ENCYCLOPEDIA OF ANIMAL RIGHTS AND ANIMAL WELFARE

2ND EDITION

EDITED BY MARC BEKOFF

FOREWORD BY JANE GOODALL

Encyclopedia of Animal Rights and Animal Welfare

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Foreword

It is an honor for me to have the preface that I wrote for the first edition of the *Encyclopedia of Animal Rights and Animal Welfare* be included in the updated and expanded revision of this unique collection of essays. An incredible amount has happened in the field of animal protection in the eleven years since the first edition appeared, and these two volumes highlight much of what we have learned and accomplished during that period.

As I wrote in my preface to the first edition, never before had an attempt been made to gather together comprehensive information about the use and abuse of nonhuman animals by our own human species, along with the complex issues that must be understood by those who are concerned with animal welfare and animal rights, and some of the ways in which different groups are tackling these issues. Because human beings are animals, this book could have been expanded to include the horrible abuse and torture to which we subject other humans; theoretically, there could be a whole section on human rights. But that is not the purpose of the editor. This encyclopedia is concerned with the essential dignity of the wondrous nonhuman beings with whom we share this planet, and our human responsibilities toward them. These are the beings known in common balance as animals, which is how I shall refer to them here.

Of course, we humans are much more like other animals than was once thought, much more so then many people like to, or are prepared to, believe. I have been privileged to spend 50 years learning about and from the chimpanzees, our closest living relatives. A detailed understanding of chimpanzee nature has helped, perhaps more than anything else, to blur the line, once thought to be so clear and sharp, dividing humans from the rest of the animal kingdom. Once we are prepared to accept that it is not only humans who have personalities, not only humans who are capable of rational thought and simple problem solving, and above all, not only humans who can experience emotions such as joy, sorrow, fear, despair, and mental as well as physical suffering, then we are surely compelled to have new respect not only for chimpanzees, but also for so many other amazing animal species. (In fact, I received my first lessons about the amazing capabilities of nonhumans from my dog, Rusty, before I was 10 years old.)

The only thing that we humans do, that no other animals do in the same way, is to communicate by means of a sophisticated spoken and written language, and this I believe lays on us certain responsibilities toward the rest of the animal kingdom. It might be mentioned here that in the Book of Psalms in the Old Testament, one word was mistranslated. "Dominion" is not the best translation of the original Hebrew word *Tam Shilayhu*. Rather the word implies a "respectful and caring attitude toward creation," suggesting a sense of responsibility. This, of course, gives the text a

completely different meaning. I have been fortunate. I have been able to spend many years observing chimpanzees and other animals in their own natural environments, thereby gaining unique insights into their true nature. For this reason I believe it is my particular responsibility to share my knowledge with as large an audience as possible for the benefit of the animals themselves. Chimpanzees have given me so much, and I am haunted at the thought of those who are imprisoned in the name of entertainment or science. As I have written elsewhere, the least I can do is to speak out for the hundreds of chimpanzees who, right now, sit hunched, miserable, and without hope, staring out with dead eyes from their metal prisons. They cannot speak for themselves.

This is why I am so very glad that this encyclopedia has been put together, for it speaks out for animals, for all kinds of animals. It broadcasts a simple message, a plea, that needs desperately to be heard as we move ahead in the 21st century: Give animals the respect that, as sentient beings, is their due. And this simple message is delivered here by a multitude of voices from many different disciplines, from biology, including ethology, the study of behavior, to ecology, anthropology, psychology, philosophy, sociology, education, law, ethnology, history, politics, theology, veterinary science, and public administration. This multidisciplinary collection of contributors means that the essays discuss the central theme from different perspectives; collectively they provide an astonishingly rich overview of the extent of animal suffering in our modern society, and the various steps that have been taken by those fighting for animal welfare and animal rights. And, importantly, the material is presented in a straightforward way intended to appeal to the general public as well as scientists. Once this encyclopedia reaches the shelves of libraries in schools and universities, many young people, as well as their teachers, will have access to this valuable information.

This reference work provides the reader with an opportunity to acquire in-depth understanding of complex issues. And because different contributors voice differing opinions, the reader will also be able to develop his or her own carefully reasoned arguments to use when discussing controversial issues with people who hold different views. This is important. The more passionate one feels about animal abuse, the more important it becomes to try to understand what is behind it. However distasteful it may seem, it really is necessary to become fully informed about a given issue. Dogmatism, a refusal to listen to any point of view differing from one's own, results in moral and intellectual arrogance. This is far from helpful, and is most unlikely to lead to any kind of progress. The us versus them attitude brings useful dialogue to an end. In fact, most issues are quite complex and can seldom be described in simple terms of black and white, and until we become fully cognizant of all that is involved, we had better not start arguing, let alone throwing bricks at anyone.

Let me give an example. During a semi-official visit to South Korea, my host organization set up a press conference. The subject of cruelty came up. I said that I would like to discuss their habit of eating dogs. My interpreter blanched. Quite clearly she felt that this was politically insensitive and would embarrass my hosts! I explained that in England, the country where I grew up, people typically ate cows and pigs and chickens, and that pigs are at least as intelligent as dogs and, in fact, make wonderful pets. Yet only too often they are kept in horrendous conditions. I suggested that the most important issue, if one was going to eat an animal at all, which I did not, was not so

much the species as how it was treated in life. At this point one of the journalists assured me that the dogs they ate were bred for eating. This led to discussions about whether or not this made any difference, the ways in which dogs and pigs were kept, and a variety of other issues. The point was that an almost taboo subject was aired in public, and this led, for a number of people, to new ways of thinking about animals in general.

Perhaps the bitterest pill that we who care about animals have to swallow is that, only too often, it is through a series of compromises that progress is actually made, and this seems agonizingly slow. There are, of course, situations when the cruelty inflicted is so great that no compromise is possible. Then it is vitally important to know as much as possible about the situation. This encyclopedia may provide the animal activist with information about how similar situations have been successfully tackled.

The essays in this volume are necessarily brief, summarizing information which, in some cases, is extensive. Each essay can serve to stimulate the reader to pursue a particular issue in greater depth, guided by the extensive lists of references and key organizations that have been compiled for the encyclopedia. These lists will be a goldmine for all those who care about animal issues. All in all, these two volumes are a unique contribution to the field of animal protection.

Albert Schweitzer once said, "We need a boundless ethic that includes animals, too." At present our ethic concerning animals is limited and confused. For me, cruelty, in any shape or form, whether it be directed toward humans or sentient nonhumans, is the very worst of human sins. To fight cruelty brings us into direct conflict with that unfortunate streak of inhumanity that lurks in all of us. For all who like me, are committed to joining this particular battle, this encyclopedia will prove invaluable. A great deal of the behavior that we deem cruel is not deliberate, but due to a lack of understanding. It is that lack of understanding that we must overcome. And every time cruelty is overcome by compassion, we are moving toward that new and boundless ethic that will respect all living beings. Then indeed we shall stand at the threshold of a new era in human evolution—the realization of our most unique quality: Humanity.

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U.K. January 2009

Preface

> Currently, there is growing interest in the nature of human-nonhuman animal (hereafter animal) interactions as we head into the 21st century, for it is clear that there are many important associated issues that demand immediate and careful attention.

That is how I began my introduction to the first edition of this encyclopedia, the first of its kind, more than a decade ago. These statements are just as true today, in 2009, when there is even greater and growing interest in human-animal interactions in general and in the field of animal protection more specifically. This expanded and updated revision of the *Encyclopedia of Animal Rights and Animal Welfare* will address the needs of students, researchers, and the general public.

There is unprecedented and growing global interest in the well-being of animals. Many people come to these issues from very different walks of life, both academic and nonacademic, and from many points of interest, for example, social, political, educational, philosophical, psychological, legal, zoological, ethological, ecological, theological, anthropological, sociological, historical, biographical, medical and veterinary sciences, ethnological, and public health, which are represented in this volume. We thought it important, therefore, to collect as much information as possible in one easy-to-read reference book.

The issues with which humans need to deal to develop informed views about human-animal interactions require that people from many different disciplines get involved in the discussions. And, of course, these exchanges of ideas must be open, and people must be sensitive to all different views if we are to make progress. We hope that we have been successful in presenting different viewpoints, because us versus them interactions are not very helpful and tend to alienate, rather than unite, individuals who share common concerns and goals. It is important for all people to listen to one another, and for all of us to listen to the animals with whom we are privileged to share the planet and interact. Respect for the dignity of all animals' lives needs to underlie consideration of how humans interact with other animals. Thus, we hope that we and our authors have covered the issues from varied approaches, including theoretical matters and practical applications, using information gathered from animals living in highly controlled laboratory environments and those living in the wild. All types of data are important, and much useful information about the complexity, diversity, and richness of animals' lives has come from the study of free-living animals.

It also is important to stress that there is a long, rich, diverse, and sometimes painful history of events that center on how animals have been used by humans in various

sorts of activities. We had to make some difficult choices of which topics to include and which to exclude. Because of space considerations, we decided not to include entries on individuals, even though they may have made profound contributions to the history of animal welfare and animal rights. Although we have only some historical information in the *Encyclopedia,* we call readers' attention to the historical account of the people who contributed to the anti-vivisection movement, published by the American Anti-Vivisection Society in Fall 2008. This account is extremely useful: http://www.aavs.org/images/spring2008.pdf.

We were thrilled that many extremely busy and over-committed people, a veritable who's who of people working on topics related to animal protection, thought that this revision was important enough for them to free the time to write new essays that reflect the growing interest and the accumulation of scientific information in hot fields such as conservation ethics, the use of noninvasive field techniques to study wildlife, exotic species, wildlife contraception, the importance of animal sanctuaries, the emotional lives of animals and animal sentience, puppy mills, no-kill shelters, dogfighting, cockfighting, bullfighting, animals in the performing arts, stress and well-being, the gender gap in the animal protection movement, factory farming and disease, climate change and its effect on animals, pet renting, the welfare of fish, the legacy of captive chimpanzees, animals in disasters, the Endangered Species Act, animal law from an international perspective, the nature and importance of human-animal interactions in general (anthrozoology), and the welfare of whales and dolphins.

In addition to many new essays, we have pieces written by founders and leaders of major animal protection groups, and people directly involved in humane education in the United States and abroad, including China, India, Kenya, Israel, Australia, and the European Union. There are a number of essays in this edition on various cultural and religious views of animals, which bear on issues of animal protection. Having these kinds of firsthand contributions from people who are actually doing the work is invaluable.

This revised and expanded encyclopedia offers a discussion of just about all of the major issues that need to be considered in discussions of animal protection. Essays vary in length; some are short, covering topics succinctly, with others more wide-ranging and detailed. All in all, the information in these two volumes is both broad in scope and unprecedented. While the vast majority of essays are presented in a neutral manner, a few are more personal, because it is very difficult to be impartial when writing about our animal kin. All humans have unique responsibilities to animals that need to be taken seriously. We and the animals whom we use should be viewed as partners in a joint venture. We can teach one another respect and trust, and animals can facilitate contact among us and help us learn about our place in this complex, challenging, and awe-inspiring world.

It is my hope that the information in these volumes will be useful to all people who are interested in animal rights and welfare, and will help us increase what I call our compassion footprint as we head into the future.

HOW TO USE THIS ENCYCLOPEDIA

The 207 entries are arranged in alphabetical order. All of the essays in these volumes, and the list of further readings that follows nearly every one, contain information about

what has been done and what remains to be done in specific areas in animal rights and welfare. The Chronology of Historical Events in Animal Protection at the end of the second volume of this encyclopedia, and the Resources on Animal Rights and Animal Welfare section, also at the end of the second volume, provide more information for further study of animal rights and welfare. Finally, included with the affiliation of some contributors are Web sites that are outstanding interdisciplinary and international resources, containing details about the authors and various educational programs, projects, and organizations concerned with animal rights, animal welfare, and human-animal interactions.

While each of the entries generally presents an extensive summary of the issues at hand, successes that are being made in animal protection, and information about where more work is needed, entries should not be read as comprehensive treatments, nor should the list of further readings at the end be thought of as exhaustive coverage. Rather, each entry and the summary of resources should be viewed as points of departure for further investigations, like kindling that can be used to ignite larger fires. I hope that you enjoy this reference book and that the essays stimulate you to learn more about the animals with whom we share our planet.

GIVING THANKS

Suffice it to say, I could never have completed this project on my own. When Kevin Downing and Anne Thompson asked me if I'd consider revising the first edition of this encyclopedia, I jumped at the chance. How exciting it would be to update all that has happened in the eleven years since the first edition appeared! Contacting former and new authors, preventing and putting out fires, and editing and editing and editing, were extremely time-consuming. In and of itself, there is an interesting sociological story that can be told at another time. As usual, Anne Thompson was always there, as she had been for two of my previous encyclopedias, the *Encyclopedia of Animal Behavior* (Greenwood, 2004) and the *Encyclopedia of Human-Animal Relationships* (Greenwood, 2007). Thank you so very much, Anne. The people at Apex CoVantage also helped to bring this encyclopedia to life. And, of course, many thanks to all the contributors who took time out of their busy days to write new essays or revise their excellent entries from the first edition. The many and different perspectives on animal protection that are presented here show just how rich and complicated our relationships with other animals can be.

Introduction

WHY ANIMAL RIGHTS AND ANIMAL WELFARE MATTER

The growing general concern around the world about how humans interact with other animals, as well as the field of animal protection more specifically, includes academics, activists, and animal lovers, many of whom wear all three hats. No longer is someone who is interested in animal rights or animal welfare automatically dismissed as a radical. The animal protection movement is not a fringe cause made up of extremists. In the past five years, I have had the good fortune to visit numerous countries in many different parts of the world, and seen firsthand how people yearn not only to learn more about the lives of animals, but also what they can do to grant animals more protection. There are essays and news articles in the popular media daily about the use and abuse of animals across all cultures. That is how much interest there really is, and this is why I am revising, updating, and expanding the first edition of the *Encyclopedia of Animal Rights and Animal Welfare.* One audience for which this encyclopedia holds special interest is young people, especially teenagers, who have a rapidly growing concern about animal protection.

Animals are in. It's the century of the animal. Every day I receive numerous stories from around the world about the amazing intellectual skills of animals and what they're feeling; it's impossible to keep up with them all. Sometimes when I log on to my e-mail at 5:00 A.M., I'm inundated, but I am also pleased to read both down-home anecdotes and hard-data scientific papers that bear on the emotional lives of animals, human arrogance and, most welcomed, stories about all the wonderful things that people around the world are doing for animals. Popular media regularly feature articles about animals, and it's clear that animals are on the agenda of millions of people around the world. The *New York Times* published obituaries for two famous animals whose language abilities startled the word, Washoe, a "chimpanzee of many words" (http://www.nytimes.com/2007/11/01/science/01chimp.html?_r=1&scp=1&sq=washoe&st=cse&oref=slogin) and Alex, an African gray parrot, who mastered English and could count and recognize different shapes and colors (http://www.nytimes.com/2007/09/11/science/11parrot.html?scp=2&sq=ALEX+PARROT&st=nyt). In the May 7, 2007 issue of *Newsweek,* there was an essay about the emotional lives of elephants, and how they deserve far more respect then we're giving them ("Deserving of Respect: Is it acceptable to kill the elephants of South Africa even when it is necessary to save other species? The answer is no longer an automatic 'yes'": http://www.newsweek.com/id/35114).

We now know that elephants suffer from posttraumatic stress disorder (PTSD). During recent years there have also been many other surprises. We know that mice are empathic rodents—they feel the pain of other mice—and that whales possess spindle cells, which are important in processing emotions. Before this discovery, it was thought that only humans and other great apes possessed spindle cells. We've also learned that fish have distinct personalities, ranging from shy and timid to bold, and are very intelligent and possess long-term memory, that turtles mourn the loss of friends, and that birds plan for the future, and are more sophisticated in making and using tools than chimpanzees. These cognitive and emotional capacities factor in to how we should treat other animals.

I met traumatized elephants at the David Sheldrick Wildlife Trust (http://www.sheldrickwildlifetrust.org/index.asp) outside of Nairobi, Kenya, and saw the marvelous work that was being done there to rehabilitate individuals so that they could be returned to the wild. Based on the fact that zoos can't satisfy the social, emotional, or physical needs of elephants, the Bronx Zoo and zoos in Detroit, Chicago, San Francisco, and Philadelphia are phasing out their elephant exhibits, despite the fact that they are moneymakers. A landmark review of survivorship in zoo elephants, written by six eminent biologists and published in the prestigious journal *Science* in December 2008, concluded that, "Overall, bringing elephants into zoos profoundly impairs their viability. The effects of early experience, interzoo transfer, and possibly maternal loss, plus the health and reproductive problems recorded in zoo elephants . . . suggest stress and/or obesity as likely causes." Critics of zoos often ask for hard data to support claims that animals don't do well in zoos, and this incredibly detailed study, headed by Ros Clubb, shows just that.

While we often see the ways in which the lives of animals are compromised, much abuse goes unnoticed. For example, worldwide as many as 300,000 cetaceans (whales, dolphins, porpoises) slowly meet death over the course of many minutes when they get entangled as accidental by-catch in fishing nets. When their bodies are recovered, it is obvious that they had desperately struggled to escape from their entrapment, and that they sustained horrific injures while doing so. Trapped individuals sustain deep cuts and abrasions to the skin from the rope and the netting, and fins and tail flukes can be partially or completely amputated. They also have broken teeth, beaks, or jaws, torn muscles, hemorrhaging, and serious internal injuries ("Shrouded by the Sea," http://www.wdcs.org/submissions_bin/wdcs_bycatchreport_2008.pdf). The suffering of these sentient beings often goes unnoticed because it is hidden in the sea, a part of the world where human beings are less prevalent than other animals, but it's safe to say that this kind of treatment would not be tolerated if it happened on land in situations such as commercial meat production. What is simply unacceptable is that there isn't any legislation that is concerned with this problem.

THE NATURE OF HUMAN-ANIMAL RELATIONSHIPS

Our relationships with nonhuman animals are complicated, frustrating, ambiguous, paradoxical, and range all over the place. The growing field of anthrozoology (http://www.isaz.net/; http://www.anthrozoology.org/) is concerned with reaching a more

complete understanding of how and why we interact with animals in the many different ways that we do. When people tell me that they love animals, and then harm or kill them, I tell them I'm glad they don't love me. We observe animals, gawk at them in wonder, experiment on them, eat them, wear them, write about them, draw and paint them, move them from here to there as we redecorate nature, make decisions for them without their consent, and represent them in many varied ways, yet we often dispassionately ignore who they are and what they want and need. Surely we can do better in our relationships with animals.

A very good example of how difficult our relationships with animals can be centers on the keeping of exotic animals as our household companions or pets. In February 2009, a chimpanzee named Travis, who had lived in a home for years, attacked and maimed a close friend of his female human companion. As a result, Travis' long-time friend had to stab him to stop the attack, and ultimately Travis was killed by a police officer.

In the past, Travis had been allowed to drink wine and brush his teeth with his human companion (http://www.stamfordadvocate.com/ci_11717191?source=most_emailed). Numerous people were saddened by this tragedy, and outraged that Travis had been kept as if he were a dog or a cat. I pointed out that this terrible situation could easily have been avoided if Travis had been living at a sanctuary, and not in a private home being treated as if he were a human. Chimpanzees do not typically drink wine or brush their teeth with a WaterPik, and while it may seem cute, asking a chimpanzee to do these things is an insult to who they are. Furthermore, a story published by the Associated Press called Travis a domesticated chimpanzee, but this is a complete misrepresentation of who he was. Domestication is an evolutionary process that results in animals such as our companion dogs and cats undergoing substantial behavioral, anatomical, physiological, and genetic changes during the process. Travis was a socialized chimpanzee, an exotic pet, who usually got along with humans, but he was not a domesticated being. He still had his wild genes, as do wolves, cougars, and bears, who sometimes live with humans, causing tragedies to occur, because these are wild animals, despite being treated as if they're human.

Many people were surprised by what seemed to be an unprovoked attack. But to say there was no known provocation for the attack is to ignore the basic fact that Travis was still genetically a wild chimpanzee. Wild animals do not belong in human homes; they can be highly unpredictable (consider other attacks by famous animals on their handlers), and they should be allowed to live at sanctuaries that are dedicated to respecting their lives while minimizing human contact.

In an editorial, the local paper, The *New Haven Advocate,* called for a ban on the keeping of wild animals as pets (http://www.stamfordadvocate.com/opinion/ci_11733105). I hope that this tragic situation serves to stimulate people to send the wild friends who share their homes to places that are safe for everyone (http://www.stamfordadvocate.com/letters/ci_11724995).

Bucknell University philosopher Gary Steiner argues in his book *Animals and the Moral Community* that there is profound historical prejudice against animals, although more and more people are currently working on behalf of animals. While this is so, and there is a growing animal ethic globally, our attitudes and practices remain full of contradictions and ambivalence, as shown in the case of Travis. It's as if we suffer from

moral schizophrenia because it's so difficult to live with a consistent morality toward animals. Travis was tolerated as long as he behaved like a human, but killed when he behaved as a wild chimpanzee might when something happened that he found unacceptable. Animal advocate and lawyer Gary Francione notes that while we claim to accept the principle that we should not inflict suffering or death on nonhumans unless it is necessary to do so, we do so in situations in which 99.99 percent of the suffering and death cannot be justified under any plausible notion of coherence. On the one hand, animals are used and abused in a vast array of human-centered activities. On the other hand, animals are revered, worshipped, and form an indispensable part of the tapestry of our own well-being; they make us whole, they shape us, and they make us feel good. Yet animals are sometimes confused and desperate because of the widespread and wanton abuse that they suffer at the hands of humans. Animal advocate Samantha Wilson says animals feel asphyxiated when they try to tell us how much pain we bring to them and we ignore their pleas, and what's really interesting is that the animals aren't the cause of the treatment that they receive, but it is that, rather, there are just too many of us marauding human animals, dominant human beings, who think we can do anything we want because we're superior. People don't like to talk about our own tendency to overpopulate, but at the core that's the major problem.

While many people try to treat animals with respect and dignity, many also agree that good welfare is not good enough. Existing laws and regulations don't adequately protect animals. We're only fooling ourselves when we claim that they prevent pain and suffering. Good welfare, and research performed within existing regulations, allow mice to be shocked and otherwise tortured, rats to be starved or forced-fed, pigs to be castrated without anesthetics, cats to be blinded, dogs to be shot, and primates to have their brains invaded with electrodes.

Only about one percent of animals used in research in the United States are protected by current legislation. For instance, here is a quote from the U.S. *Federal Register,* volume 69, number 108, Friday June 4, 2004:

> We are amending the Animal Welfare Act (AWA) regulations to reflect an amendment to the Act's definition of the term *animal.* The Farm Security and Rural Investment Act of 2002 amended the definition of *animal* to specifically exclude birds, rats of the genus *Rattus,* and mice of the genus *Mus,* bred for use in research.

It may surprise you to hear that birds, rats, and mice are no longer considered animals, but that's the sort of logic that characterizes federal legislators. Since researchers are not allowed to abuse animals, the definition of animal is simply revised until it only refers to creatures that researchers don't need. We now know that mice are empathic beings who feel the pain and suffering of other mice (www.the-scientist.com/news/display/23764/#23829), yet this scientific fact hasn't entered into discussions about the well-being of mice and other animals. (For more information, see the "Mice" and "Rats" entries in this encyclopedia.) It is now known that even hermit crabs suffer and remember situations that caused them pain (http://news.bbc.co.uk/2/hi/uk_news/northern_ireland/7966807.stm).

Concerning the use and well-being of birds, Karen Davis, president of United Poultry Concerns notes that

> Millions of birds suffer miserably each year in government, university, and private corporation laboratories, especially considering the huge numbers of chickens, turkeys, ducks, quails, and pigeons being used in agricultural research throughout the world, in addition to the increasing experimental use of adult chickens and chicken embryos to replace mammalian species in basic and biomedical research.
>
> Slaughter experiments are also routinely performed on live chickens, turkeys, ducks, ostriches, and emus, in which these birds are subjected to varying levels of electric shock in order to test the effect of various voltages on their muscle tissue for the meat industry. (See http://www.upc-online.org/genetic/experimental.htm for specific references.)

For example, the Spring 2002 issue of the *Journal of Applied Poultry Research* featured an article in which USDA researchers describe shocking 250 hens in a laboratory simulation of commercial slaughter conditions to show that "subjecting mature chickens to electrical stimulation will allow breast muscle deboning after two hours in the chiller with little or no additional holding time."

Concern for animals has moved beyond primarily captive situations such as laboratories, zoos and aquaria, rodeos, circuses, slaughterhouses, and fur farms into the field. Many of the new essays in this encyclopedia reflect this growing interest and concern. The lives of individual animals are also now much more centrally located in the conservation or green movement, and animals' points of view, including what they like and what they want, and their fate, is more and more factored into conservation decisions, such as relocation and reintroduction projects. This has been evident in popular reaction to urban animals who become pests.

For example, in July 2008, a mother bear was shot when she returned to Boulder, Colorado, my hometown, to look for her cub, which had been electrocuted by an uninsulated electric wire. The citizens were incensed and made their feelings known. The vast majority of people thought it unnecessary to kill the mother bear, and she should have been relocated so that she could live without bothering people. She had done nothing wrong, and was merely trying to live where bears had previously lived before being displaced because of human development.

In another story, when a bear whose head was stuck in a jar left as trash by humans was killed in Minnesota (http://news.bbc.co.uk/2/hi/americas/7534325.stm), people were outraged by this action as well. They wanted to know why the bear couldn't have been tranquilized instead of killed.

In a very real sense, animals are part of the green movement, and coexistence is the guiding philosophy that drives many decisions about how to treat them without trumping their interests with our own. Fewer and fewer decisions to trade off animals for humans go without discussion and concern by a growing portion of the general population. Much interest is driven by interactions with the companion animals who share the homes of people around the world and by children, who are inherently interested in the lives of animals regardless of where they live.

While most people agree that animals are important to humans and that we must pay attention to their well-being, there is also a good deal of disagreement about the types of obligations, if any, that humans have toward other animals. Despite growing interest in and concern over the use of animals, over the past five years violations of the federal Animal Welfare Act (AWA) in the United States have increased more than 90 percent (http://www.all-creatures.org/saen/). In 2006 alone there were more than 2,100 violations of the AWA, with the highest level of violations occurring in the areas of Institutional Animal Care and Use Committees (IACUCs) (58%), and veterinary care (25%). It has been estimated that about 75 percent of all laboratories violate the AWA at one time or another.

