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## ANIMAL WELL-BEING IN ZOOS, CONSERVATION CENTERS AND IN-SITU CONSERVATION PROGRAMS

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### INTRODUCTION

Well-being, as defined in reference to one's welfare, is the condition of happiness, prosperity and good health. In dealing with an animal's well-being, there are two frames of reference to consider. First, biological well-being which encompasses the spacial, social, nutritional, behavioral and reproductive needs of a species. Secondly, cultural well-being which reflects how human beings interpret the state of well-being of animals concentrating on their perception of happiness, cleanliness, safety and the way the animals are treated by the people who care for them.

In this paper, we are not addressing freedom as a condition of well-being, only happiness, prosperity and good health. Free-ranging wild animals are not free but are restricted by consideration of space, time and individual relationships (Hediger, 1969). We will look at animal well-being under these restrictions and discuss the effort needed to maintain well-being, as the level of constraint imposed by man on animals increases, and natural surroundings give way to artificial enclosures.

To look at animal well-being under different management schemes, we first need to define the level of confinement addressed in the paper.

#### In Situ

*In situ* refers to populations of animal existing in range states where they naturally occur. Usually the animals are inside a national park or wildlife reserve where they are afforded some protection from human activities.

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### Intensive Protection Zones

An Intensive Protection Zone (IPZ) is an area, usually within government wildlife department lands, in range states into which individuals of a threatened species are concentrated. The area is strategically defined by fences, guard posts and natural barriers. The animals inside IPZs are afforded greater protection from man-induced mortality by the presence of a large, well-trained unit of wildlife guards. The IPZ connects to a larger wildlife reserve into which the animals can be moved after the threats of their survival have been controlled or eliminated.

### Conservation Center

A conservation center is an institution outside the range states that maintains animal species in semi-natural conditions with the emphasis on scientific management to aid their survival. The overriding premise is one that puts the needs of animals first. Usually, they are not open to the public and any viewing of animals is strictly controlled.

### Nature Center

Nature centers exhibit native fauna in very naturalistic surroundings in an effort to educate the local populace about their indigenous plants and animals. Nature centers concentrate on topics related to ecology and man's relationship with wildlife on a local level.

### Zoos

Zoos exhibit animals in artificial environments meant to depict the animal in a resemblance of its natural habitat for educational and recreational objectives. Progressive zoos dedicate resources to off-exhibit breeding and research programs and make each exhibit as natural and representative of the local habitat of the species maintained as is possible. There are different levels of accomplishment in zoos in reaching the goal of naturalistic display of animals and having outreach conservation and breeding programs. I have arbitrarily divided zoos into progressive zoos, good zoos, and bad zoos based on their respective level of naturalistic exhibitry and the attention paid to well-being in providing for their animals.

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### Biological Well-being

Each species has specific biological needs that need to be fulfilled for it to survive and reproduce. For most species, these biological needs are known and documented. How and where these biological needs are satisfied determines the level of well-being a species can experience in different environments.

For each species, biological and behavioral needs should be prioritized to reflect the most important needs necessary for survival. From this list, a profile of essential needs can be developed that must be met for basic biological well-being. Like essential vitamins or amino acids, certain biological needs must be present for biological survival. These must be satisfied in all instances. Other biological needs are less critical to survival but do play an important role in providing increasingly better living conditions for the animals (i.e., well-being).

Based on these parameters, the in-situ animal populations would possess the maximum amount of biological resources needed for biological well-being. These biological resources would steadily decline as we put the animals under increasing levels of confinement. As the natural sources of biological well-being pare away, man attempts to substitute them to maintain the animals well-being. As the animal becomes more confined, man substitutes hay for natural grasses, prepared meat diets for carcasses, culverts for dens and concrete pools for lakes. This is all done to maintain biological well-being. How successful we are in providing for biological well-being depends on how well we understand the biological needs of the species and how well we provide for their biological needs within different levels of confinement.

### Cultural Well-being

Cultural well-being is reflected in how human beings interpret the state of the animals well-being in relation to its living conditions. This is essentially done by asking the question, "Is it happy?". Happiness being an essential part of well-being, along with prosperity (offspring?, territory?) and good health.

These are some generalizations that I have encountered over the years observing the relationship between people and wild animals held in

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captivity.

People seem to sense an animal is happy when:

- it has a reasonable amount of space to live in.
- it is living in a normal social grouping of conspecific
- it is in a habitat that resembles its natural home.
- the food provided resembles its natural diet.
- the environment is clean
- the environment is safe and secure.
- they do not look or act bored.

