

# The Future of Zoos Through the Eyes of a Dreamer

Steve Martin, Natural Encounters, Inc.





### Abstract

Walt Disney said, “First, think. Second, believe. Third, dream. And finally, dare.” I believe dreaming is what made Walt Disney so successful, and what helps shape zoological facilities of the future. Dreams have inspired me toward many goals, some achieved and many still living in my imagination waiting for the right condition to take flight.

I dream the zoological facility of the future will flourish in a safe zone where daring to act on dreams is supported and nurtured, and dreams that don’t work out are seen as opportunities to start again with more information, rather than a failure to be punished through peer pressure or criticism. In future zoos, all animal care professionals will have a clear understanding of the science of behavior-change and be able to apply these principals at extraordinary levels with every animal at the facility instead of just the animals in their section. Through this exemplary training, animals experience optimal welfare and desirable behaviors will replace problem behaviors. I see animals in environments rich with behavioral opportunities, empowered with control, and motivated to use their senses and adaptations to “earn” a living, much like their wild counterparts. When animals do what nature built them to do, their behavior will convey insights and stories that inspire caring and conservation action in guests at our facilities.

### Introduction

When I dream of the next level of zoological facilities, I think about advancements in animal training, animal welfare, guest experience and more. Maya Angelou said “I did then what I knew how to do. Now that I know better, I do better.” In future zoos, doing better will include breaking out of the comfort zone, discovering new goals, and daring to pursue those goals. It means good enough is never good enough because there is always a better way, if only you can dream it. A safe zone is required to nurture these kinds of dreams and inspire creative

thinking and acting that will sometimes result in failure. In this safe zone is where people can realize failure is simply an opportunity to start again with more information. Life on this planet has evolved, in part, through failure. Every individual of every species has taken action that did not work well for them, and that failure led to different behavior and better outcomes that shaped the future behavior of that animal. Walt Disney himself experienced many failures, including being fired from his job at a newspaper for lack of creativity.

Creating a safe zone requires team work and high trust accounts. It is not uncommon to see people at odds with each other for one reason or another. Dr. Susan Friedman often says, “It’s hard being human.”, which is absolutely true. And I think it’s hard building trusting relationships as well. But, given the motivation and an understanding of the science of behavior change principals, it’s more than possible.

Think of building trust with any non-human animal in your life. You build trust through repetitions of behavior that results in positive reinforcement.

You can’t force an animal to like you any more than you can force a human to like you. You can force people to do things, just like you can force animals to do things, but threats and coercion weaken trust. Building trust with a human involves first discovering a person’s reinforcers. For many, recognition is a strong reinforcer for behavior and it can be something as simple as saying “Thank you” or “Nice job” when you genuinely feel the praise is warranted. We often miss opportunities to reinforce behavior and make a deposit into the trust account because we expect people to operate at a certain level without reinforcement. People have actually said to me, “I’m not going to thank him for doing what he gets paid to do.”

Unfortunately, many people squander trust catching people doing something wrong rather than building trust by catching people doing something right. I’m not saying you should avoid correcting people. On the contrary, I am saying when a

---

*First, think.  
Second, believe.  
Third, dream.  
And finally, dare.*

---

person does something wrong, you have an important opportunity to add trust to the account by helping the person grow from the experience. When your motivation is to help and not hurt, you look at these opportunities differently. When someone does something wrong, look at it as an opportunity to help that person grow, put trust into the account, and create a “safe zone” where the person is comfortable learning from mistakes. Otherwise, people might hide their mistakes and then no one learns from the situation and the same mistake may be made by others.

For some, it is reinforcing to yell at people and express their discontent while motivating people to comply with rules or commands. Forcing people to perform out of fear of reprimand is not uncommon in some facilities and may get some short-term results. However, animals, including the human animal, motivated by threats will only operate at the level necessary to avoid the aversive stimulus. On the other hand, animals motivated by positive reinforcement will look forward to the interactions, be more creative about how to earn the reinforcers and will work harder to gain the reinforcers. Just saying “Thank you” or “Good job” can reinforce desirable behavior that might replace unwanted behavior and build trusting relationships at the same time.

#### Dreaming of Expert Training

Animal training in zoological facilities is more common than ever before. However, the application of training technology varies greatly from one facility to the next and from one person to the next. Training with positive reinforcement is a relatively new activity in zoos and, as such, many people are left to their own imagination and guesses when figuring out how to shape a new behavior. They think they are doing a good job because they make some progress. But, they invest their belief in a technology that they know so little about. Far more than saying “good” or clicking a clicker and giving a treat, expert animal training involves extraordinary mechanical skill, deft perception of body language and antecedent conditions, and an exceptional understanding of the science of behavior-change principals. These are just a few of the most important characteristics learned through experience and expert guidance.