On the other hand, progress is being made. In June 2008, the Spanish government extended legal rights to great apes that include the right to life, protection of individual liberty, and prohibition of torture (www.reuters.com/article/scienceNews/idUSL2565 86320080625?feedType=RSS&; see also http://www.greatapeproject.org/). Kentucky Fried Chicken (KFC) outlets in Canada agreed to require more humane treatment of chickens, including improved slaughtering methods, and to serve vegan chicken items made of soy (http://edmontonsun.com/News/Canada/2008/06/01/5739946.html). In July 2008, Governor Arnold Schwarzenegger signed a law that strengthened the protection of downed cows (http://www.hsus.org/press_and_publications/press_releases/schwarzenegger_signs_law_protecting_california_downed_cows_072208.html) who aren't strong enough to survive their trip to a slaughterhouse. In March 2009, the U.S. government banned the use of downer cows for food (http://news.yahoo.com/s/ap/20090314/ap_on_go_pr_wh/mad_cow/print). Farm Sanctuary (www.farmsanctuary.org) achieved a precedent-setting victory after a ten-year battle with the New Jersey Department of Agriculture. Farm Sanctuary's press release notes that, "In a monumental legal decision, the New Jersey Supreme Court unanimously declared that factory farming practices cannot be considered 'humane' simply because they are 'routine husbandry practices'" (http://www.farmsanctuary.org/mediacenter/2008/pr_nj_decision08.html). In addition, in July 2008, great apes that had been used to make movies were moved to the Great Ape Trust sanctuary in Des Moines, Iowa (http://africa.reuters.com/odd/news/usnN16285101.html). In August 2008, at the International Primatological Congress held in Edinburgh, Scotland, there was a symposium on invasive research on great apes, one of the first of its kind ever held at this prestigious meeting. This important gathering came at a time when the European Union (EU) was considering Directive 86/609, which would confirm a total ban on the use of great apes and wild-caught primates in invasive research (http://ec.europa.eu/environment/chemicals/lab_animals/revision_en.htm). Soon after that, legislation was passed in Spain to protect great apes. And in November 2008, because of unrelenting and intentional abuse, Proposition 2 was passed in California by a vote of 63 percent to 37 percent to protect factory-farmed animals so that, beginning in 2015, farm animals will have the right to lie down, stand up, turn around, and extend their limbs. A *New York Times* editorial supported this legislation and urged other states to implement it (http://www.nytimes.com/2008/10/09/opinion/09thu3.html?_r=2&th&emc=th&oref=slogin&oref=slogin).

Which animals we choose to eat also presents major problems, as shown by noted author Michael Pollan in *The Omnivore's Dilemma* and *In Defense of Food*, and in Gene Baur's *Farm Sanctuary,* a superb review of the horrors of factory farming. Not

only is a diet with less meat better for us and for animals, but also for the planet as a whole. In addition to extremely important ethical questions that center on the use of animals for food, there are many environmental concerns (http://www.ciwf.org.uk/resources/publications/environment_sustainability/default.aspx; http://www.ciwf.org.uk/includes/documents/cm_docs/2008/s/sustainable_agriculture_report_2008.pdf). For example, it is estimated that by 2025, 64 percent of humanity will be living in areas of water shortage. The livestock sector is responsible for over eight percent of global human water use, and seven percent of global water is used for irrigating crops grown for animal feed. Animal agriculture is responsible for 18 percent of global anthropogenic greenhouse gases (GHGs). In New Zealand, 34.2 million sheep, 9.7 million cattle, 1.4 million deer, and 155,000 goats emit almost 50 percent of greenhouse gases in the form of methane and nitrous oxide (http://www.newscientist.com/article/mg20026873.100-how-kangaroo-burgers-could-save-the-planet.html). Animals are living smokestacks (http://www.nytimes.com/2008/12/04/science/earth/04meat.html?pagewanted=2&_r=1&ref=science). According to the Swedish group Lantmannen, "Producing a pound of beef creates 11 times as much greenhouse gas emission as a pound of chicken and 100 times more than a pound of carrots" (http://www.nytimes.com/2008/12/04/science/earth/04meat.html?pagewanted=2&_r=1&ref=science).

A major concern is the high prevalence of infectious disease that results from factory farming, including streptococcus, Nipah virus, multidrug-resistant bacteria, SARS, avian flu, and other diseases (http://www.hsus.org/farm/news/ournews/factory_farming_emerging_diseases.html; https://hfa.org/factory/index.html). There is even evidence that workers who kill pigs can suffer nerve damage (http://www.iht.com/articles/2008/02/05/healthscience/05pork.php). Physicians were mystified when three patients who visited the Austin Medical Center had the same highly unusual symptoms, including fatigue, pain, weakness, and numbness and tingling in the legs and feet. But the patients had something else in common; they all worked at Quality Pork Processors, a local meatpacking plant.

Even the United Nations' Nobel Prize-winning scientific panel on climate change urged people to stop eating meat because of the climatic effects of factory farming (http://afp.google.com/article/ALeqM5iIVBkZpOUA9Hz3Xc2u-61mDlrw0Q). They suggested, "Don't eat meat, ride a bike, and be a frugal shopper—that's how you can help brake global warming." In addition they suggested, "Please eat less meat—meat is a very carbon intensive commodity . . . Studies have shown that producing one kilo (2.2 pounds) of meat causes the emissions equivalent of 36.4 kilos of carbon dioxide."

An essay in *Conservation Magazine* (July/September, 2008) titled "The Problem of What to Eat" (http://www.conbio.org/CIP/article30813.cfm) highlights the major problems:

> It turns out that many core issues such as pesticide use, soil health, and the impact of food miles are more nuanced and complicated than you might think. . . . According to a recent study by researchers at Carnegie Mellon University, foregoing red meat and dairy just one day a week achieves more greenhouse gas reductions than eating an entire week's worth of locally sourced foods. That's because the carbon footprint of food miles is dwarfed by that of food production. In fact, 83 percent of the average U.S. household's carbon footprint for food consumption

comes from production; transportation represents only 11 percent; wholesaling and retailing account for 5 percent.

It has been calculated that the carbon footprint of meat-eaters is almost twice that of vegetarians (http://www.nowpublic.com/environment/love-mother-earth-slash-carbon-footprint-going-veggie; http://news.sg.msn.com/lifestyle/article.aspx?cp-documentid=1647349). Commercial meat production clearly is not sustainable, according to the most often quoted definition from a United Nations Report, as development "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987, p. 1). Further, all definitions of sustainable development ignore the lives of animals.

Dissecting animals as part of educational practices is also being questioned. Schools at all levels around the world are banning this practice not only because of ethical issues, but also because non-animal alternatives are as good or better for reaching educational goals (http://www.interniche.org/). More than 30 published studies show that alternatives such as computer software, models, and transparencies are at least as likely as dissection to achieve the intended educational goals. Technological advances, such as imaging that allows students to view the nervous system at any level, to rotate the image, to make certain layers opaque and others transparent, to cut away certain layers, and to repeat these operations in reverse, add an overwhelming advantage to these alternatives.

Educators around the world agree. In Gujarat, India, Bhavnager University has replaced the annual use of more than 3,000 animals with non-animal alternatives, Israel banned vivisection in schools in 2003, and in March 2008, the Faculty of Zoology at Tomsk Agricultural Institute in Russia ended the use of animals for dissection (http://www.vita.org.ru/), even as Russian President and *Time* Magazine's person of the year Vladimir Putin admitted to having harassed rats when he was young (http://www.time.com/time/magazine/europe/0,9263,901071231,00.html).

Medical schools in the United States are swapping pigs for plastic (http://www.nature.com/news/2008/080507/full/453140a.html). In this essay it was noted that while doctors used to try out their surgical skills on animals before being allowed to work on patients, now only a handful of medical schools in the United States still have animal labs. Live-animal experiments were on the curriculum in 77 of 125 medical schools in 1994, but now it is thought that only 11 of 126 schools still use them, and this trend is being followed around the globe. By February 2008, all American medical schools had abandoned the use of dog labs for teaching cardiology (http://www.nytimes.com/2008/01/01/health/research/01dog.html?_r=1&scp=1&sq=belloni%20dogs&st=cse&oref=slogin). For more information on alternatives, see these Web sites: www.aavs.org, www.idausa.org/campaigns/dissection/undergradscience.html, and www.petakids.com/disindex.html. Francis Belloni, dean at New York Medical College, has said that "the use of animals was not done lightly and had value," but added that students would "become just as good doctors without it" (*New York Times* article cited above).

The debate about the use of non-animal alternatives continues. On the one hand, Roberto Caminiti, chair of the Programme of European Neuroscience Schools (htpp://fens.mdc-berlin.de/pens) has argued that it will never be possible to replace animals in

research (*Nature,* 2009, p. 147). Caminiti avoids any discussion of the numerous non-animal alternatives that are available, many of which are being used successfully by many of his colleagues. On the other hand, Bill Crum of the Centre for Neuroimaging Sciences at the Institute of Psychiatry at King's College London counters Caminiti as follows:

> To my mind, there is a moral inconsistency attached to studies of higher brain function in nonhuman primates: namely, the stronger the evidence that nonhuman primates provide excellent experimental models of human cognition, the stronger the moral case against using them for invasive medical experiments. From this perspective, "replacement: should be embraced as a future goal." (http://www.nature.com/nature/journal/v457/n7230/pdf/457657b.pdf)

It is clear that people who are interested in animal rights and animal welfare are involved in an ever-growing social movement, and the time has indeed come to move forward proactively, and not merely reactively, to educate, and to raise consciousness. In March 2006, I gave a lecture at the annual meeting of the Institutional Animal Care and Use Committees in Boston. I was received warmly, and the discussion that followed my lecture was friendly, even though some in the audience were a bit skeptical of my unflinching stance that certain animals feel pain and a wide spectrum of emotions. After my talk, a man approached me and informed me that he was responsible for enforcing the Animal Welfare Act at a major university. He admitted that he'd been ambivalent about some of the research that's permitted under the act and, after hearing my lecture, he was even more uncertain. He told me that he'd be stricter in enforcing the current legal standards, and work for more stringent regulations. I could tell from his eyes that he meant what he said, and that he understood that the researchers under his watch would be less than enthusiastic about his decision. But he needed someone to confirm his intuition that research animals were suffering, and that the Animal Welfare Act was not protecting them. I was touched and thanked him. Then he put his head down, mumbled, "Thank you," and walked off. In September 2008, I learned that he had recommended that I be invited to a conference about enriching the lives of laboratory animals. Although I would like to see research with lab animals phased out entirely and the animals moved to a sanctuary, this is a first step in raising awareness that laboratory animals cannot be given what they need, and that there are non-animal alternatives that are as good or better. Over the past few years, in my extensive travels around the world, I've learned that many of my colleagues now agree that animal welfare often isn't good enough (Bekoff, 2008b).

The work on behalf of ending some laboratory uses of animals stems from the pioneering efforts of Henry Spira, founder of Animal Rights International (see Singer, 1998). In the 1970s, working from his small apartment in New York City, Spira and his grassroots organization were responsible for having federal funding pulled from a project in which researchers at the American Museum of Natural History performed surgery on cats' genitals and pumped them full of various hormones to see how the mutilated cats would behave sexually. Spira also formed the Coalition to Abolish the Draize Test, a test that involves using rabbits to test eye-makeup. The Draize test is

torture, and rabbits, who have very sensitive eyes, suffer immensely. By 1981, the cosmetics industry itself awarded $1 million to Johns Hopkins University's School of Hygiene and Public Health to establish the Center for Alternatives to Animal Testing. Most cruelty-free products trace their history back to Spira's tireless and unflagging efforts to stop animal abuse.

ASKING ANIMALS WHAT THEY WANT

In this revised edition of the *Encyclopedia of Animal Rights and Animal Welfare,* there is considerably more information on animal cognition and animal emotions and sentience. These are among the hottest areas in a field called cognitive ethology (Bekoff, 2006, 2007b; Bekoff and Pierce, 2009), or the study of animal minds. This information was used in a very novel study by renowned ape language researcher Sue Savage-Rumbaugh. One way to find out what animals want is to ask them and then write a paper with them, as Savage-Rumbaugh did. She coauthored a paper for the *Journal of Applied Animal Welfare Science* (JAAWS) with the bonobos she studied for years, Kanzi Wamba, Panbanisha Wamba, and Nyota Wamba (http://www.informaworld.com/smpp/content~content=a788000924~db=all~order=page). Because Sue and the bonobos had two-way conversations, these amazing beings using a keyboard with symbols (lexigrams), and she could actually ask the bonobos questions and record their responses (http://www.myhero.com/myhero/hero.asp?hero=sue_savage_rumbaugh; http://www.iowagreatapes.org/media/releases/2008/nr_10a08.php). She also notes,

> Although it is true that I chose the items listed as critical to the welfare of these bonobos and facilitated the discussion of these particular items, I did not create this list arbitrarily. These items represent a distillation of the things that these bonobos have requested repeatedly during my decades of research with them.

Sue discovered that these were the items the bonobos agreed were important for their welfare:

1. Having food that is fresh and of their choice
2. Traveling from place to place
3. Going to places they have never been before
4. Planning ways of maximizing travel and resource procurement, for example, obtaining food
5. Being able to leave and rejoin the group, to explore, and to share information regarding distant locations
6. Being able to be apart from others for periods of time
7. Maintaining lifelong contact with individuals whom they love
8. Transmitting their cultural knowledge to their offspring
9. Developing and fulfilling a unique role in the social group

10. Experiencing the judgment of their peers regarding their capacity to fulfill their roles, for the good of the group
11. Living free from the fear of human beings attacking them
12. Receiving recognition, from the humans who keep them in captivity, of their level of linguistic competency and their ability to self-determine and self-express through language

Clearly, eating well, having the freedom to move about and to have time alone, being stimulated by novelty, being an active member of a social group, being appreciated for the beings they are, and living free from fear, all figured into the bonobos' assessment of what they needed in captivity. Enriched and challenging social and physical environments were important to them, as they would be to most animals who find themselves living in situations where their options are limited. This sort of preference testing could be used on a wider array of species, and in this way they can tell us what they want and need. In doing this we can make "good welfare" better.

EVERY INDIVIDUAL CAN MAKE A DIFFERENCE: WE'RE WIRED TO BE KIND

> The first annual Kindness Index, introduced today by Best Friends Animal Society, finds that most Americans, in addition to loving their pets, believe overwhelmingly that they have a moral obligation to protect animals. They are also adamant about passing these values on to their children . . . The major discovery of the poll is that far more people than we imagined really want better lives for animals, and they're prepared to help. We simply have to create the opportunities. (http://www.bestfriends.org/aboutus/pdfs/061906%20Kindness%20Index.pdf)
>
> I believe that at the most fundamental level our nature is compassionate, and that cooperation, not conflict, lies at the heart of the basic principles that govern our human existence . . . By living a way of life that expresses our basic goodness, we fulfill our humanity and give our actions dignity, worth, and meaning. (His Holiness The Dalai Lama, "Understanding our Fundamental Nature")
>
> Human beings are wired to care and give . . . and it's probably our best route to happiness. (Psychologist Dacher Keltner: http://www.nytimes.com/2008/11/27/us/27happy.html?scp=3&sq=dacher&st=cse)

Despite everything we read about competition and nastiness, most research nowadays supports what University of California psychologist Dacher Keltner claims. Humans are wired to care and to give, and it makes us feel good to help others. We're also learning that egalitarianism has been a force in shaping many human societies (Bekoff and Pierce, 2009), so it should be natural that we all work for a science of unity that respects other animals and cherishes the beautiful and magical webs of nature.

We need to replace mindlessness with mindfulness in our interactions with animals and the earth. Nothing will be lost and much will be gained. We can never be too

generous or too kind. Surely we will come to feel better about ourselves if we know deep in our hearts that we did the best we could, and took into account the well-being of the magnificent animals with whom we share earth, the awesome and magical beings who selflessly make our lives richer, more challenging, and more enjoyable than they would be in their absence. Doesn't it feel good to know that there are animals out there who we have helped, even if we cannot see, hear, or smell them? Doesn't it feel good to know that we did something to help the earth, even if we do not see the fruits of our labor?

If we forget that humans and other animals are all part of the same world, and if we forget that humans and animals are deeply connected at many levels of interaction, when things go amiss in our interactions with animals, and animals are set apart from and inevitably below humans, it is certain that we will miss the animals more than they will miss us. The interconnectivity and spirit of the world will be lost forever, and these losses will make for a severely impoverished universe. As Paul Shepard wrote:

> There is a profound, inescapable need for animals that is in all people everywhere, an urgent requirement for which no substitute exists. This need is no vague, romantic, or intangible yearning, no simple sop to our loneliness or nostalgia for Paradise . . . Animals have a critical role in the shaping of personal identity and social consciousness . . . Because of their participation in each stage of the growth of consciousness, they are indispensable to our becoming human in the fullest sense.

To conclude, here are ten overlapping reasons why we all need to be concerned with animal rights and animal welfare, why we need to do better, and why we need to increase our compassion footprint (Bekoff, 2008a, 2010):

> Animals exist and we share Earth with them
> This land is their land, too
> Animals are more than we previously thought
> We have become alienated from animals
> We need to mind animals and look out for one another
> We are powerful and must be responsible for what we do to animals
> What we're doing now doesn't work
> "Good welfare" isn't good enough
> We all can do something to make the world a more compassionate and peaceful place for animals and for ourselves
> We need to increase our compassion footprint

I offer these reasons to stimulate discussion, not because they're the only reasons why we need to examine the concept of animal welfare and treat animals with more respect and dignity, but because reflecting on these and perhaps other reasons will force us to be more responsible for what we do to animals and help to increase our compassion footprint. Some people worry that more attention to animals means less attention for needy humans, but this is a baseless concern. Many people who work for animals also work for humans. In addition to working for animals, I work with many children's

groups, senior citizens, and prisoners, and I also sponsor a young girl in Uganda so that she receives medical care and an education. Compassion begets compassion, and seamlessly crosses species. I truly feel that it will be much easier to live in a world where ethical choices are commonplace and compassion is the name of the game, rather than in a world where we ignore others' lives. I hope you agree.

Studying nonhuman animals is a privilege that must not be abused. We must take this privilege seriously. Although the issues are very difficult and challenging, it does not mean they're impossible to address. Certainly we cannot and must not let animals suffer because of our inability to come to terms with difficult issues or to accept responsibility for how we treat them. Questioning the ways in which humans use animals will make for more informed decisions about animal use. By making such decisions in a responsible way, we can help to ensure that in the future we do not repeat the mistakes of the past, and that we move toward a world in which humans and other animals may be able to share peaceably the resources of a finite planet.

I believe that we are born to be good, and there is hope for the future when we come to realize that the competitive survival of the fittest mentality is not who we really are or have to be. It's not really a dog eat dog world, because dogs don't eat other dogs. Being kind and good must also include cultural pluralism in the diverse and often tough world in which we live. And we need to constantly remind ourselves that we live in a more-than-human world, as philosopher and master magician David Abram reminds us. Goodness and kindness will allow us to do what needs to be done to heal the conflicts we have with other animals and amongst ourselves. Now is the time to tap into our innate goodness and kindness to make the world a better place for all beings, creating a paradigm shift that brings hope and life to our dreams for a more compassionate and peaceful planet. The essays in this encyclopedia contain the information that is needed to make the best and most enduring compassionate choices.

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A

ABOLITIONIST APPROACH TO ANIMAL RIGHTS

The abolitionist approach to animal rights seeks to provide both a deontological theory (a theory of moral obligation) concerning the moral status of nonhumans, and a practical approach to animal advocacy. The central tenets of the abolitionist approach are that animal use should be abolished and not merely regulated because animal use cannot be morally justified, and that veganism is a baseline moral principle and should be the primary focus for animal advocacy. The abolitionist approach squarely and unequivocally rejects all forms of welfarism, which maintains that the central goal of animal advocacy is to regulate animal exploitation to make it more humane and regard veganism as an optional way of reducing suffering and not as a fundamental moral tenet or a central focus of advocacy.

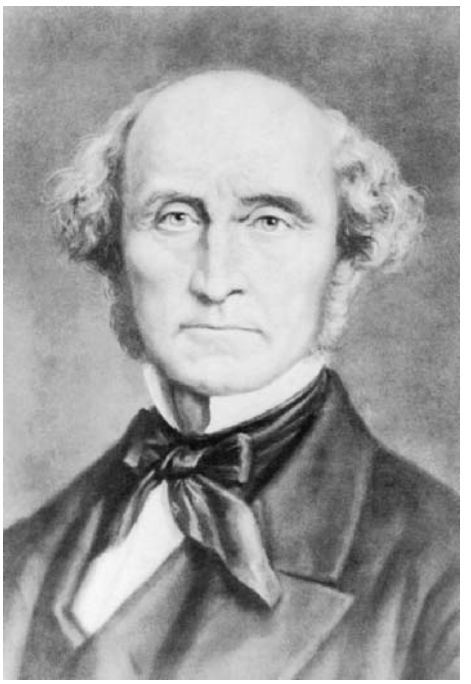
There are animal advocates who disagree with the abolitionist position as described but who nevertheless use the term abolitionist to characterize their views. The central characteristic of the new welfarism, which is the prevalent approach to animal ethics promoted by large animal advocacy organizations in North America, South America, and Europe, is that the abolition of animal use is the long-term goal of animal advocacy, but that welfarist regulation of the treatment of animals is the most efficient way of moving incrementally toward that abolition. The abolitionist approach described here rejects this view.

Because large animal organizations adopt a traditional welfarist or new welfarist approach to animal ethics, they are understandably hostile to the abolitionist perspective. The abolitionist movement, currently developing as an international phenomenon, is one that has emerged largely as a grassroots endeavor of advocates who have little or no connection to any of the large animal organizations. Abolitionists are often part of Internet communities that provide social support and discussion of theoretical and practical issues.

Abolitionism and Animal Welfare

The abolitionist approach rejects animal welfare as a general matter for both theoretical and practical reasons. As a theoretical matter, all forms of welfare assume that nonhuman animals have a lesser moral value than humans, a notion extant in animal welfare theory from its emergence in 19th-century Britain. Although welfarists such as Jeremy Bentham and John Stuart Mill argued that animals deserved to be included in the moral community and given at least some legal protection, they did not oppose the continued use of animals by humans. According to the welfarists, although animals

were sentient, they did not have an interest in not being used by humans because they were not self-aware and did not have an interest in continued existence. That is, animals lived in the present and were not aware of what they lost when we took their lives. They did not have an interest in not being used; they only had an interest in being treated gently. These and related views about the supposedly superior mental characteristics of humans led Bentham, Mill, and other early welfarists to regard animals as having less moral value than humans. This position is represented in contemporary animal welfare theory by Peter Singer, the leading figure. Singer, like the original welfarists, argues that most animals do not have any interest in continuing to live.



English philosopher and economist John Stuart Mill was an early advocate of legal protection for animals. (Library of Congress)

There probably are significant differences between the minds of humans and those of nonhumans, given that human cognition is so closely linked to symbolic communication which, with the possible exception of nonhuman great apes, nonhumans do not use. There is, however, no reason to maintain that any cognitive differences mean that animals have no interest in continuing to exist. To say that any sentient being is not harmed by death begs the question and is, in any event, decidedly odd. After all, sentience is not a characteristic that has evolved to serve as an end in itself. Rather, it is a trait that allows the beings who have it to identify situations that are harmful and that threaten survival. Sentience is a means to the end of continued existence. Sentient beings, by virtue of their sentience, have an interest in remaining alive; that is, they prefer, want, or desire to remain alive. Therefore, to say that a sentient being is not harmed by death denies that the being has the very interest that sentience serves to perpetuate. This would be analogous to saying that a being with eyes does not have an interest in continuing to see or is not harmed by being made blind.

The fact that the minds of humans differ from those of nonhumans does not mean that the life of a human has greater moral value any more than it means that the life of a human who is normal has greater moral value than the life of a mentally disabled person, or that the life of an intelligent person has greater moral value than that of a normal but less intelligent one. Although the differences between humans and animals may be important for some purposes, they are completely irrelevant to the morality of treating animals as human resources, even if we do so humanely. The abolitionist position maintains that we are obligated to accord

every sentient being the right not to be treated as a resource.

The abolitionist approach does not support the idea that some species of nonhumans, such as nonhuman great apes, are more deserving of moral or legal protection than other species on the ground that the former are more similar to humans. With respect to being treated as a human resource, all sentient beings—human and nonhuman—are equal.

The abolitionist approach also rejects animal welfare on practical grounds. Animals are property; they are defined as economic commodities with only extrinsic or conditional value. To the extent that we protect animal interests, we do so only when it provides a benefit—usually an economic benefit—to humans. As a result, the protection of animal welfare is, for the most part, very limited. Regulation does not decrease animal suffering in any significant way, and it does not decrease demand by making animal exploitation more expensive. On the contrary, welfare reform generally increases production efficiency so that it becomes cheaper to produce animal products. To the extent that a welfare regulation imposes any sort of additional cost on animal production, that added cost is *de minimis*. Moreover, welfare reform makes the public feel more comfortable about using animal products, and perpetuates rather than discourages animal exploitation. There is absolutely no empirical evidence that animal welfare reform will lead to abolition or to significantly decreased animal use.

Abolitionism and Veganism

Although veganism may represent a matter of diet or lifestyle for some, ethical veganism is a profound moral and political commitment to abolition on the individual level and extends not only to matters of food, but to the wearing or use of animal products. Ethical veganism is the personal rejection of the commodity status of nonhuman animals and the notion that animals have less moral value than do humans. Indeed, ethical veganism is the *only* position that is consistent with the recognition that, for purposes of being treated as a thing, the lives of humans and nonhumans are morally equivalent. Ethical veganism must be the unequivocal moral baseline of any social and political movement that recognizes that nonhuman animals have inherent or intrinsic moral value and are not resources for human use. Ethical vegans believe that we as people will never even be able to see the moral problem with animal use as long as we continue to use animals. We will never find our moral compass as long as animals are on our plates, or on our backs or feet, or in the lotions that we apply to our faces.

Animal advocates who claim to favor animal rights and to want to abolish animal exploitation, but continue to eat or use animal products, are no different from those who claimed to be in favor of human rights but continued to own slaves. Moreover, there is no coherent distinction between flesh and dairy or eggs. Animals exploited in the dairy or egg industries often live longer, are treated worse, and end up in the same slaughterhouses as their meat counterparts. There is as much if not more suffering and death in dairy or egg products than in flesh products, but there is certainly no morally relevant distinction between or among them.

The most important form of incremental change on a social level is creative, non-violent education about veganism and the need to abolish, not merely to

regulate, the institutionalized exploitation of animals. Veganism and creative, positive vegan education provides a practical and incremental strategy, both in terms of reducing animal suffering now, and in terms of building a movement in the future that will achieve more meaningful legislation in the form of significant prohibitions of animal use.

Rather than embrace veganism as a clear moral baseline, welfarists promote flexible veganism or consuming with conscience, which they see as one way to reduce suffering, along with welfarist reforms that they promote as reducing suffering. That is, welfarists restrict the scope of animal ethics to suffering; anything that arguably reduces that suffering, including being what Peter Singer calls a conscientious omnivore, represents a morally defensible position. Putting aside that welfare reforms do not result in significant protection of animal interests, the welfarist position on veganism reflects the view that animal use is itself not morally problematic, which assumes that animal life is of lesser value than human life.

Abolitionism and Single-Issue Campaigns

The abolitionist approach promotes the view that veganism and creative, non-violent education about veganism are the primary practical and incremental approaches that should be pursued. In addition to rejecting campaigns that seek to make animal exploitation more humane, the abolitionist approach generally regards single-issue campaigns, such as those involving foie gras or fur garments, as problematic because they reinforce the view that certain forms of exploitation are worse than others. For example, the anti-fur campaign implicitly and often explicitly characterizes fur as involving some greater degree of exploitation than does, say, wool or leather. But any such characterization would be inaccurate. Both wool and leather are every bit as morally objectionable as fur in terms of the suffering involved and the fact that, irrespective of any differences in suffering, all three forms of clothing involve killing animals for human purposes. Foie gras is no worse than other animal foods.

Abolitionism and Domesticated Nonhumans

The abolitionist position maintains that if we recognize that nonhuman animals should not be treated as resources, the appropriate social response would be to stop bringing domesticated nonhumans into existence. We should care for those whose existence we have caused or facilitated, but we should not cause more to come into existence.

Representative Web sites are:

Animal Rights: The Abolitionist Approach: www.AbolitionistApproach.com

Vegan Freak: Being Vegan in a Non-Vegan World: www.veganfreak.com

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AFFECTIVE ETHOLOGY

Affective ethology refers to the behavioral study of one's affective states, emotions, feelings. Research toward animal emotions has been overshadowed for many years by scientific taboo, but over the last decade interest in animal emotions has gained increasing attention. Affective ethology is important for our treatment of animals, as the question of whether animals can experience feelings like pain, fear, joy and happiness is at the core of discussions on animal welfare and animal ethics.

