. The ANPWS is currently considering guidelines aimed at developing '... an educated and sympathetic public able to derive the most from their experience without unnecessarily affecting the cetaceans with which they interact'.[37]

4.43 Hec Goodall considers that the pressure of the growing number of visitors at Monkey Mia could affect the area and concludes:

> '... we frankly see no easy solution and have to realistically concede that the delightful dolphin situation at Monkey Mia may sadly have a limited future ...'[38]

He believes that it is almost impossible to duplicate anywhere else in Australia the favourable circumstances at Monkey Mia of an isolated, unpolluted, sparsely populated area with a few interested, gentle people who had access to ample fresh fish and a lot of leisure to patiently and slowly cultivate the dolphins' initially hesitant interest.

4.44 No studies have been carried out which compare the educational impact of seeing cetacea live in oceanaria with viewing them in the wild. Many whale enthusiasts attest to the strong effect of seeing live cetacea for the first time, whether this occurred in an oceanarium or in the wild. It has been stated that:

> 'there is something about the experience of being close to a whale or dolphin that continues to draw thousands of people each year to aquariums and the ocean ... This is the lure of oceanariums, whale watching trips and dolphin shows.'[39]

4.45 Both forms of viewing require supplementary interpretive and educational programmes to teach people about what they are seeing. In the U.S.A., when whale watching changed from being the recreation of a few enthusiasts to a business for

thousands of visitors, entertainment and educational facilities were added and experienced naturalists accompanied excursions to answer questions.[40]

4.46 A study of whale watching in the U.S.A. concluded that seeing cetacea in their own environment has fostered awareness of and concern for the marine environment generally. It stated that:

> 'many people who go whale-watching out of curiosity or enthusiasm for whales have little or no interest in other marine life. But the experience of seeing whales in their natural habitat leads many to take an active interest in the marine environment.'[41]

The move among many institutions to display animals in environments approximating their natural habitat indicates that there is a perception that the impact is greater when animals are seen in their own environment.

Audio-Visual Displays and Models

4.47 Some critics of oceanaria have argued that the advanced technology of underwater filming makes live display unnecessary anyway. Sidney Holt has stated that:

> 'we are now in an era when film and video, camera and typewriter, handled by dedicated naturalists, can at last reveal to us and show to the public what wild animals really look like and how they behave and live ... If intentions are educational then it would be far better to invest in securing and widely distributing more such material than in constructing yet more oceanaria.'[42]

4.48 Television and other audio-visual programmes can present the characteristics and behaviour of cetacea more effectively than any other medium of display through the use of sophisticated underwater technology. They can also have a strong

impact on viewers. For example, a television station in San Francisco, which broadcast a locally produced documentary on whales, was pledged $35 845 for the whale in the 17 minute break that followed the screening of the film.[43] Critics of television as an educational resource state, however, that there is a loss of information in half-hour specials which reveals the animals entire life in a matter of minutes. The complexity of content, scale and dimension of the environment, the actual presence of the animal and the sense of interaction with it cannot be adequately conveyed through this medium.[44]

4.49 School education programmes and displays such as the 'exploratorium', housing full-scale models of the blue whale and sperm whale, proposed by Project Jonah[45] are also excellent educational resources. However, it is obvious from attendances at oceanaria and at areas for viewing in the wild, that people wish to experience cetacea live. It seems that people wish to see live displays after their curiosity has been aroused by an audio-visual programme or they seek more information about the animal after seeing it live.

CHAPTER 5

RESEARCH

Research on Captive Cetacea

5.1 As noted in Chapter 4, much of what is currently known about cetacea was discovered either through observations of, or experiments with, cetacea in some oceanaria. These studies have been carried out both by veterinarians or employees of oceanaria and by other interested bodies such as government authorities or university departments using the facilities of oceanaria. Oceanaria have also carried out studies of cetacea in the wild and have built up considerable expertise in rehabilitating stranded cetacea, complementing the work done by government bodies.

5.2 Vancouver Aquarium, for instance, has published a list of all research on wild and captive cetacea carried out between 1975 and 1982 which involved the use of aquarium staff, facilities, materials, animals or funding.

5.3 Hubbs Sea World Research Institute is a non-profit foundation with aquarium and acoustics laboratory which has access to the animals at Sea World oceanarium in San Diego. Among its projects it has co-operated with the Institute of Developmental Biology in Moscow in a study of distinctive natural markings to identify individual cetacea for population studies, done aerial surveys of marine mammals in the Bering Sea, carried out bioacoustic studies for future identification of regional populations of killer whales, pilot whales and several species of dolphins and studied the effects of noise pollution on behaviour of beluga whales in Bristol Bay, Alaska.

5.4 Many of the publications cited in this report were the result of studies carried out on captive cetacea in oceanaria, or in other institutional captive or controlled situations. Knowledge of behaviour, nutritional requirements, communication and reproduction was established through these studies. The United States Navy Department has, over the past 20 years, conducted studies on cetacea at centres in California and Hawaii which have provided information on physiology, anatomy, diseases and diving.

5.5 However, Defran and Pryor, while summarising the available scientific literature on the behaviour of cetacea in captivity, complained that:

> 'given the number and diversity of species that have been maintained in captivity ... one would expect to find a rich literature on species-typical behaviour and on the comparative behaviours of captive cetaceans. Such is far from the case. Relatively little published information is available for captive species and what does exist is heavily weighted toward the bottlenosed dolphin.'[1]

5.6 Knowledge about cetacea has also come from a variety of other sources.

Other Research on Cetacea

Strandings

5.7 Information on aspects of cetacean research such as taxonomy, anatomy, life history, social structure, pathology and diet have been gained from strandings. Strandings can also provide an opportunity for obtaining data on the impact of human activities on cetacea and on marine ecosystems such as heavy

metal and organochloride accumulation. Collation and analysis of stranding records may provide information on patterns and changes in distribution and abundance of cetacea.

Commercially Harvested Cetacea

5.8 Most early knowledge of anatomy, distribution, migration and feeding habits came from commercially harvested cetacea and from observations by whalers. Curtailment of whaling in some countries and high public awareness about preservation of whales has led, more recently, to an increasing emphasis on research on live cetacea.

Benign Research

5.9 Research has recently emphasised benign or non-intrusive methods. At the preparatory meeting held at the Seychelles, May 1983, for the Conference on Non-Consumptive Utilisation of Cetacean Resources, benign research was defined as:

> 'research that does not depend on the human-caused death of wild animals nor involve significant stress or injury to them. This would in principle include research on dead stranded animals, but such research was not thought to be within the scope of this Conference. Regarded, in this context, as a form of non-consumptive utilisation of cetaceans, and to the extent that taking and holding cetaceans in captivity is regarded as non-consumptive, it follows that research on captive animals which meets the above criteria would also be encompassed by the term.'[2]

5.10 A recent application by Sea World of San Diego for a permit to capture 90 orcas for scientific research was considered by many critics to be invasive and cruel because it

involved processes such as stomach lavages, tooth pulling, liver biopsies, tagging, and hearing and eye tests. The orcas were released after the tests.

5.11. Studies of the type carried out on three cetacea at Whipsnade in the United Kingdom, using video and sound recordings, notes and keepers records, could be considered non-intrusive because behaviour was monitored without disturbing the animals.

Wild Cetacea

5.12 Studies on cetacea in the wild are becoming popular as benign forms of research and increasingly effective with advanced technology. Field studies using radio-tracking, static tagging, aerial surveys, photography and observations of naturally marked animals have provided information on diving behaviour, movement patterns, population structure, social behaviour and bioacoustics. Field work is expensive and is often carried out or funded by governments. In the U.S.A., the National Marine Fisheries Service has conducted a range of research programmes. These included a census of the bowhead whale population conducted between 1978 and 1981; a three-year census of grey whales in Alaska, including studies on feeding, ecology, migration and distribution; field studies on humpback whales in Glacier Bay, including an acoustic survey, behaviour of the whales in response to vessels; radio tracking and photographic identification to provide information on distribution, abundance and movements; and information gathering on all cetacea on the north-east region's continental shelf. During the 1970s an assessment of the killer whale populations in British Columbia and Washington State was made by Canadian and United States scientists using photo-identification techniques. The study identified the number of pods and the number of individuals within each pod.

5.13 In Australia, research on cetacea funded by the ANPWS includes: aerial surveys of southern right and humpback whales in Western Australia; aerial and shore-based surveys of humpback whales on the east coast to assess numbers during northward migration and to obtain information on behaviour such as sighting cues, diving time, diving interval and period between blows; and investigations into the incidental catch of small cetacea in gillnet fishing in northern Australian waters.

5.14 Other institutions and individual researchers are also involved with studies on cetacea in Australia. McNamara and Harwood have stated that:

> 'in Australia there is a good deal of scientific interest in cetaceans; scientists in government departments, museums, universities and other institutions are engaged in a range of research programs. The fields being covered include population dynamics and modelling of exploited species, collection and analysis of sightings information on a wide range of species, investigations of interactions between small cetaceans and commercial fishing operations in Australian waters and analysis of historical information on whaling. Some research is also being carried out on cetacean reproduction, taxonomy, anatomy, behaviour and ecology.'[3]

Twenty-seven publications on cetacean research were listed in the 'Australian Progress Report on Cetacean Research, June 1982 to May 1983', presented to the IWC. To date, the only detailed study of the ecology and behaviour of small cetacea in Australian waters was of bottlenose dolphins, by Lear and Bryden.[4]

5.15 Several voluntary whale sighting programmes have been carried out in other countries. Voluntary workers have provided useful information by observing the behaviour of cetacea along the South African coast. The Annual Symposium of the European

Association for Aquatic Mammals, which was held in Germany in March 1985, listed sightings along the coasts of Belgium, France, Monaco, Netherlands, Spain, Sweden and the United Kingdom. Information gained included data on distribution, population status, movements, feeding, group size, size and species.

5.16 A cetacean sanctuary has been established by the IWC in the Indian Ocean. In 1981 a workshop to plan a programme of scientific research in the sanctuary recommended benign research on the biology of cetacea and their role in the marine ecosystem, the establishment of research centres and investigation of 'frontier' areas of cetacean research such as communication, navigation, behaviour and physiology of diving.