Cultural well-being takes the biological needs of the animals and injects into them human ideas about happiness and examines how they are reflected in the animals environment and its behavior.

Different levels of confinement provide more or less of the factors humans expect to find in the environment and in the animal that make it appear happy. We will now look at these factors in relationship to varying degrees of confinement.

In people's minds, an animal can never have too much space, for people equate space with freedom. But when people come to view wildlife, they expect the animals to be easily observed. In a national park or wildlife reserve, this is accomplished by conditioning the animal to tourist vehicles or boats. This can be done because the animals are protect by law from harm by people and quickly become used to another neutral entity in their lives. Some animals even use tourist vehicles for their advantage as evidence by cheetahs in the Masai Mara who use land rovers as elevated observation points from which to look for suitable prey.

In an IPZ, and to a lesser extent in conservation centers, suitable space is provided but with little emphasis on visibility and greater emphasis on protection. The goal here being to increase and maintain a fragmented population at all costs. Poaching, disruption of behavior and harassment of the animals is strictly forbidden. Great efforts are made to insure the protection of these animals as is the case with IPZ's for black rhinos in Zimbabwe where poachers are shot on sight.

Zoos must provide viability by design. They are in business to exhibit

animals. The space allocated to each species should be the maximum available to satisfy biological and cultural demands of well-being. This requires innovative and costly exhibits. More importantly, it requires careful selection of species which are exhibited, making sure their allotted space is biologically and culturally perceived as adequate. If this cannot be done, they should not be maintained until quality space can be dedicated to their zoo home range.

In regards to social groupings, surrounding and food, wildlife reserves provide the best balance of these needs. As we confine the animals into smaller spaces, we need to provide as natural a situation as possible. IPZs and conservation centers stress the importance of these factors and integrate them into their overall management. At the zoo level, the more that appears natural in the animals lives the more people will perceive the animals are happy and prosperous. Selection of species that can be afforded properly constructed exhibits, allowing a natural lifestyle, will go a long way in presenting a positive image to the visiting public. Even if the above natural factors are met, there is still a need to consider boredom as a factor affecting people's perception of happiness in animals. If an animal is not provided with a proper environment and looks bored or sad or displays stereotypic behavior, the public will respond adversely. These behaviors are unnatural responses to an artificial environment. An improvement in space, habitat quality, food sources, the number of conspecific and health care usually will eliminate these negative behaviors. If these improvements in the quality of its life do not change the negative behaviors then most likely this individual/species should not be kept at the zoo level of confinement. Preferably, if needs to be maintained only in conservation centers where the more abundant semi-natural environments can help to eliminate destructive behaviors. Even in certain cases, the conservation center may not provide enough resources for well-being and the animal should be maintained only *in situ*.

Safety, security and cleanliness are uniquely human responses to living in this world. Animals do not worry about their safety, they go about their lives concerned about living, not worrying about being injured or killed. Many species of mammals and birds clean and groom themselves and some animals keep their den sights clean, but most go about their lives not overly concerned with a clean home range. People are concerned about unclean environments because of the relationship to

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disease The impact of waste on a restricted environment is well known. People like cleanliness and an animal in a clean environment makes them happy so they feel the animal also must be happy about it.

In regards to these factors, there is a reversal of which level of confinement provides the best situation for animals as people see them. In situ areas provide little security or cleanliness as people want it. Natural factors such as predation, disease, starvation, intra-species aggression, along with human poaching, hunting and harassment take a heavy toll on individual animals living in wild places. IPZ and conservation centers provide protection from certain types of harm like poaching, harassment, starvation and at time, predation and disease. Intra-specific aggression and some health related problems related to large areas and limited observation of animals will still occur. Zoos do provide the best security and the cleanest environment for animals. Most of the *in situ* mortality factors can be eliminated by the extensive care and protection provided in a zoo situation. Two factors that contribute occasionally to making a zoo environment unsafe for animals are accidents; usually due to small spaces, poorly designed facilities or improper care and vandals.

Because of this improve security and cleanliness, zoo animals live much longer than wild animals. This is both a blessing and a curse. Long-live animals produce more offspring over their life-time. They also must be expensively maintained well past their reproductive and even exhibit value years. here again, the perception of happiness depends on the quality of life than on the quantity of years. Zoos must be prepared to provide quality environments and care for all their animals for their entire life if they are to be perceived as providing conditions conducive for well-being. Aged animals, like aged people, deserve special care. Planning for their retirement needs to begin while the animal is young.