My dream is for all animal-care professionals to give their



animal a “voice” through its behavior. When an animal has the ability to say “No” and the trainer acknowledges this communication with appropriate behavior, such as backing away, the animal experiences a level of control that forms the foundation for a trusting relationship.

As we walked by a clouded leopard’s enclosure at a zoo, the leopard jumped up on the platform at my eye level, just inches away, and showed overt aggressive body language, e.g. vocalizations, staring at me, and hair raised. I said to the keeper, “Ok, let’s just keep moving.” She responded, “No, wait. We have to stand here until he is calm, then we can go.” I kept quiet and followed her lead. After a minute or so, the aggression subsided and she led the way out of the building. When I asked why she wanted to stay there in front of the cat with all that aggression happening, she replied, “I was told we have to stay there because he wants us to leave and we don’t want to reinforce that aggressive behavior. So, we have to wait for the animal to calm down and then we can leave to reinforce the calm behavior.” This led to a good conversation about who we want to be to that cat, and how do we know what the animal is thinking?

Do we want to give the animal a voice or take away its voice? Do we want to be the boss, the alpha, the leader, and make the animal comply with our commands? This may work for some people with some animals on restraint or when they can inflict pain, discomfort, or fear. But, my goal is to be a partner with the animal, someone who the animal wants to be



around because of the positive interactions. If an animal tells me, through its body language, that it wants me to leave, then I leave. To stay would probably take trust from our account. After I leave I build a plan for how to create a trusting relationship with that animal through positive reinforcement, and avoid any situation in the future that might encourage aggressive body language. One of my favorite plans is to repeatedly walk past the animal and drop a piece of food in a place the animal can reach, like a food chute, or tossed under the door or through the mesh barrier. In this plan the food is place non-contingently and I never stop to look at or talk to the animal. The predictability of the reinforcer every time I walk by is important. This counter conditioning procedure will help the animal begin to replace fear behavior with calm, attentive behavior at my approach. There are many ways to build trust with that cat, but standing in front of it when it is aggressing may only lead to more aggression and a bankrupt trust account.

An animal's voice should be acknowledged by the trainer the moment she/he enters the room. Too many trainers just blunder into a training session with no consideration for the animal's behavior. They place a bucket of favorite food items in front of an animal, then arrange target sticks, tongs, bait sticks, and other training tools at their feet, all before ever looking at the animal. The animal had no opportunity to either invite the trainer into its personal space or express, through its body language, a level of concern that would stop the approach of a sensitive and skilled trainer. When information flows one direction, the stage is set for a "Command session" instead of a training session where information flows in both directions.

In my dream, a command is different from a cue in that it suggests an animal must do the behavior or there will be aversive consequences. Commands are often associated with a loud, stern voice, strong demanding body language, and an attitude that the animal must obey. Common in command sessions is the idea that an animal is trying to put one over on the trainer, messing with his mind, or has some other nefarious motive for their actions. This leads to blaming the animal for desirable behavior. The moment a trainer blames the animal and washes his hands of the responsibility for undesirable behavior, is the moment dreams become mired in old-school mentality and fail to progress training outcomes at a high level.

To dare to take responsibility for your animal's undesirable behavior is a big step for many trainers. For some, it may create a feeling of vulnerability to criticism or compromise their status as supervisor, manager or elite trainer. For others, it may mean more work to try and figure out what they did wrong or how to find solutions for the problem behavior. For whatever motivation there is to blame the animal, there are strategies and solutions inspired by the empowerment that comes with accepting responsibility for problem behavior of the animal you are training. The first step is to recognize the animal's behavior reflects your training skills. The second step is to understand "behavior is not in the animal, it is in the environment we create," which is another one of my favorite quotes from Dr. Susan Friedman.

Think about how clear, two-way communication might improve your training outcomes. Perfectly timed and delivered cues (SD), meticulous use of prompts, precise timing of bridging stimuli, and immediate delivery of reinforcing consequences are just a few things trainers do that bring clarity to

the training environment. Animals communicate in kind with subtle body language that skilled trainers read and instinctively adjust their own behavior to promote this important dialogue. Unfortunately, not all communications are so clear in today's training environments.