Voluntary and Short-term Captivity

5.17 Another research alternative is emerging which is somewhere between captivity and the wild. In the Institute of Delphinial Research, directed by Jean-Paul Forton-Gouin, the dolphins are in direct contact with the sea and are free to come and go as they please. Paul Spong has established a floating 'orcalab' which allows him to observe orcas. Research proposed included pod movement and acoustics, sensory psycho-physiology, language learning, communications, behaviour, diving, frequency of food intake, heart function and body temperature. Norris has suggested a dolphin science sabbatical, a proposal previously foreshadowed by John Lilly, where dolphins would be captured and studied for a short period then released. In 1971, Hubbs Sea World took a grey whale for a year to study then released it again.

Opposition to Research on Captive Cetacea

5.18 Opponents of oceanaria have been critical of research with captive cetacea for four main reasons. Many believe that sufficient research on captive cetacea has already been undertaken. Project Jonah considered that:

> 'increasingly, scientists are realising that the limits of the knowledge to be gained from captive cetaceans have already been reached and that to take understanding of these wonderful creatures any further will necessitate observations in the wild.'[5]

5.19 It has been stated that research on captive cetacea does not benefit cetacea generally. Belford concluded that:

> 'although public service, and research have been said by some to be benefits of keeping captive cetaceans ... few, if any, benefits accrue to wild populations from this research. The public can be equally or better-served by viewing free-ranging animals either directly or on television. I am unaware of any behaviour or nutritional research on captive dolphins which has been directly advantageous for wild animals. To the best of my knowledge, no diseases which can be treated in wild populations have been identified in captive cetaceans.'[6]

5.20 Critics have claimed that studies done on captive cetacea produce distorted results. Pilleri considered that:

> 'even when the only purpose is scientific study - the animals are so physically and psychologically deformed in the process that any discoveries made are distorted and give a thoroughly inadequate picture of true behaviour in the wild.'[7]

Saayman and Tayler have stated:

> 'Studies of captive dolphins have been made possible largely as the result of the establishment of public oceanaria where the primary emphasis is upon commercial display of trained animals. Results derived from such studies may be distorted by a variety of factors. Dolphins unresponsive to training procedures are generally rejected, and the colony therefore does not contain representative samples of animals. Furthermore, the age/sex ratios of normal populations of dolphins are not known and therefore cannot be duplicated in captivity. In many institutions captive conditions are grossly inadequate and the death rate is high ...; thus the possibility of long-term studies on stable populations is often excluded.'[8]

5.21 It is also considered that the potential for adverse effects of captivity on cetacea is likely to outweigh any benefits from research findings obtained. Holt maintained that:

> 'in our view there are virtually no subjects of scientific research that can now justify the retention of wild dolphins in the artificial conditions of tanks and circulating sea waters.'[9]

Rice quoted Eglash as saying:

> 'I cannot think of any reason, research or otherwise, which would justify the lengthy captivity which many cetaceans have been subject to. Field research and specimens from natural mortality should provide enough data to allow our understanding to progress; if not, then ignorance seems to me the best alternative.'[10]

Arguments in Favour of Research on Captive Cetacea

5.22 Ling has pointed out that:

> 'the need to study captive animals to complement field studies has become essential since access to biological material from commercial sources (whaling) has ceased, in Australia at least.'[11]

5.23 Abel has argued for the continuation of oceanaria for research 'to develop our knowledge and understanding of the animals and their needs to better protect them in the wild'.[12]

5.24 Klinowska and Nicholson, in a supplementary paper to the Conference on Non-Consumptive Utilisation of Cetacean Resources, believed that:

> 'although interest in cetaceans has increased greatly in recent years, the flow of new quantitative scientific information has not matched this interest, except in a few areas, particularly those related to the management of large whales. There is a great need for reliable information about the smaller species, some of which are, or may be, endangered particularly through by-catching and environmental change. Traditional field work is very costly in time and money - the animals are visible for perhaps 5% of the time and new observers need much training before they can even reliably identify species. Small cetaceans, however, can be kept in captivity and it has been shown (Ray, Carlson, Carlson and Upson, 1981; Ray, Upson and Henderson, 1977; Martinez and Klinghammer, 1978; Pryor and Kang, 1980) that the basic behaviours are present in captivity, and in the field.'[13]

5.25 The Animals on Display workshop concluded that:

> 'although technological developments have made it possible to extend some laboratory studies to field situations, many other studies can only be done effectively - if at all - with captives.'[14]

5.26 Although Holt is opposed to keeping cetacea captive he has come to the conclusion that:

> '... there is one scientific enterprise, and one only, involving the cetaceans, which could justify maintenance of certain of the smaller species in captivity under special conditions. That is the attempt to communicate between the species - us and them ... But even there, the most interesting things are coming from observations and experiment in the wild or in "open captivity".'[15]

5.27 Bryden has called for 'symbiotic investigations of wild and captive dolphins' because these are:

> 'central to the development of population models, and demonstrates how important studies of captive animals can be in the development of conservation strategies for dolphin stocks.'[16]

Research Aims

5.28 While a great deal has been discovered about cetacea through research and a considerable amount of literature exists on studies of captive and wild cetacea, the main concern is whether it actually contributes to the welfare of the animals.

5.29 Threats to cetacean welfare in the wild have been identified in Wake of the Whale[17] as whaling, pollution, fishing and harassment. Baltic seals abort their pups from

excess of poly-chlorinated biphenyls and it is possible that cetacea do also. Whales entering the Mediterranean are likely to be badly burned by chemical wastes. Dumped radioactive waste, explosives and chemical weapons may possibly affect the deep-diving species of cetacea such as the bottlenose dolphins and sperm whales.

5.30 Fishing is an immediate and even greater threat because cetacea become entangled and drown in fishing nets. Fishing could also reduce the food supply to the extent that it might prevent recovery from previous depletion through whaling. If the proposed krill fishery in the Antarctic goes ahead, baleen whales may be classed as pests.

5.31 Overseas, there are examples of oceanaria carrying out studies, on both captive and wild cetacea, which address some of the identified threats to cetacean welfare, and of institutions or individuals using the facilities or animals of oceanaria for research for this purpose. This research function exists only in a minority of oceanaria.

Research Programmes in Australian Oceanaria

5.32 In Australia, one oceanarium, Pet Porpoise Pool, has had a major role in research on and preservation of cetacea. It has co-operated with the Australian Museum at its own expense, to monitor annually the populations of sperm, humpback and southern right whales off the mid north coast of New South Wales. It has a long record of rescue and rehabilitation attempts for sick and stranded cetacea often at considerable expense to the oceanarium. This has led to the identification of species of cetacea virtually unknown in Australia and, in one case, considered extinct. The management stated that:

> 'the oceanarium's experience and expertise is widely utilized being regularly called upon in a consultancy capacity by Government and

> Private interests, both locally and overseas. Significant marine life specimens resulting from the area's fishing industry operations and strandings are regularly, voluntarily collected, often at considerable expense and effort by the oceanarium and supplied to the Aus[tralian] Museum Sydney and appropriate Universities, etc.'[18]

The oceanarium was used by CSIRO in 1972 for studies on seal moulting. In 1973 researchers studying human blood clotting at Austin Hospital, Melbourne, used blood collected from Marineland (Surfers Paradise) and Pet Porpoise Pool. Dolphin blood samples were also supplied to the Port Elizabeth Museum, South Africa, in 1981. In 1984 the marine mammals at Pet Porpoise Pool were used for research into animals' sweating mechanisms by the Faculty of Veterinary Science at the University of Queensland. Dawbin noted that Goodall's work has been recognised by his appointment as an associate of the Australian Museum.[19]

5.33 Atlantis has also recently made a contribution to the preservation of wild cetacea by co-operating in studies on the threat of gillnet fishing to small cetacea. ANPWS provided funds for a study by the Western Australian Museum on incidental drownings of cetacea in gillnet fishing. In this study, captive cetacea at Atlantis Marine Park were used to determine whether they could detect acoustically reflective materials which might be attached to gillnets to help cetacea to avoid being caught in those nets.

5.34 Marineland of South Australia conceded that it had not initiated any scientific studies and stated 'we are not in the science business'.[20] However, they had been approached by a Federal Government Department inquiring into the possible training of dolphins in particular patterns of behaviour.[21]

5.35 Hyne stated that he has not carried out any experiments on the cetacea in his veterinary care at the African Lion Safari, Warragamba, but that 'the routine findings that we have accumulated both from monthly examinations and from examinations on sick animals have been the basis of a couple of papers that I have had published'. Two veterinary students have produced papers which involved study of captive cetacea and some 'people claiming to have knowledge of communication, mental telepathy, with cetaceans have been allowed to associate with the animals'.[22]

5.36 King Neptune's Park at Port Macquarie does not have any research programmes. They do not employ a biologist or scientist. The management stated that because their facility was not situated near a university, no research in association with scientific studies was carried out. They had written to Newcastle University, however, inviting use of their captive animals for research purposes.[23] They had also been involved in rescue and rehabilitation of sick and stranded marine animals.

5.37 Sea World has worked closely with University of Queensland for a number of years. A study of parasites in marine mammals has been carried out by Dr R. Lester of the University. Sea World and the University have planned a tagging programme to study the migratory habits of local herds of Tursiops. Anatomy students from the University regularly visit Sea World. Dr Bryden, from the Anatomy Department, specialises in marine mammals and uses the animals at Sea World. He has published several papers on his findings.

