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I began studying elephants some 26 years ago as the 19-year-old assistant to Cynthia Moss in Amboseli National Park in Southern Kenya. Started by Cynthia in 1972 the Amboseli Elephant Research Project is the longest study of wild elephants in the world and one of the longest studies of individually known mammals ever carried out. The population now numbers 1025 elephants, all individually known, some for as many as 30 years.

The Amboseli Elephant Research Project is a very dynamic, very active project. Over the years in Amboseli I have worked with an extraordinary group of colleagues. No less than 15 different people have studied the Amboseli elephants. Together we have carried out research on their social organization and behavior, population demography, reproductive behavior, male aggressive behavior and musth, feeding behavior and ecology, maternal behavior and calf development, female competition and cooperation, vocal repertoire and communication networks, Maasai attitudes toward elephants, elephant ranging patterns, reproductive endocrinology, and genetics. The project has followed every individual without interruption for 28 years, recording their births, deaths, estrous cycles, matings, age at first musth and cycles of musth, age at first reproduction, and inter-calf intervals. Last month Cynthia Moss received a Macarthur Fellowship, affirming the importance of Cynthia's life's work and the value of the Amboseli Elephant Research Project. We are all extremely proud on Cynthia's behalf!

To this day, it is the complexity and intelligence of elephants that holds my fascination. People often ask me, "Haven't you answered your questions yet?" Or "How many years does it take to study elephants?" When you are dealing with a socially complex and intelligent animal, answers only lead to more questions.

I would guess that among this audience I am best known for my research on musth, but I have studied elephant vocal communication in as much depth. Both topics have held my fascination and stirred my passion in different ways. During my study of musth I was young, a little wild and adventurous. I had a fantastic puzzle to resolve and a thrill was that each day I was able to fit another piece into place. Being in the presence of the wild power of musth males was for me a high, and I lived on adrenalin and feelings of exuberance. Now I am driven by something deeper: the desire to understand the hearts and minds of elephants, to be able to share that knowledge with others in order that I may influence the way we view and interact with elephants.

I have always loved the company of animals and being in nature. As I began to know elephants as individuals I came to realize just how incredibly privileged I was. Not just the good fortune of living in a tent in the bush studying a wild animal, but the honor of being in the company of elephants. By just sitting quietly observing the context of every action I was given a window into the elephant's world. The experience of being an accepted witness to the major events in their lives, of being able to call Vladimir to my car and touch him though the window, of being able to initiate a contagious game of elephant antics by play trumpeting to youngster, Slo, of having Tonie touch my chest in a gesture of gratitude, of playing a game of catch with Jasper, of being able to call Eudora and her hour-old baby, blocked by 10 minibuses from escape from 12 hyenas, to the side of my car so that I could give them safe passage, and of being confident enough of my relationship with the musth males to allow them to tower over my small jeep and rest their tusks on my front window — these are experiences that rest deep inside my psyche.

Each of you in this room probably recognizes the feelings I am expressing — those of being able to understand and communicate with another species — and those feelings are probably a driving force for what you do, too. But I believe that there is a difference. You have intimate experiences with elephants primarily on your terms — the elephants you know are your captives. I have had them on the elephant's terms as a privileged guest in their world. There is no higher accolade than the reward of their trust in me.

From our first sighting of a musth male in Amboseli we have observed 94 different individuals in musth. There are now some 55 males who come into musth each year. We can boast for at least one individual, Bad Bull, records of musth for a period of 25 years. He was a huge and fearsome bull when we first saw him in musth in 1976 and he is an enormous, majestic, not-to-be-underestimated male now. Our records estimate that he is over 60 years old and he still rules Amboseli every year during the months of June, July and August.

What have I learned about the nature of musth males? That they are busy in mind and body, intensely alert, easily irritated by low sounds and other distractions, energized and highly strung, driven, powerhouses who are easily provoked, and yet having said all of that they are surprisingly reasonable and predictable. Each male has his own personality and his own particular response to being in musth. Some males can be trusted not to do something nasty, others cannot. Young males coming into musth for the first time are less predictable; they are unsure of their new selves, apparent slaves to their raging hormones. Male society is clear and ordered. Male elephants continue to grow in height and weight through most of their lives and older, larger individuals rank above younger smaller individuals. Relations between non-musth males are smooth and amicable because this simple rule is learned and respected. Each male knows precisely where he stands in relation to every other individual in his community of males. But, enter musth and the tables are turned. A small musth male can lord it over a much larger, normally dominant non-musth male and he will go out of his way to do just that, threatening and pursuing the biggest of the big boys.

Be any bull elephant's master at your peril; harass, shout at, shock, beat, or dominate, he will remember and he will wait to turn the tables on you when he is in musth. He will show you what stuff he is made of. That, after all, is his driving force — to use his aggressive state to be master of all that he can so that when he finds an estrous female he does not have to fight for her; he has merely to fold his ears and dribble more urine. Try to take him on when he is in musth and you are asking for a fight. He will escalate.

