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ANIMAL WELL-BEING IN THE WILD AND IN CAPTIVITY

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INTRODUCTION

Some, like a character in Galsworthy's *The Forsyte Saga* (1922, 189-191), would consider there was nothing to discuss about the rival merits of wild and captivity. "To shut up a lion or tiger," thought Young Jolyon at London Zoo, "was surely a horrible barbarity." Here is contemporary comic writer Stephen Fry in serious mood: "Is it possible, [our grandchildren] will ask, that we actually stole polar bears away from the Arctic and set them in concrete-floored cages in southern climes to be gawped at?" (Fry 1993, 275). In fact, similar sentiments were expressed 600 years ago by Chaucer (1960, 524), who noted how a captive bird's wild habitat ('a forest, that is rude and cold') seems unattractive to us (as compared with the fine conditions we think we are providing), but there's no doubt which the bird would prefer: "For ever this brid wol doon his bisnesse; To escape out of his cage, if he may; His libertee this brid desireth ay."

Some recent philosophical writers, who seem to be fighting a sort of rearguard action on behalf of behaviorism - the refusal to take seriously the reality and importance of the animal's own conscious experience - which has been scientific orthodoxy through much of this century, would probably suggest we were being anthropomorphic in worrying about the animal's own feelings. Michael Leahy (1991, 92) maintains that the captive animal's necessary non-realization of its situation, its inability to conceptualize its state, means that these must be quite different from, and nothing like so serious a matter as, human captivity. Another philosopher who thinks our concern for animals misplaced is Peter Carruthers (1992, 196). Peter Harrison (1991) thinks animals no more able to suffer than plants, because of their lack of an inner life. I don't agree, not least because thinking this way seems so out of line with our recognition - on straightforward scientific grounds, 135 years after *The Origin of Species* - that we humans are ourselves

mammals, primates, indeed probably on genetic grounds strictly apes (Dawkins 1993, 82).

I believe we can sensibly speak of an animal's well-being, and not just in the sense we might possibly speak of a plant's well-being. An animal in a state of well-being presumably feels better, perhaps enjoys itself more, at least suffers less than if it were in a poorer state.

Let's come back to the dreadful contrast of wild and captivity, as portrayed or suggested by Chaucer, Galsworthy and Fry. It seems to me that there were several other, and more acceptable, ways of keeping animals even long ago than the bare cages we should all abhor - deer parks, for example (Bostock 1993, 18-20). Francis Bacon wrote 400 years ago about how he didn't like aviaries, except they "be of that largeness as they may be turfed, and have living plants and bushes set in them; that the birds may have more scope and natural nestling ...". Wouldn't a bird, kept in an aviary like this, probably not choose to escape, even if it could, and wouldn't that be a pretty good indication of good conditions? I will come back to the range of ways of keeping animals in my last section, to try to show there are acceptable approaches to keeping animals; some kinds of "captivity" contrast pretty favorably with the wild, though we need, ideally, as much knowledge as possible of the animal's natural habitat and way of life there, to make our captive conditions acceptable.,

But first, I want to compare wild and captivity. This isn't a straight comparison of good with bad. Animals do suffer in the wild, and they are protected in good captivity. I will fill out the details of this in the following sections, before discussing how captivity can be more benign, whether or not it can ever strictly be regarded as better than life in the wild.

LENGTH OF LIFE AND VIOLENT DEATH

It was all very well for Blake to write that: A robin redbreast in a cage
Puts all Heaven in a Rage but he couldn't know that robins normally live in the wild a mere tenth of their potential life span and have, any year, only a 50% chance of surviving to the next (Lack 1970, 88-106). So captive animals often do live longer than wild ones; for many animals it must be true that only with human protection have they any chance

of dying of (as we say) old age. A robin in a roomy, comfortable aviary like Bacon's might have a rather good bargain in terms of total pleasure or satisfaction from living. The risks in adult life for large mammals like lions or chimpanzees are probably much less than for small birds or small mammals such as rodents, but there will still be for lions and chimpanzees a high death rate in early years (as there was with humans until the protection offered by modern medicine). Bertram recorded that about 20% of lion cubs survive in the wild to maturity, most cubs dying of starvation.