Assessment of Research Benefits

5.38 The research carried out by or in association with oceanaria in Australia, with the notable exception of Pet Porpoise Pool cannot be said to have made a major contribution to the preservation and conservation of cetacea. In relation to the gillnet fishing trials carried out using captive cetacea at Atlantis, seemingly the most important contribution made by an oceanarium to the preservation of cetacea which die in their thousands in this manner annually, ANPWS said:

> 'It would be fair to say that that research could not have been done with wild animals. Whether it was absolutely essential to do it is really not at issue. It certainly made the research that we were considering more efficent in that we were able to eliminate some materials and select others. It really devolves into a question of a particular piece of research, the benefits that are seen to come from that research in themselves and the costs involved in keeping an animal in captivity. It is a matter of weighing those in individual instances.'[24]

5.39 It has been argued that the costs to cetacea of keeping them in captivity have been considerably reduced; that studies on cetacea have led to a greater understanding of their needs in captivity and to subsequent improvements in captive techniques, husbandry and conditions. These have often been incorporated into guidelines which many oceanaria must now comply with. However, evidence currently available does not conclude that captive cetacean welfare is necessarily improved under these conditions. Atlantis, the only oceanarium in Australia established under guidelines, has had no capture or captive mortalities. However, it has only been established since 1981 so insufficient time has elapsed to make any conclusive assessment. Marineland of South Australia, which in the view of the Committee does not have ideal conditions, has had two successful

births in captivity and its present three adult inhabitants have been held there for 16 years. Two of the original colony have died, one after seven years and the other after 14 years in captivity. Pet Porpoise Pool, similarly, does not use the husbandry system recently developed after research and used currently by Atlantis, yet it has had two successful births and some very successful cases of rehabilitation of cetacea in difficult circumstances.

5.40 Even if it could be demonstrated that captive cetacean welfare had improved considerably through research, there is not adequate evidence to show that this research has yet had results for the welfare of cetacea generally which would justify that captivity.

5.41 Captive cetacean research has contributed to knowledge of physiology, behaviour, nutritional requirements, communication and life history. However, as well as having the potential for adversely affecting cetacean welfare, it has the disadvantage that captive behavioural modifications will affect research results. Research on diseases in captivity is similarly constrained because different microbial pathogens exist in the wild. Ecology of the species, population studies, migratory patterns, social structure and feeding behaviour cannot be studied in captivity.

5.42 Research on wild cetacea, however, also has some disadvantages. Traditional field work is costly in time and money. Research directed at migrating, breeding or feeding animals has the potential for disruption of normal behaviour patterns and population studies require a long-term commitment for meaningful results to emerge. There is no opportunity to control some environmental variables while varying others for experimental research.

CHAPTER 6

WELFARE

Behaviour

6.1 Critics of oceanaria contend that the mental and physical welfare of cetacea suffers in captivity because their environment is so different. Project Jonah has stated that '... it is not possible to adequately cater for the needs of an intelligent, social, free-ranging animal like a dolphin in captivity'.[1] They believe that boredom, frustration, compression of activity and sensory deprivation are caused by captive conditions.

6.2 Some criticism of cetacean welfare centres on observations of the animal in the two different situations. Dr Sidney Holt believes that:

> 'One has only to see animals in the wild in comparison with the appearance of those that have been for any time in captivity to see vast differences in condition and behaviour.'[2]

6.3 Critics have been alleged that cetacean behaviour in captivity exhibits symptoms of stress analagous to human reactions in captive situations. Hindley argues that:

> 'many species of animals seem to experience the full range of human emotions including grief, anxiety, and depression. There is also considerable evidence to indicate the development of psychotic and neurotic behaviour under prolonged and extreme stress.'[3]

Pilleri maintains that captive conditions for cetacea are 'equivalent to the increasingly deprecated solitary confinement of man' and that cetacean behaviour in this situation displays typical symptoms of prison neurosis.[4]

6.4 Animal welfare scientists consider that stress in animals is difficult to define and measure. They conclude that assessments must be based on as much knowledge as possible about behaviour, physiology and external appearance without projecting human emotions and expectations onto the animal.[5]

6.5 Andersen has suggested that:

> 'In the psychic environment there may be many serious causes for a high mortality but it is almost impossible objectively to define these causes. Dolphins have only few objective signs which can give us a hint of their psychic state of health. It always ends up with a kind of feeling or believe (sic).'[6]

6.6. Lee rejected the argument that:

> 'largely by inference from the effects of solitary confinement on humans, it is concluded that cetacea suffer in captivity.'[7]

He considered that:

> 'the conclusion that cetaceans respond similarly to humans in confinement, whether it is based upon relative "intelligence", brain size or structure, or behavioural capacity is highly subjective. It is even possible to argue that cetaceans by virtue of their behavioural capacity, may enjoy the environment of a marine park.'[8]

6.7 He contended that the only objective way of assessing the effects of capture and captivity on cetacea is to examine evidence of responses which are typical of animals experiencing adverse environments:

> 'These responses are increased mortality and reduced longevity, impaired reproduction, physiological stress and abnormal behaviour.'[9]

6.8 In a core paper for the Global Conference on the Non-Consumptive Utilisation of Cetacean Resources, Pilleri identified behavioural changes and physical degeneration in captive cetacea which, he concluded, did indicate stress.

6.9 Pilleri considered that:

> 'the lack of space in aquaria and the complete isolation of cetacea or the reduction in the size of their communities, leaving only a few specimens together, have an extremely adverse effect which results in serious psychic disturbances in the animals.'[10]

6.10 He found that behavioural disorders manifesting psychic disturbance included stereotype gestures such as the adoption of iterative routes, establishment of pecking orders, aggressiveness towards other cetacea and people, suicidal tendencies, masturbation and homosexuality.

6.11 Stress, he considered, was caused by the cramped conditions in oceanaria. Cetacea were used to travelling long distances in large schools. This situation could not be emulated by oceanaria and 'desocialisation' occurred as a result. As well, captivity removed the fight for existence and the ambivalence between wanting and not wanting, owing to fear, became intensified and stereotyped to form severe tensions. A final cause of cetacean stress was that the bond with their own

spatio-temporal system is seriously disturbed and contact with humans and dressage can never replace the relationships prevailing in the wild.[11]

6.12 Pilleri also argued that captive cetacea displayed many physical signs of degeneration as a result of their captive environment. These included probable brain size reduction with atrophy in the areas most responsible for controlling the means of communication, ultimately resulting in the cetacea ceasing to emit sounds underwater. This was because captivity made no demands on the sensory organs. Cetacea, fed dead fish, did not need to track down prey and they could find their way around the pool without using their sonar. Other physical signs included adiposity or conversely, weight loss, and the fin of the orca, usually rigidly upright in the wild, drooped in captivity. Finally, Pilleri considered the possibility that dressage might affect the polyphase sleep pattern of cetacea.

6.13 He concluded that the combination of unhygienic conditions, stress and physical degeneration had much to do with the high mortality rate of cetacea in oceanaria.

6.14 Nick Carter had also arrived at the conclusion that cetacea suffered from stress in captivity. He stated that:

> 'there is no longer any question that psycho-physiological effects have been, and continue to be, prime causes of the suffering and consequent high mortality rates among captive dolphins.'[12]

Carter, citing work done by Robson,[13] described various situations in which respiratory problems ending in death were caused by psycho-physiological reactions.

6.15 He referred to several case histories where physical signs or abnormal behaviour were the consequence of capture, holding or transport induced stress. A dolphin developed a duodenal ulcer when it became nervous because of crowds peering at it through a glass wall. Several dolphins became aggressive towards humans and cetacea and some had to be released. A pilot whale developed symptoms of psychoneurosis. One day, as it was being watched by crowds through the glass of its tank, it deliberately swam at the glass and smashed it.

6.16 Saayman and Tayler have written:

> 'Among the most important prerequisites for the maintenance of a healthy breeding colony of dolphins is an adequately spacious pool, the acoustical properties of which should cater to the acute auditory perception of dolphins ... Inadequate spatial conditions may lead to abnormally severe aggression. The widely varying composition of free-ranging groups of dolphins ... indicates that provision should be made in captivity for the animals to associate or disperse at will. Ideally, an offending dolphin should be able to retreat from both the sight and sound of a more dominant animal. Furthermore, dolphins rely primarily upon acoustical mechanisms for navigational and discriminatory purposes ..., but in captivity they are often maintained in small and shallow circular tanks with concrete walls and glass windows. These holding facilities represent, in effect, acoustical reverberation chambers which may grossly disturb an animal with a highly developed auditory perceptual system. The clinically sterile conditions of many oceanaria, although presenting favorable viewing conditions for the public, deprive the dolphins of all contact with marine flora and fauna, the latter representing their prey. In the case of inshore dolphins, which usually inhabit murky seas, crystal clear water in captivity may further inhibit their normal acoustical repertoire. The absence of the above prerequisites may, indeed, lower the physical condition of the animals, a factor in itself likely to distort the

> results of behavioral studies. In summary, while it is relatively practicable to provide many terrestrial mammals with favorable seminaturalistic conditions in game reserves, it is difficult, if not impossible, for the majority of institutions to reproduce in captivity the necessary prerequisites to cater for the unique socioecological adaptations which the dolphin has made over millions of years.'[14]

6.17 There is considerable difficulty in establishing whether certain behaviour in captive cetacea indicates suffering or stress. There are over 50 different species of small cetacea with vastly differing life patterns so the reaction of each captive species must be assessed against the behaviour exhibited by its wild counterparts for an accurate analysis. However, often little is known about the history, distribution, environment and activities of many of these species.

