

Historical Perspectives

Jay Sweeney

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For over 50 years, Jay Sweeney, VMD (University of Pennsylvania), has been professionally committed to the care and conservation of marine mammals. As a founder and co-owner of Dolphin Quest, Jay realized his dream of creating model habitats for bottlenose dolphins and a nonprofit foundation that supports vital marine conservation and research. Through Dolphin Quest, Jay, along with partner Dr. Rae Stone, has also created innovative interactive educational programs with bottlenose dolphins in natural lagoon environments. Since 1972, Jay has operated a thriving veterinary consulting practice in Aquatic Animal Medicine for international clientele and has gained world renown through hundreds of lectures, including as the main lecturer in many medical workshops for veterinarians, over 50 published journal articles, and extensive field research work with free-living marine mammals. His contributions to the development of modern preventive healthcare programs for marine mammals have revolutionized husbandry practices for these animals in oceanariums and aquariums worldwide. Jay is recognized as a leader in the diagnosis and treatment of diseases of aquatic mammals as he continues to provide medical support, new location design assistance, training of personnel in medical capabilities, and a broad array of animal management procedures. He is a past president of the International Association for Aquatic Animal Medicine (IAAAM) and continues to actively serve on many of its committees. In addition, Jay is a member of the American Veterinary Medical Association (AVMA), the International Marine Animal Trainers Association (IMATA), the European Association for Aquatic Mammals (EAAM), and the Alliance of Marine Mammal Parks and Aquariums (AMMPA). Jay received the prestigious “Excellence in Marine Mammal Medicine” award in 2002 from the IAAAM and “The Sonny Allen Professional Achievement Award” in 2005 from IMATA.

(The text above was taken from the Dolphin Quest website: <https://dolphinquest.com/about-us/about-the-founders>.)



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Genesis and Benefits of Human/Dolphin Interactions Leading to Dolphin Interaction Programs: Personal Observations from 1969 to 2020

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My first direct contact experiences with marine mammals occurred in the summers of 1969 and 1970 as a third- and fourth-year veterinary student at the University of Pennsylvania School of Veterinary Medicine. I spent the summer months of those two years as an extern at SeaWorld in my hometown of San Diego under Dr. Dave Kenny. There, I observed dolphins, killer whales, seals, and sea lions that were engaged in shows for public entertainment and also observed those stranded on local beaches. At that time, all animals were acquired via collection from the wild, and then, after a brief period of acclimation, trained using basic operant conditioning, delivered typically by a single trainer “working” with a single animal until basic behaviors were performed reliably. Other animals were taught the same behaviors in the same way by the same trainers (Figure 1 is a more recent example). Eventually, the animals were mixed into a group as a show team, remaining with those animals with minimal,

if any, changes over time. Show performances were maintained by repetition with as little variability as possible. During this period, I was given the opportunity of working hands-on with the animals during medical procedures that were performed under physical restraint, always requiring removing the animal from the water, usually by draining the pool of water. This, of course, took a considerable amount of time (hours in some cases) and cost in pumping and/or in lost saltwater in closed recirculating systems. So, in those days, clinical attention to cetaceans was reactive, not preventive.

The 1970s

In the mid-to-late 1970s, there were two major developments in marine mammal husbandry management (especially for cetaceans). First, training for dolphins in show programs progressed from formal stand-up rigidity (Figure 2) to much more



Figure 1. Trainer with dolphin (Photo provided by Dolphin Quest)



Figure 2. Pre-1970 style of training dolphins and sea lions (Photo provided by Jay Sweeney)



Figure 3. Dolphin jumping over trainer in water (Photo from Marineland of the Pacific)

diverse and dramatic behaviors, especially those including trainers entering the water for combined (dolphin/trainer) actions that included physical behaviors such as foot-pushes both under and out of the water (rocket rides) and fast swims with a trainer balanced on the back of a dolphin (surf riding), and calm interactive behaviors where trainer/dolphin duos remained at the water surface (Figure 3). These types of behaviors were very popular with both dolphins/trainers and audiences at marine parks. Additionally, the rigid style of animal management during training activities relaxed. Communication and techniques were shared between trainers, resulting in diverse enrichment options for the animals—for example, toys, direct spontaneous interactions between trainers and animals, and even interactions between members of the public and the animals (Figure 4). Such was first noted at Marineland of the Pacific where after each show performance, balls were thrown into the water allowing animals and people to play catch together for considerable periods of time. These unstructured moments were very clearly enjoyed by all.