An important root of the taboo goes back to the Cartesian school of thought. The seventeenth-century French philosopher René Descartes stated that only humans have souls, and therefore they are the only beings that can reason and feel, whereas animals are merely complex machines, which only *appear* to think or feel (Margodt, 2007). Two centuries later, Charles Darwin argued that humans and animals are not radically different, but rather related. Humans and other animals have a common ancestry and share mental characteristics. Darwin brought a range of behavioral information together in support of feelings such as fear, anger, pleasure, and love in animals (Darwin, 1872, 1890).

Behaviorism—another major root—denies the possibility of studying animal minds. It reacted against unfounded 19th-century claims regarding animal minds, such as stories about mice cooperating to cross rivers on floats of dried cow-dung, carrying mushrooms filled with berries as provisions (in Romanes, 1882). Behaviorism's goal was to have psychology accepted as a serious science, and argued it should discard consciousness and instead focus on the prediction and control of behavior. This taboo on considering animal consciousness was broken in an unprecedented way by primatologist Jane Goodall during the 1960s with her study of wild chimpanzees. Her descriptions of chimpanzees tickling, chasing and laughing, and of infant chimps being depressed after losing their mothers, only make sense within the context that they have feelings, minds, personalities (Goodall, 1971).

During the 1970s, Donald Griffin coined the term cognitive ethology for the study of behavior suggestive of consciousness and thinking in animals (Griffin, 1976). Referring to many studies, he emphasized the versatility of animal minds (e.g. in solving problems) and their rich communication systems. Though Griffin had to endure a lot of criticism, cognitive ethology has gained considerable support among ethologists.

Since the 1990s, several books have raised a variety of arguments and observations in support of animals' experiencing emotions, thus picking up a thread started by Darwin 120 years before (see Masson & McCarthy, 1994; Bekoff, 2000; Balcombe, 2006; Bekoff, 2008). These works indicate that the scope of affective ethology is no less varied as that of cognitive ethology.

How did the notion of affective ethology arise? Gordon Burghardt argued that

cognitive ethology isn't appropriate to indicate the study of private experiences in animals (1997), but that animal minds are broader than the cognitive sphere; they also relate to affective and motivational aspects. However, Burghardt did not really suggest an alternative name for the phenomenon. In 2004, I proposed the terms affective ethology and motivational ethology, and naming the behavioral study of private experiences ethology of mind. This discipline then comprises three sub-disciplines, namely cognitive, affective and motivational ethology (Margodt, 2004). In 2007 I was contacted by the Hungarian philosopher László Nemes, who also suggested the notion of affective ethology. Indeed, this seems to confirm that this idea logically follows from Donald Griffin's suggestion regarding cognitive ethology and the existing field of affective neuroscience.

In recent years, the interest in animal emotions has increased due to developments in affective neuroscience. Noninvasive brain imaging techniques such as PET (positron emission tomography) and fMRI (functional magnetic resonance imaging) scans allow for the detection of changes in regional blood flow related to emotional reactions, and may lead to unprecedented comparisons between human and nonhumans (see Davidson, Scherer & Goldsmith, 2003).

A large variety of emotions remain to be studied in animals belonging to a wide range of species. In addition to behavioral observations in the wild and in captivity, carefully designed experiments allow further exploration of the emotional world of animals. Jaak Panksepp and colleagues showed that rats have a stronger preference for being tickled (rapid finger movements at their undersides) than being petted (gently stroked on the back). Tickled rats expressed seven times more 50-kHz chirps—typical for playful situations—than petted rats. They also ran four times as quickly to a human hand, and repeatedly hit a bar to signal that they wanted to be tickled, whereas they almost never pressed a bar to signal that they wanted to be petted (see Balcombe, 2006).

Affective ethologists will be challenged by other scientists who are skeptical about emotions in animals. A leading critical voice is that of Oxford University zoologist Marian Stamp Dawkins, who argues that it remains logically possible that emotional behavior is not accompanied by any feelings in animals. Statements about what animals feel can only be personal views, not something grounded in hard facts (Dawkins, 2000). The debate on animal emotions thus remains ongoing.

Affective ethology also has a second meaning, apart from the study of affective behavior. It also implies that ethologists have to undertake their research on the animals they study in a *caring* way. Harry Harlow studied depression in primates by separating infants from their mothers and isolating them for months or even years in tiny steel chambers, which he called Pits of Despair (Blum, 1994). His research methods may have been most effective, but they were ethically highly questionable. It may be expected that the more the field of affective ethology grows, the stronger will be the calls to care for the welfare interests of sentient, feeling beings.

See also Animal subjectivity; anthropomorphism; anthropomorphism—critical; consciousness, animal; sentience and animal protection; sentience and animal protection; sentientism; Whales and Dolphins, Sentience and Suffering

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Koen Margodt

ALTERNATIVES TO ANIMAL EXPERIMENTS IN THE LIFE SCIENCES

Within education and training in biology, medicine and veterinary medicine, animals often play a central role in laboratory practical classes. Alive, they are used in experiments to illustrate physiological and pharmacological principles, and for acquisition of a range of clinical and surgical skills. They are also killed for their tissue and organs, and so that students can perform dissections in anatomy classes. Tens of millions of animals—perhaps more—are used for these purposes each year around the world.

Animals suffer harm in various forms during capture, breeding and incarceration, and suffer pain and injury during experiments. These are sometimes conducted without anesthetic, and with lasting negative impact on the individual animal, if he or she survives. Killing is obviously also a serious form of harm, because the most significant freedom that each individual animal has—his or her life—is denied.

Dissecting Convention

In this conventional, harmful use of animals, the relationship between the animal and the student is clearly a negative one. This reality is not what most students are expecting when they choose to study the nature and processes of life (through biology), or train to heal people or animals (through medicine). Harmful animal use is a counter-intuitive practice, and creates a learning environment that is not conducive to effective acquisition of knowledge, skills and responsible attitudes.

The limitations of harmful animal use and the advantages of new approaches are illustrated by the many published studies comparing conventional methods with alternatives. In almost all cases, the alternatives are shown to be equivalent or superior in terms of student and trainee performance. Moreover, assessing how effectively teaching objectives are met requires an identification of a broader range of teaching objectives beyond the standard, and must address the negative messages of the hidden curriculum. These include the lessons that instrumental use of animals is acceptable, and that compassion, respect for life, and ethical concerns as a whole are unimportant—or even obstacles to effective education and training.

Awareness, Objection and Innovation

Some students may even choose not to study the life sciences at the university level because of an awareness of the harm caused to animals in many classes. This results in a loss to the related professions of some of the most sensitive and critical-thinking students. Desensitization of students who do enter these classes is a damaging consequence of harmful animal use, and self-aware students may recognize this psychological process. Students who find that practices are against their ethical positions or religious beliefs may face academic or psychological penalties from teachers if they challenge the status quo. However, informed and responsible conscientious objection can be a powerful catalyst in resolving ethical conflicts in education and in implementing progressive teaching methods, clearly illustrating the intersection of animal rights and civil rights.

Despite the inertia of convention, the replacement of harmful animal use with other methods has been gaining momentum around the world. Progressive, humane alternatives have now fully replaced animal experiments and dissections in a growing number of university departments. Technological innovation, particularly the development of multimedia software and its potential to support the learning process, has played a major role in this ongoing revolution. The economic advantages of using alternatives, and the broader social and cultural changes in favor of ethical treatment of animals, also contribute.

Types of Alternatives

Alternatives, therefore, are progressive learning tools and teaching approaches that can replace harmful animal use or complement existing humane education. They include non-animal learning tools as well as alternative approaches that are neutral or beneficial to individual animals. Often developed by teachers themselves, and typically used in combination, alternatives include:

Mannequins and Simulators Life-like mannequins can support effective training of clinical skills such as taking blood, intubation, and the management of critical care scenarios. The perfusion of ethically sourced organs in advanced simulators allows for realistic surgery practice from student to professional level. By allowing repeated practice, these alternatives enable students and trainees to gain the confidence and competence necessary to work with real patients.

Multimedia Software and Virtual Reality (VR) Visualization and understanding of

anatomical structure and function can be enhanced through high-resolution images, video clips, and animations available in multimedia software. Virtual labs can illustrate the interplay between complex phenomena and related symptoms, and support the development of problem-solving skills. In true virtual reality (VR), clinical skills and surgical procedures can be practiced in a highly immersive environment, and even the sense of touch—haptics—can be simulated. Just as an airline pilot trains using flight simulators in order to be fully versed in all likely scenarios, so must all students and professionals who will be working with patients achieve the required level of mastery. Simulations can help guarantee this.

Ethically Sourced Animal Cadavers and Tissue All future veterinarians will require hands-on experience with animals and animal tissue. The use of ethically sourced cadavers and tissue is an alternative to the killing of animals for dissection and surgery practice. The term ethically sourced refers only to cadavers or tissue obtained from animals who have died naturally or in accidents, or who have been euthanized due to terminal disease or serious injury. Body donation programs can provide cadavers in an ethical way.

Clinical Work with Animal Patients Student access to clinical learning opportunities could be significantly increased in order to replace animal experiments and to better prepare students for their professions. A progressive approach to learning veterinary surgery might involve mastering basic skills using non-animal alternatives, then using ethically sourced cadavers for experience with real tissue, and finally performing supervised work with animal patients. Shelter sterilization programs are an important potential resource; students can observe, assist and then perform castrations and spays. The clinic can also teach many other skills that the lab cannot, such as post-operative care and supporting the recovery of patients, reflecting a growing awareness that caring is a clinical skill.

Student Self-Experimentation For further experience of the whole, living body, the consenting student is an excellent experimental animal, particularly for physiology classes. The intense involvement and self-reference of such practical classes makes them highly memorable and supports effective learning.

In Vitro Labs The rapid development and uptake of in vitro technology in research and testing needs to be supported by student familiarity with the technique. Animal tissue and cells used for in vitro practical classes can be sourced ethically, and within some biology practical classes, the use of animal tissue can be replaced directly with plant material.

Field Studies Students may study animals in a laboratory setting as a model for nature, or they may face invasive or otherwise harmful interactions with wild animals. However, biology is not just experimentation, nor does its study require harm. Studying animals within their natural environment can be a particularly rewarding alternative.

The use of the above replacement alternatives illustrates the potential of humane education to transform a negative relationship between students and animals into a positive one.

Efforts to Offer Alternatives

The International Network for Humane Education (InterNICHE) works with teachers to introduce alternatives, and with students to support freedom of conscience. Resources developed by InterNICHE to catalyze change include: the multi-language book and database *From Guinea Pig to Computer Mouse* (2003), which presents case studies, information on curricular design and assessment, and details of over 500 alternatives; several Alternatives Loan Systems or libraries of mannequins, simulators, and software; the Humane Education Award, an annual grant program to support the development and implementation of alternatives; the information-rich Web site www.interniche.org; and InterNICHE conferences, outreach visits, and training around the world.

Alternatives to harmful animal use are possible for all practical classes within the life science disciplines. In many departments, the word alternative may not even be used because these are increasingly becoming the standard teaching approaches—and in some cases examples of best practice—often backed by laws and regulations stating that alternatives should be used wherever possible. The multiple positive impact of alternatives means that replacement is to the benefit of students, teachers, animals, the life sciences, and society itself. Further effort is required to replace the remaining harmful animal use internationally, but increasing success with the implementation of alternatives illustrates how science and ethics can indeed be fully compatible.

See also Dissection in Science and Health Education; Dissection, Student Objections to

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Nick Jukes

ALTERNATIVES TO ANIMAL EXPERIMENTS: REDUCTION, REFINEMENT, AND REPLACEMENT

The concept of alternatives, or the Three Rs—reduction, refinement, and replacement of laboratory animal use—first appeared in a book published in 1959 entitled *The Principles of Humane Experimental Technique.* The book, written by two British scientists, William M. S.

Russell and Rex Burch, was a report of their scientific study of humane techniques in laboratory animal experiments, commissioned by the Universities Federation for Animal Welfare (UFAW). In this book, Russell and Burch hypothesized that scientific excellence and the humane use of laboratory animals were inextricably linked, and proceeded to define in detail how both of these goals could be achieved through reduction, refinement, and replacement of animal use. Russell and Burch's work had relatively

little impact upon the scientific community for almost two decades. In 1978, physiologist David Smyth conducted a survey on the Three Rs for the Research Defense Society in England and wrote the book *Alternatives to Animal Experiments,* in which he used the term *alternatives* to refer to the Three Rs. Thereafter, for those familiar with the concept, the Three Rs have become interchangeable with the word *alternatives*. In some circles, however, the word alternatives is understood to signify only replacement. Hence, in order to avoid possible misinterpretations, one of the Three Rs should precede the term alternative when discussing specific methods (reduction alternative, refinement alternative, or replacement alternative).

Definition of the Three Rs

A reduction alternative is a method that uses fewer animals to obtain the same amount of data or that allows more information to be obtained from a given number of animals. The goal of reduction alternatives is to decrease the total number of animals that must be used. In fact, reduction means better experimental design. Much progress has been made in reducing the number of animals required for product safety testing. This is partially due to the development of substantial databases as well as to the use of non-animal methods such as cell culture to prescreen for potential harmful effects. Most companies try to obtain as much information about their products as possible before they test them in animals. This has led to a large reduction in animal use.

In doing research, scientists can decrease the number of animals they use by appropriate experimental design of their experiments and by more precise use of statistics to analyze their results. Researchers can also reduce the number of experimental animals by using ever-evolving cellular and molecular biological methods. These systems are sometimes more suitable for testing hypotheses and for gaining substantial information prior to conducting an animal experiment.

Refinement alternatives are methods that minimize animal pain and distress, enhance animal well being, or use animals considered to be lower on the phylogenic scale. An important consideration in developing refinement alternatives is being able to assess the level of pain an animal is experiencing. In the absence of good objective measures of pain, it is appropriate to assume that if a procedure is painful to humans, it will also be painful to animals. Refinement alternatives include the use of analgesics and/or anesthetics to alleviate any potential pain.

Animals can also experience distress when they are unable to adapt to changes in their environment, such as might be caused by frequent handling or by experimental procedures. Refinement alternatives, such as properly-taught handling techniques that decrease distress, can significantly contribute to the welfare of laboratory animals. Animal welfare may also be enhanced by enriching the environment of the animals during the times when they are not undergoing experimental procedures. Such enrichment can range from placing species-appropriate objects for play and exploration in animal cages to group housing of social species.

Replacement alternatives are methods that do not use live animals, such as in vitro systems. The term in vitro literally means "in glass," and refers to studies carried out on living material or components

of living material cultured in Petri dishes or in test tubes under defined conditions. These may be contrasted to in vivo studies, or those carried out in the living animal. Certain tests that were once done in live animals, such as pregnancy tests, have been completely replaced by in vitro tests. Other types of in vitro systems include the use of human cells in culture or human tissue obtained from surgeries and other medical procedures. In addition to replacing animals, these studies can directly provide valuable information about humans, which cannot be obtained from some animal models.

Other examples of replacement alternatives are mathematical and computer models, use of organisms with limited sentience such as invertebrates, plants and micro-organisms, and human studies, including the use of human volunteers, post-marketing surveillance and epidemiology.

The Future of the Three Rs

The Three Rs of reduction alternatives, refinement alternatives, and replacement alternatives are seen as mainstream concepts through which scientists can achieve optimal scientific goals while taking the maximal welfare of animals into consideration. In doing so they are seen by many to be the middle ground where scientists and animal welfare advocates can meet to reconcile the interests of human health and animal well-being. Those interested in promoting the Three Rs have begun a series of World Congresses on Alternatives and Animals in the Life Sciences, the first of which took place in Baltimore, Maryland in 1993 and the sixth in Tokyo, Japan in 2007. These meetings provide a forum for scientists to participate in dialogues with the animal protection community to focus not on the differences between the two groups, but on opportunities for collaborative efforts and shared concerns. Acknowledgment and implementation of the Three Rs will ensure that the only acceptable animal experiment is one that uses the fewest animals and causes the least possible pain or distress, is consistent with the achievement of a justifiable scientific purpose, and is necessary because there is no other way to achieve that purpose.

The issues of pain and distress are the focus of most laws pertaining to animal use in biomedical research. However, an overriding consideration is that the general public accept that animals have intrinsic value, and this recognition is a significant consideration in how animals can be used in biomedical research.

See also Toxicity Testing and Animals

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THE AMERICAN SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS (ASPCA)

The American Society for the Prevention of Cruelty to Animals, or the ASPCA as it is known, was the Western Hemisphere's first humane society and was founded by Henry Bergh on April 10 1866. Shortly after its founding it served as the inspiration and model for the formation of SPCAs and humane societies across the country.

Bergh was the son of a wealthy New York City shipbuilder who enjoyed travel and the theater. While serving as a diplomat in St. Petersburg, Russia he was inspired to dedicate the rest of his life to the protection of animals. On his return trip to the United States he stopped in London to meet with representatives of the Royal Society for the Prevention of Cruelty to Animals to learn how their organization functioned.

Shortly after his return to New York City, he organized a meeting of influential business and political leaders at Clinton Hall on February 8 1866. Bergh gave a speech enumerating the many terrible deeds done to animals, the important role that animals played, and the need for a society to protect them. The original charter for the ASPCA listed the names of many prominent New Yorkers, including Horace Greeley, members of the Rockefeller family, and the mayor of New York City. Just nine days after the charter was granted by the New York State Legislature, Bergh convinced the legislature to pass an anti-cruelty law that gave the new society the authority to enforce it.

From the very start the ASPCA was active in publicizing the plight of animals and intervening on their behalf. One of the first cases that Bergh and the new ASPCA brought before the courts was that of a cart driver beating his fallen horse with a spoke from one of the cart wheels. This event would eventually be depicted in the seal adopted by the ASPCA, showing an avenging angel rising up to protect a fallen horse.

Within the first year, Bergh and the ASPCA would address many of the same questions that continue to occupy the efforts of his successors at the ASPCA and

Henry Burgh, angered at seeing horses mistreated on the streets of New York, founded the American Society for the Prevention of Cruelty to Animals in 1866. (AP Photo)

other humane societies including the treatment of farm animals, dogfighting, horses used to pull trolleys, turtles transported for food, and vivisection.

Recognizing the difficulty of coordinating the efforts of a far-ranging national organization, Bergh encouraged and helped others to start independent SPCAs across the country. The ASPCA became the model for hundreds of others societies, many of them using a variation of the SPCA name, the charter, and even the seal. The first such society was founded in 1867 in Buffalo, New York and included Millard Fillmore, C.J. Wells and William G. Fargo among it supporters. Boston, San Francisco, and Philadelphia soon followed.

Bergh's aggressive tactics soon earned him a host of enemies. The carting and transportation companies that depended on horses, butchers, dogfighters, and gentlemen's fox hunting organizations soon sent up an outcry that the ASPCA was interfering with their business and affairs. By 1870 Bergh and the ASPCA were hard pressed to defeat efforts to limit its charter and weaken the anti-cruelty laws.

The issues in these early years were frequently played out in the pages of the newspapers. Stories about the ASPCA's arrests, court cases and rescues of animals were given great attention. In addition, Bergh wrote many letters to the papers to explain the actions of the ASPCA and to point out problems that needed to be addressed. The newspapers were soon in the middle of a long feud between two of America's most famous men, Henry Bergh and P.T. Barnum. Bergh would attack Barnum on the care provided for the animals in his menagerie and performing in his shows. Barnum would defend his practices and use the publicity from the dispute to attract even larger crowds. Over time, Barnum would become a grudging admirer of Bergh and the work of the ASPCA, eventually helped to form an SPCA in Connecticut.

In 1873, Henry Bergh and the ASPCA's attorney, Elbridge Gerry, helped to rescue a young girl from an abusive home. The "Mary Ellen case" would lead to the myth that Bergh had claimed she deserved at least the same protection provided for animals. While the myth was unfounded, the case did, however, lead to the formation of the Society for the Prevention of Cruelty to Children, and the movement for child protection.

The ASPCA helped to change the way that Americans thought about animals. The organization also helped to introduce a number of innovations that provided for their care and protection. Bergh helped to design and introduce an ambulance for horses, and promoted an early version of the clay pigeon instead of live pigeons as a target for shooters. Further innovation continued into the 1950s, when the ASPCA helped with the design and implementation of equipment for the humane slaughter of animals for food.

Its hands-on services in New York City would grow to include an animal hospital and animal shelters. For one hundred years, from 1894 to 1994, the ASPCA would provide animal control services for the City of New York. During this time, hundreds of thousands of animals would be rescued by ASPCA ambulances, treated in clinics, sheltered, and placed in new homes whenever possible. Before the ASPCA assumed the animal control duties for New York City, unwanted dogs were drowned in an iron cage lowered into the river. During the following century, methods employed to euthanize unwanted dogs and cats would

evolve from the use of gas, to decompression chambers, and ultimately to sodium pentobarbital injection. At the same time the promotion of responsible care of companion animals, including spaying and neutering, helped to reduce the numbers of animals euthanized by 99 percent.

In August 1996, the ASPCA negotiated with the University of Illinois to acquire the National Animal Poison Control Center. This is the nation's only 24/7 animal poison control center, staffed full-time by specialists in veterinary toxicology. Staff will typically answer over 125,000 calls from veterinarians and members of the public, providing expert advice for dealing with exposure to various toxins. In 2007 the ASPCA Animal Poison Control Center (APCC) found itself at the center of the largest pet food recall in history. Beginning in February 2007, pets around the country were getting sick after eating one of what turned out to be a wide range of pet food brands. By the middle of March, Menu Foods recalled over 60 million packages of cuts and gravy-type foods from over 100 brands. Veterinary toxicologists at the APCC were in regular contact with veterinarians at the ASPCA's Bergh Memorial Animal Hospital, comparing the information that they were collecting from veterinarians and members of the public across the country with cases being treated at the hospital. They were able to provide substantial information to the veterinary profession and the public on the symptoms to look for, and aggressive treatment protocols for animal that had eaten the food. Eventually it was discovered that Menu Foods had purchased wheat gluten from China that had been adulterated with melamine and cyanuric acid to enhance its nitrogen/protein profile. When mixed into the pet food to help thicken the gravy, and then consumed by the pets, the melamine and cyanuric acid would react in the kidney to form crystals that would block kidney function, sickening and killing the animals.

In 2007 the ASPCA launched a vigorous community-based program called ASPCA Mission: Orange. The focus of the effort was to develop community collaborations to address issues that put companion animals in the designated communities at risk. The first group of cities included Austin, Texas, Spokane, Washington, Tampa, Florida, Gulfport-Biloxi, Mississippi, and Philadelphia, Pennsylvania. The ASPCA provided financial grants and staff leadership to evaluate the unique needs of each community and work with community leaders to establish programs to address the issues that put animals at risk.

In 2006 the ASPCA expanded its national anti-cruelty training and support programs. In 2007 that included the addition of veterinary forensic services, including the nation's only mobile Crime Scene Investigation unit dedicated to animal cruelty cases. This service proved invaluable during the investigation of dogfighting charges against professional football quarterback Michael Vick. ASPCA staff assisted federal authorities in the investigation, including examining the remains of dogs found on the site of a suspected dogfighting and breeding operation. When Vick and his co-defendants pleaded guilty to federal charges, the ASPCA was called upon to provide behavioral expertise to evaluate the dogs seized during the investigation, and make recommendations for their disposition. Approximately 50 dogs were evaluated, and all but one were found suitable for placement in either foster care or sanctuary facilities.

The ASPCA continues as one of the world's largest humane societies. It still operates animal hospitals and shelters in New York City, and its humane law enforcement agents enforce the anti-cruelty laws in New York State. The ASPCA also promotes education and legislative activities that fulfill the original mission described for the organization by its founder Henry Bergh, ". . . to provide effective means for the prevention of cruelty to animals throughout the United States."

See also Animal Protection: The Future of Organized Activism; Royal Society for the Prevention of Cruelty to Animals (RSPCA) History

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Stephen L. Zawistowski

AMPHIBIANS

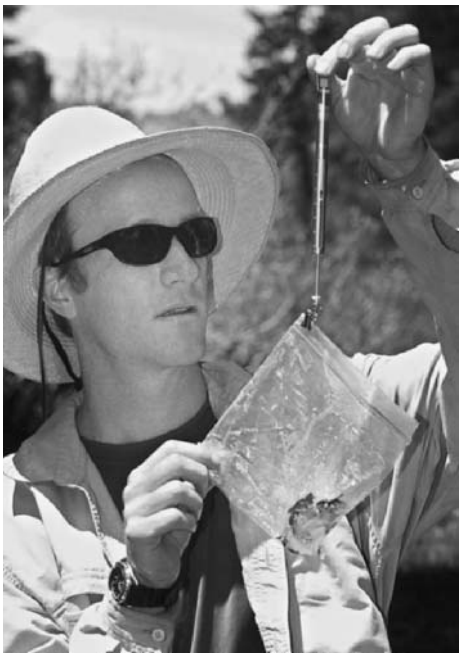
Many biologists today are concerned by evidence that populations of amphibians around the world are declining and the welfare of amphibians is seriously affected in their natural habitats by human-caused environmental deterioration. Because the skin of amphibians is not readily resistant to water loss, most species are restricted to streams and ponds or to moist terrestrial and arboreal habitats. The moist skin of amphibians may also make them more vulnerable to injurious ultraviolet rays and chemical pollution than other groups of vertebrates with better skin protection. There is general concern that major global changes in the environment may be specifically injuring amphibian populations throughout the world. For example, ultraviolet (UV) radiation is harmful to humans, and the middle part of the spectrum (UV-B) is particularly dangerous. Recent evidence has shown that the eggs of some species of frogs and toads are very sensitive to UV-B, with high mortality within egg clutches exposed to this radiation. This raises fears that the current reduction in the ozone layer around the earth may subject amphibians to increased levels of UV-B.

There are three groups of amphibians: caecilians, salamanders, and frogs. Caecilians are earthworm-like amphibians that occur in aquatic and terrestrial habitats in Asia, Africa, and America. Little is known about their biology. Therefore, populations may or may not be declining.

About 400 species of salamanders occur in Asia, Europe, North America, and northern South America. Some species are entirely aquatic, living in streams, rivers, or ponds. Other species are semiaquatic or consist of aquatic larvae and terrestrial adults, while yet others are strictly terrestrial, inhabiting burrows in the soil, or strictly arboreal. The arboreal species, though less well studied, are probably suffering from deforestation in Central and northern South America. Adult males and females of terrestrial species are territorial, defending feeding areas under rocks and logs, and they are aggressive toward some other species

of *Plethodon* that appear to be declining. Terrestrial salamanders may not be greatly affected by UV-B or by airborne pollution, due to the buffering influence of the soil.

Streamside salamanders live in habitats that are flushed by flowing water, and thus they too may be relatively protected from airborne pollution, such as acid rain, but not necessarily from UV-B. The salamanders that may be most affected by pollution and UV-B are those that either live in ponds as adults or breed in ponds and produce aquatic larvae. If worldwide changes in the environment are occurring, the welfare of pond species might be most at stake.



Vance T. Vredenburg, a researcher from the University of California, Berkeley, weighs a mountain yellow-bellied frog caught in a pond in the Sierra Nevada near Ebbetts Pass, California. Vredenburg has been studying the decline of the mountain yellow-legged frog. (AP Photo/Rich Pedroncelli)

About 4,000 species of frogs occur throughout North and South America, Europe, Asia, and Australia. They inhabit arboreal, terrestrial, semi-aquatic, and aquatic habitats. As with the salamanders, considerable attention has been focused on pond-breeding species with regard to the injurious effects of pollution (such as acid rain) and UV-B radiation.