6.18 Certain broad behavioural patterns are displayed by most cetacea in the wild including formation of schools, co-operation among members, epilemetic (care-giving) behaviour, formation of complicated social structures and separate feeding, resting and play activities. Within these behavioural patterns there are significant differences. Some species are deep sea animals which are only seen out in the ocean and rarely come near the shore. Others have been observed remaining close to the coastline, swimming into the shallow shore for rest. Some cetacea swim long distances on a seasonal basis while others are observed always in the same area. While some species feed and are most active during the day, others are nocturnal feeders and species such as orca are equally as active day and night. Tropical and temperate oceanic dolphins typically form large schools, while schools of species found near the shore are much

smaller. Single dolphins may be encountered in bays and rivers. Orca, killer whales, live in family groups for life. They form small, extremely stable, polygynous pods. Pseudorca, false killer whales, also form highly cohesive schools. Species such as Tursiops truncatus, bottlenose dolphin, Stenella, spotted dolphin, Sousa, white dolphin and Lagenorhynchus, pacific white sided dolphin, create large and highly fluid schools often divided into sub groups which may remain stable only for short periods before changing. Delphinus delphi, common dolphin, greatly disturbs the surface of the water when it travels, unlike Lagenorhynchus or Lissodelphis, northern right whale dolphin which can hardly be seen in the water. Globicephala macrorhynchus, short finned pilot whale has been observed lying for long periods at the surface in stationary schools, blowholes and anterior portions of the back exposed above the water.[15]

6.19 A further problem in using behaviour to assess cetacean welfare is that there are wide variations in reactions to capture and captivity by different species and by different individuals within the same species. In one study of a live capture fishery in Southern California, reactions to capture and initial captivity were observed as covering the range from advanced shock to calm, uneventful behaviour. One species suffered from sharp-edged ulcers for which the cause was considered to be stress. Another species started swimming and eating normally almost immediately and had no physical or behavioural signs of stress. One species has been known to make high speed runs at the walls of the enclosure. Reactions within the same species were also shown to differ markedly according to the age of the individual. Reactions of remaining members of the pod in the wild also varied. In some cases individuals waited by the captured animal until it was taken into the boat. Other species left their companion immediately. Members of some species became aggressive when their companion was captured.[16]

6.20 All overseas reports of capture and transportation of cetacea indicated that they all showed signs of considerable stress during this period. This has been, or could have been mitigated in some cases with improved capture and transportation techniques. However, obvious behavioural and physical abnormalities seem to occur in all cetacea during capture.[17] Frequent injections of drugs and force feeding immediately after capture would confirm that cetacean welfare is considered to be severely at risk during this time.

6.21 Concepts of normality may vary according to the period of time the animal has spent in captivity. Cetacean behaviour immediately after the animal is placed in captivity seems to be considered normal, by overseas accounts, when heartbeat and respiration are normal, the cetacean is feeding voluntarily and aggressive activities and chaotic swimming patterns have abated.[18] Cetacea which have been kept captive for a considerable length of time or which have been born in captivity will be considered normal if they carry out most aspects of known social patterns such as courtship, mating, consort relations, birth, rest and play.[19]

6.22 As well as age, species and individual behavioural variations, different captive conditions and treatment of captives such as size of tank, presence of other cetacea, extent of human intervention, training techniques and numbers of performances daily may elicit different behaviours.[20]

6.23 Evidence indicates that there are a great many variables which must be taken into account when assessing cetacean behaviour in captivity and in drawing any conclusions about whether a particular form of behaviour indicates that the animal is suffering.

6.24 Defran and Pryor, after reviewing available evidence, have concluded:

> 'not all species have been kept routinely or with equal success. Such factors as availability, ease of collection and transport, and state-of-the-art medicine, husbandry, and training technology have favored the maintenance of some species over others. Additionally, the ease of maintaining a species in tank settings seems to reflect in part the ecological characteristics of the natural habitat of the species. The shallow, coastal water favored by the bottlenosed dolphin in the northern areas of the Gulf of Mexico apparently preadapt it well for tank living. In contrast, open-ocean pelagic species such as Dall's porpoise, Phocoena dalli, seem to have much greater difficulty in adapting to the tank environment. The sociobiology of the species, especially the degree of dependence on con-specific tank mates, also plays a part in the adjustment process.'[21]

6.25 More information is required to establish specific behaviours under particular conditions for objective stress measurement. This includes:

- normal patterns of behaviour of particular species in the wild;

- comparisons of behaviour patterns of cetacea which have been held in captivity for a short time and for a long time;

- comparisons of patterns of behaviour of cetacea captured in the wild and those born in captivity;

- differences in behaviour associated with variations in species, sex, age and weight;

- variations in environmental conditions such as size of pool, water conditions, food, noise, light and presence of other cetacea;

- details of husbandry methods;

- effects of different approaches to training, performances and human intervention;

- use and effect of anti-stress agents; and

- aetiology of diseases.

6.26 There is general acknowledgement even among those who support oceanaria, that cetacean behaviour is changed by captivity and that adverse effects may result.

6.27 The Animals on Display Workshop stated that:

> 'bringing animals into captivity alters their natural state. If captivity causes adverse effects, these effects, on balance, are outweighed by such benefits as enhancement of human appreciation for all animals, conservation of species, and advancement of knowledge.'[22]

6.28 Norris was equivocal. In 1980 he wrote:

> 'most that is known in any depth about the behaviour of dolphins has come from observations of captive animals. Yet the environment of captivity, which is at best a pool a few dozen metres in longest dimension and 5 or 10m deep, can allow only certain aspects of normal behaviour to occur. Intragroup relationships may persist, but are usually distorted because relationships seldom remain intact. At best only hints of normal movement and activity patterns can persist where feeding schedules are determined by the work days of trainers.'[23]

However, he also indicated that:

> 'captive dolphins, given adequate numbers, sex and age distribution, (more than 3 to 5) will establish quite normal social patterns between members. They play, seek special sleep partners, instruct their young, caress and sometimes quarrel.'[24]

Later:

> 'in the captive environment the movement patterns of wild animals are of course restricted, but because such animals continue to swim nearly all the time, just as their wild relatives do, they may move as far in a day. Stereotyped "zoo patterns" are very seldom seen in the adaptable species, though oceanic animals may circle much of the time and should not be kept except in special experimental situations.'[25]

6.29 Ridgway was also unsure. He stated that:

> 'it is possible that survival in captivity is related to the psychological stress caused by the captive conditions. Major illness episodes have been shown to occur after major life change events in humans. (Rahe et. al. 1967.) This does not necessarily apply to other species.'[26]

6.30 There is both overseas and Australian evidence of behavioural abnormality in captive cetacea which may be attributable to stress.[27]

6.31 However, some findings on behaviour have been considered contentious or have been refuted. Norris denied that cetacea go mute in captivity. He pointed out that:

> 'Well over half of all scientific studies of their sounds have been done with trained animals in tank environments, and in fact,

> George Pilleri (1982), who has raised the question, has himself published papers on the sounds of captive dolphins.'[28]

With regard to brain atrophication claimed by Pilleri, Ridgway has stated:

> 'during the past 15 years, I have examined the brains from dolphins that died at four of the largest oceanaria in the United States. My series includes dolphins that had been in captivity for as long as 16 years. I have found no evidence to support the claim of Pilleri (1983) that "cetacea kept in captivity actually do display many symptoms of degeneration".'[29]

Ridgway has also denied that dolphins go mute in captivity. He states that:

> 'My present studies concern the sonic repertoire of dolphins captive for as long as 22 years. I have recorded as many as 50 000 sounds from an individual in a single 24-hour day.'[30]

6.32 Abel claims that Pilleri's observations on behaviour and physical abnormalities were distorted by the very small size of tank being used.[31] It should be noted also that Pilleri observed that when a male cetacean was placed in a larger steel tank with a capacity of 30 cubic metres:

> 'The greater width ... allows the animal more freedom in its movements and during the last six months new swimming patterns have been observed. The individual movements are not stereotyped; the changeover from one pattern to another is very irregular and impossible to anticipate.'[32]

6.33 Forms of behaviour attributed to captive cetacea such as stress, aggression, dominance, masturbation and relationships with other cetacean species have also been observed for wild cetacea and documented in the literature cited. Some animal

welfare scientists consider that conflict, frustation and stress experienced by animals in the wild are probably helpful in survival and reproduction. It is not always possible, on the available evidence, to know whether the nature and extent of these forms of behaviour in captivity differ from those which occur in the wild.

6.34 It is not possible to generalise from examples of behaviour in specific cases to conclude that all cetacea suffer in captivity. Information on cases often does not identify species, age, numbers of other cetacea present and the conditions under which the cetacean was kept captive. Carter, for instance, citing the case of the dolphin with the duodenal ulcer stated:

> 'it was found that this animal alone, of the entire group, had become nervous because of the crowds that peered at him through a glass wall.'[33]

6.35 Available information does confirm that all cetacea suffer some stress during capture and transportation.

6.36 In Australia, two observations about apparent stress in cetacea were documented at African Lion Safari, Warragamba by F. Smith.[34] and at Atlantis Marine Park, Yanchep by R. Fuller.[35]

Mortality and Longevity

6.37 It is generally accepted that analyses of mortality rates and longevity can be used for the objective measurement of the welfare of animals in captivity.

6.38 Overseas evidence shows that cetacean mortalities are high in captivity and that life expectancy is reduced. A summary of all information sighted on overseas mortalities is included in Appendix II.

6.39 However a number of problems exist in assessing mortality and longevity data. Information on longevity and mortality rates for different species of cetacea in the wild is far from complete and it is not always possible to compare captive and wild rates. There is, however, some limited data. Gaskin concluded that the maximum life span of Delphinus Delphis is about 25 years[36] and that the life span of free-ranging Tursiops is up to 20 years.[37] Bigg considered that orca may live from 48 to 100 years in the wild.[38] Ridgway believed that mortality in the wild is between 10 and 20 per cent annually.[39] Spong found a 9.3 per cent mortality for orca over a ten year period.[40]

6.40 The evidence on mortalities is disputed by a number of critics on both sides of the debate. Belford noted that few data on captive cetacea had been provided by independent scientists not employed by or associated with aquaria and he went on to illustrate that there have been considerable differences between the results of various surveys.[41]

6.41 Norris characterised Pilleri's documentation of capture mortality as a 'series of undated instances whose total numbers or trends cannot be assessed'. He claimed that newer methods of capture and husbandry have made significant changes. Species which are good captive animals have been identified and difficult forms are now no longer sought. Captive mortality rates for bottlenose dolphins, the most commonly kept species, have dropped and:

> 'Present data indicate that in the best organizations life spans for it may exceed those in nature and births are frequent.'[42]

6.42 Pilleri, in turn, has criticised the findings of decreased mortality in oceanaria by the Animals on Display Workshop,[43] based on the census of captive marine mammals in the United States from 1979 to 1983, calling the statistics '... nothing more than a meaningless bag of incommensurable relations'.[44]

6.43 Abel has written,

> 'I am aware of the selective mortality statistics being used by Project Jonah Victoria in opposition to Marine Parks. However, many of the figures quoted have not been quantified, and presented in perspective to the current legislations, guidelines or status of Marine Parks in Australia in 1984.'[45]

Project Jonah, Victoria, has countered by alleging that:

> 'While figures from overseas dolphinaria have been difficult to come by, accurate figures from Australian dolphinaria have been quite impossible to obtain.'[46]

6.44 Abel drew attention to the study of cetacean mortalities made by Walker (See Appendix II). He considered:

> '... that it has been misused in another attempt to substantiate and give scientific credibility to the arguments put forward by todays activists.'

