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Effects of Psycho-Physiological Stress on Captive Dolphins

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Comments

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Introduction

Morgane (1978) has stated that:

> *Man sees all other creatures through the narrow focus of his own knowledge and sees the whole image in distortion. We patronize animals for their incompleteness and dependence and for their fate in having taken form so far below ourselves... a great mistake, for animals should not and cannot, be measured by man. Many are gifted with many extensions of senses we have lost or never attained....They live by voices we may never hear. Some may not be our accepted brethren, but also they are not our underlings.*

If this "narrow focus on human knowledge" can be said to distort the image of the whole, it follows that an overly rigid adherence to orthodox scientific criteria, when attempting to measure the intelligence and behavior of dolphin "specimens" (particularly in the abnormal situation of confinement) will diminish, not increase, our ability to understand these creatures. An approach to studying dolphins is as harmful to our interests as it is to those of the dolphins if the procedures used involve capture and confinement for entertainment or "education." In this process, the animal is demeaned, so that its natural character cannot be appreciated. And the educational experience that accrues is hardly a wholesome source of learning, because the knowledge of the teachers themselves is distorted, since it is based on experiences with abnormally conditioned animals.

In fact, dolphins are phenomenal beings, with complex behavior patterns and capabilities that, so far, have been recognized by very few people. Those who have begun to appreciate these animals are almost unanimous in agreeing that familiarity breeds awe at the potential abilities of dolphins. For example, Jerison (1978) comments:

> *If being human means being receptive to new ideas, it surely requires us to recognize that, although unique in many ways, human intelligence has counterparts in other species.... If we define intelligence as encephalization, we have to consider humans as part of a set that also includes some cetacean species...*

It is therefore reasonable to postulate that the conditions of capture and confinement might be as stressful and harmful to dolphins as they would be to humans. This hypothesis is supported by the following evidence.

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Stress from Handling in Wild Animals

Konrad Lorenz, Nobel Prize winner and the "father" of animal ethology observes:

> ...*Similarities and analogies in the nervous processes of animals and men are sufficiently great to justify the conclusion that higher animals do indeed have subjective experiences which are qualitatively different from but in essence akin to our own* (Lorenz, 1967).

For instance, shock is a condition of collapse that may follow severe psychological or physical pain or injury. Stress, resulting from fright, anxiety, frustration, and apprehension, as well as boredom and isolation, may result in degenerative psychological and physical changes that may lead to prolonged illness and death. Dolphins suffer shock in capture, in addition to stress during and after landing, transport, and eventual confinement.

For reasons unknown, some individual animals, like certain individual human beings, have a greater ability to endure stess than others. For example, off the North Pacific coast of the U.S. and Canada, between 1962 and 1973, 50 killer whales (*Orcinus orca*) were caught and kept for oceanaria. (This total does not include 12 that died during capture operations.) The 2-year mortality in captivity was reported to be 25 percent in immature whales and 87 percent in adults (Bigg and Wolman, 1975). It is noteworthy that the data show that the captive females had a considerably higher mortality rate than did the males. Another intriguing finding was that the females who died showed a higher growth rate than those that survived (Ridgway, 1979).

While domestic animals, doubtless due to adaptation, suffer decreased trauma, and possibly less shock, after restraint and transport, it is well recognized that shock elicits a more violent and severe reaction among wild animals (Harthoom, 1979; Thorpe, 1965). Often, mortality may be related to a combination of stresses that are experienced in rapid succession. Further, the possibility that death may be an *emotional* response to stress cannot be avoided (Kisker, 1964).

Recognition of the problem of mortality among live wildlife prompted the drafters of the Convention on International Trade in Endangered Species (CITES) to include clauses stipulating that "specimens will be so prepared and shipped as to minimize the risks of injury, damage to health or cruel treatment." Additional recognition of the stresses imposed on dolphins in traveling shows prompted the South African Minister of Economic Affairs, Chris Heunis, in 1977, to amend Section 16(i) of the Sea Fisheries Act 1973 to ban the importation of dolphins and killer whales for display purposes.

Capture Shock and Confinement Stress in Dolphins

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. Many of the psycho-physiological disorders have been classified on the basis of the bodily symptoms by which they are commonly expressed among both humans and animals (Kisker, 1964). The symptoms noted in necropsy studies performed to determine the immediate physical cause of death among captive killer whales demonstrates a striking correspondence with those of psycho-physiological disorders (Ridgway, 1979).