Not, of course, that the animals know they face short lives, so it doesn't make their lives miserable, as the theologian B. H. Streeter (1935, 156-7) notes, in the course of considering the degree of suffering in nature. However, so far as zoos are concerned, it is surely true that many of their animals would, if they had lived in the wild instead, have died young. If we assume that in some cases at least life in a zoo is satisfactory for the animal concerned, and where an animal would have been living no life at all were it not in a zoo, in such cases the comment on their captivity "It seems sad" is inappropriate (Rachels 1976, 213).

Not that all animals in zoos live to old age or, sadly, can all be allowed to. As the breeding of captive animals improves and approaches the rate of increase in the wild, either birth control or the killing of surplus animals is likely to be necessary (Cherfas 1984, 119, 122). But at least if any animal has to be killed in a zoo it will be a humane death. Death in the wild can be violent, or slow, as from injury or disease.

A mouse caught and played with by a cat is not a pleasant sight; a wild cheetah will provide her cubs with a living, injured young gazelle to practice hunting on (Ammann 1984, 111). Personally, I find disturbing even the sight of a hen carrying a struggling frog. Still, these may be isolated incidents. Obviously, they will only happen once in a victim's life, and may in any case be alleviated by the action of endorphins or some similar mechanism, just as severely injured humans (in sport or battle) often feel no pain till later. Still, I would dispute the confidence of Streeter (1935, 156-7) that life and death struggles between animals involve little suffering because non-humans probably hardly feel pain. On biological grounds this seems unlikely, as recognized in an interesting discussion by the contemporary theologian John Hick (1968, 356 ff.).

So the fact an animal in a zoo is protected from the violence and other dangers of natural life is not an aspect of captivity to be scorned (Jones 1987). We are in some degree conferring on our captive animals a protection which civilization has (to some extent) conferred on ourselves.

ARE ZOO ANIMALS HEALTHIER THAN WILD ANIMALS?

Take health first in the straightforward sense of freedom from infection or injury. Wild animals are anything but free from such problems. A single individual can be astonishingly heavily parasitized (Rothschild and Clay 1961, 17). Wild animals can be very much worse for wear compared to their protected, medically attended cousins in captivity; for example a wild lion compared to a zoo or safari park lion (Smith 1979, xv).

Many wild animals must be able to cope with their infections, but those who cannot die. If serious ill-health isn't obvious among wild animals, that is because a seriously unhealthy wild animal is soon a dead one. The middle course open to humans and well-cared-for captive animals is not an option.

Still, mild states of ill-health can cause discomfort without causing death. A successful parasite (biologically) does not kill its host, but may cause discomfort or worse. Here the captive animal is better off in that treatment easing minor suffering should be available.

But zoo animals can have their own particular health problems. The stress of being captured and transported can make an animal more liable to serious parasitic infection. Conditions in zoos can aid the spread of parasites, or else necessitate the provision of a dull, sterile environment in order to restrict their spread. Ungulates kept in small paddocks are prone to parasitic infection; cats can be, when kept in other than very large enclosures. Until recently, they were thought to require concrete or tiles, easily washed and sterilized - and thus robbed of familiar and carefully deposited smells. It has now been found that deep woodchip litter, in addition to other advantages, prevents parasites' eggs surviving. The new findings have greatly improved the situation for zoo primates too (Chamove et al 1982). An animal can be exposed in a zoo to infections that it wouldn't face in the wild (Dunn

sense of purposefulness.

Our feeling of frustration in failing to complete some task is (like pain, pleasure and boredom) no doubt biologically useful. So it is likely that animals can feel similar frustration to ours - say if a lion has a meal to eat, but keeps being disturbed by hyenas.

Probably very important also are a sense of security and a sense of belonging. The Harlows' (very inhumane) experiments showed how infant monkeys need a source of security, a source of confidence (Rowell 1972, 135 ff). Dogs can show their general sense of unease by failing to groom themselves. Of course an animal should be able to enjoy this sense of security, and indeed many other pleasures, in good zoo conditions.

Obviously in the wild there are all sorts of discomforts, problems and very real dangers: parasites, insect bites, problems of finding food - the unpleasantness of sometimes going without or actually starving - and so on. But we have our problems too, and for most of us, most of the time, they are not overwhelming. What often prevents nervous breakdown is a sense of purpose and a sense of security. Although war is a cause of appalling suffering, the suicide rate tends to go down in wartime, presumably because people have more sense of purpose, and of comradeship and belonging, and these more than compensate for the presence of extra hardships in preventing extreme depression. A state of non-depression, a state far from that extreme depression which could lead to suicide is likely to accompany the state of being very busy; having things to get on with.