Second, trainers and veterinarians progressively began working together in the training of medical behaviors (animals trained to voluntarily hold reliably for medical procedures such as venipuncture and gastric, blow, and urine collections). These medical behaviors were first utilized with killer



Figure 4. Trainers find/make great toys for play with dolphins (Photo provided by Dolphin Quest)



Figure 5. Medical behaviors were first developed with killer whales (Photo from Marineland of the Pacific)

whales, largely as a necessity, given their size and the logistical challenges in obtaining such samples (Figure 5). The success with such behaviors quickly led to training in other cetaceans and eventually with pinnipeds, beginning with California sea lions. This teamwork approach to animal healthcare management not only yielded abundance and reliability of obtaining medical samples, it led, in many cases, to a team approach to preventive medicine between trainers and veterinarians. Also of note was that with the training of medical behaviors, trainers invested more time in the animals to successfully attain such behaviors. Along with more time, the training processes required a large amount of careful hands-on contact with the animals. Again, for both animals and trainers, the hands-on interactions were mutually reinforcing. Quickly evident was that trainers and animals were establishing true positive relationships of trust. The knowledge and experience gained in the training and benefits of medical behaviors became huge subjects of interest at the annual International Marine Animal Trainers Association (IMATA) conferences of the late 1970s and 1980s.

The 1980s

At this point, some key manager-level persons provided strong advocacy for the team approach to behavior management, including in daily husbandry priorities. This was highlighted, again, at Marineland of the Pacific in Los Angeles, where team successes in burgeoning behavior/medical management were celebrated throughout the organization as animals (cetaceans and pinnipeds) were clearly benefiting from the attention and variability in daily activities. In those days, another key action that was taking prominence at Marineland was the presence of a large group of volunteers who fielded assistance with customer service “on the ground” and also were encouraged to keep a “watch” on animals away from shows and programmed activities. Some of the volunteers were “regulars,” clearly animal lovers, who very much became team members within the healthcare management schemes at that location. During the off seasons, Marineland was closed every Monday and Tuesday. As the consulting veterinarian at the facility, I spent these days at the park performing healthcare activities. These were the times in which basically all animal-related activities were direct interactions between company animal-related employees AND the volunteers. The one unforgettable element of this was watching (and participating with) trainers and volunteers who *played* with the animals. It became very evident to me and virtually all others that the animals significantly “brightened up” as

they elevated the diversity of the responses to the presence of people. This was, in my mind, the beginning of interactive programming between resident marine mammals and people.

The second major event on the animal healthcare management front was the fact that, again, Marineland of the Pacific was very receptive to providing training experiences for persons wishing to learn about, and possibly be employed in, the marine mammal display field(s). These opportunities were provided *ad hoc* to resourceful persons and allowed by employees and management (Tom Otten and Brad Andrews) of the park who obviously saw the advantage of future employee development and in adopting passionate animal lovers. At the time, I was able to provide the same experiential training for young veterinary students and veterinarians, noting that this opportunity was afforded to me at the beginning of my training by SeaWorld. One such “student” was Dr. Rae Stone, a young veterinarian who was the most resourceful student of the lot. Dr. Stone initiated a project at Marineland in 1982 exploring a new medical technology called diagnostic ultrasonography (Figure 6). From this early work was developed what now is a mainstay of our diagnostic armamentarium practiced by marine mammal healthcare managers around the world. However, the medical breakthrough technology was not the only huge beneficial element to grow from this work. To perform medical diagnostic ultrasound exams on marine mammals, it quickly became apparent that the technician, as well as the animal, needed to be comfortable in the process. This required that the animals become trained for the specific orientations needed but also trained to be held for sufficient periods of time while the procedure was performed. The animals also needed to remain calm and relaxed so as to avoid ANY splashing that might ruin the ultrasound machine with saltwater (Figure 7). It was this