Because of the decline of numerous species of amphibians in nature, scientists who study amphibians in the laboratory have had to reevaluate the ethics of using large numbers of individuals in research or in teaching. For example, a biologist who wishes to conduct an experiment can often estimate just how many frogs or salamanders are needed to obtain significant results; that biologist can then collect or purchase just the minimum number of animals needed to perform the experiment effectively. In the laboratory, animals can often be housed in individual containers, thus reducing the potential for mortality caused by the spread of infections and contaminants. Another tactic used by laboratory biologists is to cycle the same frogs or salamanders through a series of experiments, rather than obtaining a different set of animals for each individual experiment. This is not always possible when, for instance, surgery is required, but cycling animals among behavioral or ecological experiments is often feasible.

Concern about amphibians takes two basic forms: concern about their welfare in nature and, given the decline of once-abundant species, the treatment of these animals in the laboratory. More and more species are being listed as threatened or endangered, and these designations should help to improve awareness and reduce local human-induced impacts on their populations. Such restrictions will

also limit the number and kinds of species that can be used in biological research.

See also Reptiles

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Robert G. Jaeger

ANIMAL BODY, ALTERATION OF

People have been adorning and modifying their bodies for thousands of years, most likely since we first evolved as humans. All societies everywhere physically alter their bodies in an attempt to meet cultural standards of beauty as well as their religious and social obligations. In addition, since the earliest farmers first domesticated animals around 10 thousand years ago, humans have been modifying, and sometimes adorning, the animal body as well. Here we refer to the physical alteration of animal bodies through selective breeding, surgery, tattooing, branding, genetic modification, cloning, and other practices.

Since the first animals were domesticated for food, labor, and their skins, domesticated animals have changed in a whole host of ways, both behaviorally and physically. Natural selection has favored those traits that made individual species, and individual animals, good prospects for domestication—lack of fear, curiosity, relatively small size, and gregariousness, for example—making the earliest domesticates look and behave differently from their wild relatives.

Of course once humans began selectively breeding their animals (and killing those whose bodies or temperaments were unwelcome) in order to emphasize or discourage certain traits, the animals changed even further, resulting today in animals who are, for the most part, smaller (yet fleshier), more brightly colored, with shorter faces, rounder skulls, and more variations in fur and hair type as well as ear and tail appearance. They also became tamer, friendlier, and more dependent on the humans who cared for them.

As farmers and, later, show breeders, learned more about the inheritance of traits, animal breeders began selectively breeding their animals for more specific characteristics, such as overall size, fur and wool color or texture, ear and tail shape, and more. Termed artificial selection by Darwin, selective breeding has led to the creation of hundreds of breeds of dogs, one of the most intensively bred animals in the world. Using dogs as an example, breeds were created in order to fulfill human desires. Some breeds were created to retrieve ducks during a hunt, others were created to herd sheep, and still others were created to race.

With the advent of industrial methods of food production in the 20th century, changes in livestock breeds accelerated. To produce the most meat in the shortest amount of time, animal agribusiness companies bred farm animals such as pigs and chickens to grow at unnaturally rapid rates. These changes have been encouraged by new developments in agricultural science aimed at improving the productivity of food animals. For example, U.S. beef cattle are routinely administered hormones to stimulate growth, and to increase milk yield, producers often inject dairy cows with hormones.

Since the early part of the 20th century, farmers have been experimenting with creating new livestock breeds, via careful cross-breeding, in order to maximize size, fat composition, productivity, or other traits. Since the development of artificial insemination and the ability to freeze semen, cattle farmers are able to more selectively breed their prized bulls and cows to replicate the traits of the parents.

The pet and show industries, too, rely on artificial selection (and today, following the livestock industry, artificial insemination) to create breeds of animals with favorable (to humans) traits. Recent years have seen an escalation in the varieties of dogs, cats, and other companion animals being developed in order to appeal to discriminating consumers.

While early breeds of dogs were created to highlight working traits, recent breeds have been geared more toward aesthetics. On the other hand, since cats are not working animals, most cat breeds have been created for aesthetic purposes, with an eye toward color, size, fur type, tail, ear, and body type. The result is hundreds of breeds of dogs, and dozens of breeds of cats, rabbits and other species, all bred by large and small breeders to sell through the pet industry. Another result is a whole host of health problems associated with these breeds. Dogs in particular are at risk for problems associated with the odd proportions in body, legs, and head that are bred into many of the breeds. Even without the specific genetic defects associated with certain dog or cat breeds, many modern breeds of dog or cat are unable to survive without close human attention. While dependency has been bred into domestic animals since the earliest days of domestication, it has accelerated in recent years with the production of animals such as Chihuahuas, *WHO are physically and temperamentally unsuited to survival outside of the most sheltered of environments.

Another form of artificial selection refers to breeders' emphasis on deleterious traits in the breeding process. Japanese Bobtails (cats with a genetic mutation resulting in a bobbed tail), hairless cats, and Scottish Folds (who have folded down ears) are examples of this type of breeding. More disturbing are cats that go by the name of Twisty-Cats, or Kangaroo Cats, all of whom have a genetic abnormality which results in drastically shortened forelegs or sometimes a flipper-like paw rather than a normal front leg, and who are being selectively bred by a handful of breeders.

Genetic manipulation of animals represents a new scientific development that has irreversibly changed animal bodies. Because pigs, beef cows, and chickens are created for one purpose—food consumption—their genes have been altered in a whole host of ways to suit that purpose, resulting in, for example, pigs engineered to have leaner meat, tailor-made to suit a more health-conscious consumer.

Genetically engineered animals are also becoming more popular among scientists who experiment on or test animals. Genetically modified mice and rats are especially popular, allowing researchers to study the ways that genes are expressed and how they mutate. Genetic engineering has even found its way into the pet world, with the production of a new hypoallergenic cat (selling for 12–28 thousand dollars), created by manipulating the genes that produce allergens.

In terms of reproduction, cloning animals is the wave of the future, allowing humans the greatest level of control over animal bodies. Thus far, the livestock industry has been most active in the use of cloning, reproducing prized breeder animals in order to ensure higher yields (in meat, wool, etc.) by cloning only very productive animals, but cloning is found in the vivisection and pet industries as well. Laboratory scientists are also cloning mice, rabbits and other laboratory animals in order to ensure that the animals used in research are genetically identical, and to control for any imperfections. In the pet world, cloning has been less successful, but a handful of companies today either offer cloning (for cats; dogs have not yet been cloned) or tissue-freezing services for those animals which cannot yet be cloned.

Another way that animal bodies have been changed is through surgical procedures. Because the control of animal reproduction is critical to keeping domestic animals, castration has been used for thousands of years to ensure that undesirable animals cannot breed, or to increase the size or control the temperament of certain animals. Castration methods include banding (in which a tight band is placed around the base of the testicles, constricting blood flow and eventually causing the scrotum to die and fall off after about two weeks), crushing (this method uses a clamping tool called a Burdizzo, which crushes the spermatic cords) and surgery (in which the testicles are removed from the scrotum with a knife or scalpel). In the 20th century, with the keeping of companion animals rising in popularity, surgical techniques to remove the uterus and ovaries of female animals were developed, and spaying is now an extremely common surgery for companion animals, although it is very rarely performed on livestock. Castrated animals are often referred to by different names than intact males, using names such as *ox, bullock* or *steer* for cattle, *barrow* for pig, *wether* for sheep, and *gelding* for horse.

Other forms of surgical modification have also been common for years, particularly in livestock and purebred companion animals. For example the last century has seen a number of procedures performed on livestock as a result of the close confinement necessitated by factory farm production. The debeaking of hens (amputating, without anesthesia, the front of the chicken's beak) is common in the egg industry, where chickens are so intensively confined in tiny cages that they may attack each other due to stress and overcrowding. Even in situations where livestock is not as closely confined, farmers often remove body parts. One mutilation that's increasing in popularity is tail-docking of dairy cows, in which producers amputate up to two-thirds of the tail, usually without painkillers. Cattle are often dehorned, and sheep often have their tails removed (usually via banding, also without anesthesia).

In the pet breeding world, companion animals undergo surgical procedures in order to make them conform to the artificial requirements of the breed. Breed

standards demand that certain dogs, for example, must have their tails docked, their ears cropped, or both. In addition, many companion animals today experience surgical procedures which are used to control unwanted (by humans) behavior. Some people, for example, have their dogs de-barked (by cutting their vocal cords) in order to reduce barking, and many cat owners elect to have their cats declawed (which involves amputating the front portions of a cat's toes) in order to prevent harm to their furniture.

Identifying animals in order to determine ownership is important in the livestock, animal science, and pet worlds. Branding is the oldest form of marking ownership on animal bodies, and has been used since the ancient Greeks, Egyptians and Romans marked both cattle and human slaves with iron brands. Still popular amongst cattle ranchers today, brands are used to prevent theft, to identify lost animals, to mark ownership, and to identify individual animals. Some horses are branded as well, either because they are very expensive or, in the case of some wild American horses, because they are federally protected. Today, freeze brands (which freeze, rather than burn the skin), ear tags, tattoos, and microchips are often used instead of brands for livestock, laboratory animals, and companion animals.

While much less common than the above forms of modification, animals are also, occasionally, subject to tattooing, piercing, or hair dying not for practical purposes, but for aesthetic reasons. The most common form of adornment for animals is found in the show and pet dog worlds, where long-haired breeds of dogs have their hair professionally cut and styled, often with ornaments like barrettes and other accessories. Poodles, in particular, are expected to have a certain look which must be maintained via often rigorous grooming.

In the United States, in the heyday of the circus and carnival sideshow, tattooed families were a popular sideshow attraction, and they often included a tattooed dog. Today, some people involved in the body modification community pierce or tattoo their own pets, although most tattooists and piercers do not appear to condone these procedures (which, after all, do hurt). Here, as with people tattooing or piercing themselves, the tattoos are ostensibly marks of individuality (although they likely reflect the owner's personality more than the dog's) and, like branding, marks of ownership as well.

Some people also dye their animals' hair, usually for a special event. Feed stores around the country routinely sell dyed chicks and baby bunnies for Easter, for example, and some pet owners dye their own animals' fur for holidays like St. Patrick's Day, either with commercially produced pet fur dye, or products like food coloring. Finally, in recent years, evocative photos of "painted cats" began to appear, which showed cats with intricate designs painted on their bodies. While the photos turned out to be Photoshopped, they continue to circulate on the Internet, inciting awe, outrage, and interesting discussions regarding what humans can or should do with animals.

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Margo DeMello

ANIMAL LIBERATION ETHICS

At the core of animal liberation ethics is an argument from consistency directed against the contemporary view of egalitarianism. This view claims that all human beings are equal whatever their gender, race, or psychological traits, such as intelligence, skills, and sensitivity. It rejects the view that the members of a particular biological group may be discriminated against because they belong to that group, and it considers ethically offensive the idea that the intellectually less endowed, the disabled, small children, or the elderly may be routinely taken advantage of by more rational or autonomous human beings. Thus neither biological characteristics nor particular psychological properties over and above sentience are important for equal treatment. If we are ethically required to treat like cases alike, as ethicists since Aristotle have urged, then the moral status of members of other species should be the same as the moral status of members of our own species at a similar psychological level. This means giving basic rights to most of the individual animals whom humans use as means to their ends.

Animal liberation ethics, which became important in the 1970s, was perceived as subversive to received theory and practice. In response to its challenge, defenders of humanism—the view that human lives and interests should always be given greater weight than nonhuman lives and interests—offered a number of objections. They claimed that humans have special duties toward their closest kin; that, in contrast with race, species differences corresponded with significant differences; that it is not possible to have rights without the capacity to claim them; that it is not possible to have rights without the capacity to have duties; and even that nonhuman animals, lacking verbal language, have no conscious interests that need to be taken into consideration. Such objections can be rebutted. To begin with, the notion of closest kin can be used to justify discrimination against members of the human species as well as members of other species. Even if race does not correspond with significant differences, gender does. Also, we grant basic rights to small children, although they certainly cannot claim them or have duties. Finally, the theory of evolution has wiped out the traditional notion of fixed, totally distinct essences; since Darwin, the idea of differences in kind rather than in degree between us and all other animals is unlikely. Even the (highly controversial) appeal to the potential for becoming full rational beings in order to draw a line between human infants and nonhuman animals at a similar mental level overlooks the fact that there are human beings whose mental disabilities cannot be reversed.

All things considered, those who argue against speciesism believe that there is no argument for discrimination between members of different species that could not be used as an argument for discrimination among humans. Justifications for equality cannot be accepted only up to a point and then arbitrarily rejected. In highlighting the arbitrariness of the humanist position, animal liberation ethics not only seeks to protect nonhuman beings, but also challenges the direction

Masked animal activist holds a monkey who was once used for laboratory experimentation. (Animal Aid)

and basis of much of Western moral thinking.

From this perspective, the request to remove other animals from the realm of *things* in order to include them in our own moral community, and the goal of dismantling the social institutions and practices that are based on their exploitation for human ends, are part and parcel of that slow but steady process of enfranchisement which has until now marked what we call moral progress.

See also Animal Rights; Animal Rights, Abolitionist Approach; Animal Rights Movement, New Welfarism; Animal Welfare and Animal Rights, A Comparison; Evolutionary Continuity; Speciesism

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Paola Cavalieri

ANIMAL MODELS AND ANIMAL WELFARE

Animals serve in laboratories as models of human biology and medicine. Controversy exists as to whether such use is scientifically sound; if it is not, then it would not be ethically justifiable. Furthermore, there is controversy over whether animal use would be justifiable even if the science is good. Consumers can try to avoid cosmetics and some other products that have been safety-tested on animals. In contrast, few medicines are developed without the use of animals as models.

Animal modeling is more complex than it at first would appear. Animals cannot be thought of as miniature people, identical in every way but size and language. Not even humans' closest relatives, the great apes, can be seen as substitute people. Rather, animals must be carefully chosen to model some particular aspect of human biology—not the *whole* of human biology. Data extrapolated from animals must be interpreted in this limited context. Over-interpretation of animal data invites criticism.

A bewildering array of animal species is pressed into service as models.

Rodents, rabbits, and primates may first come to mind, but horses, roundworms, fruit flies, zebra fish, songbirds, and many, many others model some aspect of human biology. Woodchucks, for instance, are susceptible to a virus similar to human hepatitis-B. Leprosy can be produced in nine-banded armadillos but in few other animals. Labrador retrievers develop a hip dysplasia that resembles human osteoarthritis. Squid nerve axons transmit nervous signals much as human nerves do. These are but a few of the thousands of ways in which animals are used as models for normal and diseased human biology.

Cell and tissue culture have made many uses of animals obsolete. After all, why use an animal as a model when actual human cells can be grown in the lab and studied? Typically, scientists use tissue-culture systems to study events at the cellular and subcellular levels. For example, tissue culture is used to study which types of cells HIV, the human immunodeficiency virus, is capable of infecting, and what events occur in the cell that eventually kill it. But when research requires studying the interaction of many different cells and tissues, such as how the immune system fails to protect the brain from the effects of the AIDS virus, or how medications will affect this, then scientists may turn to whole-animal models.

Many factors influence the choice of model. Animal welfare requires scientists to consider using less-sentient species when possible (such as fruit flies instead of mice or monkeys). Cost considerations push scientists to choose smaller animals with shorter life cycles for many studies. Data may be most easily obtained and analyzed from smaller, simpler organisms than from larger ones; thus, zebra fish are chosen for studies of organ development, because the embryo is largely transparent and develops in an egg outside of the mother's body. On the other hand, larger size is sometimes required, such as when surgeons develop new techniques by using pigs. To best interpret data in light of what is already known, scientists will often choose the animal models most common to their fields, whether that original association was somewhat arbitrary (such as use of rats rather than hamsters in psychology experiments) or based on unique biological attributes (such as studies of vitamin C in guinea pigs, one of the few non-primate mammals to require vitamin C the way humans do). Increasingly, research requires knowing an animal's genetic makeup, so well-studied and easily modified species, especially mice, zebra fish, and fruit flies, have become more widely used.

It is controversial just how useful animal models are. Certainly no drug is marketed in the United States without having been studied in animals. Is this because there is always a biological need to use animal data to develop drugs, or simply because the law requires animal safety data to be submitted before a drug can be licensed?

Models may be classified in many ways. This essay looks at three broad categories of animal models: testing for product development, skills development, and induced and spontaneous models of disease.

Animal Models in Safety Testing

Using animals to test the safety of drugs, cosmetics, and environmental chemicals is what most people think of—and criticize—first. The crudest version of safety testing is to apply a compound to an animal—either acutely at high doses

or at lower doses over a longer period of time—and watch for reactions. The reactions may be eye irritation, rashes, fetal deformities, cancers, or other toxicities. To move beyond a simple Safe/Not Safe determination, scientists developed more measurable practices, such as the Draize test for eye irritation or the Lethal Dose 50 (LD50) test. Both are ways of quantifying how much of a compound leads to what degree of injury. Both are still used today, though less than in the past.

This crude approach to safety testing may be criticized both for the suffering it inflicts on animals and for how reliably this information, especially the quantitative information, really applies to people. There is no guarantee that a compound that causes cancer in mice will do so in people, or that one that is safe in mice will not cause human disease. Moreover, small animals have much faster metabolisms and may have variations in the enzymes that process chemicals, so the *amount* of compound that is safe or dangerous may be different for a mouse than it would be for a person.

Safety testing does not usually generate truly new biological information and, for this reason, replacing animals in safety testing is a more realistic goal than replacing them in original research. The Center for Alternatives to Animal Testing was started in 1981, at Johns Hopkins University, to develop alternatives to these types of testing. It is necessary that animal alternatives, such as development of an artificial skin to replace guinea pigs in testing for contact irritation, be evaluated scientifically and validated as useful before regulatory agencies, such as the Food and Drug Administration or the Environmental Protection Agency, will consider them an acceptable replacement for animal studies.

Animal Models for Skills Development and Teaching

Animals have been used in classrooms for years. They have been used to teach students anatomy or to demonstrate physiological functions, such as how the heart beats. In addition, animals have been used to allow human and veterinary surgeons-in-training to develop their manual skills before working on actual patients. For surgeon training, dogs and pigs have often been chosen, because their size more closely approximates a human patient than that of other animals. For microsurgical training—such as learning to repair blood vessels or nerves—smaller animals, such as rats, are often used. For most such training, healthy animals are used and then euthanized at the end of the training session.

As with safety testing, animal models are still used, but their classroom use has been decreased, because of greater reliance on alternative methods and models. Many medical schools have phased out animal use during the four-year MD curriculum, though animals may still be used in advanced surgical-residency training. Many veterinary schools allow students to opt out of classes that would require medically unnecessary surgeries to be conducted on healthy laboratory animals. Human and veterinary surgeons-to-be can acquire many of the basic skills of cutting tissues and placing stitches via the use of artificial (plastic, foam, etc.) models—and through practice on the cadavers of animals euthanized for other purposes. An imitation rat has been marketed for teaching microsurgical skill.

Surgical research differs from surgical training. Although large (humanlike) sizes may be useful for surgical training, they are less relevant in researching

surgical concerns such as organ-transplant rejection, surgical infection, or healing processes. For these studies, rats and genetically modified (transgenic) mice are commonly used.

Animal Models of Disease

There is no field of human medical, surgical, or psychiatric research that does not include some use of animal models. Animals are used to study the normal, healthy biology relevant to disease processes, as well as to study the diseases themselves. How animals are used depends on what the scientist is trying to learn. For example, a scientist may cause a cancer in an animal by implanting some cancer cells into the animal's body. This will tell little about what causes cancer in people (people don't typically get cancers from transplanted cancer cells), but may be useful in studying some approaches to treating already-developing cancers. Conversely, a study on how influenza is transmitted may yield valuable information for preventing an epidemic, but may tell nothing about how to treat the infection once it has developed.

Spontaneous animal models of human disease are those that develop more or less naturally, possibly by genetic mutation. A mutation in the gene that codes for the molecule dystrophin, for example, knocks out that molecule's function, resulting in Duchene muscular dystrophy in dogs, people, and mice. Though the mutations arise naturally in these species, they are then continued through selective breeding. In this ways, colonies of dogs or mice with a predisposition to muscular dystrophy were developed for research. Other spontaneous animal models for study can include infections that develop and spread in wild, pet or food animal populations, or through accidents, injuries and poisonings that occur outside of the laboratory. Laboratory animals may be maintained into older age to study the conditions known to naturally arise in geriatric animals of a particular species or strain.

Induced animal models are those that start with healthy animals and then cause a disease in those animals in the laboratory. Cancers may be induced by exposure to chemicals, by irradiation, or through transplant of tumor cells. Infections may be caused by directly exposing an animal to a virus, bacteria, prion, or fungus. Psychiatric conditions may be caused by manipulating an animal's environment, by subjecting an animal to shocks or other stressors, or through injection of chemicals. Some conditions may be caused by surgically altering an animal, say, by creating an abnormal blood flow through an organ or removing some organ or gland entirely, such as in early studies of diabetes mellitus that involved removal of the pancreas from previously healthy laboratory dogs.

An increasingly active approach to animal modeling is through genetic modification of mice, zebra fish, rats, and other species. Genes may be introduced that will cause disease. One example is the "oncomouse," developed at Harvard University, into which a cancer-promoting oncogene was inserted, making the animal more prone to cancers. The opposite is to "knock out" a gene to cause disease: removing a functional gene, such as one that encodes a cell's insulin receptors, leading to diabetes in those mice unable to respond to their body's own insulin. Even more complicated is the ability to turn added genes on, or to knock out a gene's function, at any point in an animal's life, simply by adding a special chemical to the diet that the gene responds to.

Negative models, in which an animal fails to respond as a human might, can also be useful. Scientists find value in studying the small number of animals capable of being infected with HIV and susceptible of developing an AIDS-like condition. But there can also be reason to study animals (most apes and monkeys, for example) that are resistant to that virus, in order to figure out why they are resistant and to see what lessons that might hold for preventing human HIV infections.

No matter the animal model, none is a perfect replica of human health or disease. Those models that involve animal sickness or death—as most of them do—must be chosen only when a scientist is convinced no other method will answer important biological questions.

See also Alternatives to Animal Experiments in the Life Sciences

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Larry Carbone

ANIMAL PROTECTION: THE FUTURE OF ACTIVISM

From its institutional beginnings in the second half of the 19th century to the period of the second World War, the humane movement focused on developing a worldwide network of societies for the prevention of cruelty to animals, which provided direct care of animals and a range of other services, pushed the passage of basic anti-cruelty laws in the United States and many other countries, promoted humane education as an instrument of childhood socialization, and advanced the notion that cruelty to animals is the sign of a socially maladapted personality. For the most part, however, these focus areas centered on the regulation or improvement of individual behavior, and organized animal protection achieved more limited gains in its efforts to confront cruelty by corporate or institutional actors.

The latter part of the 20th century witnessed a surge in worldwide activism on behalf of animals, with a more concentrated focus on institutional forms of cruelty and a commitment to changes in policy to address these large-scale contributors to animal mistreatment. Few people would quarrel with the idea that cruelty to animals is a serious matter. The difficulties come in applying anti-cruelty principles to legal, institutional uses of animals which, however abusive or harmful, have a wide array of corporate and political defenders.

As we examine the current state of the humane movement, it is obvious that we are situated in an odd and even contradictory place in history. There are more people and organizations devoted to helping animals, and extraordinary participation in pet keeping, wildlife watching, and other expressions of kinship or identification with animals—all of which manifest a deep appreciation and love for them. Yet, there is also more exploitation than ever—from staged animal fights to puppy mills, from trophy hunting to

factory farms, from exotic pets to bush meat, from animal testing to tiger farming. Each industry, from animal cloning to Internet hunting, has its built-in defense mechanisms and its innovative means of exploitation.

With the rise of powerful new economies in China and other Pacific Rim nations, where humanitarian concerns hold little or no influence within institutional or cultural traditions, there are enormous challenges ahead for the movement. These problems are compounded by the lack of a free press in some nations and the absence of non-governmental organizations to drive reforms. Moreover, in a world beset by so many other pressing social and political concerns—war, resource scarcity, pandemics, and global financial crises—we face powerful competition for attention, capital, and human resources.

One lesson from animal protection's past is the need to establish humane, animal-friendly values permanently within relevant institutions of government and civil society. Within schools of social work and education, at veterinary and medical colleges, in wildlife and agricultural sciences departments, and in law schools, the movement must work to see that animal welfare concerns are sustained. The same is true for law enforcement and environmental protection agencies, and international regulatory bodies where animal welfare issues surface.

The humane movement must also reinforce the case for animal protection by continuing to draw the connections between cruelty to animals and other pressing social concerns. With the spread of disease and the danger of pandemics threatening humankind, we need a serious international campaign to stem the exotic animal trade and the cockfighting culture, wherever they thrive. With the metastasis of domestic violence undermining our families and communities, we need to ensure that people make the connection between cruelty to animals and interpersonal violence. With adulterated animal products finding their way into school lunch programs and other commodity programs sponsored by the federal government, we need to underscore the urgency for reform in food production and food policy.

Expanding the definition of corporate social responsibility to include animals, and shifting consumer preferences and corporate behavior toward cruelty-free or more humane choices, will be the key to many positive changes for animals. Recent developments in the farm animal welfare sector have validated this principle, as growing numbers of consumers opt for non-factory farm products and companies increasingly shift their purchasing preferences to less intensive production practices like cage-free or crate-free livestock. One of our great challenges will be to translate these trends to China and other developing nations, since global capitalism often migrates to areas that lack adequate regulatory standards. Humane values will not necessarily take hold in other markets solely because they have taken hold in the United States.

Throughout the world, farm animal welfare is inextricably bound to a broader debate over food and its relationship to public health, environment, energy use, and national security. In addition to animal protectionists, advocates for food reform, public health, small-scale farming, anti-hunger, and smart energy are also pressing for change. The humane movement is part of the larger pattern of growth for organics, sustainable agriculture,

locavorism (eating only what grows locally), flexitarianism (a semi-vegetarian diet with occasional meat consumption), vegetarianism, and other manifestations of conscious eating. Animal agriculture is the subject of unprecedented scrutiny and criticism, in the wake of high-profile exposes (e.g., the HSUS investigation into a Southern California slaughter plant called the Hallmark Meat Company), and major reports from the FAO (*Livestock's Long Shadow*) and the Pew Commission (*Putting Meat on The Table: Industrial Farm Animal Production in America*), and widely viewed or read treatments of the issue (e.g., *Supersize Me, Food, Inc., Fast Food Nation,* and *The Omnivore's Dilemma*).

With the passage of successful ballot initiatives on farm animal welfare in Florida (2002), Arizona (2006), and California (2008), organized animal protection has become a catalyst for public debate about factory farming, while forcing industry to abandon some of the most controversial intensive confinement practices. These victories, especially the passage of Proposition 2 in California, have reordered political perceptions of this issue, signaling to lawmakers that there is a dominant sentiment in the public for animal welfare and a new paradigm in food production. The younger generations of Americans will grow up with a new sensibility about the basic treatment of farm animals, regulatory bodies will be charged with ensuring their welfare as new laws are passed, and the entire landscape of opportunity in this sector of humane work will be transformed.