It is probably important to many animals, too, to have plenty to get on with, which wild animals normally obviously do, as well as having a sense of security and, where appropriate, companionship, a home base and proper relations with one's companions in the case of a social animal. Marian Dawkins mentions experimental findings that sheep are stressed by situations such as being put in a truck or chased by a dog but nothing like as much as they are stressed by simply being separated from the rest of the flock (Dawkins 1980, 59), which bears out what I am suggesting.

And life in the wild is often not all "business," essential activities for survival, compensated for only by a sense of purpose such as I have

been proposing. There are also plenty of reports of animals enjoying themselves in a direct way - otters sliding down banks, badgers playing leapfrog, and so on.

So in brief, to give the provision of regular food and safety from predators and other dangers, not to mention discomforts, as pure and simple advantages, of captivity over against life in the wild is to leave out certain related disadvantages which go hand in hand with such advantages: the loss, in particular, of purposeful living. However, in many cases it is possible to provide conditions of captivity which do a lot to compensate for the loss of the positive side of wild existence. But we need to recognize that positive side to realize our responsibility to provide suitably enriched captive conditions.

EVOLUTION AND ADAPTATION

All animals, obviously, are adapted to life in their natural habitats (the "wild"). I think it follows from this that they are in a state of well-being there, but only to some extent. It follows also that they are not very likely to be in a state of well-being in captivity, but not that they can't be in a state of well-being there - certainly if we take trouble to provide what they need.

One argument for animals' positive well-being in the wild is that as animals presumably cannot live efficiently, and cannot reproduce efficiently if they find life too difficult - if they get too disturbed, or too miserable, or are hurt too much - there will be selection of characteristics producing some degree of well-being, perhaps some degree of happiness (Darwin 1929, 146).

Whether this is an additional adaptation, or an additional feature of adaptations in general - i.e., perhaps adaptation in some respect to a particular aspect of one's environment involves being in a state of well-being in regard to it - my next point is that adaptation is not perfect or complete. Here are several reasons for this (perhaps worth noting not least because passionate people like the novelist Richard Adams who oppose zoos are inclined to talk as if animals are perfectly adapted to their natural environments - and therefore inevitably in a state of ill-being anywhere else).

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1. Animals are, so to speak, never designed from first principles, but rather themselves "adaptations", in the sense of "adaptive alterations," of what went before. One human example of imperfect adaptation is the tendency to suffer arthritis around the area of the hip bones, probably partly as a result of our being a two-legged "vertical" animal converted from a four-legged "horizontal" one.
 2. If animals were perfectly adapted, evolution, which is essentially the improvement of adaptations, could not occur (de Beer 1972, 10).
 3. All individuals of any particular species differ slightly, having slightly different sets of genes, so that they are not equally adapted, even though to a great extent they are all inheritors of millions of years of natural selection. Even if one could identify a pair of animals almost perfectly adapted to their environment, their young would not be to the same extent, or to the same extent as each other, for all get dealt a slightly different genetic "hand."
 4. As evolution is a matter of the differential passing on of genes, so that different genes gradually become more widespread through the gene pool of any particular species, as a result of the individuals carrying them being slightly more successful in reproducing, the welfare of individual animals is hardly going to be benefited by evolution except in as much as genes aiding welfare also enable the animals carrying them to reproduce successfully, which also includes surviving long enough to reproduce. There seems no way in which the welfare of animals past breeding age can be selected for, except where their welfare assists younger relative of theirs to reproduce.
 5. There must be some "survival of the fittest." Although even a small reproductive advantage conferred by a gene is enough to ensure its selection - i.e., its gradual spread through the gene pool - it seems likely that many individuals of any species die young, in some cases this being part of natural selection (i.e., where the death is due to some genetically inherited disadvantageous feature in an animal compared to its conspecifics). So while the so-called struggle for survival is in many ways a

peaceful struggle, hardly suggesting nature red in tooth and claw, it still does involve a great many animals dying long before their potential life span, and by no means entirely without suffering (as we saw above).