I learned the rules of elephant society by trial and error; sometimes I overstepped their limits and elephants do have means of letting us know when we have gone too far. I learned to let the elephants set the pace. If I approached a musth male and he threatened me or even altered his behavior because of my actions, I turned off my car engine and waited. Gradually I learned to read the expressions and mood of each musth male and they over time individually learned that I respected them. They began to trust me. I was simply there — an occasional annoyance, yes, but not more than that.

I began studying elephant communication in 1985, initially with Katy Payne. But in the late 1980s my studies were interrupted when I was woken from my peaceful Amboseli existence to the fact that elephants were being poached over much of the rest of Kenya. I took time off from my communication research to carry out surveys to examine the effect that poaching was having on elephant populations and to fight for an ivory trade ban.

In 1990 I accepted a job at the Kenya Wildlife Service where, for four years, I had the rather daunting responsibility of finding practical solutions to the conservation and management

problems of Kenya's elephants. The job was both challenging and rewarding and in retrospect it was important for me to have to be in the position of having to take ethical decisions regarding the treatment of elephants. For example, taking decisions about when and how elephants should be shot on control, reviewing Kenya's policy on culling, and deciding when elephants should be given veterinary treatment, and when they should be left to die, all sharpened my focus on ethical issues. Ultimately, though, I believed that I could have more impact on elephant survival and welfare by doing what I think I do best — bringing an understanding of the minds of elephants to the public.

What do elephants think about? What kind of emotions do they experience? Can they anticipate the future? Do they contemplate the past? Do they have a sense of self? A sense of humor? An understanding of death? These are difficult questions to find the answers to because we cannot simply ask an elephant how she or he feels. At the same time the longer one spends immersed in the world of another species especially in its natural environment, and the more one is able to use expressions, postures and vocalizations of individuals to predict accurately subsequent behavior, the closer one comes to a correct understanding of the emotions that accompany them. In this way understanding the elephant's vocal repertoire can give us a window into an elephant's mind.

African elephants produce a broad range of sounds and most, though not all, of these are used in communication with other elephants. Sounds range from the lower frequency rumbles to higher frequency trumpets, roars, screams, cries, bellows, barks and snorts as well as some strange idiosyncratic sounds apparently made up by individuals. To date I recognize some 75 different calls. Elephants live in a complex society bound together by different layers of communication. Male and female elephants live in two very different social worlds, and the manner in which they use their communication skills reflects these differences.

The majority of elephant sounds are made by adult females, juveniles and calves and very few by adult males. Of the 75 calls, adult females make 70%, juvenile females and calves of both sexes 68% and infants of both sexes 33%, while adult males make only 29%. And of the 30 known low frequency rumbles adult females make 6 times as many as males.

The survival of females and their offspring depends upon the cohesion and co-ordination of the extended family, and on their ability to compete with other groups for access to scarce resources. Their calls underline the importance of the unit. They use calls to reinforce bonds between relatives and friends, to care for youngsters, to reconcile differences between friends, to form coalitions against aggressors, to coordinate group movement, and to keep in contact over long distances. Males live a more solitary life where reproductive success and survival depend to a degree upon an individual's ability to advertise his sexual state, identity and rank and to listen in to the activities and location of others.

Just as learning a new language allows one to understand another culture, learning the meanings of vocalizations has taught me what sorts of issues are important to elephants. If I had to choose the single most important concern to an elephant that the study of their repertoire has taught me it would be the value of their family and friendships. Over and over again elephants use vocalizations to tell one another how much they are valued and how important their contribution is.

As I was watching Echo's family discussing some plan of theirs I was struck by the fact that elephants must be some of the best team players there are. They have all of the right skills and they use them very effectively: good leadership, good communication, clear roles, co-operation, consensus building, respect for one another, and skilful reconciliation.

Decision-making is a group activity. Anyone in the family can make a suggestion, though it is typically adults who make suggestions rather than youngsters, and some individuals take a more active leadership role than others. But once a suggestion has been made it is open to discussion and negotiation by anyone in the family. Individuals add their voice discussing, commenting and concurring.

When a quick decision has to be made in time of crisis the response is very different: Everyone follows the lead of the matriarch. Her authority is complete because she has gained the respect and trust of her family. An elephant matriarch does not rule by force or by fear; she is a leader because the rest of the family trusts her to do the best for them. She has earned their respect.