Innovation, technological or otherwise, as a continuing force for good or ill to animals, is another hallmark of our age. Genetic engineering, however, can cut both ways. It can make it possible to prevent suffering by precluding the birth of male chicks in the egg industry, or advance humane population control through the mechanism of immunocontraception. On the other hand, it promises to open up the prospects for replicating several thousand monogenic disorders in laboratory animals, perhaps leading to their expanded use in biomedical research, and for increased emphasis on cloning and the propagation of transgenic animals, with attendant suffering and health problems.

On the unambiguously positive side, innovations in the marketplace are making it easier to reduce our impacts on animals. Soy- or wheat-based meat facsimiles, in vitro testing in the cosmetics and household products industry, and synthetic and natural fiber clothing all provide a pathway for alternatives to animal use, without requiring sacrifice or any reduction in our quality of life.

Clearly, in the face of global trade and capitalism, the humane movement must expand its reach to address problems in developing nations. Many animal issues, such as testing, animal agriculture, and the fur trade, necessarily transcend national boundaries, while others such as companion animal overpopulation and wildlife protection, present imposing challenges in nations where animal care and control entities and wildlife protection agencies are weak or lacking entirely. Through direct aid, training, and improved worldwide enforcement of international wildlife treaties, the United States and other affluent nations can and must extend themselves in support of animals in need and help build local and regional capacity to address these problems.

In the United States, high-profile cases of animal abuse or tragedy have raised consciousness about our responsibilities

to other creatures. The abandonment of pets during Hurricane Katrina (2006), the pet food adulteration scandal (2007), and the Michael Vick dogfighting conviction (2007) all revealed a widespread intensity of feeling and regard for companion animals. The Hallmark Meat Company/Westland scandal and the passage of Prop 2 showed that such concerns could extend to animals raised for food. All of these situations and their outcomes are part of an emerging consensus that animals matter and that we must do better in our dealings with all species.

Of the current range of threats, it is climate change—now finally finding its place on the geopolitical agenda—that poses a macro-level threat to animals. The Nobel Prize-winning Intergovernmental Panel on Climate Change (IPCC) has predicted that without immediate and meaningful action to reverse the warming trend, 15–37 percent of plant and animal species will be extinct by 2050. Climate change is already adversely affecting animals around the globe: Diseases are more frequently emerging and spreading to new areas; rising air and sea temperatures are damaging critical habitats and threatening species that rely on these habitats for survival; and increasing numbers of extreme weather events are displacing or killing unprecedented numbers of farm animals, companion animals, and wildlife.

Other human-caused threats to the environment, such as habitat destruction and the pollution of freshwater and ocean habitats, also threaten the lives of animals, and require the animal protection movement to align itself more frequently with environmental advocates.

How ever great the threats, there are also more opportunities for animal protection to make tremendous gains in the years to come, taking advantage of the tremendous popular interest in animal welfare, the depth of popular understanding and affection for animals, and a growing appreciation for the principle that the fate of humanity is bound up with that of other species.

Wayne Pacelle

ANIMAL REPRODUCTION, HUMAN CONTROL

For animals who live their lives directly under the control of humans, one of the most important forms of influence that we exert is the control of the animals' reproduction and family relationships. This control is exerted in order to achieve the number and the type of animals to meet various human requirements for food, work, commerce, entertainment, research, or companionship. Humans have created highly specialized breeds within animal species, some of which could never have occurred naturally, which have particular qualities such as a defined size, shape, color, strength, ability to win races, or capacity to produce large quantities of meat, milk, and eggs.

The physical and sometimes psychological characteristics of animals kept directly under human control are selected not by the evolutionary pressure of the environment but by the needs and choices of humans. The reproductive choices that animals would normally make for themselves are made instead by humans. Human influence extends to when the animals breed, which animals breed and which do not breed, how many young are produced, in what physical and social environment, what social relationships exist between parent and offspring, and

how the genotype and phenotype of the animals may be changed. The widespread use of reproductive technologies such as artificial insemination (and increasingly frequently, embryo transfer and possibly cloning) means that one highly-valued bull, for example, can be the biological father of hundreds of thousands of calves on several continents, altering and reducing the gene pool of the entire breed. The widespread use of one selected pedigreed dog for breeding can have a dramatic impact on the appearance, and possibly health, of the breed as a whole.

Young domestic animals are often removed from their mothers at a much younger age than would be the case in nature, and some have no contact with their mothers at all. Naomi Latham and Georgia Mason have recently reviewed numerous scientific studies showing that maternal deprivation leads to abnormal behavior that is indicative of stress and has a profound effect on the mental and physical health of young animals.

Farmed Animals

Human control of farmed animal reproduction has led to very large increases in the production of meat, milk and eggs, with productivity increasing most steeply over the last 35 years.

Selective breeding by humans has specialized domestic cattle into those used for producing milk (dairy cows) and those used for producing meat (beef cattle). Dairy cows have been specialized to put most of their physiological effort into producing milk in their very large udders, and tend to be thin animals. The amount of milk produced for human use

Scientists and park rangers move a tranquilized elephant cow after she was darted in Kruger National Park, South Africa. After tranquilizing the animals a team of scientists examine them to see if a contraception program can limit population growth. (AP Photo)

by specialized dairy cows (such as the Holstein breed, which now dominates in developed countries, and is increasingly being exported to developing countries) is about 10 times what a calf would need. The highest yielding dairy cows now produce about 5,500 gallons (or 10,000 kg) of milk a year or more. The average milk yield per cow is eight times higher in North America than in developing countries, where specialized breeds may still be a minority. Beef cattle, in contrast, have been bred to put most of their physiological effort into fast growth and heavy musculature. This over-specialization has welfare impacts for cattle of both dairy and beef breeds.

In herds of wild and feral cattle that scientists have studied, adult females would normally have one calf and one yearling with them, and family bonds often continue when the offspring have reached adulthood. A calf would normally suckle for at least eight months or until the next calf is born, and the herd's calves often stay together in a crèche guarded by the herd. But commercial dairying also requires that the calf be separated from its mother a few days after birth, breaking the emotional bond that has formed between them. The calves are then reared away from their mothers and, if they are reared for veal production in veal crates, they are reared in isolation from others of their kind. (The use of veal crates for calves has been prohibited in the European Union since January 2007, on grounds of animal health and welfare. Phase-outs or bans have been enacted in Arizona and California and agreed to by some major North American food companies.) Because dairy breeds are selected for high milk production, not for muscle, the male calves of dairy breeds are often considered useless for beef production in developed countries and may be shot at birth. If the cow fails to become pregnant again soon enough, she is considered economically worthless and is likely to be sent to slaughter.

Highly specialized dairy cows have such high physiological demands on their bodies that they are likely to suffer from painful lameness, mastitis, and low fertility. Often they are worn out and in poor health after having produced only two or three calves, compared to traditional breeds of cows that can last for 15 lactations. In this sense the breeding strategy adopted by humans, which in the short term produces high milk yield from a cow, is also costly from the point of view of creating healthy and long-living cows. Specialized beef breeds have a different problem; the most heavily muscled beef cows, such as the Belgian Blue breed, often require surgery in order to give birth.

Equally dramatic changes have been made in the control of the reproduction of commercial pigs (hogs). Wild and feral pigs live in small groups of a few sows and their litters. When she is about to give birth, a sow walks away from the herd and builds a nest of grass, sticks and leaves to cover herself during birth and suckling for the first couple of weeks. The mother and piglets then join the rest of the herd and the piglets become integrated into the group gradually. Sows wean their piglets gradually at up to 16 to 17 weeks of age.

The aim of commercial pig farming is to rear and sell the maximum number of piglets per sow per year, with a steady supply throughout the year. Maximizing production means control of the sow during pregnancy, birth, lactation and weaning, and severely restricting her natural behavior. Nearly all sows, at least in developed countries, are artificially

inseminated. In order to monitor and control the sow during pregnancy, she may be kept in a sow stall (gestation crate), a narrow stall which prevent her from turning around or even lying down easily. (Sow stalls/gestation crates are prohibited in the European Union from 2013 onward, on the grounds of animal health and welfare. Phase-outs or bans have also been enacted in Australia, Florida, Arizona, Oregon, California, and agreed by some major North American food companies.)

Commercial sows have large litters of around 12 piglets, compared to around 4–6 piglets produced by their ancestor, the wild boar. In the search for productivity, selective breeding has created sows that are very large compared with their many tiny piglets, making it more likely that some of the piglets may get crushed to death when the sow accidentally lies on them. To try to solve this problem, most sows are kept in farrowing crates when they give birth and are suckling their piglets. These are narrow stalls that prevent the sow from turning around and prevents the piglets from coming any closer to her than to be able to reach her teats. In order to reduce the time to the sow's next pregnancy, the piglets are weaned and removed from their mothers at a time when naturally they would still be suckling and they are still very dependent on their mother socially. In Europe they are removed around 3–4 weeks of age; in North America this can be done as early as two weeks of age.

Sows have not lost their very strong motivation to build a nest, and make the same movements to try to do so even in a bare farrowing crate. Piglets have not lost their need for their mothers. Abrupt early weaning and mixing with unfamiliar pigs stresses the piglets and results in a high incidence of diarrhea and other disease. Dan Weary and David Fraser at the University of British Columbia observed that in the first few days after weaning the piglets call constantly for their mothers.

In natural conditions, a hen builds a hidden nest and lays a small clutch of eggs, then stops laying and incubates the clutch. The mother communicates with her chicks even before hatching, and after hatching she spends her time protecting and teaching her chicks for several weeks. In commercial production, hens lay around 300 eggs continuously during a year. Chicks are reared in tens of thousands from eggs incubated in hatcheries, without ever seeing a parent bird.

The human selection of chickens, by specializing the birds into laying breeds and meat breeds, has caused biological anomalies on perhaps the largest scale yet known in human uses of animals. Laying hen breeds have very little breast muscle development, the muscle needed for meat production. In commercial hatcheries, the just-hatched chicks of laying breeds are separated by sex and the male chicks are killed at one day old (approximately 368 million per year in North America and 416 million a year in the EU25, according to statistics collected by the UN's Food and Agriculture Organization).

The economics of large-scale meat chicken farming depends on the chickens' speed of growth, their quantity of breast muscle, and their efficiency at converting food into muscle. The application of breeding technology to developing commercial hybrid chickens during the period since the 1960s has resulted in chickens designed to grow at a speed that puts them just on the edge of biological viability, typically to the age of five to seven weeks, when they are ready for slaughter. Recent research by Toby Knowles and his colleagues at Bristol University has found

that nearly 30 percent of fast-growing meat chickens become moderately or severely lame. These birds are normally unable to reach adulthood in good health unless their food intake is severely restricted, because their skeletal and heart development cannot keep up with their growth rate if they are allowed to eat as much as they want. Human control of chicken breeding in the service of human needs has thus created animals that can be seen either as maximally productive or alternatively as biologically unviable and even, in the case of male layer chicks, commercially worthless.

Companion and Sports Animals

Human intervention has created large numbers of breeds and types of dogs, cats, horses, and other animals that have been kept for use or cooperation with people in work, in sport, and for companionship. Many of these are classed as pedigrees, and their breeding is highly controlled in order to produce traits that people see as desirable. As with food animals, this can often conflict with the health and welfare of the animals. In addition, since the animals have been bred with only one function in mind, any animal who fails to look right or perform to the highest standard is in danger of being rejected or even destroyed at an early age. Critics believe that pedigree breeding contributes to the already severe welfare and social problems caused by surplus and unwanted dogs, cats and horses.

Approximately 400 dog breeds have been created so far by humans over hundreds of years, all of them believed to be descended from the grey wolf. Modern dog breeds include extremes of size and shape very far removed from the wolf ancestor. Dogs were bred to have short legs to chase animals underground, to have strong jaws for guarding or fighting, to be large and strong for hunting large animals. Even in modern urban society, where nearly all dogs are kept as companions rather than for work, people still appear to prefer dogs of defined breeds. In Europe, typically three-quarters of the dogs owned are pedigree dogs, sometimes called purebred dogs, rather than mongrels.

In most modern societies, the most important characteristics of dogs are their appearance rather than their working ability, behavioral characteristics, or personality. Dog breeds have been refined and defined into breed standards by the breed societies and Kennel Clubs of the world. New breeds are still being designed for the requirements of modern urban life, such as tiny teacup dogs as accessories for celebrities, and hairless dogs bred for people suffering from allergies. The enthusiasm for dog breeding is often driven by competitive dog shows, which are often criticized for encouraging breeders to select for features that damage welfare. Examples include flat faces and short noses (such as for the bulldog and Pekingese, as well as the Persian cat), which make breathing difficult and increase the risk of heart problems; legs that are too short in proportion to the back (such as for the dachshund), increasing the risk of painful spine problems; loose skin and skin folds on face and body (such as the Shar Pei), leading to irritating and painful dermatitis between the folds; ears and hair that are too long, which may prevent dogs from keeping themselves clean without human help; and very long hair covering the eyes that may make a dog timid or defensive.

The emphasis on breed standards and breed purity can give the impression that

pedigree dogs are in some sense of higher quality than dogs of a thoroughly mixed breed, but that is far from being the case. Veterinarians are aware that certain dog breeds have a much greater risk of inherited or breed-related disease than the general dog population. When breeders strive to perfect an ideal dog type or develop a new breed, two serious problems can arise. These are inbreeding, and the development of breed standards that call for unnatural and inappropriate body conformations. Inbreeding is almost inevitable in breeds that have only a relatively small number of dogs, and for numerically large and established breeds it is common to use only a fraction of the dogs for breeding, in order to maintain the desired appearance. Inbreeding (sometimes called line-breeding) decreases the genetic diversity of the breed and increases the effect of deleterious, often recessive, gene mutations.

Many breeds, including Labrador and golden retrievers, German shepherds and Rottweilers, suffer from high incidences of hip and elbow dysplasia (disorders of bone growth that lead to painful arthritis and lameness). Between a quarter and a third of the world's dog breeds have inherited eye diseases, including painful and blinding conditions such as glaucoma and degeneration of the retina. Several breeds that carry the piebald or merle genes for coat color have inherited deafness. These conditions can be disabling and lead to euthanasia. Recently it has become clear that a high proportion of the popular Cavalier King Charles Spaniel breed, in addition to being at high risk of heart disease, suffer from a mismatch between the shape of the brain and the shape of the skull, caused by breeding for a particular head shape. This results in a very painful neurological condition known as syringomyelia, which causes the dogs to scratch their necks continually and sometimes scream with pain. The massive head size of bulldogs means that puppies often have to be born by caesarean section. And dogs bred for certain behaviors such as herding, guarding, or chasing can be frustrated by the restrictions of modern urban living conditions, with resulting behavior problems.

A positive development is that both professionals and the public are now debating how our animal breeding practices impact animal rights. The UK's Kennel Club, in response to criticism, has announced a reform of breed standards to remove the worst features that cause ill health and disability. The revised standard for the Pekingese, for example, requires the dog to have a defined muzzle. In dairy cow breeding, breeders claim to be paying more attention to traits that improve health, rather than only selecting for high production. These initiatives have the potential to improve welfare, although it is too early to predict how effective they will be. Unfortunately the human desire to design animals for our own convenience remains a powerful force. Whatever viewpoint is taken, the evidence must make us question to what extent intervention operates to the benefit of the animals.

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Jacky Turner

ANIMAL RIGHTS

Two opposing philosophies have dominated contemporary discussions regarding the moral status of nonhuman animals: (1) animal welfare (welfarism) and (2) animal rights (the rights view).

Animal welfare holds that humans do nothing wrong when they use nonhuman animals in research, raise them to be sold as food, and hunt or trap them for sport or profit, if the overall benefits of engaging in these activities outweigh the harms these animals endure. Welfarists ask that animals not be caused any unnecessary pain and that they be treated humanely.

The animal rights view holds that human utilization of nonhuman animals, whether in the laboratory, on the farm, or in the wild, is wrong in principle and should be abolished in practice. Questions about how much pain and death are necessary miss the central point. Because nonhuman animals should not be used in these ways in the first place, any amount of animal pain and death is unnecessary. Moreover, unlike welfarism, the rights view maintains that human benefits are altogether irrelevant for determining how animals should be treated. Whatever humans might gain from such utilization (in the form of money or convenience, gustatory delights, or the advancement of knowledge, for example) are and must be ill gotten.

While welfarism can be viewed as utilitarianism applied to animals, the rights view bears recognizable Kantian features. Immanuel Kant was totally hostile toward utilitarianism, not because of what it implies may be done to nonhuman animals, but because of its implications regarding the treatment of human beings. To the extent that one's utilitarianism is consistent, it must recognize that not only nonhuman animals may be harmed in the name of benefiting others; the same is no less true of human beings.

Kant abjured this way of thinking. In its place he offered an account of morality that places strict limits on how individuals may be treated in the name of benefiting others. Humans, he maintained, must always be treated as ends in themselves, never merely as means. In particular, it is always wrong, given Kant's position, to deliberately harm someone so that others might reap some benefit, no matter how great the benefit might be.

The rights view takes Kant's position a step further than Kant himself. The rights view maintains that those animals raised to be eaten and used in laboratories, for example, should be treated as ends in themselves, never merely as means. Indeed, like humans, these animals have a basic moral right to be treated with respect, something we fail to do whenever we use our superior physical strength or general know-how to inflict harm on them in pursuit of benefits for ourselves.

Among the recurring challenges raised against the rights view, perhaps the two most common involve (1) questions about where to draw the line and (2) the absence of reciprocity. Concerning the latter, critics ask how it is possible for humans to have the duty to respect the rights of other animals when these animals do not have a duty to respect our rights. Supporters of the rights view respond by noting that a lack of such reciprocity is hardly unique to the present case; few will deny that we have a duty to respect the rights of young children, for example, even while recognizing that it is absurd to require that they reciprocate by respecting our rights.

Concerning line-drawing issues, the rights view maintains that basic rights are possessed by those animals who bring a unified psychological presence to the world—those animals, in other words, who share with humans a family of cognitive, attitudinal, sensory, and volitional capacities. These animals not only see and hear, not only feel pain and pleasure, they are also able to remember the past, anticipate the future, and act intentionally in order to secure what they want in the present. They have a biography, not merely a biology.

Where one draws the line that separates biographical animals from other animals is bound to be controversial. Few will deny that mammals and birds qualify, since both common sense and our best science speak with one voice on this matter. Moreover, new evidence concerning fish cognition and behavior is leading some philosophers and scientists to recognize the psychological complexity of these animals.

Line-drawing issues to one side, the rights view can rationally defend the sweeping and, indeed, the radical social changes that recognition of the rights of animals involves—the end of animal model research and the dissolution of commercial animal agriculture, to cite just two examples.

See also Animal Liberation Ethics; Animal Welfare and Animal Rights, A Comparison

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Tom Regan

ANIMAL RIGHTS MOVEMENT, NEW WELFARISM

Until the 1970s, the prevailing approach to animal ethics was represented by the animal welfare position. This position holds that it is acceptable to use animals for human purposes, but recognizes a moral and legal obligation to regulate our treatment of animals to ensure that it is humane and that we do not impose unnecessary suffering on them. The welfarist approach was challenged in the 1970s by the emergence of the animal rights position, which rejects welfarism on theoretical grounds (even humane animal use cannot be justified morally) as well as practical grounds (regulation simply does not work and fails to protect animal interests). The rights position proposes that recognizing the moral significance of nonhuman animals requires that animal exploitation be abolished and not merely regulated.

New welfarism is a term that describes an approach to animal ethics that is characterized by a recognition of the limitations of traditional animal welfare but an unwillingness to embrace the rights/abolitionist approach, and the consequent promotion of some improved version or theory of welfare reform. There are several versions of new welfarism, including the following three.

Welfare as a Means to Abolition

Many new welfarists believe they seek the abolition of animal exploitation as a long-term goal but advocate the improved regulation of animal use in the short term as the means to achieve the abolition (or significant reduction) of animal use by gradually raising consciousness about the moral significance of nonhuman animals. Although this position has been promoted by many of the large animal organizations in North America, South America, and Europe, it has both theoretical and practical problems.

As a theoretical matter, if our use of animals is not morally justifiable, promoting more humane exploitation as a means to the end of abolition raises a serious issue. For example, if we believe that any form of pedophilia is morally wrong, we cannot, consistent with that position, campaign for humane pedophilia. In the struggle against human slavery in the United States, many of those who favored abolition refused to campaign for the reform of slavery because they considered reform as inconsistent with the basic moral principle that slavery was an inherently unjust institution. Similarly, the

promotion of more humane animal use is inconsistent with the idea that we cannot justify animal use in the first instance.

As a practical matter, this first version of the new welfarist position—that improved protection for animal interests in the short term will eventually lead to abolition—is problematic for at least three reasons. First, the history of animal welfare regulation makes clear that, because animals are property, animal welfare regulation is, as a practical matter, incapable of providing any significant protection for animal interests in the short term. Welfarist regulation generally protects animal interests only to the extent that there is an economic benefit to humans.

Second, there is no evidence that making exploitation more humane leads to the abolition of that exploitation. Indeed, the contrary appears to be true. We have had animal welfare laws for nearly 200 years, and yet we now exploit more animals in more ways than at any time in the past. To the extent that animal welfare reform raises consciousness about animals, it merely reinforces the notion that animals are things that we are entitled to use as long as our treatment of them is humane, and facilitates the continued acceptance of exploitation which is characterized as meeting that standard.

Third, the phenomenon of new welfarism has resulted in a curious partnership between those who claim to endorse animal rights and institutional animal exploiters who claim to seek mutually acceptable welfare reforms, which the former believe will lead to abolition and the latter believe will further reassure the public that animal treatment is at a morally acceptable level. But because animals are property, these reforms are necessarily limited to minor changes in animal treatment that, in many cases, actually improve animal productivity and increase producer profit. Animal advocates have, in effect, become advisers to institutional exploiters and have helped them to identify certain practices that are not cost effective. To the extent that welfare reforms result in any benefits to animals, these benefits are offset by the fact that exploiters can point to the support of animal advocates, which in turn promotes the continued social acceptance of animal exploitation. Indeed, many large animal advocacy organizations actively promote animal products that supposedly have been produced in a humane manner. Such promotion may actually increase consumption by those who had stopped eating animal products because of concerns about treatment, and will certainly provide a general incentive for continued consumption of animal products.

This first version of new welfarism presents the false dichotomy that, even if we embrace abolition as the ultimate goal, we have no choice but to pursue welfarist regulation in the short term, because that is the only realistic strategy, given that animal use will not be abolished any time soon. Putting aside that welfarist regulation does not significantly protect nonhumans in the short term and does not lead to abolition in the long term, this position neglects other strategies that are arguably not only more consistent with a theory that rejects animal use as immoral, but are also more effective as a practical matter in reducing demand for animal products and in building a political movement that will support abolitionist measures. The rights/abolitionist approach focuses on veganism as a moral baseline and prescribes incremental social and political change primarily through creative, nonviolent vegan education.

Many new welfarists, however, reject veganism as a moral baseline. They maintain that it is more practical to support welfarist reform and to promote animal uses that are more humane. But this approach reinforces the prevailing view that animal use is morally acceptable if treatment is humane, and it makes veganism appear to be a radical or extreme response to animal exploitation, which is counterproductive to the goal of abolishing animal use.

Peter Singer and Animal Welfare

The second form of new welfarism is the position advocated by Peter Singer. Although Singer is often characterized as an animal rights advocate he, like Jeremy Bentham (1748–1832), is a utilitarian who maintains that normative matters are determined only by consequences, and he rejects the concept of moral rights for humans and nonhumans alike. Singer agrees with Bentham that sentience is the only characteristic required for animals to be morally significant, and that no other characteristic, such as rationality or abstract thought, is needed. Singer maintains that we should apply the principle of equal consideration and should treat animal interests in essentially the same way that we would treat the similar interests of a human, and not discount or ignore those interests on the basis of species alone. But, also like Bentham, Singer regards most nonhumans as living in a sort of eternal present that precludes their having an interest in a continued existence. This position leads Singer to maintain that killing animals per se does not raise a moral problem, and so he does not challenge the property status of animals as inherently problematic.

Because Singer does not challenge the property status of nonhumans, and maintains that their use per se does not raise a moral issue, his theory is essentially a version of animal welfare. It is arguably more progressive, in that it requires that we accord greater weight to animal interests than is required under the traditional welfarist approach but, as a theoretical matter, Singer never explains how to do this and, as a matter of his individual animal advocacy, he promotes traditional animal welfare reform such as more humane slaughtering processes or larger cages for battery hens. In any event, Singer does not see animal welfare as a means of abolishing animal use, because he does not advocate abolition as a long-term goal and, therefore, he differs from the new welfarists described in the previous section. Rather, he sees animal welfare as a means to reduce animal suffering. He maintains that we can be what he calls conscientious omnivores if we take care to eat flesh and other products made from animals who have been raised and killed in a humane fashion.

If Singer is wrong in assuming that animals do not have an interest in their continued existence, then our use of animals in ways in which we do not use humans and our treatment of animals as our property *necessarily* violates the principle of equal consideration. Humans who lack the reflective self-awareness of normal adults, such as those with particular forms of amnesia, or very young children, or those with certain mental disabilities, are still self-aware and have an interest in continuing to live. There may, of course, be a difference between the self-awareness of normal adult humans and that of nonhuman animals. But even if that is the case, it does not mean that

the latter have no interest in continuing to live and it does not justify treating the latter as commodities. Critics believe that Singer begs the question from the outset by maintaining that the only self-awareness that matters to having an interest in life is the sort that normal humans possess. Singer's view that if some animals, such as the great apes, have humanlike self-awareness, they are entitled to greater moral significance and legal protection than other nonhuman animals, merely perpetuates an unjustifiable speciesist hierarchy.

Moreover, even if animals do not have an interest in continued life, the application of the principle of equal consideration to issues of animal treatment is problematic in a number of respects. Any such endeavor requires that we make interspecies comparisons in order to determine whether the animal interest in question is similar to a human interest and, therefore, merits similar treatment. This sort of determination is difficult when only humans are involved. It is almost impossible when comparing members of different species. There is an understandable tendency to think that a human interest is always different and more important. In addition, assessments of similarity are particularly difficult given the property status of animals. The fact that an animal is property and has only extrinsic or conditional value automatically prejudices us against perceiving an animal interest as similar to a human one. Given the importance of property rights, it should not be surprising that many humans think that any inability to use their property as they wish is a significant deprivation that leads them to discount heavily any animal interests at stake.

The Feminist Critique of Rights

Another version of new welfarism may be found in the writings of certain feminist theorists who assert that rights are patriarchal and reinforce hierarchies, and that we must therefore move beyond rights to develop an ethic of care for our relationship with nonhumans. Those who adopt this view reject universal rules, such as an absolute prohibition on the use of animals as human resources, in favor of using values such as love, care, and trust to guide our use and treatment of animals in particular situations.

Although rights certainly have been used to establish and reinforce a variety of morally odious hierarchies, rights are certainly not inherently patriarchal. Instead, a right is simply a way of protecting an interest; it treats that interest as inviolable even if the consequences to others of violating it are considerable. Such normative notions are necessarily part of feminist theory in that no feminist believes that the morality of rape is dependent on a case-by-case analysis in light of an ethic of care. On the contrary, a woman's interest in the integrity of her body is correctly treated as inviolable: a woman has a *right* not to be raped.

Similarly, if nonhumans are sentient, we have no justification for ignoring the fundamental interests of those nonhumans and treating them as a resource. The feminist ethic of care does not go beyond rights, as some of these theorists maintain. Rather, it is a form of welfarist theory which, like Singer's position, seeks to accord greater weight to nonhuman interests but still preserves the hierarchy of humans who, despite what these theorists state, are accorded protection of their rights that is denied to nonhumans.