6. In some cases certain species, as a result of environmental changes they fail to adjust to, are in varying degrees ill-adapted (de Beer 1972, 10-13). Animals (perhaps certain more adventurous or exploratory individuals of a species) will sometimes move into new habitats, or may adopt some new behavior. This may be a substantial factor in evolution (Hardy 1975: 37-45; Ewer 1953: 117-119). In the new habitat or the new niche, selection will operate to improve adaptation to it, but this will be a slow process, and the development will be occurring in a population, not in any single individuals. Some or all individuals may well be rather ill-adapted in the early stages of moving into a new habitat or a new niche, as in the situation of an environmental change which forces upon a population a need to adapt, if it has enough genetic adaptability; failure to adapt in such circumstances is likely of course to result in extinction (de Beer 1972, 5-6; 10-13). Tigers may have moved fairly recently into tropical regions, and be as yet inadequately enough adapted to them to suffer discomfort from the heat.

So here are several reasons why adaptation cannot be perfect, and I think they are reasons similarly why animals are not going to be in a state of complete well-being in the wild. They aren't necessarily reasons why animals are likely instead to be in a state of well-being in captivity, not least because we, in our varying degrees of ignorance about animals' environmental adaptations, must often force upon them captive conditions to which they are not at all adapted. However, it's still quite possible that captive conditions may be comfortable in ways in which wild conditions are not. Natural selection isn't operating, or not in the same way, in captivity, so animals are here free of the factors which are likely to produce some degree of discomfort in the wild.

Another point about different animals' possible "suitability" for captivity is that animals are adaptable as individuals: they have varying degrees of cultural or behavioral (or physiological) adaptability. Some move readily into new environments created by man (like cities); others cannot adapt so easily. Some become tame easily, some can be

trained easily, others not. Some can change their habits easily, e.g., switch to different kinds of food (of course, within limits); some (like koalas) cannot. This is a theoretical reason why it's not out of the question that we can keep some animals in a state of well-being. Of course we should go a long way, in fact as far as possible, towards providing the conditions they need. But the fact we can never do this perfectly - we can't reproduce the wild - doesn't mean that we can never keep animals properly. With our providing, as far as we can, the right conditions, and their ability to adapt (in varying degrees), it may well be the case that some of them can be in a state of well-being in captivity.

KEEPING ANIMALS

We began with comments on lions, polar bears and birds in cages. But keeping animals doesn't have to be like this. Sometimes, indeed, we can create an artificial habitat so attractive that animals just drop in: ponds for wildfowl, or for freshwater invertebrates, for example. Agreed, this is exceptional. In some ways the deer in a large park may be living almost naturally. The Duke of Bedford, who saved the Pere David's deer from extinction in the early years of this century, kept them at Woburn in a very large area with lakes and marshes, where they bred well, but also faced such natural hazards as a high loss of young born in particularly bad weather.

The more normal, basic way of keeping animals is in what I would (perhaps over-optimistically) call a semi-naturalistic enclosure - one which hopefully suggests the wild habitat to some degree, if not very closely. But the really important thing is that it should produce whatever features the animals need to allow and stimulate a large portion of their natural behavior, certainly including whatever means of locomotion - climbing, burrowing, swimming, and so on - they would normally use in the wild. For many animals such as various ungulates, and wallabies, their needs may be met by little more than a field suitably enclosed (Duncan and Poole 1990, 220). Rodents such as prairie dogs or porcupines may need only an enclosure of reasonable size allowing burrowing: they will create for themselves what else they need, and will be fully occupied by excavations and their social relations.

Even with animals quite easily catered for, there is always room for improvement, especially in the light of their wild behavior, guided by careful monitoring of the animals' behavior in the enclosure (ibid.: 222-3), but such improvement, or enrichment, becomes much more urgent with the more "difficult" animals: the highly intelligent, exploratory, opportunist and sometimes also (to make it worse) physically powerful animals such as bears, dogs, primates (especially apes), and perhaps pigs.

Needed here is ingenuity in doing all possible to make the animals' lives more interesting, in particular whatever can be done to elicit their natural behavior (Shepherdson 1988). The obvious deprivation of zoo animals is the occupation of food seeking which in many cases would occupy them for long periods in the wild. The remedy is to hide food so that it has to be searched for, or provide it so that it has to be worked for in some way. As before, it is usually a matter of providing a more or less natural-looking area. But where an area something like the natural habitat will probably be enough for wallabies, this may be far from enough, even with a tree or two or a climbing frame or two, for chimpanzees. A wooded enclosure the size of the chimpanzee island at Arnhem (de Wall 1982) is a different matter. Where an area like this is not available, it is still desirable for the enclosure to be as natural as possible or at least have natural elements such as a grassy area and plants, but it is still more important to provide what will stimulate the animals, which may be, for example, an artificial termite mound into which they can stick straws to extract not termites but honey. The significant thing about this example is that it is provided in the light of knowledge of what chimpanzees do in the wild.