Time out from positive reinforcement is a negative punishment training procedure used too often in training sessions. It's confusing to animals and often results in aggression, apathy, or frustration. At best, a time out tell animals what not to do. However, expert-level training occurs when communications are focused on helping an animal understand what to do in a positive reinforcement program. Generally, trainers give time outs in an attempt to punish a specific behavior or even an animal. They blame the animal for what is often a trainer error associated with un-clear criteria for behavior, low rate of reinforcement, poor antecedent arrangement, or poor mechanical skills. My dream involves trainers responding to undesirable behavior not with time outs, but by ignoring wrong behavior and then immediately cueing a couple of high probability behaviors, each followed by high value reinforcers. This will create behavioral momentum that will often get the animal back on track and with more motivation when the trainer cues the behavior the animal missed earlier.

Someone asked me, "So, if an orangutan spits in your face you won't give him a time out?" I responded, "Absolutely not." I would do my best to stay calm, quickly try to understand his motivation for the spit and my role in the problem behavior, cue a couple easy and high-probability behaviors like hand or foot presents, reinforce each of those behaviors with large quantity of high value food items to get the atmosphere back to positive, then leave the area to clean up and develop a plan. My plan would include evaluating the antecedent conditions that led up to the spitting, evaluate the function of the behavior (what is the reinforcer for the behavior?) and then build a plan for how to replace spitting behavior with more desirable behavior. This plan would likely include higher rates of reinforcement and possibly shorter training sessions. Many trainers ask for 30 or more behaviors in a training session, all reinforced with slivers of treats. These "blazing behaviors" training sessions are often associated with unclear communication and low rates of reinforcement and lead to undesirable behavior. A good alternative plan might be to ask for four or five behaviors in a training session, with each correct behavior followed by super-sized reinforcers.

Communication is also muddled when trainers fail to follow a bridging stimulus with a back-up reinforcer. They mistakenly think this form of training is a variable schedule of reinforcement. They fail to realize if the bridging stimulus is a reinforcer (a secondary reinforcer) they are using a continuous schedule of reinforcement. Technically, failing to back up a bridging stimulus with a reinforcer is a respondent extinction trial. Just as Pavlov paired the metronome sound with the meat powder that triggered salivation from the dog, a clicker, or other bridging stimulus, is paired with food (or other reinforcer) in our training sessions. Pavlov called the metronome sound a conditional reinforcer ... the meaning of the metronome is conditional on being paired with a back-up unconditional stimulus. When his work was translated from Russian to English, the word "conditional" was translated as "conditioned" - a very different word and meaning. When trainers fail to back up a



bridging stimulus with another reinforcer, the bridging stimulus begins to lose its ability to predict another reinforcer is coming. Consequently, the bridging stimulus loses its ability to mark specific behavior, the rate of reinforcement decreases, and animals get confused. All of this can lead to poor training outcomes, frustration-elicited aggression, apathy and so much more. Unfortunately, when these things occur, many trainers blame the animal instead of their training strategy. BELIEF in the science and reevaluation of training strategies would empower trainers with better tools in times like these.

But, what explains when animals continue to work in this misguided training system? When the clicker, whistle, or verbal bridge is not reliably backed up with another reinforcer, many animals will simply look for more salient information about when a reinforcer is coming. They start watching the trainer's body language. The subtle movement of the hand toward the bait bag is a visual bridging stimulus that often supersedes the audible bridging stimulus, especially in training systems where the bridge is not reliably backed-up.

So, what if a trainer wants the animal to perform multiple behaviors before getting a food reinforcer? It is possible to thin the pairing of the bridging stimulus and the back-up food reinforcer so the cue for a behavior becomes the bridging stimulus and reinforcer for the previous behavior. However, it is important to note that this is a process that should be implemented systematically over time to help the animal understand not every performance of a correct behavior will be reinforced with food. When done right, the cue gains history of predicting reinforcement is coming and it will itself become a conditional reinforcer. Ultimately, a trainer can perform a sequence of multiple behaviors with the food reinforcer reserved as the consequence for the final behavior in the sequence. In this system, the audible bridge is not sounded so you maintain the meaning of the bridging stimulus through the reliable pairing with a back-up reinforcer. Again, I emphasize that this system should be systematically implemented over time, generally several months or even years. Too often, animal trainers move haphazardly and reduce the pairing of the bridge and the back-up reinforcer and most often confuse the animal and weaken the meaning of the bridging stimulus.

### Dreaming of Welfare

Improving welfare is more than modifying enrichment programs and doing more positive reinforcement training. Improved welfare is



associated with every interaction and every condition we create for the animals in our care.