If a wild animal is perceived by people to live in natural surroundings, in natural social grouping, eating natural looking food in a large area but still visible and the area is clean and safe and it does not appear bored or sad, then the animal must be happy. If wild animals are treated at all like we treat domestic animals, people consider the cruel. We must remember that wild animals did not ask to be confined and in providing for their care we are held to higher standards than those deemed acceptable for domestic animal management.



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## Standards

Now that we have looked at what well-being means for animals both biologically and culturally, how do we attempt to provide animals with a state of well-being as their level of confinement becomes more artificial. One way is to develop standards that guide people in developing the proper environment for animals that not only provides for but also fosters well-being.

A standard is defined as a grade or level of excellence or advancement generally regarded as right and fitting. For each species to be managed in confinement in zoos or conservation centers, a set of standards should be developed by a committee with representation coming from a diverse audience such as that represented at this meeting; biologist, zoologists, curators, philosophers, behaviorists, animal protectionists, field researchers and administrator.

The American Zoos and Aquariums Association through Species Survival Plans, (SSP) provide expertise in genetic and demographic management of a captive population. What is greatly overlooked is the consideration of what each species needs in captivity to experience well-being.

In SSP master-planning, a husbandry manual is formulated which describes certain standards to maintain a species in artificial environments. I have attended several of these planning sessions and feel it is detrimental to develop of these so-called minimum standards. It is a contradiction in terms if we define a standard as a "level of excellence generally regarded as right." How can providing the minimum to house a species in captivity be promoted? By basing our present standards on the status quo which includes some deplorable facilities for certain species, the zoo community leaves itself open for justly deserved criticism. Husbandry manuals fall short because they describe what is being done now, not what should be done for the animals to raise their standard of living to a level where they can experience a state of well-being. The standards for management of a species in captivity should stand by themselves, be emulated, be goals to reach for. For the sake of discussion, let us call them optimum standards of confinement (OSC). These OSCs, if set by a multi-disciplinary committee, should satisfy the biological needs of a species and our culturally



based response to how those needs are being satisfied. By doing this, a new dimension of performance would be created which will raise animal care to species care. These OSC's will allow for animal well-being to be the driving force of captive conservation programs because it sets forth the level at which an animal can be satisfactorily maintained and experience well-being in different degrees of confinement. Just managing numbers and space allotment, removes dignity and well-being from the equation. When well-being is considered first, then the number of suitable spaces will be real and the numbers of animals that can fill those spaces will be real.

The decision to maintain animals in conservation centers or in zoos should be linked to a percentage of compliance with the OSC as determined by the committee. For instance, if the committee determines that 75% compliance with the OSC for species "A" provides adequate resources for a state of well-being in a zoo setting, then zoos, realizing that level of compliance could exhibit animals of species "A" while continuing to strive for a complete realization of OSC for that species. If a zoo could only attain 60% compliance, they could not maintain this species until they had brought their facilities up to the 75% compliance level.

At this point, I would like to run through an example of setting an OSC for an animal I am very familiar with, the okapi (*Okapi johnstoni*).

#### **BIOLOGICAL NEED**

Okapi are forest dwellers that need shade and cover.

Range over a relatively small area (2km<sup>2</sup>) in the wild.

Solitary except for mother w/ calf, female territories overlap, males wander through the territories of several females.

#### **RESPONSE IN CAPTIVITY**

Trees in pen, areas with thick brush and shrubs. Access to shelter at all times.

Need 1 acre per animal which is heavily wooded.

Can exhibit alone, preferably with a neighbor or a male/female companion.

Eat leaves from 125 species of trees, spends 12-14 hrs a day eating.

Provide browse, several times a day, good diet of hay, grain and vegetables.

Drinks water frequently.

Fresh water always available.

Mother spends very little with her calf during the first three months.

Provide separate calving areas w/ multi-stall/pens for mother to avoid calf except for nursing.

Sensitive to loud noises.

Locate away from sources of loud noises, provide place to hide when frightened.

Sensitive to cold.

Provide heated winter quarters.

Male needs to remain with females for 24 hours during estrus.

Provide for 24 hour watches during estrus.

Does not like rain.

Provide shelter.

Does not like insects.

Spray for insects, provide insect proof quarters.

Lives for 25 years.

Provide for long-term optimum care.