Knowledge of the animal's wild habitat and behavior is the best source of ideas for what can be provided to enrich its captive environment, and naturalistic enrichment - features identical to those in the natural habitat which would stimulate the animals' natural, or simulation of wild features - is probably the best approach. Examples of such enrichment at Glasgow Zoo for black bears, polar bears and cats are described by Colin Tudge (1991, 223-8).

Markowitz has pioneered several elaborate devices to elicit their natural behavior from animals, such as flying meatballs for servals to leap to grab, or arrangements by which polar bears or primates can perform some task and thus produce food (Markowitz 1982, 46-55; 175-9). He

has found that many animals will voluntarily work for their food in preference to merely being given it, which is eloquent evidence of the need of some animals for occupation and even creative activity. Some of Markowitz's work has been criticized (e.g., for conditioning animals to respond to artificial stimuli) (Cherfas 1984, 128 ff; Campbell 1979, 213), but there is clearly great room for, on the one hand, learning from study of the animals' wild behavior, and, on the other, exercising ingenuity in how to simulate or substitute for features of their wild environment in the captive one.

Sometime animals may be kept in an enclosure which is frankly non-naturalistic but which is highly suitable for them even so because it succeeds in supplying what they need. A paradigm example of an enclosure of this sort, though not in a zoo, is the "enriched pig pen" developed at the Edinburgh School of Agriculture. Domestic pigs were studied in semi-wild conditions for many months and (very significantly) much natural behavior was observed. A pen was then designed so as to include the right features to elicit most of the behavior which had been observed in the larger area - nestmaking, rooting, and so on. This approach worked: most of the pigs' wild behavior still occurred in the "enriched pig pen" (Woodgush 1983, 196-8; Huntingford 1984; Duncan and Poole 1990, 209-213). Zoos will normally have much more space available than the area of the "pig pen", but the wild study leading to the identification of the essential stimuli for eliciting different parts of the animals' behavioral repertoire, and then the careful providing either of those stimuli or of substitutes for them is a fine demonstration of how an enclosure can be improved - or designed from scratch - in the light of study of the wild behavior of the species concerned.

Howletts' gorilla enclosure (near Canterbury in England) is a good example of a non-naturalistic enclosure which yet meets the animals' requirements admirably, as is borne out by their breeding success. The enclosure looks more like a sort of gymnasium than a bit of rain-forest - a sort of health club for gorillas, indeed, or a holiday camp.

Enclosures can be much more realistic - if money and imagination are available - as in some very elaborate displays described by David Hancocks (1989, 264), though some naturalistic displays (not Hancocks') are more for the public benefit than the animals'. Animal occupants of beautiful exhibits sometimes have far less space than

appears and can't reach the plants. And short term changes in enclosures - recommended for example by Hancocks - are unlikely to be feasible in vastly expensive displays with fiber-glass trees and the like.

A very different approach to keeping animals is training them to perform various tasks and generally treating them as domesticated animals, which camels and llamas are, and perhaps elephants too, though only partially. To have llamas pulling carts, and camels giving rides, where possible, seems, in view of their being domesticated animals, unobjectionable and likely to be good for their mental as well as their physical health (Kiley-Worthington 1990; Hediger 1968, 133-9).

So in the end contrasting the wild and captivity is not really the point, for it makes all the difference what sort of captivity we are thinking of. Really good captivity probably compares quite favorably with the wild, on which, in some respects, it should have been modeled. It also makes a great difference what animal we are thinking of. Our criteria for judging animal well-being - natural behavior especially, but also health, breeding, the occurrence of abnormal behavior and so on - should also guide us as to whether some animals should not be kept at all. Whether enrichment for (for example) polar bears (providing stimulating items to investigate and so on) is in the end more than alleviation of their captive state remains a matter of dispute. I wonder myself just how far we can compensate in a zoo for the range of experiences, the range of smells and sights and sounds, the meeting with members of its own or other species, of an animal's natural life. Much remains to be investigated.