I dream that one day the predictable nature of life in human care will evolve to more closely simulate the variable environment of life in the wild. Feeding regimes will change from the perfect diet placed in the same place, on the same stainless-steel plate, at the same time, by the same person every day, to a system where animals are empowered to perform behavior for their food by using their senses and adaptations to “earn” a living, much like their wild counterparts. Caring for these animals does not mean protecting them in a vacuum from every possible danger, distraction, or bacteria. Caring for our animals will mean preparing them to thrive in an environment filled with risks, uncertainty, and distractions. Expert training will be an essential tool for preparing animals to deal with life in human care, from helping animals cope with novel and aversive situations, to teaching them to voluntarily participate in their own health care. Expert training is a critical tool for providing the highest welfare for animals.

In my dream, people will reevaluate all interactions with animals, including their assumption that training with positive reinforcement has improved the welfare of their animals. In some cases, welfare has decreased when animals are brought into a positive reinforcement program. Competition for food reinforcers can cause aggression between conspecifics, diets can get reduced to unhealthy levels to create motivation, trainers can cause frustration and aggression with unclear communication and poor training strategies, and raptors and other animals are taken out of exhibits, restrained on jesses or leads, and trained by well-meaning but inexperienced handlers. The list goes on and on. Positive reinforcement training done well can certainly improve welfare in many ways. But, training done poorly, or especially with the wrong animal or trainer, can decrease welfare.

Owls obtained from rehabilitation programs and used in educational programs are on the poor end of the welfare continuum. They simply do not adjust well to life in human care like many other species of raptors. When owls are handled by non-expert trainers, their stress rises, and welfare decreases even more. The best owls for use as ambassador animals are ones that were raised by humans. Unfortunately, some people think they are doing a good deed when they “rescue” an injured owl from a rehabilitation facility and give it to their education staff for use as an ambassador animal. My dream is for no more adult owls from rehabilitation to be brought into ambassador animal programs at zoological facilities. Adult owls from rehabilitation programs already in ambassador animal programs would experience improved welfare in an exhibit where they are not handled by humans.

I dream all institutions will truly evaluate welfare using observable behavior considered from the animal’s perspective. When an animal has a vote to participate or not, caregivers become partners in the relationship and force and coercion become a thing of the past. Welfare should be more than a goal for zoological facilities and animal care professionals to pursue. Welfare should be the lens through which we view all of our interactions with animals in our care and the criteria with



which all of our animal programs are judged.

#### Dreaming of Exceptional Guest Experiences

Over 700 million people visit zoological facilities each year. How many of them leave without better knowledge and attitude about animals and the planet we share with them?

I dream of guest opportunities that transcend traditional experiences of looking at animals in enclosures, maybe reading some interesting graphics, and moving on to the next exhibit like they would at a museum. In future zoos, animals will have access to habitats free of visual barriers, but still safely confined. Animals will roam out of their traditional holding space and into areas where guests can see them doing what nature built them to do, e.g., foraging, climbing, brachiating, swimming, and so much more. Their behavior will provide glimpses into the species-appropriate behavior of their wild counterparts. When animals can seemingly leave their exhibits but choose to return, the obvious take home message for the guests is, “The animals like being here.”

Animal exhibits will focus more on animal needs and behavior than on visitor appeal and user convenience. With welfare as our guide, animal care professionals will work closely with architects to design exhibits that not only look nice, but promote a wide range of species-appropriate behavior. However, providing opportunity for behavior is not enough. Without motivation, there is limited opportunity for learned behavior. When caregivers are also expert trainers, they will arrange antecedent conditions that motivate animals to use exhibits as they are intended and display species appropriate behavior that helps people learn more about the animals they are viewing. Exhibits will promote increased activity, provide mental

stimulation, and expand the animals' choice and control in the environment.

Traditional keeper talks and education programs will give way to engaging behavioral experiences staged in natural settings and convey important messages and stories through animal behavior. Where natural history lectures currently exceed the attention span of the audience, keeper talks in future zoos will include animals doing species-appropriate behaviors that help tell our most important stories about the environment and the species with which we share this planet. Carefully designed messaging and engaging presentations will be the hallmark of habitat theater and exhibit shows. When these presentations involve husbandry or medical behaviors, we open the door for our guests to see just how much we care about our animals that we teach them to voluntarily participate in their own health care.

Formal presentations will provide a safe zone for guests where they are assured they will not be put on the spot and asked to participate if participating is not comfortable for them. A guest's excitement and anticipation for a show changes when a presenter starts the show saying, "How's everybody doing today?" and then follows with, "No. You can do better than that. How's everybody doing today?" That attempt to rally the crowd and create enthusiasm usually backfires for people who do not appreciate being put on the spot or told they are doing something wrong. Other pre-show warnings like, "Don't stand up. Don't put your hands up. Don't park your stroller there, etc.," also drain the enthusiasm from the guests. To start a show this way often makes guests feel uncomfortable, maybe even enough to avoid the show in the future.