### CULTURAL NEEDS

### RESPONSE IN CAPTIVITY

Clean enclosure.

Pick up manure twice daily.

Clean water

Clean waters every day.

Safe enclosure.

All fences/facilities neat and in good repair. Barriers suitable for a large ungulate.

Okapi do better if they have access to the outside year round.

Concentrate captive population in warmer climates.

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Security	Locked gates, 24-hour security force, visible keeper staff.
Easy viewing.	Browse in areas close to public. Hay inside one thicket.

The okapi will be happy and the public will feel they are happy if the okapi has the above conditions provided for them. This list satisfies the spatial, temporal and social needs of the okapi; i.e., their biological well-being, as well as what people would like to see in the exhibit to satisfy their cultural view of the okapi's well-being. A committee would determine what parts of the OSC are mandatory and what areas could be escrowed for an institution to receive and house one okapi. For instance, an institution may have only 3/4 acre/per okapi available now, but more space will be made available in the future, with approval from the OSC committee they could then receive and manage okapi. But, if the area has little tree cover, more trees must be planted before okapi can be housed there. Trees being so essential for okapi well-being that no trees can not be tolerated, but a little less space is not as critical.

This process will vary with each species, but should be kept simple by outlining basic biological and cultural needs of each species. First prioritizing them, then having a committee structure a standard and decide what percentage of the standard should be required to be in place to provide confined animals with a basic state of well-being. The assumption that underlies the process is that institutions are striving for a complete representation of the OSC realizing certain aspects of the animals' needs must be present initially to provide for well-being and that less critical needs will be attended to as soon as funds and time permit. This is in their best interest since public and private notions of their operation can only become more positive as their attention to animal well-being becomes more apparent.

## CONCLUSION

Recognizing that animal well-being is an important goal of conservationists, we must be able to describe well-being for each species and design a method to implement programs that provide for a state of well-being when they are confined. In this paper, I have suggested developing standard which detail optimum conditions for animal

well-being in different degrees of confinement.

Implementation of these standards will be difficult and costly. But, if we are to raise the level of care of animals confined by us for their own good, we must dedicate new resources and new energy to developing and realizing optimum standards of confinement. To raise the standards of care under different degrees of confinement requires less effort and expense in places of little confinement and becomes steadily more costly as the level of confinement increases. Here is where hard decisions lie, for if we cannot provide the standard at a certain level of confinement then the animal should only be maintained in situations of less confinement.

Until a standard can be met at a certain level of confinement, efforts should be concentrated on maintaining the species at the level where standards of well-being are already being met.

Coming from a conservation center background, I see that conservation centers have more resources available in which to satisfy biological well-being for certain species than zoos do. But, for other species, conservation centers have less resources available than those working *in situ*. Every time White Oak Conservation Center considers helping a new species, we go through our own OSC checklist to see if we can really provide for that species' well-being. Believe me, sometimes the answer is no. We may have to let certain species fight for their survival *in situ* because we can not realistically satisfy their OSC at the conservation center or zoo level. (But, we can provide *in situ* support as if they are part of our programs.) Other species may only be helped at the conservation center level which is the best level for species being considered for reintroduction attempts where they may better prosper *in situ*.

Everyone working with confined wildlife needs to consider the well-being of individual animals while we consider the well-being of a species. As the human consciousness explores more meaningful relationships with other species on this earth, the conservation community needs to be leading the way in developing a new covenant with wildlife based on dignity and well-being.

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## REFERENCES

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## LUKAS DISCUSSION

Grandy: This paper is a spectacular beginning for what we are trying to do, to come together. Lukas makes several critical points in his work, such as the notion that space should be the maximum available to satisfy the biological and social needs of the animal. If this is not feasible then the animal should not be maintained. A few important issues addressed were quality housing, the ability to afford animals before we bring them in and maintaining the animals well beyond their reproductive years.

This paper speaks fundamentally to the kinds of responsibilities that the animal protection community and the public see as necessary to properly care and maintain animals. We have to provide them with far more than minimum care. I heartily endorse the idea of standards. We should, in all cases, have a floor of humane care that provides not "minimally" but "fully" for the care and well-being of the animals. I do not accept the notion of settling for seventy-five percent of optimum. Seventy-five percent will never become one-hundred percent unless there is a forcing mechanism. Zoos are fraught with problems of economics and budget and place too much emphasis on variety of species rather than quality housing. We need mandatory standards to eliminate these problems.