Of course other matters come into the question of whether a certain species should be kept, such as the need or otherwise for conservation captive breeding. But our judgment of the animal's well-being must clearly be a major factor as a guide to action, only to be overruled to a very limited degree by other considerations.

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BOSTOCK DISCUSSION

Pokras: I love the fact that Bostock's paper came after Bekoff's presentation. This is a nice transition and melding of ideas. One of the issues I see Bostock questioning are the goals of keeping animals. We have educational goals, long-term conservation captive breeding goals, even research goals. Those goals are in some sense very separate. It may be that individual institutions cannot or should not be doing all those things, that perhaps specialization could be important.

Again, one of the important factors is timescale. If we are talking about a very short timescale, such as an emergency or a highly endangered species, perhaps it would be more appropriate to do a higher degree of intervention. But if our goal is long-term conservation of a population, one thousand years for example, then we cannot exclude evolution. If I want to keep a population for one thousand years I have got a very difficult issue, for I have a population that is going to be subject to a lot of evolutionary pressures in that one thousand years. That is going to be difficult to accomplish, for I cannot keep them by themselves. They are what they are because they have had the predator/prey interaction.

We veterinarians go in and inoculate short-term captive animals with a vaccine to prevent parasites. We should not do that with a long-term population. Parasites and hosts evolve together, they are a part of biodiversity. Elimination of the parasites is not in the best interest of the animal if they are to be held in long-term captivity. In the short-term we can enhance the animal's well-being, but if we are talking about evolutionary time our goals are very different.

Part of well-being is the issue of variety. Things change drastically over time, the time scale depending on that particular animal's biological clock. A very small animal with a high heart rate and a very short life span is running on faster time. Its life happens more quickly than that of a whale. Whales and reptiles do things very slowly. To appreciate and understand what is going on we need time-lapse photography or a different set of skills, understanding and sensitivity.

I do not know what animal's cognitive lives are like, but there is huge individual variation. Again, what that means for long-term captive management I am not quite sure, but think people have begun to take

that into account. Choice is a very important factor for animals in captivity. The word "choice" may have a connotation of consciousness that I do not mean to imply. I am speaking of the ability to make maximum number of choices on their own such as food selection. Perhaps this is bringing me back to the need for specialization, need for wider cooperation. There are probably a number of facilities that should not be trying to captive-breed anything, but do a wonderful job with environmental education.

Robinson: I will begin by addressing the paper on its own terms, and then look at certain fundamental assumptions that might underlie it and some of the disagreements that may generate. Without being pejorative, I read Bekoff's paper as a wonderful apology for captivity. I think the argument is made very strongly that life for creatures in captivity can frequently be favorably compared to life in the wild. The assumption is that it is better to live long, live healthy and be better fed. Certainly looking at our own species we recognize that that is not always the case. Literature is full of examples demonstrating that we do not particularly like pleasant, well-fed circumstances or the bourgeois life. The existence of hang-gliding and fast cars suggest that we do not like that lowest common denominator of good health. There is also the self-destructive urge, such as alcohol and tobacco, and anyone who looks at animals recognizes that animals go through the same thing. They frequently search out stressful circumstances.

Another thing that was alluded to in Bostock's paper is the idea of freedom of choice, the idea of mental health. How does one get at this notion? How important is freedom to us as human beings? To animals? Do we become accustomed to a lack of freedom? Is it relative? Is it purely an anglo-saxon preoccupation?

Looking at some of the deeper assumptions underlying the paper, there is an conjecture that the well-being of animals provides a criterion on which to evaluate captivity. I make the argument that once an animal is in captivity its well-being is of greatest importance. But the well-being of an individual animal is not the paramount criterion on which a decision is made about bringing that animal into captivity. This leads into another issue; how do you balance the well-being of individuals and species? Captivity can be justified on the basis of the well-being of the aggregate of all individuals in the species, rather than the well-being of the well-being of those individual animals in captiv-

ity. I think this assumption underlies many of the justifications that the captive breeding zoo community has used about bringing animals into captivity.

Why bother to conserve species? Is this an important moral argument? The answer to that question can justify the preceding one, which is whether animals should be brought into captivity. I would argue yes. I think we have a moral responsibility to care for our fellow human beings, domestic animals and wild animals. Because of our resource consumption and desire to populate the world with our own progeny we directly affect other people and animals. Because we do interfere in the lives of others, especially wild species, we do have the responsibility to conserve their populations, and to do so in as humane a way as possible.