He pointed out that Walker observed that a thorough, systematic, detailed examination of possible variables that may potentially affect changes in the mortality of cetaceans captured in the future is much needed. These studies should provide additional information to update clinical and husbandry techniques in order to cover capture mortality. He went on to say that Walker further stated that the greatest mortality of all species concerned occurs in the first year of captivity and that the

data presented in the paper on longevity and mortality rates are actually analysed over a two year period. Several major advances have been made in the techniques mentioned and as a result mortalities in these first two year periods have been overcome. Abel argued that the result of Walker's paper now would show 100 per cent survival when we now keep only those species, Tursiops or Sousa in captivity.[47]

6.45 Abel considered that it is necessary to identify: the source of the statistics being quoted, the species involved, the circumstances under which they were collected, the reason for collection, whether the statistics included stranded animals, the capture conditions, whether the statistics were within a 5, 5-10, 10-15 or 15-40 year period and whether the cetacea were collected prior to or after whale protection legislation and guidelines.[48]

6.46 Statistics for mortalities during capture for oceanaria and for cetacea in captivity in oceanaria in Australia show that generally Australia has a better record than overseas in catching and keeping cetacea.

Table 2: Capture Mortality for Cetacea for Australian Oceanaria

	Females	Males	Deaths
Atlantis, Yanchep	4	3	0
Marineland of SA, Adelaide	3	2	0
King Neptune's Park, Port Macquarie	2	1	0
Pet Porpoise Pool, Coffs Harbour	0	0	0
African Lion Safari, Warragamba	3	2	0
Sea World, Surfers Paradise	7	7	0
TOTALS	19	15	0

Table 3: Australian Captive Cetacean Mortalities

OCEANARIUM		SPECIES	SEX	ESTIMATED AGE	CAPTIVITY TIME	DATE OF ARRIVAL	DATE OF BIRTH	DEATH	SOURCE	METHOD OF CAPTURE
Atlantis Marine Park Western Australia	1	Tursiops truncatus	M	5-9		1981			Capture	Breakaway Hoop
	2	Tursiops truncatus	M	5-9		1981			Capture	Breakaway Hoop
	3	Tursiops truncatus	M	5-9		1981			Capture	Breakaway Hoop
	4	Tursiops truncatus	F	5-9		1981			Capture	Breakaway Hoop
	5	Tursiops truncatus	F	5-9		1981			Capture	Breakaway Hoop
	6	Tursiops truncatus	F	5-9		1981			Capture	Breakaway Hoop
	7	Tursiops truncatus	F	5-9		1981			Capture	Breakaway Hoop
African Lion Safari New South Wales	2	Tursiops gilli?	F	20-25		16.1.73		16.3.73	Seaworld, Qld	Net in Shallow
	3	Tursiops sp.	F	25 +		16.1.73		10.8.73	Seaworld, Qld	
	4	Tursiops sp.	F	4-8		16.1.73		21.11.75	Seaworld, Qld	
	5	Tursiops sp.	F	15 +		26.10.73		11.11.73	Seaworld, Qld	
	6	Tursiops sp.	F	15 +		28.11.73		5.9.74	Capture	
	7	Tursiops sp.	M	12 +		5.10.74		27.7.76	Capture	
	8	Tursiops sp.	F	2-4		Nov. 1974		26.1.77	Capture	
	9	Tursiops sp.	F	7-9		12.12.75		9.2.81	Capture	
	10	Tursiops sp.	F	2		28.1.76			Capture	
	11	Tursiops sp.	M	10-15		23.3.77			Seaworld	
	12	Tursiops sp.	M	15-20		23.3.77			Seaworld	
	13	Tursiops sp.	M	15		23.3.77		14.12.79	Seaworld	
	14	Delphinus sp.	F	3 +		12.7.77		13.7.77	Stranding	
	15	Tursiops sp.	?				24.11.80	24.11.80	Captive birth	
	16	Tursiops sp.	F				8.3.82	8.3.82	Captive birth	
	17	Tursiops sp.	M				15.11.83	30.12.83	Captive birth	

OCEANARIUM		SPECIES	SEX	ESTIMATED AGE	CAPTIVITY TIME	DATE OF ARRIVAL	DATE OF BIRTH	DEATH	SOURCE	METHOD OF CAPTURE
Marineland of	1	Tursiops truncatus	M	18-20		1969			Capture	
South Australia	2	Tursiops t.	M	18-20		1969			Capture	
	3	Tursiops t.	F	6		1969		1983	Capture	
	4	Tursiops t.	F			1969		1975	Capture	
	5	Tursiops t.	F	18-20		1969			Capture	
	6	Tursiops t.	M	5			1980		Captive birth	
	7	Tursiops t.	F	3			1982		Captive birth	
Pet Porpoise	1	Tursiops t.	F	27	12 1/2	1974			Stranding	
Pool	2	Tursiops t.	M	18	12 1/2	1974			Stranding	
New South Wales	3	Tursiops t.	F	5			1979		Captive birth	
	4	Tursiops t.	F			1975		1975	Accidential netting	
	5	Tursiops t.	F			1978		1980		
	6	Tursiops t.	F			1984			Removed from stranded mother	
	7	Tursiops t.	?				1985		Captive birth	
Seaworld	1	Tursiops t.	F	32	19	1966				
Queensland	2	Tursiops t.	M	25	18	1967				
	3	Sousa chinensis	F	25	17	1968				
	4	Tursiops t.	M	25	16	1968				
	5	Tursiops t.	F			1971		1981		
	6	Tursiops t.	F	19	13	1972				
	7	Tursiops t.	F			1972		1978		
	8	Tursiops t.	F	17	13	1972				
	9	Tursiops t.	M	20	13	1972				
	10	Tursiops t.	M	16	12	1973				
	11	Tursiops t.					1973	?		
	12	Tursiops t.	M			1973		1977		
	13	Tursiops t.	M			1973		1977		
	14	Tursiops t.	M			1973		1983		
	15	Tursiops t.	F	18	11	1974				
	16	Tursiops t.	M	18	11	1974		1985		

OCEANARIUM		SPECIES	SEX	ESTIMATED AGE	CAPTIVITY TIME	DATE OF ARRIVAL	DATE OF BIRTH	DEATH	SOURCE	METHOD OF CAPTURE
Sea World Queensland (Continued)	17	Tursiops t.	F	17	10	1975				
	18	Tursiops t.	M	9 1/2			1976			
	19	Tursiops t.			7		1976	1983		
	20	Tursiops t.	M			1978		1983		
	21	Tursiops t.	F				1978	1983		
	22	Tursiops t.	F	5			1980			
	23	Tursiops t.	M	19	4	1981				
	24	Tursiops t.					1981	1981		
	25	Pseudorca crassidens	F			1982		1982		
	26	Tursiops t.	F			1982		1982		
	27	Tursiops t.	M			1982		1982		
	28	Tursiops t.	F		3	1982				
	29	Tursiops t.	M		2	1983				
	30	Tursiops t.	F		2		1983			
	31	Tursiops t.					1983	1983		
	32	Tursiops t.	F		1 1/2	1984				
	33	Tursiops t.	F		1 1/2	1984				
	34	Pseudorca crassidens	M	1 1/2		1985				
	35	Pseudorca crassidens	F			1985				
	36	Tursiops t.	F	20	1/2	25.6.85				
	37	Tursiops t.	F	5	1/2	30.8.85				
	38	Tursiops t.	F	7	1/2	7.5.85				
King Neptunes Park, N.S.W.	1	Tursiops t.	F	15-16	12				Captured Point Plumber	
	2	Tursiops t.	F	14	7				Captured near Port Macquarie	
	3	Tursiops t.	M	8	5				Stranded in Kendall River	
	4	Tursiops t.	F	4	5 wks	1977		1977	Stranding	
	5	Tursiops t.	F	10	3 wks	1980		1980	Stranding	
	6	Tursiops t.	F	8-10	3 wks	1981		1981	Stranding	
	7	Tursiops t.	F	6	5 wks	1982		1982	Stranding	
	8	White River dolphin	F	14	7 yrs	1974		1981	Captured Harvey Bay. 12-18 months in Pet Porpoise Pool.	