In attempts to alleviate the trauma and subsequent effects that induce "shock" diseases, dolphins are on capture injected with cortisone and a prophylactic, broad-spectrum antibiotic (Saayman and Tayler, 1973). Despite this treatment, however, mortality rates re-

main high, and the number of dolphins that successfully endure captivity for long periods of time is commensurately low. Of 21 dusky dolphins (*Lagenorhynchus obscurus*) 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 to 30 years.

In dolphinaria abroad it is, in many cases, difficult to form a true idea of mortality rates because deaths of dolphins and whales have not been announced, and replacement animals have been given the same names as the dead animals, so that the public will not become aware of the deaths (Greenpeace, 1980). However, in 12 years of operation (1966-1978), the Napier Marinelands (New Zealand) admitted that their death tally for dolphins stands at 68, and this number does not include those dolphins that were dead when brought aboard or that were maimed during catching. Nor does this figure include those that died while being brought into port. In 1980 Marinelands in New Zealand decided to discontinue keeping dusky dolphins for display, because they did not adapt well to captivity (Robson, 1978).

Frank Robson (1978), a gold medalist for his scientific work on behalf of the Amsterdam Museum of Natural History, and the chief trainer at Napier Dolphinarium for 4 years, has expressed his concern at the lack of recognition that almost every disease contracted by captive dolphins has a strong causal link with psycho-physiological factors. He based his claim on 14 years' experience with both practical and scientific research on the disastrous relationship between psycho-physiological reactions and the health of dolphins in captivity.

Robson noted the sudden deaths of perfectly healthy dolphins, who had their blowholes tightly closed while out of the water. This indicated to him that death was due to psycho-physiological shock reaction incurred while enduring "stress" that had advanced to severe shock. When this stage is reached, processes that control the dolphin's natural breathing function of "blowing" are blocked by the effects of its disturbed emotional state.

The opportunity to test this assumption came when Robson investigated the reason why hundreds of dolphins were accidentally captured in trawl nets in waters near New Zealand during 1970-1974. The examination of these unfortunate victims revealed that they were physically healthy; few had died as a result of drowning. Only 5 percent were found to have water in the lungs; 92 percent had died from the ravages of psycho-physiological shock reaction, and the remaining 3 percent had died from internal hemorrhage of the heart—another type of shock reaction, since no water was found in the lungs.

Robson divided death in dolphins caused by psycho-physiological reactions into three categories:

Category 1: Sudden death, such as described above.

Category 2: Death of dolphins that survived the catching and transportation to pools, but died within a month of being caught.

Category 3: Dolphins that died, usually from respiratory problems, after being held captive for varying lengths of time—many were found to be suffering from pneumonia.

Robson considers that the inability of dolphins to deal with mental/emotional disorders, usually attributable to captivity, was responsible in many cases for the pneumonia or other respiratory problems.

He states that the first symptoms of the presence of these psycho-physiological states is a gradual or spasmodic decline in appetite. The effect of this is a reduction in blubber thickness, thereby

decreasing the dolphins' natural insulation. This, in turn, causes a lowering in body temperature and is responsible for the dwindling ability of dolphins to retain body heat in the chilly water. This phenomenon is a critical factor in the promotion of pulmonary affliction and pneumonia. Based on observations of the ante-death behavior of afflicted dolphins, we can conclude that little doubt remains that, while pneumonia may have been the direct cause of death, this condition was induced by stress. Death therefore resulted from the psycho-physiological inability of the dolphin to maintain sufficient control over respiration due to inhibitory emotional disturbances.

The foregoing observations tend to be supported by those of K.S. Norris, Professor of Natural History, University of California, an internationally recognized authority on free-ranging dolphins. Writing in 1976, he states:

> *Confinement compresses natural activity so tightly that it may be distorted beyond recognition. The captive porpoise forms unnatural life patterns, like the antelope in a zoo, used naturally to ranging many miles a day which comes to promenade in a stereotyped figure of eight around his cage until the single track is rutted a foot below the surrounding soil....Rigid daily regimes such as dolphin show routines are especially stressful.*

The observations of Norris have been endorsed by many former workers at dolphinaria, as well as others who have studied these animals closely. In mid-1979, the former dolphin trainer and curator of the Port Elizabeth Oceanarium, Colin Tayler—who was employed at the oceanarium for 10 years, during which time he was responsible for building up the famous dolphin shows—said he believed stress was the main cause of three recent dolphin deaths (*Cape Argus*, August 14, 1979).