In future shows, the spotlight will shift from the trainer to the animal. Instead of trainers directing animals to perform behaviors, animals will perform species appropriate behaviors free of direction from trainers. When an animal follows a trainer's cue to perform a behavior, there is a subliminal message that the trainer is in charge and the animal is following commands. When the animal performs behavior without trainer direction, the message is clear that the animal is in control.

A Chinese Proverb says: "Tell me, I'll forget. Show me, I may remember. Involve me, I'll understand." In my dream, educational programs will focus more on involving guests in experiences than on reciting natural history information. As zoological professionals, we have a long attention span for natural history information and we tend to want others to know as much, and care as much, as we do about the natural world. However, these feelings won't take root unless there is a bed of empathy to nurture the growth. Through close encounters and personal experiences with animals, we spark an interest that can have a lasting effect on a person's behavior.

Cheyenne Mountain Zoo leads the industry in connecting humans with animals. Each employee at the zoo understands and pursues the concept of "Defining Moments." A Defining Moment can be any experience that inspires a person to change their behavior toward conservation action or simply caring more about animals. An interest can be sparked by feeding a

giraffe, seeing a bird fly inches over your head, touching a charismatic animal, or one of many other encounters with animals. Any animal experience, especially when combined with engaging information, can inspire someone to become a member of the zoo, donate to conservation programs, or start recycling at home. All around the Cheyenne Mountain Zoo, employees are on the lookout for opportunities to create defining moments for guests.

At Cheyenne Mountain Zoo young visitors provide opportunities for employees to pursue another one of their core values, "Every Kid. Every time. Goosebumps!" When a keeper sees a group of kids, she goes into action thinking of ways to provide an experience that might lead to goosebumps in a young visitor. Tossing food to an animal, touching an animal, participating in a keeper talk, and so much more can lead

to goose-bump moments that can change the life of a kid at the zoo. There are opportunities all around the zoo for guests to experience Defining Moments and Goosebumps!

---

*Every Kid.  
Every time.  
Goosebumps!*

---

#### Conclusion

"First, think. Second, believe. Third, dream. And finally, dare." Those are the words that can direct our path to better training, better welfare, and exceptional guest experiences.

Zoos of the future will be filled with people who think about their current state, question everything, and continue to learn about every aspect of their job. They believe in a system where all animals deserve the most positive and least intrusive interactions with humans, and where an animal's body language conveys important messages that keepers respond to in appropriate ways that give the animal a strong voice and empower the animal with more control in its environment. The zoo of the future will benefit from people who dream of new ways to improve every aspect of their job, from animal care and training to providing guest experiences that inspire caring and conservation action. Some of the most important changes in future zoos involve daring to create your own path and take chances knowing there is an opportunity to fail. Zoos of the future will operate in a safe zone where people support dreamers and the mistakes they make knowing that some of the most valuable lessons are learned from failure.

Think of where you are in life and where you want to be. Think of the path forward and what it will take to travel that path; what support you will need; what relationships you will need to form; what lessons you need to learn; what skills you need to acquire.

Believe you have the ability to achieve your goals and there are many people who support you and want you to succeed. Believe people have good intentions and they act to help, not hurt. When you find that is not true of someone, kick them to the curb and stop wasting your time with them. Believe you are responsible for your position in life and stop blaming other people for your inability to move ahead. Believe you have the power to shape the behavior of people who matter to you. Believe mistakes are an opportunity to start again with more information.



Dream of new techniques, new approaches, and new ways to connect with animals and guests. Dream of the trusting relationships you want to develop with humans and other animals in your life. Dream of the perfect enclosure, the perfect training session, and the perfect behavior. Then go beyond that dream to find even better ways to provide optimal care and better training and welfare for your animals. Dream of unlimited budgets and conditions free of all restraints, because that's where you will find the path of approximations and the essential steps toward realizing your dream.

Dare to get out of your comfort zone and try, even though you might fail. Remember you have people who support you and want to see you succeed. Dare to build trusting relationships even though it might be difficult and you might not know the way. Just keep in mind your positive reinforcement strategies with animals and catch people doing something right. Dare to go beyond conventional wisdom and create your own path. Dare to do what's right instead of what's convenient. It will be an investment in your future. Dare to create goosebumps and defining moments and change the world one animal and one human at a time. 🐾

*Photos courtesy of  
Steve Martin,  
Natural Encounters, Inc.*