Figure 6. Early development of diagnostic ultrasound with marine mammals was not easy (Photo from Marineland of the Pacific)



Figure 7. Dolphin remains calm and relaxed for ultrasound exam (Photo provided by Dolphin Quest)

training and working dynamic that created the bonding and trusting relationship between trainers and their animals that now is the cornerstone to interactive activities between marine mammals and people.

In 1994, Dr. Stone and I formed a partnership with the goal of initiating an interactive program format for guests similar to our experiences with the trainers and volunteers at Marineland. The programs were to take place in natural seawater tropical ocean lagoons, with behaviorists specifically trained in the experiences as described above. Paying guests would allow for purposeful profitability, creating funds for local education programs as well as support for conservation research projects. We set about finding a place that was like-minded. The resort community was our focus from the beginning as such places have the resources to fit the desired environmental niche. With success in this quest, Dolphin Quest Inc. was born.

During my years as a consulting veterinarian, I provided services in support of university-level projects in which animal handling and sample taking were required. This work became a new challenge in dealing with a variety of species and locations amidst wild and mostly pristine marine environments, including our own Dolphin Quest facilities (Figure 8), as well as with persons from the academic community who are just as passionate in their animal interests as animal behaviorists. Most such projects involved working with graduate-level students in projects conducted by research principal investigators. Many of those students themselves have risen to principal researcher level at a variety

of universities and institutions and are individuals with whom we continue to work collaboratively to this day.

Formal dolphin interactive programs at Dolphin Quest were initiated in late 1988. As with other marine parks housing marine mammals, we were subject to two major regulatory mandates: (1) the Animal Welfare Act of the U.S. Department of Agriculture and (2) the Marine Mammal Protection Act of the U.S. Department of Commerce. Our new interactive programs were labeled by the National Marine Fisheries Service as Swim with the Dolphin (SWTD) Programs. Dolphin Quest Hawaii (at the Hyatt Regency Waikoloa on the island of Hawaii) was opened in September of that year. Dolphin Research Center in the Florida Keys was in the process of a similar program at the same time. Both were located in natural seawater lagoons which was a substantial enlargement in space from the traditional marine park (Figure 9). The SWTD name is, in some cases, a misnomer inasmuch as in many programs, guests are standing in very shallow water (less than 1 m) and/or are sitting on a submerged platform.

The 1990s

The diversity of interactions between marine mammals and their trainers became a focus and priority of daily interactions at most public display facilities, especially for cetaceans. The use of reinforcers to facilitate training began taking on more complex



Figure 8. Dolphin Quest facilities are noted for their large and beautiful tropical lagoons (Photo provided by Dolphin Quest)



Figure 9. School kids interacting with dolphins and trainers in shallow water (Photo provided by Dolphin Quest)

and innovative opportunities. The long-standing *primary* reinforcer (food) was enhanced by the provision of a more diverse diet of commercially available species of fish. But it was the development of secondary reinforcers that made for fun and creativity in the hands of animal managers. Secondary reinforcers include toys, expressions of excitement by trainers (e.g., voice, facial expressions, and “body language”), and social (cohort animals) mixing, which create more complex training challenges and the necessity for more trainer time. By this time, trainers were clearly becoming part of the social mix within the environment. They engaged in play, created games and toys, and, through the process of building bonding and trusting relationships with the animals, participated in more and more hands-on interactions, including touching, petting, rubbing, holding, and related activities (Figure 10). These sorts of engagement activities take time, and it was clear then the trainers’ time had become in and of itself a strong secondary reinforcer for the animals. The more trainer time the better, and the participation in interactive activities made for far more time spent compared to the days of repetitive show activities. From this, the concept of environmental enrichment or just *enrichment* emerged as creating relationships with the animals was, in actuality, improving the managed environment significantly.