OCEANARIUM		SPECIES	SEX	ESTIMATED AGE	CAPTIVITY TIME	DATE OF ARRIVAL	DATE OF BIRTH	DEATH	SOURCE	METHOD OF CAPTURE
Hamilton Island	1	Tursiops t.				1984		1984		
	2	Tursiops t.				1984				
	3	Tursiops t.				1984				
	4	Tursiops t.				1984				

Breeding

6.47 Lee has stated that:

> 'Physiological stress in mammals is usually accompanied by impaired reproduction. Established effects are infertility, in utero loss of embryos, in utero damage of embryos, delayed maturation and impaired lactation and parental neglect.'[49]

6.48 In North America, a census for the period 1976 to 1979 found that 70 per cent of establishments containing cetacea which had been contacted had, or were in the process of establishing, breeding programmes and that there had been a marked increase in births for the period. Data collected by Ridgway and Benirschke for the period to 1975 indicated that, in the 53 per cent of zoos and 67 per cent of oceanaria surveyed in North America, there had been 107 Tursiop truncatus births in captivity. Of these, 22 were still alive in 1976. Cornell, Asper and Duffield found that between 1976 and 1979 there were more than 25 Tursiop truncatus births in captivity and 14 were still alive in 1979. Data were provided for numbers of stillbirths and early calf mortalities caused by lack of maternal care or inexperience on the part of the mother, for the most reproductively successful cetacean - the bottlenose dolphin. The number of stillborn or early deaths remained consistent at 45 per cent for the three years. The authors stated that:

> 'the data covered several breeding programmes and did not seem to be related directly to such problems as the effects of capture since all the births recorded were clearly conceived in captivity. The 1976-1979 values for stillbirths and early mortalities in the Bottle nosed dolphin are similar to those collected in a comprehensive survey of breeding in this species up to 1975 and reported in the Tursiops Breeding Workshop (Ridgway and Benirschke 1977).'[50]

6.49 Bryden has noted that 'one of the major obstacles to the detailed study of reproduction in dolphins has been the difficulty of breeding them in captivity'. He quotes Sweeney, (1977) as reporting 31 per cent of all Tursiops pregnancies in captivity resulting in stillbirth with mortality rate of survivors at 49 per cent in the first year. Most of these mortalities occurred as a result of inadequate maternal care. Bryden commented that 'it is difficult to advise on optimal husbandry practices likely to improve reproductive performance in captive animals, because so little is known about the ecology of dolphins in the ocean'. He discussed the advisability of having other dolphins of the same species present in the pool and the optimum pool size for breeding. He concluded that 'there remain many more questions concerning reproduction in dolphins than answers' but noted that work in reproduction needs to be carried out on both captive and wild populations and pointed to the important recent physiological studies at Sea World, California which revealed 'vital information about ovulation in dolphins'.[51]

6.50 Lee considered that some recent breeding programmes in the United States suggested that husbandry is available to improve reproductive success in captivity.[52] Warneke wrote that 'it has been observed that once a colony of experienced breeding animals is established, calving occurs regularly and survival of the young appears to be assured'. He cited the examples of Sea World, Florida and Sea World, San Diego, where loss owing to stillbirth and infant mortality was less than eight per cent between 1978 and 1982.[53] Lee, using the same two examples, pointed out that intervals between births were similar to those estimated for natural populations.

6.51 It should be noted that there is a lack of information on cetacean breeding and survival rates in the wild with which to compare captive breeding programmes. However, a descriptive

and critical review of existing methods for estimating reproductive parameters in wild dolphins and small whales is provided by Perrin and Reilly (1984).[54] The review includes pregnancy rate, calving interval, gestation period, age and sex structure and size and age at attainment of sexual maturity.

6.52 Statistics for births in Australian oceanaria are given below. All were conceived in captivity.

Table 4: Births in Australian Oceanaria

OCEANARIUM	SEX	SPECIES	DATE OF BIRTH	DATE OF DEATH	AGE	STATED CAUSE OF DEATH
African Lion Safari, NSW	?	Tursiops sp.	24.11.80	24.11.80	-	Drowning
	F	Tursiops sp.	08.03.82	08.03.82	-	Drowning
	M	Tursiops sp.	15.11.83	30.12.83	5 wks	Unknown
Marineland, SA	M	Tursiops t.	1980		5 ys	
	F	Tursiops t.	1982		3 ys	
Pet Porpoise Pool NSW	F	Tursiops t.	Dec 1979		5 ys	
	?	Tursiops t.	21.06.85		few mths	
Sea World, Qld	?	Tursiops t.	20.05.73	?		Heart aneurysm
	M	Tursiops t.	29.12.76			-
	?	Tursiops t.	5.07.76	11.04.83		?
	?	Tursiops t.	21.11.78	13.05.83		Septic-aemia & intest-inal haemorr-hage
	F	Tursiops t.	8.03.80			
	F	Tursiops t.	12.02.83			
	?	Tursiops t.	18.11.83	18.11.83		Stillborn
	?	Tursiops t.	24.06.81	10.07.81		Liver In-fection

CHAPTER 7

ETHICS

7.1 Critics have argued that the question of keeping cetacea captive is essentially an ethical one which cannot be resolved simply by weighing scientific evidence. Some people have pointed out that public attitudes are undergoing a fundamental change in relation to animals. Bossley believed that:

> '... we are now on the verge of a revolution in the area of moral philosophy relating to individual rights, be they the rights of various disadvantaged humans such as oppressed groups (e.g., women, blacks, the disabled) or the rights of other species.'[1]

Project Jonah noted that:

> 'There is definitely a change taking place in people's feelings towards the other inhabitants of this earth.'[2]

7.2 Many people concerned with animal welfare now question whether humans are entitled to exploit animals and to act in a manner which will cause animals to suffer.

7.3 Critics argue that oceanaria exploit cetacea primarily for profit and that this is morally indefensible because it causes suffering to cetacea who, as intelligent and complex beings, are entitled to greater consideration by humans.[3]

7.4 They believe that arguments advanced by oceanaria, for keeping cetacea captive, such as enrichment, awareness and improved knowledge, are inconsistent with, and subordinate to, their commercial motives. Carter has stated:

'U.S. dolphinaria interests, self described as an industry, have emphasised its money value and the number of persons employed. Such matter are anthropocentric. The acquisition of cetacean specimens, bought or caught, represents significant financial investments as do the construction and maintenance of dolphinaria facilities. The case is similar with safari parks and other captive animal display enterprises providing public entertainments.

Clearly then the nature and focus of commerce differs from that of conservation, science and education ... At present, allowing for compromises, there will arise differences of priority; and where economic parameters are dominant those of conservation, science and education are likely to be hybridised.'[4]

7.5 However, proponents of oceanaria deny that keeping cetacea is immoral and they argue that the recreation/ entertainment function of oceanaria is subordinate to their role of raising public awareness and concern for conservation of the species. The Animals on Display Workshop has stated:

'Some people contend that it is morally wrong to remove animals from the wild and hold them in captivity, either because they believe that some animals have evolved sufficiently to acquire rights equivalent to those recognized for human beings, or because they believe animals are severely harmed by life in captivity. These beliefs are not currently supported by sufficient scientific evidence. Consequently, they do not provide a factual basis for an overriding moral objection to displaying animals in captivity. Human beings have a special responsibility to preserve and respect animals as part of the natural environment. Animals suffer when human action is indifferent to their pain and distress or when it causes irresponsible disruption of their habitat. Human beings, as a matter of moral obligation, owe compassion and humane treatment to animals in captivity. Bringing animals into captivity alters their natural state. If captivity causes adverse effects,

> these effects, on balance, are outweighed by such benefits as enhancement of human appreciation for all animals, conservation of species, and advancement of knowledge.'[5]

7.6 Abel considered that displaying cetacea for recreation is justified because it is necessary to encourage learning. He stated:

> 'It is a recognised fact that people will not pay for merely an educational demonstration. They will however, pay for entertainment and accept all the educational experiences provided. I feel I must emphasize again the fact that the dolphins are not "made to do tricks" in providing the entertainment requirements essential for attracting a large segment of the population to the facility in the first place.'[6]

7.7 However, critics consider that even if oceanaria could show that profit and recreation were not the primary motives of oceanaria, the use of captive cetacea for education and research is not only of dubious benefit but is also morally questionable.

7.8 Bossley argued that display based on the subordination of cetacean to trainer, teaches only that humans have the right to exploit cetacea, although he did not provide empirical research to substantiate his argument.[7]

7.9 With regard to research Bossley considered that:

> '... one does have to temper the pursuit of scientific knowledge with certain moral considerations ... The justification of obtaining scientific evidence is not a sufficient reason these days necessarily to legitimate a practice.'[8]

Carter notes that Pilleri thought that in scientific research on cetacea, an important ethical cost-benefit analysis needs to be made.[9] Jamieson and Regan concluded that although scientific

study may have many benefits which will accrue to the cetacea themselves, the morality of these benefits depends 'on the means used to secure them. And no benefits are morally to be allowed if they are obtained at the price of violating individual rights.'[10]

7.10 Sir Sydney Frost, in his report on whales and whaling, decided that any interference with cetacea required strong justification on the grounds that it was either 'essential or unavoidable'. In considering whether humans should use cetacea, he took into account the suffering that might occur as a result of that use and the effect of the possible high intelligence of cetacea on their propensity to suffer. He went on to recommend that:

> 'the taking or killing of any cetacea - whether intentionally for scientific, display or other purposes, or incidentally such as in fishing or shark netting operations - should be carefully scrutinised to ensure that it is either essential or unavoidable.'[11]

7.11 The Frost Report did not define 'essential' or 'unavoidable'; nor did it consider separately the issue of oceanaria and the ethics of keeping cetacea in captivity. The Whale Protection Act 1980, which was passed in direct response to the Frost Report, currently sanctions the existence of oceanaria, subject to certain conditions under Section 11 (1) (a) of the Act.

7.12 In evidence to the Frost Inquiry, Singer stated:

> 'If a being is capable of suffering, any suffering it might experience as a result of our actions must count in our ethical deliberations irrespective of whether the being is a human or non-human animal.'[12]

7.13 That cetacea have the capacity to suffer is unequivocal. As mammals they have 'the nervous apparatus which in human beings is known to mediate the sensation of pain'.[13]

7.14 The fact that cetacea undergo some suffering in captivity is not of itself an overriding factor in determining whether cetacea should be held in captivity. All animals, including human beings, suffer to a varying extent in their natural environment and it would be inconceivable for animals not to suffer at times in captivity. Rather, it is the nature and extent of suffering which should be taken into account in deciding whether to keep particular species of animals in captivity.

7.15 Empirical data compiled overseas on effects of captivity on cetacea have shown numerous cases of stress, high mortality, reduced longevity and breeding problems. It is also undeniable that cetacea suffer varying degrees of stress and trauma during capture.