Bostock: Rolston has very strong comments about how we cannot conserve animals in zoos because it is not done within the evolutionary process. It is outside natural selection.

Jamieson: Back to education; virtually all campaigns providing people solely with environmental information fail. In cases where information does work, people approach the data with conceptual models, belief systems. In many cases we simply do not bother to find out how people represent the issues, what their beliefs are. These models can be incredibly conceptually conservative. People assimilate new information in a way consistent with what they already believe. You can take two people, show them the same thing and they will each view that as reinforcing their private set of beliefs.

How information is presented is extremely important. Generally impersonal abstract information does not engage people. People are engaged by anecdotes as well as personalized and vivid information. The source of information is also of importance. Data that comes from institutions is much less effective than information that comes from individuals. Studies back up this notion of distrust of anonymous or institutional information.

My second point concerns suffering and nature. There is a lot of structuring and interpretation about what goes on in nature. We need to be cautious about the extent to which we incorporate stereotypes and social constructions when we discuss this issue.

There are two serious differences among the people at this table. First is the question of how we are going to handle the surplus of animals that results from captive breeding programs. Secondly there are issues of individual versus species. In some sense we all agree that nature is in the equivalent of an intensive care unit, and some believe in heroic medical intervention to save nature. Others are more skeptical, questioning if it tortures the "patient" more than helps him.

Lewis: It might be fruitful for the AZA and the animal protection community to sit down and have an honest discussion about whether something can be done together. I think that discussion would have to be undertaken with the understanding that no conclusion or common action might be reached, but the discussion may be positive nonetheless.

Lacy: Virtually every zoo, even the good zoos, has bad exhibits. It is worth discussing whether there is a way to close down those exhibits. There are animals in facilities that we know are not capable of providing a natural habitat. For example, any zoo that cannot handle polar bears should not have them. There are some very good zoos with polar bears in bad exhibits.

Farinato: Sixteen-hundred zoos are licensed and registered by the USDA. Of that figure, ten percent are accredited with the AZA. Ninety percent are not ascribing to anything we are talking about here. The few that teach empathy, personal responsibility, love and respect for wildlife are not the problem. The problem is caused by the others. What messages are being given to people visiting the ninety percent?

Hutchins: Zoos are being blamed for a lot of weaknesses in our society. People are getting inadequate scientific knowledge and coming to the zoo with those preconceived notions.

Regarding the issue of education and entertainment, we have a very puritanical view of education. Education and entertainment are not antithetical. It is possible to have both. However, if you go too far you wind up with exploitation rather than entertainment.

Bekoff: Bostock's paper is an apology. He unnecessarily makes an excuse for zoos, such as his appeal to death in nature as more humane than death in captivity. Is having a relatively good state of well-being

good enough? Bostock and I definitely disagree on what it means to have a humane death.

Lindburg: Feeding is one part of their keeping that is radically altered from the natural environment. Most zoos stop with nutrition and forget about the process; the searching, collecting, preparation and act of assimilation itself, such as parceling off thirty pounds of animal carcass with your teeth. Zoos take an anthropomorphic approach to provisioning. All have very expensive facilities for food preparation but the food comes out pulverized as though the jaws, teeth and hands of these animals were ill-equipped to handle the food.

Clutton-Brock: In response to Hutchins' question about what it is we are conserving I would like to remind everyone of Przewalski's horse, a flagship species in the world of conservation. It is really a non-species or a new species which came out of Mongolia in the last century. These animals are very inbred and have become domesticated. We really do not know what we are conserving here; is it a domestic or wild animal?

Lukas: In Florida all roadside zoos are state regulated. The federal government cannot do anything except through USDA inspections and enforcing minimum animal care. They have formed a committee with the state and are rewriting the laws together. Florida and California are the only states with such state associations, and as a result roadside zoos will eventually be illegal in Florida.

As for long-term conservation programs, there is presently an attempt to develop a model in Zaire where the priorities are to set up conservation programs and see to captive situations. Genetic material will be recycled from the wild into the captivity program and then back out to the wild. This allows the evolutionary forces to still maintain an effect on the gene we get from the wild population, as well as driving habitat protection. The key is a strong linkage between habitat protection and captive breeding programs.