The notion of "bad surplus" was discussed yesterday. The "good" surplus animals are brought into being as a result of our meeting what we see as our responsibility to endangered species, and we all agreed that bad surplus, that is animals produced as a result of poor facilities and poor, sloppy husbandry, should be immediately eliminated through use of contraceptives or otherwise improved husbandry and care. But we need to evaluate more critically the concept of good surplus. The word "good" is used because the animals are produced as a result of a presumably "good" purpose - that is, reproduction of an endangered species. The word surplus is used because, for example, only two offspring are needed for the program, but six are contained in a litter leaving four as so-called surplus. I think the whole use of the concept of surplus in this situation is wrong and represents an abdication of the responsibilities of those maintaining these animals. The reality here is that these animals are only surplus to the immediate needs of the endangered species breeding program. They are not, however, surplus to life. Let me repeat that these are animals

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produced as a result of our decision to allow breeding, and their lives are not surplus and the animals themselves are not surplus to life. Nor are they surplus to the responsibility of those who allowed the breeding to occur to provide appropriate care and facilities for the animals. If they are surplus to adequate facilities, it is because space for them was not planned. They are not something to be euthanized, killed, sacrificed or thrown away. They are animals that need to be maintained. In short, those who take responsibility for allowing their production must take responsibility for the humane care and maintenance of offspring for the lives of the animals.

Standards would also take into account the permissibility of keeping certain kinds of animals, such as polar bears. There needs to be a fundamental re-evaluation of the permissibility of keeping some kind of animals in captivity and the kind of mechanism that Lukas describes is the way to do it. I can only say I wish I had written this paper.

Lukas: The existing AWA standards are much lower than the existing zoo standards.

de Boer: Lukas' paper could not have been better. I do have a few remarks. Optimal standards would be very welcome, however I had the impression that within European breeding programs the protocols for drafting husbandry and management guidelines are continually striding for the formulation of optimal guidelines. I have great confidence that the aspects of well-being are increasingly focused on.

Lukas described the number of aspects of okapi well-being, asserting that since they dislike insects we should spray to keep them out of okapi enclosures. I believe the experience of well-being is only possible after occasional experiences of slightly less well-being. The chasing away of insects is a natural behavior and occupation for many animals. Even if an animal dislikes insects their presence is not harmful unless they negatively affect the animal's health.

The aspects of cultural well-being are entirely anthropomorphic; cleanliness, open spaces, plants present in the enclosures. We need to take great care not to fall into too many of these traps for they can be counterproductive to conservation aims and even harmful to individuals. It has been mentioned that "active health" is very important in conservation. Such anthropomorphic views may almost exclude the building of



active health in certain individuals.

In reference to the problem of good and bad zoos, I would like to refer to the "World Zoo Conservation Strategy." I did some work on drafting this document, including a chapter on good and bad zoos. I believe those zoos that want to be part of an organization express a willingness to work towards a common future. Zoos that are organized into federations are part of an effort and are zoos with which we are able to communicate. Those outside the federations are beyond our community network and we cannot bring them to higher standards.

This type of discussion is wonderful, but at some point we need to take action. By basing ourselves on the "World Zoo Conservation Strategy" we would work together and use the community network to strive toward a common future of organized zoos of the world. Secondly, it would allow us to eliminate or phase out those zoos that do not wish to be part of a common future goal.

There is a large difference between North America and other parts of the world. Many zoos in Eastern Europe - for instance, are in a very bad state, and if we saw one here we would close it immediately. Yet, in their own countries these zoos have a very important role to play, as in the local circumstances these are the only places where the vast majority of the people can ever see a glimpse of wildlife, including even wild animals from their own country. Thus, we should be careful in our judgment.

Lukas: We must appreciate the anthropomorphic concerns but do not have to pander to them. We need to be aware of how people view animals and incorporate that into how we provide well-being.

Kaufmann: There are many organizations that are part of associations and are struggling with the problems this situation brings. Are you there to encourage and lead or to push and prod? Some associations are weaker than the parts they are there to lead.

Lewis: I think statutory enforcement is critical, for the bad zoos who pay no attention to the AZA now will pay no attention to AZA standards in the future. My understanding is that the medical research community is the strongest opponent of this. If you are willing to cut a

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political deal with them, such as exempt their facility, you might be able to push it through.