7.16 The Frost Report was inconclusive about the level of cetacean intelligence and the extent to which this affected suffering. After discussing the various views on cetacean intelligence[14] it stated that:

> 'on the neuro-anatomical evidence, the Inquiry is unable to make the assumption of a potential for high intelligence in the whale. But we are persuaded by the evidence submitted to us that the issue remains open and there is a real possibility that such a potential exists and that, accordingly, allowance for it should be made in man's attitude to whales.
>
> Certain whale species, particularly some dolphin species and the killer whale, give evidence of advanced behavioural activities. It is from these behavioural studies that scientists have endeavoured to draw parallels for other whale species. Granted that many

> assumptions have been made, nevertheless it is not unreasonable to conclude that cetacea give evidence of levels of behaviour that would seem to be associated with a level of brain development and activity of some sophistication.'[15]

7.17 Assessments of cetacean intelligence have placed them in a range of categories from chimpanzees and baboons to domesticated animals such as dogs and pigs[16] to land-based mammals of high intelligence such as apes and humans.[17] It was contended that studies indicated a brain capacity of a five year old human[18] while others considered that the large brain was merely an evolutionary response to an aquatic environment.[19] Behavioural sophistication was, on one hand, argued as being a reason for concluding that cetacea had a capacity for a high level of suffering while, on the other hand, it was used to argue for a greater degree of adaptability and therefore suitability for captivity.

7.18 Short has commented that:

> '... encephalization - the relative size of the brain in relation to the rest of the body - is a fundamental trait that is a direct measure of an animal's information processing capacity, and hence is directly correlated with intelligence. The highest grades of encephalization are shared by humans, dolphins and killer whales. Next comes the apes and monkeys, whose degree of encephalization is twice that of "average" mammals like deer, or wolves, which are on a par with lemurs, and with crows. Encephalization would seem to reflect a number of different intelligences, and indicate the animal's knowledge of reality in relation to the information received by the brain. The large size of the human brain can be attributed to our linguistic ability, which gives us a new dimension to reality. If we are genuinely concerned about minimizing the pain and suffering of animals in captivity, it would seem essential to take encephalization into account ...'[20]

7.19 It has been pointed out to the Committee that captive cetacea are entitled to special consideration not only because of their possible high intelligence but also because of various behavioural characteristics, such as their long distance swimming, their sonar signals and their complicated social interactions; characteristics which do not lend themselves to confinement in a relatively small pool.

7.20 It has been inferred from these factors that the reaction of cetacea to captivity would be similar to those of humans. Thus, morally, the forcible separation of cetacea from their families and their confinement for life requires the same justification as this sort of action does in human situations. There are, however, dangers in using anthropomorphic arguments because different species do not necessarily respond to a stimulus in the same way, irrespective of the level of intelligence.

7.21 The Committee is unaware of any recent research that throws more light on the nature and level of cetacean intelligence than the research available to Sir Sydney Frost during his inquiry. It agrees with the views expressed in the Frost Report and, in view of the possibility that cetacea have a high level of intelligence, they should be given the benefit in decisions on their captivity. They should, therefore, not be subjected to the possibility of deprivation or suffering which conditions and quality of life in captivity might occasion.

CHAPTER 8

CONCLUSIONS AND RECOMMENDATIONS

8.1 Proprietors of oceanaria have drawn attention to the benefits of holding cetacea in captivity - both for humans and for cetacea. For humans these benefits have been enjoyment and increased understanding of cetacea and the natural world generally. For the cetacea themselves oceanaria claim to have contributed to their preservation and conservation by fostering public awareness and by scientific study.

8.2 The Committee acknowledges the past contribution made by oceanaria in raising awareness and advancing knowledge about cetacea. It also acknowledges the role which has been performed by oceanaria in conservation and preservation, both indirectly by fostering interest and concern and, more directly, through research and through rescue and rehabilitation of sick and stranded animals.

8.3 An examination of some of the evidence has indicated to the Committee, however, that cetacea in captivity have suffered stress, behavioural abnormalities, high mortalities, decreased longevity and breeding problems. While it notes that, in Australia, the overall record for mortalities in oceanaria over the last five years is better than for oceanaria overseas and that a number of variables must be taken into account when examining the evidence, the Committee is, nevertheless, of the opinion that cetacea generally have paid a high price for the dubious advantages of captivity.

8.4 Furthermore, the Committee points out that, with one exception, Australian oceanaria have not made a substantial contribution to cetacean conservation and preservation in the sense that few of the major threats to cetacean welfare in the wild has been addressed by oceanaria. Four of the seven Australian oceanaria do not have research programmes.

8.5 With regard to their educational role, the Committee notes that three Australian oceanaria have no educational programme and that of the fourth is very limited. The greatest emphasis, in the majority of oceanaria, has been on the relationship of cetacean to trainer in the captive situation and, in most cases, the display of cetacea has not attempted to teach people about their natural habitat. Some cetacea are trained to perform unnatural behaviours.

8.6 The Committee draws attention to the problems inherent in the administration of the present system for the protection of cetacea. Responsibility for cetacean protection and welfare is divided between Federal and State Governments. However, only Victoria, New South Wales and Western Australia have drawn up guidelines to be complied with by applicants under the legislation. The national guidelines drawn up by ANPWS for applicants under the Whale Protection Act are only used where the application is made to capture cetacea from Commonwealth waters. It is probably not possible to police the capture of cetacea to ensure that it is done within the appropriate jurisdiction. The Committee is of the opinion that the existing ANPWS guidelines do not adequately specify educational and research requirements for oceanaria. The problems of the present system of licensing and regulating oceanaria in Australia are exemplified by the differences in the establishment of the one at Hamilton Island and the proposed one at Keysborough in Victoria.

8.7 The Committee is of the opinion that evidence points to the probability that cetacea are highly intelligent animals with complex social behaviour. As the scientific community has not yet reached a full understanding of the nature of the animal, the Committee believes that it is important to give the animal the benefit in considerations on its future in captivity, especially where captivity has been shown to be mainly for the purposes of entertainment in Australian oceanaria.

8.8 The Committee concludes that the benefits of oceanaria in Australia for humans and cetacea are no longer sufficient to justify the adverse effects of capture for captivity.

8.9 Therefore, the Committee RECOMMENDS that no further facilities for keeping captive cetacea be permitted to be established in Australia and that no further permits be issued for the capture of cetacea in Australian Commonwealth or State waters. It further RECOMMENDS that importation of cetacea from overseas be banned.

8.10 The Committee also RECOMMENDS that existing oceanaria be allowed to continue keeping cetacea for the time being but that the keeping of cetacea should eventually be phased out unless further research justifies their continuance.

8.11 Under the Commonwealth 'Guidelines for the Preparation of Applications for Permits for Live Display, Scientific or Educational Purposes 1982', applicants for a permit for scientific or educational purposes are required to submit much more detailed information on scientific or educational projects than applicants for a live display permit. This includes the names and addresses of sponsors or co-operating institutions and the scientists or educationalists involved, a copy of the formal research proposal or contract and a statement of whether the proposed research has broader signficance than the individual

researcher's requirements, or responds directly or indirectly to recommendations of any national or international scientific body charged with research or management of cetacea and, if so, how.

8.12 The Committee RECOMMENDS that existing oceanaria be required to submit to more stringent assessments of educational and research functions by supplying detailed information similar to that required for applicants for scientific and educational permits in current Commonwealth guidelines and to be able to show that education and research constitute a significant component of the oceanarium's activities.

8.13 In keeping with the accepted policy of presenting animals in a manner which improves public awareness and understanding of cetacea, the Committee RECOMMENDS that display programmes in oceanaria be designed in such a way as to present only natural forms of behaviour and the facility to approximate more closely the cetacean's natural environment.

8.14 Only some States have guidelines, and national guidelines for applicants under the Whale Protection Act are only used where the application is made to capture cetacea from Commonwealth waters.

8.15 The Committee RECOMMENDS that national standards for the maintenance and care of captive cetacea be drawn up by the ANPWS in consultation with the State Government authorities, members of the captive cetacean industry and other people with knowledge of cetacean welfare for use by authorities responsible for captive cetacea in each State. The Committee further RECOMMENDS that national standards include standards for assessments of financial viability, natural display and educational and research components of captive cetacean display as well as covering all aspects of maintenance, handling and care of captive cetacea. These standards would replace guidelines for permit applications.

8.16 The Committee supports the proposal for a licensing system for owners and managers of oceanaria in addition to the existing provisions for licensing the oceanarium facility and RECOMMENDS that such a system be implemented.

8.17 It is the Committee's view that some of the existing oceanaria would not satisfy revised criteria for cetacean care and facilities and for educational and research components of cetacean display. The view was commonly expressed in evidence to the Committee by both opponents and proponents[1] of oceanaria, that these establishments should be made to upgrade their captive cetacean facilities within a specified period or close them down.

8.18 The Committee RECOMMENDS that authorities responsible for captive cetacea in each State assess any oceanaria within that State against the established national standards and, where it is found that the captive cetacean facility is unable to comply with these standards, a specified time be allocated for improvements, and if, after this period, the facility is still unable to comply with these standards, it be closed down.

8.19 The Committee recognises the time and staff constraints of State authorities responsible for captive cetacea. It notes that national bodies such as the ANPWS consult non-government organisations and individuals in matters concerning cetacean welfare. It notes also that representatives of oceanaria have established an organisation for exchange of views, dissemination of information and regulation of the industry.

8.20 The Committee RECOMMENDS that a national advisory body be established comprising representatives from Federal and State Government authorities, non-government organisations and oceanaria, which would advise the Federal and State Governments on matters relating to cetacea, both captive and in the wild and to encourage and monitor research in this area.

8.21 The Committee, recognising the role played by some oceanaria in the rescue and rehabilitation of sick and stranded animals, RECOMMENDS that oceanaria continue this work provided that it is directed towards returning the animals to their natural environment, where possible, and that the cetacea are not rescued with the ultimate intention of rehabilitating the animal for the purposes of display and of circumventing the directive that no more wild cetacea be captured.

G. GEORGES
Chairman

DISSENTING RECOMMENDATIONS OF SENATOR D. BROWNHILL

Although I was not a member of the Committee when the evidence on cetacea in captivity was taken, I have read the evidence and agree with most of the Committee's findings.

