

Captive Killer Whales in Europe

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Introduction

The early history of the live capture of killer whales (*Orcinus orca*) for oceanarium display has been described (Bigg & Wolman 1975; Hui & Ridgway 1978). After initial abortive attempts beginning in 1961 to hold whales captured by accident, a netting technique was developed by Seattle Aquarium for the capture of whales in Puget Sound and in 1968 the first commercial capture operations began in British Columbia and Washington waters in the region of Vancouver Island. Accounts of the capture and care of the earliest whales have been given (Newman & McGeer 1966; Burgess 1968). Published records show that between 1962 and 1973, 263 whales were taken of which 50 were distributed to oceanaria, 12 died during capture and the remainder were returned or escaped (Bigg & Wolman 1975). After 1973, these capture efforts stopped during the moratorium following the introduction of the Marine Mammal Protection Act 1972 and only 2 further whales are recorded as captured up to 1978 (Ridgway 1979).

Whales were imported into Europe as soon as commercial capture operations began (Taylor 1971) and six animals came in from the Vancouver area between 1968 and 1971). The supply of whales to European oceanaria was then similarly affected by the Marine Mammal Protection Act, not least because of the problems of setting up a system for foreign permit applications. As a consequence, a second major catching effort developed in Iceland, starting up as a result of incidental capture of killer whales during fishing operations. This developed into a commercial operation by 1976 and has supplied whales both to North America (from 1978) and Europe (from 1976) and the Far East up until 1983. A very small number of whales has been captured for display in Japan.

Longevity

As far as we can ascertain, 26 killer whales have been exhibited in Europe since 1968. Two of these were imported temporarily from the United States for brief exhibition at festivals and are not included in this analysis as their origin and capture dates are

not recorded. One of these whales is known to have died shortly after arrival. Of the 4 other whales imported from the Vancouver area between 1968 and 1971, one was re-exported to Sea World, San Diego in 1976.

Twenty whales were imported from Iceland between 1970 and 1982, the vast majority after 1976. Seven of these were re-exported after varying periods, four to the United States, one each to Hong Kong, Japan and South America. Eight whales remain on exhibition in Europe at present, including 3 in France, 2 in Britain and one each in Holland, Spain and West Germany and all are in good health.

Among the 24 whales considered in this analysis, we have recorded 9 deaths (Table 1). These animals lived between 0.42 and 5.75 years after capture and their mean survival time was 2.21 years. The 15 animals still alive in captivity have lived between 1.25 and 13 years since capture, with a mean of 5.37 years. Seven of these have been captured in the last six years.

Causes of Death

The causes of death of 9 whales are recorded together with their sex and survival times. Unfortunately, accurate length records are not generally available, but most animals were young (under 4 m) except for the two surviving over 5 years. Eight of

Table 1. Longevity and causes of death in 9 whales

Sex	Longevity (years)	Cause of Death
M	5.25	Mediastinal abscess
M	0.58	Systemic mycosis
F	1.00	No diagnosis
M	2.16	Clostridial myositis
M	5.75	Pulmonary abscess
M	0.42	Thrombocytopenia
M	2.75	Systemic mycosis
M	0.25	Traumatic shock
M	1.90	Peritonitis

the 9 were males, whereas the overall sex ratio of the 24 animals was 15 males to 9 females.

The majority of deaths were due to infectious disease. The two cases of systemic mycosis are believed to have been due to *Candida* sp. infection, mixed bacterial flora were cultured from the case of peritonitis and pulmonary abscess, and a beta-haemolytic *Streptococcus* from the mediastinal abscess which was associated with osteomyelitis of a rib. One animal died of traumatic shock, following severe injury to the abdominal wall and kidneys believed to have been inflicted by another whale in the pool. The two animals with systemic mycosis and the undiagnosed animal were not autopsied by us.

Discussion

It is of interest to compare and contrast the results of importing killer whales into Europe for captive display with those from North America. Data for North America were collected and analysed by Hui & Ridgway (1978) and updated by Ridgway (1979). That analysis was somewhat restricted in that discussion was limited to about 30 animals kept in facilities considered up to standard by the authors and dismissed the fate of the other specimens, a very small number of which came to Europe. Of the 7 oceanaria listed by them, 6 were within a relatively short distance of the capture area, which minimized the initial transport time.

Ridgway (1979) gave dates of capture and death for 16 whales (plus one captive-born calf) out of 31 captured over his period of study, and dates of capture for the surviving animals. Mean survival times of those which died and those surviving at the date of his paper have been calculated and compared with those for Europe (Table 2). The figures for the animals dying in captivity in both areas are very similar, suggesting that there is a vulnerable period within 2 years of capture after which survival is much improved. The survival time of European whales still living is lower than that of North America simply because more of them have been captured recently. Only 2 of Ridgway's animals were captured in the last 6 years of his study period. Emphasis was given to the great predominance of females (81.25%) among the animals lost in North America. The reverse has occurred in Europe where 8 of 9 whales (89%) were males. It seems unlikely, therefore, that any inherent sex difference in life expectancy is operating, at least within the life span (up to 13 years) of the animals under discussion.

Causes of death have been published for 22 captive whales (Ridgway 1969; Howard *et al.* 1983; Migaki & Jones 1983) and we have another manuscript case report from Hyman (1968) of an animal dying of pneumonia, not recorded by Ridgway.

Table 2. Survival times of captive killer whales

	Died	Living
North America (adapted from Ridgway 1979)	n = 16 \bar{x} = 2.54 years range 0.08–6.08	n = 17 \bar{x} = 8.22 years range 0.58–11.08
Europe (including re-exported animals)	n = 9 \bar{x} = 2.21 years range 0.42–5.75	n = 15 \bar{x} = 5.37 years range 1.25–13.0

Examination of these records together with the 9 published here (32 total) shows that the commonest causes of death in captive killer whales are pneumonia (25%), systemic mycosis including one case of nocardiosis (22%), other bacterial infections (15.6%) and mediastinal abscess (9.4%). Other conditions, occurring on one occasion only, and one undiagnosed case make up a further 28%. Bacterial infections, therefore, make up 50% of the total, which compares well with experience in dolphins. The high incidence of systemic mycosis in killer whales is unusual and alarming as, despite developments in treatment of mycotic infections, they can be very difficult to diagnose. Clinical experience indicates that upper respiratory infections with fungi, particularly *Candida* sp. are common in killer whales, and should be aggressively treated to prevent systemic spread. Mycotic infections in cetaceans are uncommon in open air, natural sea water systems and killer whales kept under these conditions may be considered less at risk.

The loss of one young whale through trauma inflicted by another animal was extremely unexpected, but clearly trainers should be aware of the potential risk of serious fighting between incompatible specimens, and facilities should allow for the separation of animals.

Killer whales in captivity are clearly capable of living for long periods provided that they adapt to captivity over the first two years. Like dolphins, once they have passed this point they appear to become more hardy as time passes. The main limitation thereafter becomes size, as the animals have a tendency to outgrow the facilities available for them. Contrary to popular opinion, killer whale survival in captivity is reasonably good, and improving all the time as we learn more about their medical care. Oceanariums displaying these animals need to apply themselves to the problem of housing and managing rapidly growing animals, preferably by working together, so that whales may continue to be exhibited for the education of the public and the promotion of the interests of their wild counterparts.

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