As noted at the beginning of this essay, in the early days of public displays of marine mammals, virtually all animals originated via collection from the wild. It was not until the 1990s that reproduction and survival of progeny began to become the basis for internally mediated population sustainability. However, longevity of progeny in the 1980s was poor. As enrichment of managed environments blossomed in the 1990s, so did survivorship of progeny. As a result, animal in-house populations began to consist more and more of “captive born” progeny. During this decade, percentage of survivorship, in some facilities, reached into the 60 to 70% range, comparable to what little information was available from wild populations at the time. Looking back from today, the observed improvement in progeny viability had a clear relationship to the functional comfort of the moms, especially where social groupings were made of compatible conspecifics. It was clear to me that this state of social equity came from the enrichment factors noted above.

The SWTG programs beginning in the late 1980s became a sensational attraction to aquatic animal enthusiasts. The few programs that commenced at that time were joined by an explosion of new programs throughout Mexico and the Caribbean islands. Most were in natural seawater coastal environments (Figure 11).



Figure 10. Physical activities between trainer and dolphin are mutual (Photo provided by Dolphin Quest)



Figure 11. Large natural coastal area of the original Dolphin Quest Bermuda (Photo provided by Dolphin Quest)

The 2000s

Whether it is called enrichment, environmental enrichment, sound population management, or animal welfare, the process of increased trainer time with a huge variety of secondary reinforcement options and mutual contact interactions has proven to have significant benefits to the marine mammals both in behavioral and social management, as well as to healthcare management, given that virtually all animals in such programs are thoroughly medical trained for voluntary positioning for medical sampling while unrestrained. As such, the process of interactions between trainers and their marine mammals has directly facilitated the realization of successful medical behaviors. Indeed, marine mammals (cetaceans and pinnipeds) were the first, if not the only, animals who voluntarily participated in their health care.

While cetacean reproduction was seeing a modestly successful learning curve for female dolphins and their trainers, there were still newborn losses within the first month of early growth, resulting in $\pm 30\%$ of fatalities. The newborn cetaceans, we have found, are very sensitive to failure to thrive problems, something noted also among wild populations along with predation losses. At the time, veterinary experience with neonates was essentially non-existent due to fears of handling losses with experiences

from the 1980s and 1990s. As a result, there was no information on the cause(s) of neonate mortalities and/or possible veterinary interventions that might have some positive impact on the losses.

At Dolphin Quest, we made a decision to challenge the prevailing fear of handling newborns to generate a veterinary management opportunity for (1) assessing causes of neonate mortality in bottlenose dolphins, (2) establishing handling parameters that provide for reliable survivorship of neonates while handled for health assessment procedures, (3) providing means for early diagnosis of neonate regression during the critical first 30 days following birth and implementation of therapeutic and/or management intervention, and (4) establishing medical norms for neonate bottlenose dolphins for reference. From those early experiences, one consistent observation of cetacean moms and babies is that they are constantly touching each other (Figure 12). In watching the early life of a neonate cetacean, it quickly became clear that a mom's flipper touch to a neonate's body is generating a social context that is imprinted on the baby and is a constant and necessary directive in future social conditioning. Cetaceans, and to a lesser extent pinnipeds, are behaviorally interactive. They love to touch, and be touched by, their conspecifics, including their trainers. Once recognized as a commonly shared social/behavioral imperative, trainers quickly recognized



Figure 12. Mom and neonate develop social interaction norms with flipper touching, etc. (Photo provided by Dolphin Quest)

the opportunity to connect within the dolphin mom and neonate social world. With this realization, Dolphin Quest initiated our Project Newborn, which focused on the four challenges above.