However, I do not agree with the conclusions and recommendations contained in paragraphs 8.8, 8.9 and 8.10, which I prefer to read as follows:

Paragraph 8.8

My recommendation: deletion of the paragraph.

Basis for that opinion: I do not believe the evidence is sufficient for that conclusion to be reached.

Paragraph 8.9

My recommendation:

The Committee recommends that no further permits be issued for the capture of cetacea in Commonwealth or State waters, unless there are adequate scientific or educational reasons for so doing. It further recommends that importation of cetacea from overseas be banned.

Paragraph 8.10

My recommendation:

The Committee recommends that existing oceanaria be allowed to continue keeping cetacea, provided they meet the strict guidelines and national standards proposed in this Report.

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APPENDIX 1

LIST OF WITNESSES WHO APPEARED BEFORE THE COMMITTEE

Abel, Mr G.R., Curator, International Oceanaria Development Co. Pty Ltd, Aspendale, Victoria
Abel, Mr R., Managing Director, International Oceanaria Development Co. Pty Ltd, Aspendale, Victoria
Anderson, Mr G.R.V., Principal Project Officer and Project Coordinator, Whales & Marine Section, Australian National Parks and Wildlife Service, Canberra, Australian Capital Territory
Barber, Mr P.J., RSPCA Victoria, Burwood East, Victoria
Bossley, Dr M.I., Glenunga, South Australia
Bullen, Mr S.L., Managing Director, African Lion Safari, Warragamba, New South Wales
Cane, Mr A.R., Development/Technical Manager, International Oceanaria Development Co Pty Ltd, Aspendale, Victoria
Dawbin, Dr W.H., Honorary Research Associate, Australian Museum, Sydney, New South Wales
Fordyce, Mrs J., Secretary, Friends of Marine World, Seaford, Victoria
Gee, Mr R.W., Acting Director, Australian Agricultural Health and Quarantine Service, Canberra, Australian Capital Territory
Gregory, Mr A.I., President, Project Jonah, Sydney, New South Wales
Hyne, Dr R.H.J., Senior Lecturer, Faculty of Veterinary Science, University of Sydney, Sydney, New South Wales
Kaye, Mrs H., Honorary Director, Project Jonah Victoria, Hawthorn, Victoria
Kelty, Ms A., National Dolphin Coordinator, Greenpeace Australia, Adelaide, South Australia
Lattimer, Mr S.C.J., Head Trainer, Marineland of South Australia, West Beach, South Australia
Little, Dr K.B., Veterinary Surgeon, Marineland of South Australia, West Beach, South Australia
McEwen, Mr G.J., Chairperson, Australian Federation of Animal Societies, Greensborough, Victoria
Meischke, Dr H.R.C., Acting Principal Veterinary Officer, Australian Agricultural Health and Quarantine Service, Canberra, Australian Capital Territory
Mosley, Dr J.G., Director, Australian Conservation Foundation, Hawthorn, Victoria
Porter, Mr R.H., General Manager, West Beach Trust, West Beach, South Australia
Richmond, Mr T., Assistant Director, Australian National Parks and Wildlife Service, Canberra, Australian Capital Territory
Smith, Miss F., Pittwater, New South Wales
Weir, Mr J.W., President, Friends of Marine World, Seaford, Victoria

Whadcoat, Mr J.H., Secretary, Lake Tyers Dolphin Protection Group, Lakes Entrance, Victoria
Whiteside, Dr S.M., Vice President, Project Jonah Victoria, Hawthorn, Victoria
Wirth, Dr H.J., President, RSPCA Victoria, Burwood East, Victoria

APPENDIX 2

REFERENCES ON CETACEAN MORTALITIES IN OCEANARIA

67 Phocoena Phocoena, harbour porpoises, were collected from Danish waters, 1962-76 mainly from nets and strandings, usually 1/2 - 1 year old. Chlorinated water in a 1000 m^3 tank was used from 1970. 50% of the animals were diseased or high risk. 23 died in the first month of captivity. Maximum longevity in captivity was 39 months. Anderson, op. cit.

In the United Kingdom since the early 1970s there were 55 confirmed imports of Tursiops truncatus. Of the 55, 23 were dead, 17 alive and 15 of status unknown. For the same period 4 orcas were dead, 2 alive, 2 re-exported and 1 of status unknown. The mean longevity in captivity of 11 dead Tursiops was 3.7 years and of 9 live Tursiops was 9.6 years. Arden-Clarke, C., 'A Review of Cetaceans in Captivity With Special Reference to Records to (sic) Delphinids in the United Kingdom', 1984.

In British Columbia and Washington, 263 Orcinus orca were caught between 1962 and 1973. 50 were kept for oceanaria and exhibited in 8 countries. 12 died during capture and the remainder escaped or were released. Survival to the end of 2 years of 48 of the orcas kept in captivity was 75% in immature orcas and 13% in adults. 3 animals still alive after 7 years, 2 months have lived the longest in captivity. Bigg and Wolman, op. cit.

A survey was made of 6 major North American oceanaria holding orcas which had adequate facilities and standards of care. Since 1965, 30 orcas had been held. 3 collected were sick. 17 died in the period 1965 to 1978 of which 13 were females. The female mortality rate was slightly above 7% yearly for females and 2.1% yearly for males. Ridgway, S. 'Reported Causes of Death of Captive Killer Whales (Orcinus orca)', Journal of Wildlife Diseases, Vol. 15, January 1979, pp. 99-104.

Ocean Park, Hong Kong, took between April 1974 and February 1982, 51 Tursiops c.f. T. gilli, 24 Tursiops c.f. T. aduncus, 16 Lagenodelphis hosei, Frasers dolphins, 10 Peponocephala electra, melon headed whales, 7 Globicephala macrorhynchus, short finned pilot whales, 1 orca and 1 Stenella longirostris, long snouted spinner dolphin. Out of 110 animals, 8 remained alive, 12 were released and 8 were transferred. 82 were dead. Most died from the chronic presence of Pseudomonas pseudomallei. Hammond and Leatherwood, op. cit.

21, or 12% of the established European captive population died in 1977. This was a reduction in loss of established animals since 1976, but there was considerable loss among newly captured specimens. 19 established Tursiops truncatus, bottlenose dolphins, died in 1977. Greenwood, Clinical and Pathological Findings in Dolphins in 1977, op. cit.

30 Cetacea were added to European captive stocks in 1978 including 29 Atlantic and Pacific bottlenose dolphins and one killer whale. 18% of the established European captive population died in 1978, including 19 established Tursiops Truncatus, 3 established Tursiops gilli, 8 established Sotalia guianensis and 1 Orcinus orca. This estimated total of 31 animals was higher than previous years but was consistent for bottlenose dolphins. Greenwood, Clinical and Pathological Findings in Dolphins in 1978, op. cit.

Captive orcas have an overall mortality rate of 4.7% yearly. The female yearly mortality rate of 7% is significantly higher than for males. Larger females have a shorter captive life span than smaller females. A total of 50 orcas from Washington and British Columbian waters were placed in oceanaria around the world. The majority of exported whales died but the standards of care in these oceanaria were not known. Of 31 orcas kept in North American oceanaria between 1965 and 1975 under acceptable standards promulgated by the Marine Mammal Protection Act 1972, 14 died. Hui and Ridgway, Survivorship Patterns in Captive Killer Whales, op. cit.

132 cetaceans were captured for public display during the period 1966 to 1972 by Marineland of the Pacific, California. Of the 22 Delphinus delphi, common dolphins none had survived by 1974. Only 15% survived the first year. Most mortality - 75% occurred during the first 60 days. Maximum survival was 2 years 7 months. Of 51 Lagenorhynchus obliquidons, Pacific white sided dolphins, 10 remained in 1974. 61% died in the first year, and 5% were lost in the first month. 5 of the 10 have lived in captivity over 8 years. Of 18 Tursiops sp. Pacific bottlenose dolphins, 5 remained alive in 1974. Mortality at the end of the first year was 50%. 5 of 33 Globicephala macrohynchus, short finned pilot whales, were alive in 1974. Maximum longevity was 7 years. 35% mortality occurred within 30 days of capture. 8 Phocoenoides dalli, Dall's porpoises were captured in 1972. 4 died during capture and transportation. 2 died in the first 60 days, one lived for 3 months and the last for 15 months. Walker, op. cit.

278 Tursiops truncatus, Pacific and Atlantic bottlenose dolphins were in captivity in North America in 1979. Average longevity was 6.1 years. 62% of the total had been alive in the 1976 census. 2 Pseudorca crassidens, false killer whales, had an average longevity of 7 years. 50% of the

total had been alive in the 1976 census. 24 orcas had an average longevity of 7.2 years. 58% of the total had been alive in the 1976 census. Of 283 Tursiops truncatus, 1976-1982, 39 had died or 14% of the total. Cornell, Asper and Duffield, op. cit.

Napier Marineland, New Zealand has taken 74 animals captive. 55, including 2 who had stranded, died, 12 were released, 2 were transferred and 1 subsequently died. 4 remain alive and 1 is of status unknown. 50% died within 4 months of capture and 73% within 2 years. All 4 Tursiops truncatus died. Of 26 Lagenorhyncus obscuris, 21 died. Of 38 Delphinus delphis, 25 died. All 4 Cephalorynchus hectori died. Greenpeace, New Zealand, 1984?

Of 21 dusky dolphins captured for display off Hout Bay, South Africa, between 1961 and 1978 only one survives. The longevity of the dusky dolphin in its natural state is estimated to be 25 - 30 years. Carter, op. cit.

Between 1966 and 1978, Napier Marinelands, New Zealand, had a capture mortality of 68 dolphins not including those which died during capture or transportation. Carter, op. cit.

Since November 1981, 122 orcas have been captured throughout the world for display purposes. At January 1984, 72 were dead, nine had been released, four had escaped and 37 were still alive. Between 1980 and 1983, 26 orcas were captured. At January 1984, eight were dead, 16 alive and two had escaped. Submission 241B (Project Jonah).

In Europe, of 172 animals, 64 are still alive, 54 are dead, 22 have been released and 32 are status unknown. Submission 457 (Greenpeace).