See also Abolitionist Approach to Animal Rights; Law and Animals; Utilitarianism

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Gary L. Francione

ANIMAL SHELTERS

See Shelters, No-Kill; Rescue Groups

ANIMAL STUDIES

Animal studies is the interdisciplinary study of human-animal relations. At times referred to as anthrozoology, animal humanities, critical animal studies, or human-animal studies, it examines the complex interactions between the worlds of humans and other animals. Several features of animal studies are emphasized in this entry.

First, animal studies is an emerging discipline and one of the fastest growing fields in the academy. The human relationship to other animals is of obvious interest and concern to a great many people. The popularity of companion animals, nature videos, animal-focused ecotourism, bird-watching, animal art, and social movements to protect wild and domestic animals are but a few examples. Animal studies is both root and fruit of this interest and concern. Overall, the field seeks to understand, and in some instance critique and revise, how humans relate to nonhumans in a more-than-human world.

The growth to date of animal studies is akin to that of other forms of social problems research that, because of the complexity of the issues and the need for interdisciplinary collaboration, evolve from subfields of others disciplines into a discipline of their own. The emergence and institutionalization of environmental studies and women's studies are models that animal studies scholars point to when describing this process.

Currently animal studies is in a pre-disciplinary phase. One can find it as an official or de facto subfield represented through courses, research and/or special interest groups in a variety of disciplines. These included interdisciplinary fields (e.g. environmental studies and geography), the social sciences (e.g. anthropology, political science, psychology, and sociology), as well as the arts and humanities (e.g. history, literature, philosophy and religious studies). There are an increasing number of journals (e.g. *Anthrozoos*; *Humanimalia, Society and Animals*), book series (e.g. Brill, Temple University Press, Columbia University Press), international societies, and online networks (e.g., the International Society of Anthrozoology; H-Animal, Animal Inventory), as well as policy institutes that make use of the fruits of this scholarship (e.g., the Institute for Society and Animals, Humane Society University). Out of this nexus, graduate degrees and undergraduate majors/minors are beginning to appear. Of particular note is the Graduate Specialization in Animal Studies at Michigan State University.

Second, animal studies emerged in response to three problematic ways of understanding animals. The first is the failure of the natural and behavioral sciences to adequately address the sentience, sapience, and agency of many animals. The second is the recognition of anthropocentrism and speciesism as prejudicial

paradigms that distort our moral relationship with other people, animals, and the rest of nature. The third is a burgeoning interest in the cultural, social, and political place of animals in human societies. A clarion response to these problems was the publication of two books by Mary Midgley—*Beast and Man* (1978) and *Animals and Why They Matter* (1984). Both texts were motivated in part as responses to the ethical and scientific blinders of behaviorism, genetic determinism, and sociobiology. Midgley is arguably the field's most celebrated scholar, and her incisive critiques of ethical, philosophical, and scientific themes inspired scholars to consider the animal question as a serious subject of study.

Third, the interdisciplinary nature of animal studies produces a wealth of theories, methods, and topics. Scholars approach the field from diverse theoretical positions, ranging from empiricism and positivism, to interpretivism and critical theory. They undertake their studies using qualitative, quantitative, and mixed methodologies, and their topics touch on wild, companion, farm and research animals. While this plurality generates a vibrant dialogue that should be praised, it can also obscure fundamentally different approaches to ethics, science, and society. This is becoming something of an unacknowledged struggle for HAS, as positivists and anti-positivists begin to clash in conferences, faculty meetings, seminars, and publications. This is to be expected, as the positivist claim to undertaking value-free and objective science is discredited, and the anti-positivist alternatives represent such a diversity of theoretical and methodological points-of-departure that it is both impossible and undesirable to establish a unitary paradigm. Indeed, these paradigms are particularly incommensurable with respect to naturalistic versus interpretive theories of science, quantitative versus qualitative methods of research, and the vision of value-free versus value-forming scholarship. These clashes have not become the primary focus of debate as of yet, but bear watching as sources of rough weather.

Fourth, like any academic field with social relevance, there is an ongoing tension between scholarship and activism. The perspectives of activists for animal welfare, protection, or rights are a source of inspiration and insight to the academy and society alike. Yet scholarship and activism are neither identical nor inseparable. Some scholars and students have precommitments to animal social movements and, for reasons of academic freedom and social relevance, this is well and good. Even so, the intellectual arm of social movements frequently engages in moral and political intransigence. So too, the academic empires some scholars attempt to build in an effort to valorize their own work is equally problematic. Dogmatism may serve academics and advocates well as they mobilize support for their positions. It is antithetical, however, to the best norms of scholarship that aspire to theoretical and methodological rigor. It is equally antithetical to the contextual realities that confront advocates on a daily basis. The trick to managing this tension is not to privilege the academy over advocacy, one concern or discourse over another, but to allow each to inform and challenge the other. We need reason and action as nuanced as the world's complexity.

Fifth, animal studies will face crucial challenges in the years ahead. One such challenge has to do with its legitimacy in academia. Despite the interest in animal

studies shown by academics and the general public, the field is receiving a cool reception in many academic departments. The reasons for this vary, but are not so different from what women, minorities, and others have experienced when they too advocated for new arenas of scholarship. This opposition includes:

- hostility toward animals as a serious subject of study
- fears that interdisciplinary fields diminish students and resources for established departments
- theoretical imperialism and the distaste for upstart disciplines that do not toe the theoretical line
- advocacy concerns that a focus on the well-being of animals will detract from the well-being of humans, and
- censorship by university administrators who fear animal studies will jeopardize corporate and government sources of funding

Proponents of animal studies will have to directly face all of these concerns if their efforts to institutionalize the field are to win out over ivory tower politics.

Another challenge has to do with creating a learning community in the context of the globalization of knowledge. As noted above, animal studies draws insights from many disciplines, theories, methods, topics, and experiences. These insights are drawn not only from North America and the animal protection movement, but from places and identity groups around the globe. The globalization of animal studies will likely continue in the years ahead. This then raises questions about how academics and others learn to generate a body of knowledge that is open to a wide diversity of perspectives, without lapsing into a lazy relativism about knowledge or moral norms. Grappling with the problem of relativism—and its opposite, objectivism—will likely require an ongoing debate over the status of situated knowledge in ethics, science, and society. It will also require ongoing attention for dialogue that creates the possibility for such knowledge.

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William S. Lynn

ANIMAL SUBJECTIVITY

We care about animal rights and animal welfare because we assume that animals are able to experience their lives subjectively—that they have an individual perspective on things and can feel good or bad about them. Thus we naturally see animals as sentient, and assume that they have an inner life of some sort, that there is "something it is like to be" them, to quote the words of philosopher Thomas Nagel. For scientists working in the field of animal welfare, the problem is whether and how we can objectively assess this subjectivity, for example, what it is like to be a battery cage hen or a laboratory rat. There exists as yet no agreement between either scientists or philosophers on precisely how we should understand the subjective aspects of life, how they might relate to observable behavior, and how we might measure them. These are deep philosophical problems that we cannot expect to resolve in the near future, but that nevertheless affect the way we think about animal suffering and our responsibility to alleviate it.

This difficulty in studying how animals subjectively experience life feeds into another meaning of the term subjective, which refers to the difficulty of gaining certain, factual knowledge. Many scientists are concerned that because experience is subjective, it is not open to reliable, objective assessment, only to prejudiced, untrustworthy, subjective judgment. Many go so far as to believe that because feelings are difficult to study, they are literally hidden from view, and should be defined as internal mental states. In such a light, describing animals as happy or sad, frustrated or content, can quite easily be dismissed as the misguided anthropomorphic projection of human emotions onto nonhuman animals.

It is, however, very important that we do not confuse the two meanings of the word subjectivity. That feelings are of an inner, personal nature does not automatically imply that they are completely hidden from others and cannot be observed and investigated. It is true that, generally, you do not directly feel what someone else (human or animal) feels, but that is not to say that, with some effort, you could not perceive and understand the quality of another's experience. With appropriate criteria and assessment procedures, objective investigation of subjective experience in animals may well be possible.

Various approaches to the study of subjective experience in animals have been developed over the years. In science, one of the first and most influential ideas was to let animals vote with their feet: when given a choice of environments or situations, animals will presumably spend most of their time in the situations they like best. Another proposal was to test how hard animals are prepared to work for various kinds of reward. To gain access to litter, for example, chickens are willing to peck a key many times. Such studies indicate what animals like and

value; however, they do not tell us whether animals suffer when they are deprived of what they value.

One approach is to test whether out of sight is out of mind: if animals can be shown to remember previous experiences of, say, companionship, play opportunities, or preferred foods, they may well miss these experiences when they are absent. Another approach is to test whether taking away valued goods, for example cage enrichment materials, affects how animals make decisions in learning tasks. Researchers found that such deprivation made rats more pessimistic in their attempts to solve learning tasks, indicating that the changes in their cage had affected them negatively and made them more anxious and uncertain.

Approaches such as these study the specific responses given by animals under controlled experimental test conditions. Another way of addressing what animals experience is through careful, patient study of their body language. In the way animals interact with and pay attention to their surroundings, the way that they orient their body, eyes, ears, nose, nostrils, or tail, they continuously express how they perceive and evaluate these surroundings. By learning to judge whether the animal's demeanor is relaxed, lively, confident and curious or, by contrast, tense, agitated, fearful or lethargic, we can get closer to how animals feel about the situation they are in, whether it makes them happy or distressed. Research on farm animals has shown that such judgments, if based on careful observation, have scientific validity. However, it is good to realize that if you don't know an animal well, or the species to which it belongs, it is possible to misinterpret its body language expressions. Indeed, many animals communicate in ways that are largely inaccessible to us, for example through smell, echolocation, or kinesthetic vibration. Judging animal body language is thus a skill that takes years to develop, and relies on extensive observation of animals in a wide range of circumstances.

It is perhaps not surprising in this light that field researchers such as Jane Goodall or Cynthia Moss who spend extended periods of their lives with animals in their natural environments speak confidently of these animals' individual personalities and emotional lives. Equally, people who work and live with animals in mutual partnership, such as dog- and horse-trainers, zookeepers and pet owners, often develop an intimate acquaintance with their animals' expressive repertoire, and many have written books about how their animals communicate with them. Such understanding leads to strong bonds and friendships, which is perhaps the best evidence that animals are not just complex physical objects, but sentient subjects with a perspective of their own.

These, amongst others, are constructive and fruitful ways of studying the subjective perspectives of animals and the quality of life they enjoy or are forced to endure. The extent to which they truly prove that animals are capable of happiness and suffering remains a point of scientific debate; however, this does not mean that until we resolve this debate there can be no compelling evidence of animal suffering. That science cannot as yet explain subjective experience does not mean its existence is uncertain or unavailable for assessment. Careful description of phenomena is the start of scientific explanation, not the result, and that our judgments of animal experience have a certain open-endedness and vulnerability to misinterpretation does not

mean that they are fundamentally shaky and unreliable. Such open-endedness always exists in communication with other sentient living beings, and we should accept this out of respect for these beings' autonomy. The way to deal with this uncertainty is not to be dismissive of studying the feelings of animals, but to devise better ways of communicating with them, and to study their expressions more closely.

The brain is of course a vitally important source of information for understanding the physical mechanisms that facilitate subjective experience. However, if we want to know what this experience is like, the range and diversity of experience of which animals are capable, behavior in all its richly expressive aspects, provides the best starting-point. We should enable and encourage animals to express to us how they experience their world, and we should learn to listen to them in as many ways as we can.

See also Affective Ethology; Consciousness, Animal; Whales and Dolphins: Sentience and Suffering

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ANIMAL WELFARE

When dictionaries define *welfare* and *well-being,* they use phrases such as "the state of being or doing well" and "a good or satisfactory condition of existence." These phrases tell us that the welfare or well-being of animals has to do with their quality of life, but to be more precise about the meaning of the terms we must go beyond the semantic issue of how the words are used and address the value issue of what we consider important for animals to have a good quality of life.

Three main approaches to this question have emerged. Some people emphasize how animals feel. According to this view, the affective states of animals (feelings or emotions) are the key elements of quality of life. Thus a high level of welfare requires that animals experience comfort, contentment, and the normal pleasures of life, as well as being reasonably free from prolonged or intense pain, fear, hunger, and other unpleasant states. A second approach emphasizes the biological functioning of animals. According to this view, animals should be thriving, capable of normal growth and reproduction, and reasonably free from disease, injury, malnutrition, and abnormalities of behavior and physiology. A third approach considers that animals should be allowed to live in a reasonably natural manner or in a manner

for which they are well suited. This view takes two slightly different forms: that animals should be in natural environments (fresh air, sunshine, natural vegetation) and that animals should be able to express their natural behavior and develop their natural adaptations. The three views of animal welfare have close parallels in the timeless philosophical debate about what constitutes a good life for humans, and they represent different values that are deeply rooted in human thought.

The three approaches to animal welfare often agree in practice. For example, allowing a pig to wallow in mud on a hot day is good for its welfare according to all three views: because the pig will feel more comfortable, because its bodily processes will be less disturbed by heat stress, and because it can carry out its natural thermoregulatory behavior.

However, there are some real differences between the three views of welfare. A pig farmer using criteria based on biological functioning might conclude that the welfare of a group of confined sows is high because the animals are well fed, reproducing efficiently, and free from disease and injury. Critics using other criteria might conclude that the welfare of the same animals is poor because they are unable to lead natural lives, or because they show signs of frustration and discomfort.

Scientific research is often very helpful in assessing animal welfare. For example, housing calves in individual stalls has many effects on their degree of movement, disease transmission, levels of stress hormones, and so on, and these measures can be studied scientifically. But which measures we choose to study in order to assess animal welfare, and how we use such measures to draw conclusions about animal welfare, involve value judgments about what we think is more important or less important for the animals. Knowledge alone cannot turn such judgments into purely factual issues. Science cannot, for instance, prove whether freedom of movement is more important or less important for animals than freedom from certain diseases.

There are also several confusing semantic issues concerning the application of the concepts of welfare and well-being to animals.

First, welfare (when it is applied to humans) has a second meaning: specifically, it is used to refer to social assistance programs (food, housing, money) designed to help vulnerable members of society. To avoid confusion between the two meanings of welfare, scientists generally use the term animal welfare to refer to the state of the animal, and use other terms (animal care, animal husbandry, humane treatment) to refer to what people provide to support a good quality of life for animals.

Second, many scientists write about a certain level of welfare and thus use the term as a kind of scale, running from high to low. Thus one might speak of poor welfare. This usage will seem strange to those who think of welfare as referring only to the good end of the scale. However, we do not have a distinctive term for the scale, and using the term welfare (or well-being) in this dual sense fills the need. A precedent is the word health, which means both (1) freedom from illness and injury, and (2) the general condition of an organism with reference to its degree of freedom from illness and injury.

Third, confusion also arises because people have tried to distinguish between welfare and well-being in various ways. One approach uses well-being to mean the state of the animal and welfare to mean the

broader social and ethical issues; thus one might say that the well-being of animals is at the heart of animal welfare controversies. A second approach uses the term welfare to refer to the long-term good of the animal and the term well-being for its short-term state, especially how the animal feels. Hence a painful vaccination may enhance an animal's welfare but reduce its feelings of well-being. A third approach, often followed in Europe, uses the term welfare exclusively because it is the traditional term in ethical and scientific writing, in most legislation, and in the names of animal welfare organizations. A fourth approach, sometimes followed in the United States, uses the term well-being instead of the term welfare because welfare (in its second meaning of social assistance programs) represents a controversial issue. Finally, many people treat the two terms as synonymous, following the lead of many dictionaries. Treating welfare and well-being as synonyms is probably the simplest approach and conforms best to everyday usage of the terms, but that will not stop scholars from continuing to propose more specialized meanings.

See also Animal Rights; Utilitarianism; Pain, Suffering and Behavior

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David Fraser

ANIMAL WELFARE AND ANIMAL RIGHTS, A COMPARISON

The notion of *animal welfare* dates back far before the notion of *animal rights.* In fact, the concept of rights in their modern sense did not enter common usage until the 1700s. It was notably through the publication of *Animal Liberation* by Australian philosopher Peter Singer in 1975 that the animal liberation movement as we know it coalesced. There were several reasons for the new radical view, all of which directly influenced the content of Singer's important book: (1) using the liberation movements on behalf of blacks and women as models, the animal liberation movement rejected *speciesism* (arbitrary discrimination on the basis of species or species-characteristics) as well as racism, sexism, homophobia, and ableism; (2) advances in evolutionary biology blurred species boundaries between humans and other animals; (3) rebellions occurred within human organizations (e.g., the Royal Society for the Prevention of Cruelty to Animals' earlier support of hunting—many of its wealthy patrons were fox hunters—led to the formation of the Hunt Saboteurs Association in 1963; now fox-hunting is illegal in Britain); and (4) modern animal cruelties were documented in Ruth Harrison's 1964 book *Animal Machines,* which exposed factory farming, and in Richard Ryder's 1975 *Victims of Science,* which revealed horrors in the laboratory.

Technically, animal rights can refer to any list of rights for animals. In 1988, for example, Sweden passed a law explicitly giving animals raised for food the right to graze. Currently, though, animal rights is widely understood to refer to

the idea of abolishing all use or exploitation of animals, a view reflected in Tom Regan's *The Case for Animal Rights.* Animal welfare, in comparison, is generally understood as advocating humane or kind use of animals, at minimum upholding animal well-being by prohibiting unnecessary cruelty (a common legal phrase).

In spite of this general meaning of animal welfare, there remains a spectrum of views as to what this phrase represents:

- **The animal exploiters' animal welfare.** To critics, a view represented by the reassurances of those who use animals as food, commercial, or recreational resources (e.g., factory farmers), stating that they care for animals well, which is a position that seems to many to be primarily exhibited for public relations or advertising purposes
- **Commonsense animal welfare.** The average person's typical and usually vague concern to avoid cruelty and perhaps to be kind to animals
- **Humane animal welfare.** A view that offers a more principled, deep, and disciplined stance than commonsense animal welfare in opposing cruelty to animals, often advocated by humane societies, for example. This form still does not reject most animal-exploitive industries and practices (fur and hunting are occasional exceptions, along with the worst farming or laboratory abuses)
- **Animal welfare as a misnomer for animal ill-fare.** A label, originated by David Sztybel, stating that even if efforts are made to be humane, animal exploitation is an *ill fate* overall. (In other words, imagine comforts being secured for humans who are to be eaten, skinned, vivisected, etc. This would still be a bad overall situation for these people). Along similar lines, in *Empty Cages,* Tom Regan disputes that animal welfare is really the norm in America, and Joan Dunayer, in *Speciesism,* places animal welfare in skeptical quotation marks when applied to the industrial uses of animals
- **Utilitarian animal welfare.** A view championed by Peter Singer, which would seek to minimize suffering overall, while possibly accepting, for example, some types of medical vivisection, but not the wearing of furs by affluent urbanites
- **New welfarism.** An approach that Gary Francione characterizes as recognizing the limitations of traditional animal welfare but one that is unwilling to embrace the animal rights abolitionist approach, resulting in the consequent promotion of a new or improved theory of welfare reform
- **Animal welfare/animal rights views that do not clearly distinguish between the two.** For example, psychologist and philosopher Richard Ryder subscribes to both ideas, although he is a complete abolitionist regarding animal use. Both animal welfare and animal rights, he says, are concerned with the suffering of others, and he evidently does not see the value of using the term to distinguish aboli-

tionists from non-abolitionists who are still humanitarians

In general, it is possible to consider animal welfare and animal rights using a common frame of reference. We can envision animal rights as championing the full protection of all of animals' vital interests. Animal welfarists, by contrast, generally agree that only some interests should be protected (e.g., avoiding unnecessary suffering, although not avoiding premature death). Also, protection of interests usually occurs to a lesser degree in the case of animal welfarists as compared to animal rightists (e.g., humans generally have more freedom of movement than animals confined for industrial purposes).

See also Animal Rights Movement, New Welfarism

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David Sztybel

ANIMAL WELFARE: ASSESSMENT

Assessment of animal welfare requires knowledge about the biology and psychology of animals—their needs and preferences, their responses to how they are treated, their perceptual and mental abilities, and their emotional states. This knowledge allows us to better understand how animals perceive the impact of housing and management on their health and welfare, and hence helps us to make more informed decisions about animal welfare issues.

A central role of *animal welfare science* is to provide this information. However, measuring the biological and psychological state of nonhuman animals is scientifically challenging. In particular, the subjective emotional experiences of animals, such as pain, fear, and pleasure, that lie at the heart of most people's concerns about animal welfare, are inherently private and therefore very difficult to assess. Many scientists and philosophers argue that we may never know whether nonhuman species have conscious experiences, let alone measure what they might be, and some contend that we should therefore only assess welfare by investigating whether the animal's biological functioning appears normal or impaired in some way. Others argue that we need to develop measures that, although indirect, may be useful proxy indicators of subjective emotional states in animals, and some researchers believe that these states can be assessed directly. Despite these differing views, animal welfare scientists have developed a number of methods to assess welfare that can be usefully split into two main approaches: the welfare indicators

approach (or what animals do), and the motivational priorities approach (or what animals want).

The *welfare indicators* approach involves measuring behavior, physiology, and physical state in order to get an idea of how animals respond to the ways in which they are treated. For example, abnormal or damaging behavior, chronic changes in the functioning of physiological stress systems, suppression or alteration of immune function, increased susceptibility to disease, and physical damage may all indicate that the animal's welfare is impaired. Those who believe that welfare can only be measured by assessing the biological functioning of an animal tend to use these types of indicators. However, other researchers, assuming that many of the species under our care *are* capable of subjective experiences, also use these measures as proxy indicators of subjective suffering. The premise here is that, as appears to be the case in humans, changes in behavior and physiology may reflect emotional experiences including pain, fear, anxiety, and frustration. Although we cannot be certain about this, and to some it may smack of anthropomorphism, it is arguable that as long as we are interested in the subjective experiences of animals, the only model species we can refer to is the human being. Humans are able to provide linguistic reports on their emotional states, which can then be related to accompanying behavioral and physiological changes, and these can be used as proxy measures of such states in animals. Researchers following this approach are currently developing a range of new welfare indicators that may more closely reflect emotional states in animals. These include vocalizations, qualitative ratings of posture and behavioral expression, and changes in decision-making behavior. Some of these indicators may reflect positive emotions as well as negative ones. There is currently a paucity of such indicators, but increasing scientific and political interest in the idea that we should not only be minimizing poor welfare, but also actively enhancing quality of life, means that this is a growing research area. There is also increasing interest in the development of welfare indicators that can be used in the field, for example on farms. The task here is to identify indicators which, although only measured at one point in time (e.g., during a farm visit) and for a subset of animals in a population, provide a reliable and valid representation of welfare.

One significant challenge that the *welfare indicators* approach still faces is how to combine information on a variety of indicators to provide a single measure of the animal's welfare. Solutions to this problem remain an important goal of animal welfare science. Similar problems exist for scientific attempts to specify absolute cut-off points at which welfare becomes unacceptable. The problem here is in identifying conditions where welfare is agreed to be good and acceptable that can act as standards against which other conditions can be compared. An obvious suggestion is to take the animal in its natural environment as the baseline condition. However, for many domestic species, it is difficult to identify what a natural environment actually is, and in most environments that we might call natural, animal welfare is far from perfect. Animals living in the wild are often under threat from starvation, extreme temperatures, injury, and predation and, in many cases, it would seem inappropriate to use measures of their behavior or physiology in the wild as benchmarks for defining acceptable welfare in animals under our care.

The *motivational priorities* approach may offer one possible solution. This approach examines how the animal values different features of its environment. Scientists have developed ways of measuring how hard animals will work to get access to resources such as food, shelter, or companions. They have shown that animals will continue to maintain access to the same amount of certain resources even if they have to work very hard for them. In the same way, the extent to which animals work to avoid things can also provide valuable information about how aversive or damaging these are. This information can be used in designing animal housing from first principles to provide what animals want and omit what they don't want. It may even be used to examine animal preferences for two existing systems, thus allowing the animal to express an overall decision about its welfare which precludes the need to assimilate many welfare indicators into one final welfare score. However, the approach has its own problems, including the fact that animals don't always choose what's best for them, conclusions are limited to the resources that are tested (the animal may be choosing the lesser of two evils), and it is difficult to decide at exactly what level of work a resource becomes important enough for it to be considered an essential feature of the captive animal's environment.

The scientific assessment of animal welfare has much to offer in terms of informing us about how animals perceive their environments and what they do or do not want. A combination of *welfare indicators* and *motivational priorities* may be the best way of assessing welfare, and a few studies have taken this combined approach. Scientific information can be used to argue that the welfare of animals kept in one way is better or worse than that of animals kept in a different way. More generally, it can inject some much needed knowledge about the animals' perceptions of the ways in which they are managed into debates about animal welfare.

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Michael Mendl

ANIMAL WELFARE: COPING

Substantial challenges to animal functioning, include those resulting from pathogens, tissue damage, attack or threat of attack by a predator or another individual from the same species, other social competition, complexity of information processing in a situation where an individual receives excessive stimulation, lack of key stimuli such as social contact cues or a teat for a young mammal, lack of overall stimulation, and inability to control interactions with the environment. Hence potentially damaging challenges may come from the environment outside the body, for example, many pathogens or causes of tissue damage, or from within it, for example, anxiety, boredom or frustration which come from the environment of a control system. Systems that respond to or prepare for challenges are coping systems, and *coping means having control of mental and bodily stability*.

Coping attempts may be unsuccessful, in that such control is not achieved, but as soon as there is control, the individual is coping. Systems for attempting to cope with challenge may respond to short-term or long-term problems, or sometimes to both. The responses to challenge may involve activity in parts of the brain and various endocrine, immunological, or other physiological responses, as well as behavior. However, the more that we learn about these responses, the clearer it becomes that these various types of response are interdependent. For example, not only do brain changes regulate bodily coping responses, but adrenal changes have several consequences for brain function, lymphocytes have opioid receptors and a potential for altering brain activity, heart-rate changes can be used to regulate mental state and hence further responses. It is often combinations of difficulties that make coping difficult. This is true for all species of animals. The methods of coping that are used may help with several problems at once. For example, many emergency responses require more energy than normal to allow the animal to utilize skeletal muscle more efficiently, make the heart pump faster, and reduce response time. Such general physiological methods of trying to cope are usually combined with one or more of a variety of physiological responses that are specific to the effect that the environment is having upon the animal. Hence if it is too cold, the animal may raise its hair, shiver, and reduce blood supply to peripheral parts of the body, but in extreme circumstances, adrenal responses are involved as well.

Coping methods may be behavioral and mental as well as physiological, and vary from very active responses to some hazards to passive responses in which the individual minimizes movement. The initial responses to a situation may be largely automatic, but if these are not effective, other changes may be brought about that affect the mental state of the individual. Some coping systems include feelings as a part of functioning, for example, pain, fear and the various kinds of pleasure, all of which are adaptive. Bad feelings which continue for more than a short period are referred to as suffering. Other high- or low-level brain processes and other aspects of body functioning are also a part of attempts to cope with challenge. In order to understand coping systems in humans and other species, it is necessary to study a wide range of mechanisms including complex brain functioning, as

well as simpler systems. Investigations of how easy or difficult it is for the individual to cope with the environment, and of how great is the impact of positive or negative aspects of the environment on the individual, are investigations of welfare. If, at some particular time, an individual has no problems to deal with, that individual is likely to be in a good state, including good feelings, and indicated by body physiology, brain state, and behavior. However, an individual may face problems in life that are such that it is unable to cope with them. Prolonged failure to cope results in failure to grow, failure to reproduce, or death. The individual is said to be stressed, and welfare is poor. A further possibility is that an individual faces problems but, using its array of coping mechanisms, is able to cope but only with difficulty and usually also with bad feelings. The greater the difficulty in coping, the worse the welfare.