Case Histories

A popular attraction at the California Academy of Sciences is the dolphin tank. Officials, noticing that one of the dolphins occasionally bled from the intestine, conducted tests and found that the animal had developed a duodenal ulcer. *He was treated on the anthropomorphic premise that the cause was anxiety.* At length, 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. When the glass wall was covered up, the condition cleared up (Cousteau, 1975).

Bimbo, a pilot whale of Marineland of the Pacific, was less fortunate. When his female, and a Pacific white-sided dolphin, which were his only companions, died he swam round his tank for days, clasping each of his dead companions with a flipper. He refused food and lost 20 percent of his 4,500-lb weight. Dr. M.E. Webber, a physician, suggested he had become psychoneurotic: in human terms, a manic-depressive. One day, as the usual crowd watched him through the glass of his tank, he swam with all his power against a glass port, shattering it. A few months later, because of his deteriorating mental state, he was released near a pod of other pilot whales. An "emotional convict" returned to freedom, he was not seen again (Cousteau, 1975).

Dan, a male bottlenose dolphin (*Tursiops aduncus*) became so agressive after 8 years of captivity in Port Elizabeth Oceanarium, that he had to be released in August 1976. Not only did he threaten human beings, but he prevented the other dolphins in the oceanarium from performing their circus acts. It has now been alleged, though not confirmed, that Gambit, the Atlantic bottlenose dolphin caught off Walvis Bay in November 1976 is showing similar traits. His female companion, Purdey, died early in

March 1979 of *Klebsiella pneumoniae* infection.

Malia, an Indian Ocean bottlenose dolphin (*Tursiops aduncus*) was captured by the Port Elizabeth Oceanarium in April 1977. Later, she was confined in solitude for months because it was presumed that she was pregnant. Her only companion throughout this time was a child's plastic surfboard, which she managed to wedge just under her tail. In March 1979 she contracted *Klebsiella pneumoniae,* but recovered after treatment. After the capture of three new bottlenose dolphins in 1979, she was returned to Port Elizabeth.

About mid-1980, because repairs were being made to the main pool, she was transferred again to a small retaining pool. A few weeks later she went off her food and, despite feeding every 5 hours plus the application of a range of antibiotics, she became progressively thinner; she died in early September. The symptoms prior to death, which was believed to be due to respiratory disease, conformed very well with Frank Robson's description of disease induced through psycho-physiological disturbance.

Conclusion

The author's 25 years' experience with the consequences of the stress caused by the capture, holding, and transport of wildlife amply confirm that these procedures result in a tragic wastage of life. Some extremes are accurately described by the former dealer Jacques-Yves Domalain in his well-known book *The Animal Connection.* Through visits to captive animal facilities in many parts of the world, the author endorses the views of K.R. Norris concerning the deleterious effects of captivity, as shown in the abnormal behavior of captive animals. Despite the difficulties, field work with gorillas, chimpanzees, orangutans, and wolves demonstrates that the most realistic observations and assessments on wild animals are those made in the natural environment.

Notwithstanding the useful captive breeding work done by a number of reputable zoological establishments, studdies by IUCN/SSC/TRAFFIC 1980 and others (Burton and Barzdo, 1980) show that, overall, zoos continue to be consumers rather than conservors of wildlife, and that husbandry of captive animals for breeding for ultimate re-introduction into the wild is of minimal, if any, significance. Possibly, the maintenance of captive wild animal populations for educational and research purposes may alleviate continued pressure on wild populations. But the evidence shows that the profit-motivated use of animals in circus-type displays merely consumes animals; it does not assist in their conservation.

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The Judeo-Christian Tradition and the Human/Animal Bond

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This paper surveys the role of animal imagery in the literature of the Old Testament and in post-biblical Jewish literature, discusses biblical materials that speak to the relation of humankind to animals, and assesses the subsequent use of these traditions to support or negate specific attitudes toward the natural environment.

A righteous man has regard for the life of his beast, but the mercy of the wicked is cruel (Proverbs 12:10).

It is always perilous to some degree to ask a modern question of an ancient text or tradition. The obvious danger is that the investigator will shape the tradition to suit his or her own predetermined purposes and ignore or explain away that which does not fit those aims. The Judeo-Christian tradition has had that sort of treatment on the very question that we will investigate here. Interpretations based on self-interest have been all the more easy to arrive at because the human/animal companion bond is a subject that has not received a great deal of self-conscious reflection in the Judeo-Christian tradition and its literatures, and because many of the ecological conditions within which the contemporary inquiry is raised did not obtain in the ancient world.

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