In captive situations, with free contact, one of the most basic of elephant social tenets is broken. Smaller individuals attempt to rank above larger individuals not by gaining the elephant's respect but through the use of discipline and fear. I have often heard it commented that elephants "discipline" their young and that discipline being natural in elephant society is therefore something that an elephant can understand. I have no idea how this myth was started, but I have never seen calves "disciplined". Protected, comforted, cooed over, reassured, and rescued, yes, but punished, no. Elephants are raised in an incredibly positive and loving environment. If a younger elephant, or in fact anyone in the family has wronged another in some way much comment and discussion follows. Sounds of the wronged individual being comforted are mixed with voices of reconciliation.

I am currently working on a very time-consuming but rewarding project. Working in cooperation with the Library of Natural Sounds at Cornell we aim to build up a library of elephant vocalizations targeted for use by biologists, elephant managers, conservationists, educators as well as the general public. It is our belief that the library will provide new tools for the conservation and management of elephants. For example, by the comparison of calls or the down-loading of calls for play back in the field, the library could be used for improving the census of forest elephants, for the humane movement of elephants to new areas, for moving or deterring crop raiding or "problem" elephants, to monitor and improve the well being of captive elephants and to define and ensure their proper legal treatment and care. By stimulating the minds of school children and the general public with a sense of wonder, the library will instill a greater appreciation for elephants and the conservation issues that affect them and their habitats.

Day by day I am measuring and comparing elephants calls. The more that I learn about the complex manner in which elephants use sound to communicate with one another the more convinced I am of their intellectual and emotional complexity.

Now to the tricky question that you would probably prefer not to ask me but as keynote speaker I am allowed to ask myself: What do I feel about elephants in zoos? I feel sad when I see elephants in zoos and I have seen a lot of sad elephants in zoos. On the basis of all I have learned about elephants my personal feeling is that those zoos that cannot provide a full social experience for elephants do not have the moral right to keep them. I don't feel that any of the zoos I have visited meet the standards that we should aspire to.

I would like to pose some questions to all of you. How many zoos today provide their elephants with a basic family unit? How many provide elephants with enough space? How many allow elephants the freedom to be themselves? These are some of the most basic elephant needs. How many use protected contact? Of those zoos with captive breeding programs, how many have thought about the long-term future of the elephants they produce? Do they have plans for the social, emotional and physical needs of the calves and mothers? Will they keep the calves with their mothers? Do they intend to form families and herds? Of zoos that have produced calves

how many have kept those calves with their mothers? What provisions are there for the social needs of bulls in captive situations? How many of you have reflected on the emotional impact of the various invasive procedures you use?

I'm sure that you can give me a long list of reasons why things are done the way they are today, but I would argue that as long as elephants are confined in small spaces, behind bars, in barns, on chains, moved with electric prods and bull hooks, kept in socially deprived conditions, social misfits will be produced. You cannot raise intelligent, socially and emotionally complex beings under socially deprived and emotionally abused conditions and expect to produce normal individuals. It won't work. Your musth males will continue to kill people, and other elephants. Your females will kill people, and be unable to raise their own young. It is a vicious circle.

I know that everyone is trying their best to make things better for elephants in captivity and I am not blaming anyone for the situation that exists today; it is a product of our collective historical perspective on the acceptable treatment of animals. Society's views on animals have evolved extremely rapidly in the last few years and it isn't easy economically or conceptually to keep abreast of changing attitudes. But I would like to see a day in the future when a limited number of zoos in the country keep elephants and that these facilities allow elephants the freedom to be together in situations where they can interact in natural family groupings, where they can be allowed to mingle with males on occasion, to reproduce without artificial insemination and to care for their own calves in the context of their families. I think this concept will be difficult, but I do believe it is possible. And I challenge you as a group to think dynamically and move forward.

Anyone who has spent as many years as I have watching elephants in total freedom has a responsibility to say something about the way elephants should be treated. I don't have any reservations about saying that elephants are highly intelligent and that they have complex and deep emotions. We have moved way beyond worrying about being labeled anthropomorphic. We know too much about elephants. The argument simply isn't relevant.

Knowing what we do about elephants we have to start thinking seriously about elephant welfare — not just give lip service to it. We all need to think about what we do to elephants, wildlife managers and conservationists, field researchers as well as those working in captive environments. We all need to think about what we do and ask ourselves questions every time we're about to do something invasive, disturbing, stressful and painful to an elephant. We need to ask ourselves, can I do this differently, is this really necessary? We need to examine our justifications, weigh up our options, and search for alternatives.

I would like to reiterate what Cynthia asked for and request all of you to think about developing a kind of Bill of Rights for elephants, a statement of what we can and cannot do to elephants, and what they should have in life. When I last visited Animal Kingdom I spoke to John Lehnhardt about the possibility of Disney hosting a seminar on Elephants and Ethics and I would like to revisit that possibility. I believe that the time has come for us to begin to put shape to a code of conduct for the treatment of elephants to ensure that they are treated ethically and with consideration.

We all care about elephants. Let us all stand up for elephants.