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Donald M. Broom

ANIMAL WELFARE: FREEDOM

Freedom means the possibility to determine actions and to make responses, and has been thought of by many philosophers, including Immanuel Kant, as necessary for a good life in sentient individuals. However, freedom to seek pleasure without concern for all consequences is wrong, and there are few freedoms or rights which would be accepted as valid under all circumstances. The right to free speech can cause great harm to certain individuals and hence can be morally wrong, as can the right or freedom to drive a car as fast as you wish, to carry a gun, or to select the sex of your offspring. In the same way, social animals are constrained by their relationships with others such that specification of individual freedoms can sometimes be erroneous. The socially competent pig or dog is not free to do as he or she chooses. The safer argument when evaluating what comprises a moral action is to consider the obligations of the actor.

One of the approaches that has been adopted when attempting to ensure that the welfare of animals is good is to list the freedoms that should be provided for. The idea of specifying the freedoms that should be given to animals was put forward in the Brambell Committee Report, which was presented to the Government of the United Kingdom in 1965. The freedoms were defined as freedom from: (1) hunger and thirst; (2) discomfort; (3) pain, injury, or disease; (4) fear and distress; and (5) the freedom to express normal behavior by providing sufficient space, proper facilities, and company of the animal's own kind.

This list of freedoms has been a useful general guideline, but animal welfare science has progressed rapidly since that time and there is now good evidence for the needs of most domestic species. The needs are identified by strength-of-preference studies and research identifying the extent of poor welfare if it is not possible to fulfill the needs. There is now

little point in listing the freedoms, because the species needs are a much more accurate way to decide upon what should be provided to ensure good welfare.

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ANIMAL WELFARE: RISK ASSESSMENT

Many people who are interested in the assessment of animal welfare want to use a science-based approach. Indeed, such science-based analyses will likely become the major way in which future legislation will be formulated. This trend is already obvious in the European Union (EU). Risk analysis is one way to quantitatively study animal welfare. Risk analysis comprises three parts: risk assessment, risk management, and risk communication. This essay deals only with risk assessment.

Risk assessment is a systematic, scientifically based process to estimate the probability of exposure to a hazard, and the magnitude of the adverse welfare effects (that is the consequences in terms of severity) of that exposure. The aim is to analyze the risk of animal suffering, that is, poor welfare, in a quantitative or semi-quantitative fashion depending on the type of data available. Conversely, a similar approach could be used to make an assessment of the likelihood of good welfare.

Hazards are identified as events or circumstances occurring in an animal's life that may result in adverse effects for an individual animal. For example, concrete floors may result in lameness for a dairy cow; lack of space may lead to stereotypic behavior for a captive animal; crowding of fish during capture or grading may lead to scale loss and other superficial injuries; misuse of a captive bolt (also called a cattle gun, which is used to stun cattle prior to slaughter) may cause pain by not inducing immediate unconsciousness. It may also be possible to characterize the hazard more precisely in order to define its quality or quantity in some way (e.g., the nature of concrete floor surface, power of the captive bolt, exact size of floor area).

The consequences of being exposed to the defined hazard are analyzed in terms of the intensity and duration of the adverse effect(s) being suffered by an individual animal. The combination of intensity and duration (severity) is then expressed in some way as the magnitude of the severity.

The likelihood of the severity occurring is also assessed or calculated depending on the quality and type of data available, and assessors are asked to give maximum, minimum, and most likely incidence.

While the above considerations refer to an individual, it may be necessary to know how commonly it happens, that is, the exposure of a population of animals to the hazard, for example, in the national herd, or in a trading area such as the United States or European Union.

The data are also analyzed for their degree of reliability or uncertainty/certainty, as information may vary from a metanalysis at one extreme (low uncertainty/high

certainty) to little published evidence, that is, scarce or no data available, or evidence provided in unpublished reports, or few observations and personal communications, or experts' opinions which vary considerably (high uncertainty/low certainty).

Data can be also confounded by the degree of biological variation. For example, there is good data to show that animals that have had their pancreas removed will develop diabetes, that is, there is a high degree of certainty (or low uncertainty) and the biological variation is probably zero. However, the time it takes for fish to die from anoxia on ice, or the chance of a dairy cow becoming lame on a concrete surface is neither 100 percent nor zero, and any average will depend on biological and other factors leading to a range due to biological variation; this can also possess a high degree of certainty. Overall uncertainty associated with exposure to a hazard is recaptured by measuring the maximum and minimum estimates of the most likely value of the proportion of the population exposed, and those that suffered the adverse effect.

Risk pathways are helpful to identify precisely what hazards an animal may be exposed to and to make sure that multiple hazards are covered. For example, in abattoirs it would be important to look at pre-slaughter gathering in lairages, as well as the methods of stunning and killing and bleeding out.

Finally, a risk score is calculated applying either numbers obtained from the data (a quantitative risk assessment), or allocating numerical scores to bands of data, for example, no, low moderate or severity (say from 0–3) (a semi-qualitative risk assessment). Uncertainty is reflected in the range of values obtained from maximum, minimum, and most likely.

The methodology used does not give a precise numerical estimate of the risk attributed to certain hazards. However, the output can be used to rank problems and identify areas of concern, as well as guidance for future research. The methodology does not take into account interactions between factors and assumes linearity in the scores. These assumptions cannot be tested. When the risk scoring is semi-quantitative, as it always is for welfare assessments, the figures are not on a linear scale, and so a risk score of 12 cannot be interpreted as twice as important as a risk score of 6.

The risk assessment approach is the first to compare the severity of procedures and environments to which animals are exposed in a mathematical way. Alternatives can be compared, for example, within and between different systems of husbandry, between different breeds or strains, between different methods of slaughter, mutilations, or breeding. In this way risk scores can be used to prioritize risk management in a trading area, for example, by passing legislation. It will also be useful to prioritize research funding.

Hazard Analysis and Critical Control Points: After a risk assessment has been carried out, it may be possible to identify particular points in the risk pathway that can be used to monitor stages of the process which involve exposure to specific hazards that jeopardize animal welfare, and for controls to be put in place.

Further Reading

European Food Safety Authority (EFSA): http://www.efsa.europa.eu/EFSA/ScientificPanels/efsa_locale-1178620753812_AHAW.htm (See EFSA Web site for opinions that comment on welfare.)

David Morton

ANIMAL-ASSISTED THERAPY

Animals' ability to motivate and bring comfort and joy to people's lives can be harnessed to enhance the quality of a person's life. Dramatic evidence of benefits in specific cases inspires people to incorporate animals into institutional settings, and some make regular visits with a companion animal to a facility. It is not surprising that the practice of using animals for activities, therapy, and in education has developed faster than the scientific knowledge of efficacy, the animals' needs, and the educational curricula for health professionals.

Seeing a sick or depressed child come alive in the presence of a dog, or an elderly person with Alzheimer's disease emerge from a silent cloud when a cat approaches motivates countless people to participate as volunteers in animal-assisted activities, therapy, and education. Although such programs are staffed by volunteers in virtually every community, the promise of animals helping people remains to be broadly mainstreamed in medical settings as a common intervention for treatment. Standards for veterinary screening and oversight of the animals is an essential aspect of an integrated plan for therapy that uses animals.

People's enjoyment of animals, along with growing evidence for the healthful effects of contact with companion animals, has facilitated the expanding practice of incorporating animals in interventions. Therapeutic uses of animals range from brief visits to full-time partnership. In the United States, since the 1980s, dogs and cats have been brought to visit in nursing homes and hospitals. Full-time service dogs also began to be placed with persons using wheelchairs, providing them with therapeutic companionship and comfort 24 hours a day, and normalizing their lives in the community.

Assistance dogs are now specially trained to offer specific assistance in a growing range of tasks. Dogs offer emotional support and companionship that presumably are of greater importance than the instrumental tasks they perform. Dogs assist people with their personal needs, including giving warning and assistance with epileptic seizures, warning of hypoglycemic episodes, and calming during episodes of mental illness. Whether the animal is a short-term visitor brought by a handler or a full-time assistance animal, they have the potential to be beneficial.

Another common animal-assisted intervention that requires professional supervision, physical infrastructure, extensive care and management for the horses, and ongoing assistance from several helpers, is equine assisted therapy, or hippotherapy, in which the movement of horseback riding is used to offer muscular and postural stimulation and motivate riders in their learning and classroom activities. Since a treatment team is required for working with horses, special organizations address this form of therapy, including the North American Riding for the Handicapped Association (NARHA).

The Animal and Handler

Many applications of animal-assisted activities, therapy, and education use an animal that is brought by a handler to serve another person who can benefit. The handler may complete special instruction courses and take the animal for training and screening in order to be well-

prepared to visit institutions and other settings. An advantage of this system is that the person offered the visitation is spared the responsibility of oversight and care of the animal. Someone who is institutionalized, in hospice, or in medical recovery often is not prepared to assume responsibility for an animal's care, but can still benefit from occasional visits with an animal.

When the person is vigorous and healthy enough to oversee and provide most of the fulltime care for the animal, it may be more beneficial for the same person to be the handler and also receive the benefits. Assistance dogs provide a fulltime therapeutic relationship. Dogs may be specially bred and extensively trained over a couple of years, as with guide and service dogs, or the training may be conducted over a shorter period of time, as with hearing and seizure dogs. Psychiatric service dogs are a new development, where the handler arranges for the training, usually with a companion animal that is already on hand. The handler may have a physical or mental disability and still assume the major responsibility for the dog's care. Dogs placed with people in wheelchairs have been termed service dogs, and are prepared similarly to guide dogs, with special breeding, puppy raisers, and extensive training. As the applications of assistance dogs have broadened, the designation of service, guide, and hearing dogs has often converged with the term assistance dogs; however, the nomenclature is not entirely consistent.

Legislative protection permits an assistance animal for people with a disability that interferes with their ability to perform the activities of daily living. Regulatory language allowing public access may use the term service or assistance animal, and the terminology has become less specific and more overlapping. The lack of any system for governmental or regulatory certification, paired with the personalized training of dogs to address specific needs of the person, results in a continuing expansion of the special roles of dogs.

The Welfare of the Animal

Most animal-assisted interventions employ dogs or horses. Both of these species benefit when handlers are knowledgeable about their basic needs and veterinary guidance is available. Dogs readily take to partnership with their human companions. Most breeds of dogs used are those that were specifically shaped to assist humans in particular tasks. When a breed that is well-suited for the expected tasks is selected, a dog given suitable experiences and training has a high probability of becoming a successful partner. Virtually all dogs welcome the handler, enjoy walks, and are expressive, loyal, and attentive—all traits that are highly valued by people who spend time with dogs. The subtle attentiveness of dogs to humans is now well documented, showing that dogs respond to the gaze, pointing, or yawning of a human. Thus, a natural compatibility arises between the dog that likes working as a partner and the handler who feels appreciated and loved by the dog.

Horses offer inspiring partnerships that can be highly motivating as an intervention. The safety concerns and the challenges of managing such a large animals require that a number of people be involved in providing equine-assisted therapy. The welfare of horses has been well studied, and information is available on methods of training, husbandry and transport.

Adequate curricula to assure the appropriate application of animal-assisted interventions, as well as the welfare of the animals involved, are only now coming to be available. In the United States, optional programs for certifying handlers and their animals have focused on preparing volunteers and their animals.

There have been few educational avenues for health professionals to gain coursework and practical experience in applying animal-assisted interventions and learning about the animals' needs. Practitioners have been self-taught and sought out their own path of study and experience. A recent development is the establishment of the International Society for Animal-Assisted Therapy, which accredits educational programs designed to prepare health professionals.

For the past couple of decades, practitioners of animal-assisted therapy have begun with traditional educational programs in the health professions and have had to develop their own techniques for animal-assisted interventions, building them upon their own health disciplines. To address this curricular gap, the International Society for Animal-Assisted Therapy now offers an accreditation process, with stated requirements and a detailed review process. Already, two institutions are accredited to offer instruction in Animal-Assisted Interventions, the Institute for Social Learning with Animals, in Germany, and the Institute for applied Ethology and Animal Psychology, in Switzerland. Applications from other countries are forthcoming. These programs accept students from a variety of health professions and offer flexibility for enrollees to focus on a specific area of interest for their internship and special project, such as equine-assisted therapy or animal-assisted pedagogy. These programs will be of value to those working in a wide range of settings, and with a range of species of animals. They also expand the curricular materials available for practitioners.

In the United States, the University of Denver offers a special emphasis on animal-assisted interventions within the social work program. The Bergin University of Canine Studies in Santa Rosa, California, provides undergraduate and graduate instruction focused on assistance dogs. These recent developments signal an accelerated emphasis on bolstering the number of professional opportunities in animal-assisted interventions.

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Lynette A. Hart

ANIMALS IN SPACE

Before human beings ventured into space, American and Russian scientists launched animals with the aim of testing both their rocket engineering and the living conditions of the environment(s) which they would eventually encounter (e.g., the effects of weightlessness and risk of sun radiation). Once human missions began, astronauts typically also took animals with them so as to conduct further biological experiments, a practice that continues to this day at the International Space Station.

Insects and animals launched on either orbital or suborbital flights with little chance of survival have included chimps, dogs, monkeys, cats, rabbits, mice, rats, turtles, frogs, spiders, bees, crickets, silkworms, fruit flies, ants, and fish. Many of them never returned. Over the years many countries have issued stamps, bubblegum cards, and even cigarette packets commemorating both those that did and those that did not make it back to Earth; such acts could potentially benefit animal welfare by promoting awareness, but it is far from clear that this has ever been the aim behind them.

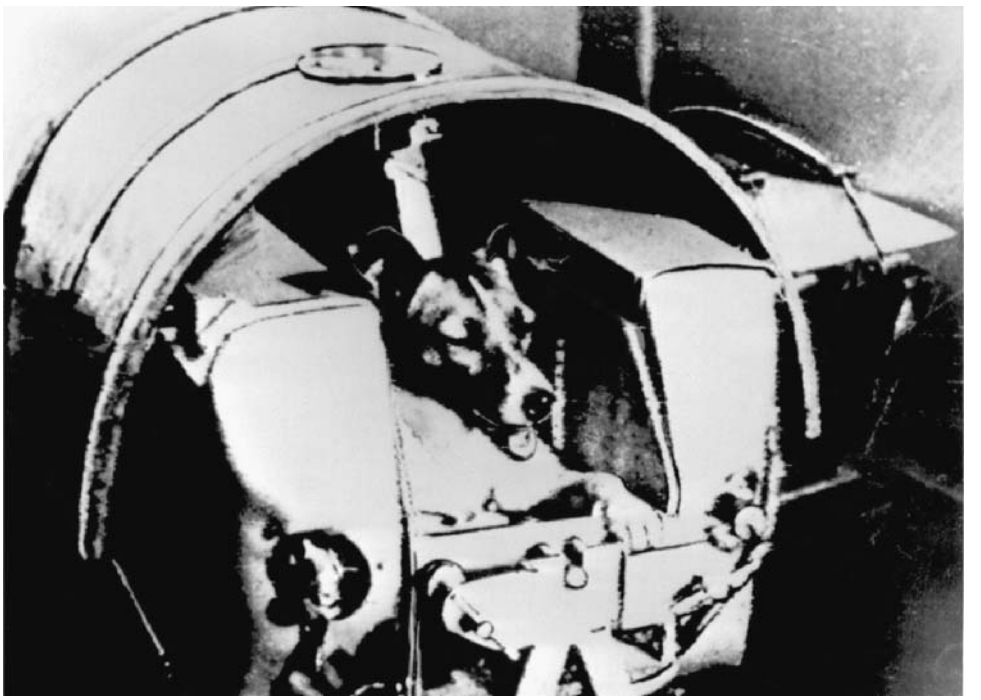
With the exception of a jar of fruit flies which was successfully flown 106 miles above the earth and parachuted back in 1947, the first five animals to be sent into space—collectively known as the Albert Series—all boarded V-2 Blossoms from White Sands, New Mexico between 1948 and 1950. Albert I was a rhesus monkey who, on June 11 1948, was launched with virtually no publicity or documentation. Three days later another lab monkey, Albert II, reached an altitude of 83 miles, but died upon impact. In August that same year, an anesthetized mouse, Albert III, was the first astronaut to return alive. He was followed, in December 1949, by Albert IV, a monkey who died on impact after a successful flight. In May 1950 the last of the Alberts, a mouse named Albert V, was launched; this mouse survived impact, having been photographed in flight. Next came the animal astronauts of the Aerobee missile flights, launched from Holloman Air Force Base, New Mexico. First up, on September 20 1951, were Yorick, another monkey, and his 11 co-passengers, all mice. The 236,000-foot missile flight was successful, and Yorick became known as the first monkey to survive spaceflight. On May 22 1952 he was followed by Patricia and Mike (two Philippine monkeys) and Mildred and Albert (two mice), who were all placed in different positions (the last two inside a drum where they could float weightlessly) and shot up 36 miles at an average speed of 2,000 mph, in order to test various effects of rapid acceleration. They were all recovered safely by parachute.

Meanwhile, back in the USSR, Soviet scientists began experimenting on rats, mice, rabbits and, eventually, dogs. The latter were chosen with the ultimate aim of designing a human space cabin (monkeys were thought to be too fidgety). Between 1951 and 1952, the Soviets launched at least nine stray female dogs (always in pairs, some dogs flew twice) on at least six of their R-1 series rockets (the precise facts are disputed among researchers). The first pair of hounds, Dezik and Tsyganka ("Gypsy"), were launched on August 15 1951 and were successfully recovered by parachute. Next came Dezik and Lisa, who in September of that year tragically died in an unsuccessful flight. The third pair, Smelaya ("Bold") and Malyshka ("Little One"), were launched

successfully, despite Smelaya's brief escape on the eve of their mission. The fourth launch (carrying a pair of dogs whose names remain unknown) was as tragic as the second, but the fifth (also carrying two anonymous strays) was successful. Finally, on September 15 1951, the last pair of R-1 canines were launched successfully, though only after one of the original crew (Bobik) escaped and was replaced at the last minute by a dog found near the local canteen, which they named ZIB (the Russian acronym for "substituting for missing dog Bobik").

Four years later, on November 3 1957, Sputnik 2 famously orbited with a 13-pound stray female mongrel named Laika ("Barker," though her real name was Kudryavka, which means "little curly"). Two other dogs had been trained for this flight—Albina, who was the first back-up, and Mushka, upon whom the life support and instrumentation were tested. The dogs were all kept in increasingly smaller cages for periods of two to three weeks.

Laika's mission commemorated the 40th anniversary of the Great October Socialist Revolution (celebrated on November 7), yet shortly after the launch the Soviets caused public outrage by announcing that Laika—the first living being to orbit the earth—would almost certainly die in space because there was no recovery method, at the time, for orbital flights. For a shockingly long time, they somehow managed to persuade the world that Laika ate and barked for about a week before dying painlessly in orbit. It was not until 2002 that Dimitri Malashenkov of the Institute for Biological Problems in Moscow revealed that Laika had died from panic and/or overheating a mere five to seven hours after takeoff. The dead dog then circled the earth more than 2,500



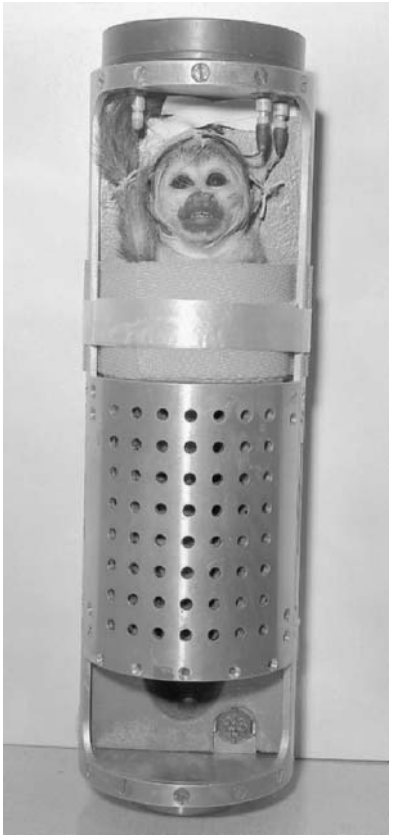
A Russian dog named Laika prepared for space launch, 1957 (AP-Photo/HO)

times before burning up in its atmosphere. In so doing she provided proof that a living organism can survive in weightlessness for a long time, thus paving the way for the human astronauts of the 1960s. Did the end justify the means? In 1988 Oleg Gazenko (one of the leading Soviet scientists involved in their animals-in-space program) announced that he regretted sending Laika into space: "The more time passes, the more I'm sorry about it. We shouldn't have done it . . . we did not learn enough from this mission to justify the death of the dog." Laika's death also enraged anti-vivisectionists in America, who were joined by anti-communists in their public expressions of outrage, an ironic turn of events given that medical researchers in the United States had previously characterized those who opposed animal experimentation as communist-led fanatics (cf. Los Angeles *Times* editorial, April 18, 1950).

On December 13 1958, a Jupiter rocket was fired, carrying a South American squirrel monkey named Gordo who, after a 15-minute, 1,800-mile flight, died when a parachute failed to open. The naval medicals concluded that his heartbeat and respiration showed that humans could survive a similar trip. However, the ASPCA complained that only inanimate objects should be used for such tests, and The British Royal Society for the Prevention of Cruelty to Animals expressed "grave concern and apprehension." Even so, Able, an American-born rhesus monkey, and Baker, a female spider monkey from South America, were launched on May 28 1959, aboard an Army Jupiter missile. They traveled 300 miles into space at speeds which at times exceeded 10,000 mph, and were recovered unharmed, becoming the first living creatures to survive a space flight. The flight lasted 15 minutes, during nine of which the monkeys were weightless. The mission was criticized by various animal welfare groups. Able died on June 1 from the effects of anesthesia. On June 3, four mice were launched from Vandenberg Air Force Base on Discoverer 3 as part of the Corona program of US spy satellite. According to the CIA, the first try at launch failed when the mice were found dead before the flight after having eaten the Krylon that had been sprayed on their cages. The second try was delayed when scientists realized that the humidity sensor couldn't distinguish between water and mouse urine. When the rocket was finally launched, it fired into the Pacific ocean, and the back-up crew of mice died.

One of the best known space monkeys was a rhesus called Sam (an acronym for the U.S. Air Force's School of Aviation Medicine), launched on December 4 1959 with the aim of testing the launch escape system of a Mercury spacecraft. The experiment was successful, and Sam was recovered a few hours later. He lived a long and healthy life until 1982. His mate, a rhesus monkey named Miss Sam, was launched in a similarly successful test on January 21 the following year.

Soon after, the Soviet Union began testing on more dogs, including Otvazhnaya ("Brave One") and Snezhinka ("Snowflake'"), who made a successful high altitude test in 1959, accompanied by a rabbit called Marfusha. Over the next year, Otvazhnaya was to participate in five more similar experiments. A few weeks later, on July 28, Bars ("Panther") and Lisichka ("Little Fox") were launched on a Korabl Sputnik 1; both dogs died when the booster exploded. On August 19 1960, Belka ("Squirrel") and Strelka ("Little Arrow") boarded Korabl Sputnik 2, accompanied by 40 mice, two



A squirrel monkey, Baker, in bio-pack couch being readied for the Jupiter AM-18 flight, launched on May 28, 1959. The Jupiter, AM-18 mission, also carried an American-born rhesus monkey, Able, into suborbit. The flight was successful and both monkeys were recovered in good condition. Able died four days after the flight and Baker died in November 1964. (NASA)

rats, a grey rabbit, and 15 flasks containing plants and fruit flies. The flight was a success, and Strelka later gave birth to six puppies one, of which was presented to President John F. Kennedy as a gift for his children.

Arguably the most famous animal astronaut of all was a four-year-old West African chimpanzee called Ham (his name was an acronym for Holloman Aero Med) who, having been chosen from a short list of six astrochimps, on January 31 1960, donned his spacesuit and boarded the Mercury Redstone rocket at Cape Canaveral to become the first chimpanzee in space. Reaching a record speed of 5,857 mph and an altitude of over 155 miles (both due to technical problems) Ham was weightless for 6.6 minutes of his 16.5-minute flight. He landed dehydrated and fatigued to be rewarded with an apple and half an orange, but went on to live a healthy life until 1983. His body was preserved by the Smithsonian Institute, which has permanently loaned it to the International Space Hall of Fame in Alamogordo, New Mexico. Without Ham, America would not have been able to launch its first human astronaut, Alan B. Shepard, Jr., on May 5 1961, though by then the Soviets had already orbited Yuri Gagarin around the Earth for almost two hours on April 12 of that same year, following their successful Kotabl dog launches. While the Soviets had chosen dogs over monkeys for their experiments (because they fidgeted less), the Americans preferred chimpanzees over dogs because they were more similar to humans.

Some of the technical defects observed during Ham's flight were not corrected until November 1961, when a chimpanzee named Enos orbited the Earth twice. The mission plan had called for three orbits, but the flight was terminated early due to technical difficulties, which included a thruster malfunction. Without this further animal testing, John Glenn would not have been able to orbit Earth in 1962. That year, Enos was reported to have died at Holloman Air Force Base of a case of dysentery unrelated to his space travel. Equally unfortunate was Goliath, a squirrel monkey killed on November 10 1961

when the Atlas E rocket he was launched in was destroyed within 35 seconds.

On October 18 1963, the French launched and successfully recovered Felix, the first cat to make it to space. A second cat launched six days later could not be retrieved. On February 22 1966, the Soviets launched two more dogs, Veterok ("Breeze") and Ugoyok ("Little Piece of Coal"), in order to test the prolonged effects of radiation caused by the Van Allen Belt during space travel. Their 21 days in space remain the canine record to this day, surpassed only by humans in 1974. On September 15 1968, Soviet scientists launched a number of turtles, worms, flies, and bacteria on a one-week mission to orbit the Moon. The reentry capsule was successfully retrieved. A similar mission on November 10 of that same year was unsuccessful.

Between 1966 and 1969, the United States launched three missions in the Biosatellite series. The first of these carried insects and frog eggs, as well as various microorganisms and plants; it was never recovered. The second, launched in 1967, had a similar cargo, but was recalled early, while the third, launched in 1969, carried a male monkey named Bonnie. This mission's main purpose was to investigate the effect of space travel on numerous functions and abilities including behavior, cognition, and metabolism. Eight hours after his recovery, Bonnie died of a heart attack caused by dehydration.

After the successful human landing of Apollo 11 on the Moon, the use of animals in space was mainly restricted to biological experiments. Popular subjects included turtles, rabbits, fish, and insects. On July 28 1973, two spiders named Anita and Arabella were to make headline news by spinning their webs in space. Between then and 1996, the Russians launched a series of life-science missions (involving various monkeys, rats, tortoises, insects, frogs, fish, newts, and quail eggs) in cooperation with a number of countries and organizations including the Commonwealth of Independent States, the European Space Agency, and the United States. A monkey named Multik died the day after his recovery from one such two-week mission, the Bion 11, putting ethical questions relating to animal experimentation back on the agenda, and causing NASA to back out of participation in subsequent Bion missions. Other life-science experiments have included Spacelab missions (1983-present day) which experimented on both humans and animals. The environment within the animal enclosure modules used in these missions meets most of the recommendations of the *NIH Guide to Care and Use of Laboratory Animals,* with the exception of its increased ambient temperature and housing density. On April 17 1988, a record number of over 2,000 creatures accompanied the seven human astronauts of shuttle *Columbia* (STS-90) on a 16-day Neurolab mission.