We, along with SeaWorld and the U.S. Navy Marine Mammal Program, collaborated to review neonate experiences (249 births combined from the three facilities) and to assess differences in management processes comparing records from the decades of 1990-1999 and 2000-2009. Findings from that study can be found in Sweeney et al. (2010). This was the first collaborative collection of data on neonate survival from a significantly sized population. It compared management practice proficiency over the progression of time between the two decades. The data reported afforded a benchmark for improvement in survivorship success for veterinarians and animal managers.

To follow through with the Project Newborn goals above, we made the commitment among all staff and managers that we would undergo restraint and medical examination of all neonates born between the two Dolphin Quest birthing facilities (Hawaii Big Island and Bermuda) at the age of 2 to 4 days,

15 days, and 30 days, then monthly through the first year after birth. Of this process, we quickly found that to prevent an aversive collection experience with the delicate neonates, we first had to establish trust and avoidance of a protective response by the moms at the moment of handling. For this, we set upon training the collection sequences, including location in shallow water and to all birthing moms prior to and through each trimester of pregnancy up to and including impending pre-parturient periods. The moms were exposed to the space limiting panels, the push into shallow water, and the collection (without chase, grabbing, or turbulence) utilizing positive reinforcement techniques, especially with trainer/mom interactive handling, creating a positive experience to the process for the moms. This training turned out to be extremely helpful in garnering a quiet and predictable experience for the neonates who always are "nose-to-nose" with their moms throughout the handling process necessary for carrying out procedures, including the physical exam, collection of blood samples, measurements for morphometric calculations for weight determination, and passing of a stomach tube to assess nursing success and/or



Figure 13. Soft panels allow for shallow water mom and neonate handling in Project Newborn (Photo provided by Dolphin Quest)



Figure 14. Trainers develop loving and trusting relationships with the dolphins (Photo provided by Dolphin Quest)

for giving water, formula, and/or medication(s). All of these processes were performed while maintaining the gently restrained neonate in the water (at eye emersion under the water). At the same time, milk is collected from the moms for assessment and/or use in formula. The Project Newborn process has

become routine for Dolphin Quest, which in the years from 2002 to 2020 has had a success rate with neonates from birth to one year of age of over 90% in 29 births during that period of time (Figure 13).

Detractors have claimed that humans interacting with dolphins or sea lions in interactive programs

is stressful to the animals. As described in this 50+ year historic recollection, human interaction experiences with marine mammals have evolved over many years of ever more and varied experiences initiated with trainers developing the training process and then adding contact progressively. Trainers of the 2000s typically are graduates of universities and specialty animal management programs, and they have become skilled animal behaviorists capable of employing sophisticated behavioral modification skills on a daily basis. By nature, trainers are animal enthusiasts. As noted herein, they also are great observers of animal behavior both in conditioning experimentation and also in watching natural behavior, particularly those interactions between mothers and their babies. Through underwater viewing of cetaceans, trainers are able to watch nursing behavior between mothers and their neonates, which is essential in monitoring the earliest progress of the babies' nutrition, as well as in accounting for excretions (urine and feces), eye condition, weight gain, etc. Observers also have noted the incredible presence of almost constant touching by the mom and baby. These interactions become more varied over time but remain almost constant, in fact, throughout life, becoming a major part of social interactions between conspecifics. It turns out that these animals look for, participate in, and gain social comfort from these contact behaviors.

We now know that as humans become more and more frequently engaged in physical interactive experiences with these animals, particularly cetaceans, they begin to also participate within the social mix of the animals within a managed population. This development of *relationships* has, in some facilities, resulted in a strong bonding between these animals and their trainers and husbandry caretakers (Figure 14). It is through this bonding of trust and social reinforcement that interactive programs like SWTD have been managed. From the veterinary perspective, animals that engage in such trainer/animal interactions perform medical behaviors to a high level of reliability and duration, resulting in true preventive medical practice(s). This fact is significant in increasing the longevity, quality of life, and wellness of these individuals. All of the above noted environmental, social, and wellness principles contribute to a high level of overall animal welfare in these populations.

Literature Cited

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