Hutchins: It is clear that the goals that zoos and zoo associations are aiming at cannot be met unless animals are kept in better than minimum conditions. This goes for conservation, for education, and for science. We know that animals kept in naturalistic exhibits, natural social groupings and provided choices will be better subjects for scientific study. They are also better for educational purposes for they can present types of behavior to the general public which illustrate the connection between nature and animals. I do not believe this can be achieved in a concrete cage.

We are suffering from historical inertia. We have a lot of good ideas of where we should head, but have a lot of existing animals that are not being properly taken care of. They are in sub-standard exhibits and collections that have been assembled with very little planning. Turning that around will not be easy but must be done.

I would like to talk about some of the practical difficulties we are going to run into. We need standards. However, there are thousands of species of mammals and birds, reptiles and amphibians, in zoo collections each with specific biological needs that must be accounted for. This is an incredible task. In many cases we are operating with imperfect knowledge, with very little information to try to develop their diets, their care and maintenance standards. We know very little about their behavior. Information from the field has led to the understanding of many animals we were previously not doing well with in captivity.

In some cases it depends on who is developing the standards. Many of the standards initially developed by the biomedical community for primates were not good for the welfare of those animals. For example, if the focus is on hygiene rather than psychological well-being you end up with animals in stainless steel cages that can easily be cleaned, but do not meet the behavioral needs of the animals. In fact, cleaning a cage can actually be stressful for the animal.

The federal regulatory agencies are not only responsible for the professional zoo community and the professional humane community. Anyone who handles animals is subject to their regulations. This is a big problem. They have a horrendous task and it makes it difficult for

them to recognize certain members of the community that are striving to do a good job. It is also difficult to be specific in legislation because they have to cover such a wide variety of situations. That is why I believe regulation itself is not necessarily going to lead to improved well-being in animals. I think education is the most important factor. The public requires education to raise their level of what they require of organizations that hold and care for animals, but education is also required for those individuals who care for animals. We need excellent education programs for staff so they do not habituate themselves to bad conditions. They must be constantly on guard and watching for ways in which to improve the lot of animals under their care.

Lindburg: I commend Lukas on his use of the word "happiness." It may not be scientific, but it is one to which we can all relate and should be the standard for which we strive.

I would like to extend his presentation to one more dimension. An animal is not constant, it changes in relation to its experiences. Its happiness, therefore, is dependent on how its circumstances relate to its experience. For example, in the captive world the wild animal's environment is highly conditioned by humans. We deliver food at a certain time every day. Animals quickly learn when the food truck will arrive. This is an anticipatory and tense time for them. If we are going to impose artificial conditions on the animals we must keep them consistent if we want to treat these creatures in a humane way.

The second aspect is that we often say the animal born in captivity has different expectations, even though it comes to that experience with certain species-typical potential for behavior. What it has learned in captivity from birth somehow ameliorates some of the more stringent conditions of captivity. This is true, but also potentially dangerous. For example when cheetahs three or four generations removed from the wild are put in a small space they will begin to pace. I think it is their search for the freedom of movement they are denied. We need to take a hard look at how being born in this environment does and does not affect the well-being of the animal.

Kaufmann: We speak of changing and modifying standards and policies, and that is a big part of what must be done. There is another aspect that goes into the educational role; standing up for what you believe and not being afraid to say it. To have the courage to say that

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we do not have the laws, that we cannot get a grip on the industry or the field. However, while there may be some wishy-washy areas there are also some definite rights and wrongs. It is wrong to keep a chimp in a cage, make him smoke a cigar and wear a suit. None of us like it. We need to have the courage to use the word "happiness," even though someone might press us on our meaning of the term. I would like to see more writing on this subject in the popular press, not just within the community.

Clutton-Brock: I was brought up with the notion that anthropomorphism was the worst sin you could commit, when animals were considered as something that could be harvested. The most marvelous change I have seen in my career is getting away from this attitude and being allowed and encouraged to view animals as individuals. I fear, however, that this is not happening to domestic animals. The worst aspect for animals in domesticity is that then people who keep them on a large scale are habituated to bad standards. They do not see them as individuals, but as units to be harvested. I hope in years to come there will be a change. I think the zoo community is leading the way, and hope it will be extended to domestic animals. The veterinary community should lead the way but there needs to be a change in thought with how to deal with domestic animals from the veterinary community as well.

Cohn: I would like to infuse a little political reality into the discussion. Washington is a very budget-conscious right at the moment. There is not an agency in government that could not use more money, so the chances of our being funded for the things we are looking for are slim. Therefore we have to take the long view. It is not going to happen overnight.