The 1990s saw China launch guinea pigs and Japan launch newts, while the United States extended its menagerie to includesnails,seaurchins,moths,crickets, carp, and oyster toadfish. More recently, in December 2001, 24 mice boarded the space shuttle *Endeavour* as part of an experiment on a bone-regulating protein called osteoprotegerin, while in January 2003, the space shuttle *Columbia* carried bees, ants, silkworms, and Japanese killifish, all part of various international high school projects. To this day, the United States, Russia, China, Japan, and France all continue to fly animals into space.

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Constantine Sandis

ANTHROPOCENTRISM

The term anthropocentrism refers to any view that asserts the centrality, primacy, or superiority of human beings in the scheme of things; that claims the purpose of nature is to serve human needs and wants; or that posits the greater value of human life and interests relative to the lives and interests, if any, of nonhumans. Such views are highly characteristic of modern civilization and are frequently implicated in discussions of the world environmental crisis, the abuse of animals, and threats of species extinction. From the anthropocentric standpoint, other species—and nature as a whole—exist in a subservient relationship to our own species. This relationship may be rationalized by some kind of metanarrative, such as a story about divinely ordered creation (and humans' bearing the image of God), the great chain of being, or a putative evolutionary hierarchy, or it may merely be asserted as the natural outcome of human development and exploitative skill. In other words, the concept of human superiority may be understood in either a *de jure* (justified) or a *de facto* (happenstance) manner.

Anthropocentrism is also characterized by such terms as "homocentrism", "human chauvinism", "speciesism," and "human-centered ethics." In its crudest expression, anthropocentrism entails an outlook of the following kinds: that human interests, needs, and desires are the only ones that count; that if any life-form can be said to possess intrinsic value, only *Homo sapiens* can; that humans represent a different order of being that exists apart from nature rather than as a part of nature. Anthropocentrism is often equated with anthropomorphism, but this is an error; the two terms should be carefully distinguished.

Three main varieties of anthropocentrism can be identified:

1. **Dominionism:** Rooted in the Old Testament and in ancient Greek philosophy, this is the position that nature and individual things in nature exist only for human benefit. Dominionism is also referred to in the literature as "strong anthropocentrism," and is commonly associated with such ideas as mastery of nature and nature's possessing only instrumental or use value, and with the human species' self-glorification. Arrogance rather than humility is the mark of strong anthropocentric attitudes and behavior. Dominionists think of nature as a boundless storehouse of resources. The frontier

mentality and unrestrained development are representative modes of dominionism.

2. **Stewardship:** A milder form of anthropocentrism may also be traced to the Judeo-Christian tradition and is found in others as well. Often labeled "weak anthropocentrism" in the literature, the stewardship view is manifested in such ideas as responsible husbandry, wise management and conservation of resources, and preservation of species and natural wonders, although sometimes preservation is linked to the notion of something's being of value for its own sake. By one estimate (Butkus, 2002) there are no fewer than 26 references to stewardship in the Bible, and even the dominionist account (in Genesis 1:26–28) of how God assigns to humans their place in nature is often interpreted as a prescription to tend the Earth in a measured and loving way. Within Islam too, humans may be seen as nature's caretakers, the vice-regents of Allah for whose glory all acts are performed. And in the thought systems of Indigenous Peoples in many parts of the world, ideas of stewardship are present—for example, in the principle that the Earth is inherited from our ancestors and must be carefully looked after, in order to be passed on intact and in good health to future generations. Within stewardship, arguably, humans still matter most, but other species matter and possess noninstrumental value as well. This framework allows room for the projects of advancing biodiversity and pursuing sustainable development.
3. **Evolutionary Perspectivism:** According to this view, it is natural for each species to act as if its survival, flourishing, and reproduction are the highest goods. Given this premise, inter-species clashes are inevitable; there could not be an ecosphere as we know it without conflict and competition. Some infer from this that whatever humans choose to do in nature is simply a reflection of our species-specific behavioral repertoire, which we exhibit just as other animal types exhibit theirs. Others suggest that nature's wellbeing is not in conflict with human-centered behavior but actually coincides with an enlightened form of our species' self-interest, so that there need be no ultimate opposition between humans and the rest of nature. That is, when humans pursue their proper end, they will then act in the best interests of nature as a whole. Entomologist E. O. Wilson even argues that what he calls "biophilia" (love of life) has played a crucial role in the history of human development (see Kellert, 2003).

Many philosophers perceive anthropocentrism as a belief that, if it ever had an important function, has now outlived its usefulness and become not just outmoded, but a dangerous threat to fragile ecosystems and even to the survival of life on Earth. Others maintain that anthropocentrism is in some sense inescapable and, at a certain level of interpretation, scarcely remarkable at all. Just as spiders, if they could evaluate the world around them conceptually and articulate their thoughts in language, would be arachnicentric, so would wolves be lupucentric and cows

bovicentric. How, then, could humans be other than homocentric? But while we may, and perhaps must, accept that human values and experience determine the standpoint from which we project outwards, it does not necessarily follow that overcoming or at least mitigating the more harmful effects of our anthropocentric outlook is an impossible goal. The human viewpoint is an anchoring reference to which we will always return, but this does not mean that all values must in the end be human-centered or that we must continue, in our thinking, to place ourselves above all else, at all times, at the center of significance. We should not conclude that empathy and connection with nonhuman nature are unavailable to us merely because we happen to belong to the species *Homo sapiens,* any more than we should conclude that it is beyond us to empathize and connect with fellow human beings just because we all happen to be individual, separate subjects of consciousness with our own peculiar identities. Perhaps it is not too great a step to recognize that in the natural world there are nonhuman entities and configurations possessing their own intrinsic value. How far we can and should try to extend ourselves beyond our foundational anthropocentrism, therefore, is something that cannot be decided in advance, and only time will tell how successful we might become at this or whether we might evolve into beings who can coexist with our own kind as well as with nonhuman species.

See also Animal-Human Interactions, Ecological Inclusion, Empathy for Animals; Religion and Animals

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Michael Allen Fox

ANTHROPOMORPHISM

Anthropomorphism is, at its most general, the assignment of human characteristics to objects, events, or nonhuman animals. Notably, belying this neutral definition is a non-neutral connotation to the word and to the phenomenon it describes. Specifically, an anthropomorphic characterization is generally held to be an erroneous one—at best, premature or incomplete, and at worst, dangerously misleading. That anthropomorphism is, further, incorrect as a description is often assumed.

Of greatest relevance to the study of animal rights and welfare are anthropomorphisms of animals as having attributes and mental states (especially emotional and cognitive states) similar to human attributes and mental states. Pets are regular subjects—a dog's low, rapid tail-wagging explained as guilt for eating a shoe, or a cat rubbing against its owner interpreted as an expression of fondness. The pain or grief of laboratory animals is often evoked by those pressing for improvements in the animals' welfare. Research in the recently developed field of cognitive ethology accumulates empirical data on precisely the kinds of mental states that anthropomorphism claims (without the backing of science): the purposes, feelings, motivations, and cognition of animals. Thus, the science and the attributions are interwoven. This is the form of anthropomorphism with which we shall primarily concern ourselves in this essay.

The Meaning of the Term

As we shall see, anthropomorphizing is generally disapproved of in describing animals. By its very definition, anthropomorphism is the misapplication to animals of words used to describe humans. Some excuse anthropomorphism as simply a form of analogy. "My dog loves that little poodle," one might say, is a claim of the presence of emotions between dogs that is analogous to those emotions in humans. In other words, the dog may not feel "love," per se, but something like love: he follows her around, he wags his tail uncontrollably when she appears, he persists in attempting to mount her . . . and so on, more or less just like human love. This is credible, although it does not exempt anthropomorphizers from criticism on factual grounds, if the claim is without scientific support. But even if all anthropomorphisms are simply analogies relying on similarities between the target and the source, not all such analogies are anthropomorphisms. Forming analogies between humans and other animals is regularly considered nonanthropomorphic. For instance, dissection of a sheep's brain in a class on human cognition is not taken to be an anthropomorphic activity. On the other hand, the protest outside the classroom making claims about the suffering of the sacrificed sheep may be.

A Brief History of Anthropomorphism

Anthropomorphic representation appeared in Paleolithic art of 40,000 years ago, when some drawings of animals included characteristically human features; anthropomorphisms have appeared in human writings for thousands of years. All religious systems include anthropomorphisms. Ancient societies projected motives and emotions onto natural phenomena—angry winds, vengeful storms—and animals and natural events were often named and ascribed personalities. Later, even physics was to be influenced by an anthropomorphic teleology. Aristotle described a rock's downward tumble not as the result of a force between bodies, but as the rock acting to achieve the desired end of being on the ground. Both ancient and modern literature as well as folk psychology are replete with anthropomorphic language. The characterizations of Aesop—the happy dog, the persistent tortoise, the industrious ant—resonate and endure to this day.

Reproach for anthropomorphisms has appeared for nearly as long as the anthropomorphisms themselves. Xenophanes (sixth century BC) was the first to give

voice to the negative tone of anthropomorphism; soon, the term was appropriated to mean the blasphemous descriptions of gods as having human forms. Modern critiques date to the 17th-century philosophers Francis Bacon and Benedictus de Spinoza. In fact, the rise of modern science is matched by the diminishment and increasing censure of anthropomorphic descriptions of natural phenomena. Many of our practices toward animals, and the traditional view of humans as the acme of the animal kingdom, would be difficult to maintain in the face of a collapse in the division between man and animals.

In its current usage, anthropomorphism is tinged with the bad flavor that the anecdotalism of late 19th-century scientists like Charles Darwin and George Romanes left in science's mouth. While on the one hand epitomizing modern science, Darwin also embraced a classically anthropomorphic attitude toward animals, ascribing everything from emotions to insight to animals with abandon—and the future sciences of zoology, biology, and ethology developed in reaction against this. A comparison of the languages of description makes the distinction clear: Darwin spoke of "ants chasing and pretending to bite each other, like so many puppies" (1871, p. 448). A century later, a more typical description of the study of ants (taken from the Web site of the Polish Nencki Institute's ethology research group) investigates the "neurochemical mechanisms underlying the phenomena of social reward and social cohesion in ant colonies" and "the role of social context in the control of expression/suppression of various elements of ant behavior." Similarly, while Darwin noted that dogs could be variously magnanimous and sensible, shameful and modest, sensible and proud, these words are notably absent from contemporary ethological descriptions of dogs.

Explanations for Anthropomorphism

Why do we anthropomorphize? Anthropomorphism's endurance marks it as likely useful—or at least not irreparably harmful—in explaining and predicting animal behavior. Just as the developing child uses animism—the attribution of life to the inanimate—to make sense of the sensory chaos of his environment, anthropomorphism may have arisen as a strategy to make familiar an uncertain world. In normally developing humans, our characteristic propensity to attribute agency to others can become a theory of mind, and will find use in social interaction. In the development of the human species, anthropomorphism may have provided a means by which to anticipate and understand the behavior of other animals. With themselves as models, our human forebears could ascribe motivation, desire, and understanding to animals to determine with which ones they might want to cooperate or from which ones they should flee—as well as which ones they want to eat.

If there *is* an evolutionary explanation, we might expect other animals to engage in some version of the behavior. In fact, many animals do appear to attribute animal characteristics to inanimate objects or occurrences—what anthropologist Stuart Guthrie has called zoomorphism. In *The Descent of Man,* Darwin described his own dog growling and barking at an open parasol moving in a breeze, as though in the presence of "some strange living agent" (1871, p. 67). Primatologist Jane Goodall observed chimps making threats toward thunderclouds. Other ethologists have noted animals shying

from, stalking, or attempting to treat as prey or playmate a variety of natural objects. Nonhuman animals seem to be subject to a similar version of animistic perception as humans.

However, we do not anthropomorphize all animals: gorillas and dogs are regularly anthropomorphized, but worms and manta rays rarely are. Frogs' lack of anthropomorphizable characteristics may have led to their dismal fate at the dissecting table when dissection was a mainstay of biology classes. What are the behaviors and physical features of animals which prompt us to anthropomorphize them?

The answer no doubt has much to do with the ease with which the animal can be mapped to the human, in terms of isomorphisms of features and similarities of movement. Physically, phylogenetic relatedness accounts for some anthropomorphizing (for example, of great apes and monkeys); simple ease of matching of parts may account for other differential treatments (an eel's lack of limbs, the facelessness of a limpet). In particular, discernable and flexuous facial features, the ability to form a mouth into a smile, and the ability to move the head expressively and reactively are reliable prompts to certain kinds of anthropomorphisms. Paleontologist Stephen Jay Gould and ethologist Konrad Lorenz both noted that animals with neotenized features, for example large heads and big eyes, may prompt affiliation and selection because these are features of human juveniles.

Arguments against and for Anthropomorphism

The primary complaint against anthropomorphizing extends the reaction to the anecdotalism of Darwin and others: anthropomorphism is not based in science. There is no objective theory formation or testing, no careful consideration of evidence; there is merely unreflective application of human descriptions to nonhumans. Some argue that anthropomorphism is a category error, that is, the treatment of an entity (an animal) as a member of a class (things with minds and emotions) to which it does not belong, or the comparison of that entity to one (such as a human) belonging in a different category. Describing a dog as feeling guilt, they claim, is like saying that ideas are green. Those who assert that there are distinctively human traits might so argue: if the trait is, by definition, what separates humans from animals, then to treat an animal as possessing the trait is a logical error. If consciousness is a defining characteristic of humans, for instance, then to claim consciousness in nonhumans is a category mistake.

Indeed, some anthropomorphisms are clearly wrong for just these reasons. Happiness is commonly attributed to an animal on the basis of an upturn of the corners of its mouth; that which appears to be a smile, however, may be a fixed physiological feature (as with dolphins) or a sign of fear or submission (as with chimpanzees), not happiness. Similarly, an animal's yawn is likely not a sign of boredom, as might be assumed by extrapolation from our own behaviors; instead, it denotes stress.

Still, the implied suggestion that any mental ability exhibited by human beings is necessarily exclusive to humans is itself premature. A number of researchers are increasingly proposing a careful application of anthropomorphic terms to explain and predict animal behavior. Interestingly, it is the professional observers of animals who often become, with exposure and despite their training, more

likely to anthropomorphize. These advocates suggest that anthropomorphisms are not necessarily incorrect. On the contrary, they say, anthropomorphisms are used in reliable ways and are useful. The comparative psychologist Donald Hebb discovered, for instance, that taking pains to eliminate anthropomorphic descriptions resulted in a diminished understanding of the behavior of his chimpanzees. Anthropomorphisms, carefully applied, may be coherent guides to predicting the future behaviors of animals. The psychologist and biologist Gordon Burghardt proposed using a critical anthropomorphism in science which accepts the inevitability of the tendency to see animals in this way, yet uses informed anthropomorphisms to develop hypotheses that can be empirically tested.

The Future of Anthropomorphism

The claims of anthropomorphism are, often, scientifically unproven—simply extrapolations from our own condition. The onus of science is to find the means to confirm or refute these assertions. Hence the future treatment of anthropomorphism by science should include empirical testing of specific attributions. In the case of attributions of mental states, the process should include a deconstruction of the concepts attributed—from love and guilt to happiness and depression—and a determination of any behavioral correlates, as well as what would count as confirming or disproving evidence of the presence of the attributional state.

The status of anthropomorphism, and the content of its attributions, is highly relevant in the ongoing discussion of the role of animals in our society: as pets, as food and entertainment, and in medical and behavioral research. They can be used to effect change in public perception or even policy. Ascribing personalities to animals is demonstrably more effective than raw statistics in getting the public to consider an animal's or species' plight. An analysis of the content—the work of cognitive ethology—will be relevant to animal law and animal rights movements. If, for instance, attributions of human-like emotional experiences and cognitive abilities to chimpanzees turn out to be correct, the question of the rights we should grant that animal is raised.

Historically, anthropomorphisms have been used to attempt to uncloak, demystify, or get traction in domains unknown (and perhaps unknowable) to humans, such as the subjective experience of an animal. They might be best thought of as attributions of human qualities to nonhumans not proven to bear these qualities. The science of cognitive ethology may provide such proofs. Anthropomorphism will likely continue regardless.

See also Critical Anthropomorphism

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Alexandra C. Horowitz

ANTHROPOMORPHISM: CRITICAL ANTHROPOMORPHISM

Anthropomorphism can be useful in studying and interpreting animal behavior if applied critically. This means anchoring anthropomorphic statements and inferences in our knowledge of the species' natural history, perceptual and learning capabilities, physiology, nervous system, and previous individual history. That is, if we ask what we as humans would do in the animal's position, or how we would feel if treated like the animal, we must apply all the information we know about the animal as well as our own experience. For example, given what we know about dogs, it would be safe to infer that a kicked dog that is writhing and squealing is feeling pain. Putting ourselves in the dog's place is acceptable in this situation, since dogs are mammals with a physiological organization similar to ours. We would not be safe in concluding that the dog is feeling pain in exactly the same way we do, however. We are on less solid ground, from a critical anthropomorphic perspective, in concluding that an earthworm on a fishing hook is feeling pain in any way comparable to our pain when stuck. This is because we know far less about the earthworm nervous system. We could, though, conclude that the experience is aversive to the worm, since it avoids or tries to remove itself from such situations. Worms squirm to avoid predation, so such behavior is adaptive.

An important use of critical anthropomorphism is to help pose and formulate questions and hypotheses about animal behavior. Although we can never directly experience what another animal, including another human being, thinks or feels, we can make predictions as to what the animal or person would do using anthropomorphic methods. Insofar as we ground them on real similarities across individuals, our predictions may be very accurate and replicable. Enough research may even allow us to claim that the subjective mechanisms are comparable as well as the behavioral responses. Many of the greatest comparative psychologists and ethologists have acknowledged their use of anthropomorphic insights in formulating ideas and generating experiments in animal behavior. However, this is rarely stated in scientific reports, especially in this century. As the scientific culture has shifted, there needs to be more encouragement of the process of critical anthropomorphism in all areas of animal care, agriculture, and research.

Why is critical anthropomorphism necessary? In numerous instances an insistence on avoiding anthropomorphism in the sense used here has impeded research progress. Certain behaviors such as vigilance, greeting, aggression, fear, indecision, and dominance can only be

recognized once we know the normal behavioral repertoire. Thus, courtship and fighting have been confused and mislabeled in species. Mating behavior, which involves neck biting in many mammals, may be anthropomorphically mislabeled aggression or fighting. In contrast, dominance wrestling in rattlesnakes was considered mating because observers did not know the sexes of the participants. When it was discovered that two males were involved, scientists stuck to their biases and said these must be homosexual snakes, or that snakes were too dumb to tell the genders apart! Why was the behavior considered sexual? Well, the entwining of the snakes certainly appeared to be so anthropomorphically and, besides, the snakes never bit or tried to injure each other as, the scientists assumed, seriously fighting animals should try to do. Now we know that rattlesnakes are not immune from their own venom and biting would quickly kill both antagonists. The wrestling allows the strongest male to obtain access to female snakes without either animal being killed.

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Gordon M. Burghardt

ANTHROZOOLOGY

See Animal Studies

ANTIVIVISECTIONISM

Antivivisectionism is a widely accepted label for uncompromising opposition to the use of live animals in scientific research. No area of human activity affecting members of other species is more controversial than animal experimentation, or more likely to trigger reactions from advocates of animal rights and animal welfare. Vivisection literally means the cutting up of living organisms for the purpose of study or research. Historically, this is an accurate description of the way in which experiments upon, generally, unanesthetized animals were performed. Antivivisectionism became a very strong movement in 19th century Victorian England, where increasing attention was being paid to animal pain and suffering, leading ultimately to passage of the Cruelty to Animals Act 1876, the world's first law specifically regulating animal research. By comparison with earlier centuries, relatively little of today's experimentation upon animals is of a highly invasive sort. But the word vivisection has persisted in the vocabulary of protest, taken on a wider meaning over time, and now denotes all procedures of scientific research that result in the injury and/or death of animals.

Antivivisectionists are by definition abolitionists, demanding a total end to animal experimentation, whether accomplished immediately or gradually, but they may also have more limited and pragmatic goals, such as ending certain kinds of experiments on nonhumans that are deemed morally unacceptable (e.g., consumer product safety testing, burn experiments, or pain experiments performed without anesthesia or analgesia). By contrast, animal welfarists, although they oppose cruelty, generally accept the use of animals as subjects of research, but campaign for more humane treatment and for reduction, refinement, and replacement in relation to animal usage.

Animal experimentation has been opposed by antivivisectionists on a number of grounds: (a) inapplicability or limited applicability to humans of the data gathered owing to cross-species differences and artificial laboratory settings; (b) methodological unsoundness (embodying poor scientific procedures); (c) dangerously misleading and harmful results; (d) wastefulness, inefficiency, and unreasonable expense; (e) triviality; (f) redundancy; (g) motivation by mere curiosity; (h) cruelty; (i) availability of alternatives, and (j) desensitization of researchers and their coworkers. Scientists who are animal users regularly argue that great advances in medicine and human (and animal) health would not have occurred without animal experimentation.

Antivivisectionists regard this as a dubious counterfactual assertion, claiming in return, however, that most of the important breakthroughs (e.g., increased human longevity, control of infectious diseases) would have occurred, or even did occur, without animal experimentation. Along these lines it has been argued that, from a historical perspective, personal hygiene, improved nutrition, physical fitness, and public works sewage systems have done more to improve health and longevity than any other measures. It is also claimed that animal experimentation has in many cases retarded rather than advanced progress. For example, the lifesaving antibiotic penicillin showed negative results in lab animals, while thalidomide (a drug sold to pregnant women in a number of countries during the 1950s and 60s as an antiemetic and sedative) appeared safe based on initial animal testing. Some antivivisectionists acknowledge that medical science has benefited from animal research, but still put the case that the future need not resemble the past in terms of how health research is to be conducted.

In recent decades, much greater attention has been paid to the ethics of animal experimentation. Virtually every scientist using live animals for research today works under some sort of ethical regulation and scrutiny and within some legal framework, however loose. Codes of conduct take many forms, and compliance with whatever system is in place may be either mandatory or voluntary, and may be subject to scrutiny by ethics review panels comprising peers or peers plus nonspecialists (often including one or more members of the public). Activities taking place under the auspices of granting agencies, professional organizations, research institutions, and journals that report the results of research typically must conform to ethical standards assigned by these entities. At the same time, many professional philosophers and others have focused on the issues surrounding animals' moral status, with important implications for the ethics of animal research. Animal rights and animal liberation theories draw strict limits

as to what is morally permissible in this field, and not infrequently forbid animal experimentation altogether. Several radical action groups, a few of which practice guerrilla tactics (e.g., making clandestine raids on laboratories to free animals or photograph experimental procedures, picketing the homes of researchers, or even threatening their lives), have secured a prominent place in the public protest arena. These influences have in one way or another generated controversy, inspired some, and alienated others, with constructive debate and change sometimes resulting. A move among scientists toward increased accountability and openness can be discerned, but at the same time some have adopted a siege mentality in regard to defending their work and workplaces.

Two philosophical issues in the larger debate over experimenting on nonhumans concern cost-benefit analysis and what may be called the central ethical dilemma. Generally, attempts to justify animal experimentation from an ethical standpoint appeal to a cost-benefit analysis. That is, they weigh the costs to animals (in terms of harm, suffering, and death) against the benefits to humans of the research in question. In the ethics of research using live human subjects, however, two other conditions must be met: (a) subjects must give their voluntary, informed consent, and (b) costs and benefits must be calculated with reference to the individual subjects concerned or else, with their consent, at least with reference to other humans who may benefit. In point of fact (b) follows from the principle that it is never ethically acceptable (because of justice considerations) to make some worse off in order by that same act to make others better off, when no benefits compensate for the losses suffered by those who end up being disadvantaged. But in the domain of animal experimentation considerations, (a) and (b) are deemed inapplicable. Critics claim that this move is prejudicial to animals and may be challenged as inconsistent, ethically wrong, and in violation of ordinary feelings of compassion. The central ethical dilemma is that the more we learn from the biological and behavioral sciences, the greater the range of similarities we see between human and other animal species, and hence the greater is our motivation for continuing to do animal research in order to understand ourselves better, but by the same token closer perceived similarity creates a heightened sense of moral responsibility toward nonhumans. It is increasingly difficult to argue, on the one hand, that animals are very like us and, on the other, to deny that they should be treated very much as we would wish to be treated.

How ever these issues are to be sorted out by individuals and society, certain things remain clear. Knowledge is not an end in itself. If it were, horrible research in the name of science, carried out routinely on hapless animals or humans, could be ethically justified. Therefore the burden of moral responsibility and justification always lies with those who would experiment on animals (or humans).

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Michael Allen Fox

ARGUMENT FROM MARGINAL CASES

See Marginal Cases

ART, ANIMALS, AND ETHICS

In recent years, animals have increasingly become serious subject matter for artists, as evidenced by the number of exhibitions taking animals and/or human-animal relationships as the key curatorial theme (see sidebar). However, despite this growing popularity of the animal theme, currently relatively few artists present the animals themselves as specific individuals, and even fewer overtly address the ethics surrounding human-animal relationships and/or the use of animals in art, either in the artwork itself or in statements made about the artwork. Instead the majority of artists tend to use animals as metaphors or symbols for the human condition, or as generic signifiers for the natural world. As discussed by Steve Baker (2001) the way in which animals are represented is important because it affects the way we think about, and hence treat animals. Consequently, the use of animals in art to stand in for something or someone else is problematic because it can result in the animals becoming marginalized, which allows the artist to avoid addressing the broader ethical issues surrounding the way humans interact with animals. Artist and social activist Sue Coe is known to ". . . object strongly to the idea of using animals as symbols, because by using an animal or its (image) as a symbol of or for something else, that animal is effectively robbed of its identity, and its interests will thus almost inevitably be overlooked." (Baker, 2006, p. 78) This disregard for the animal's interest is of particular concern where animals have been caused to suffer or even be killed in the name of art.

In a 1976 performance work titled *Rat Piece,* American artist Kim Jones burned three rats alive, pouring lighter fluid on them as they ran around a cage screaming in pain and terror. Jones' performance was a response to his experiences during the Vietnam War when he and his fellow Marines were plagued by rats which they would capture, place in cages, and burn to death. It might seem reasonable to assume that Jones' *Rat Piece* was of its time and that causing animals to suffer this way in the name of art would not be seen as acceptable in the 21st century. However, in recent years a number of artists have produced art that has involved the death of an animal or animals, even if not always in such a prolonged and torturous manner as was the case with Jones' *Rat Piece*.

The death of animals for the sake of art can take several forms. British artist Damien Hirst is renowned for his works that preserve animals such as cows, pigs, sheep and sharks in tanks of formalde-

hyde, sometimes whole, at other times cut into pieces. While Hirst has no contact with the animals he uses until after he orders them to be delivered to him dead, Belgian artist Wim Delvoye has a more complex relationship with the pigs he uses as part of his Art Farm project. Delvoye began by working with the skins of dead pigs, but has since bought a farm in China specifically to house and raise the pigs for his artworks. The pigs are placed under a general anesthetic and are tattooed with various designs before eventually being slaughtered and skinned. The skins themselves become the final artwork, either pinned flat to walls or sometimes made into a three-dimensional form of the pig. Delvoye argues that his pigs are allowed to grow old (i.e., they are slaughtered later than they would have been for commercial production) and that the pigs benefit from being valued as artworks rather than just as meat (O'Reilly, 2004, p. 26).

In other cases, artists kill the animal(s) themselves, or are in some way directly involved with an animal's death, with the death at times being an integral part of the artwork. Austrian Actionist artist Hermann Nitsch is notorious for his *Orgien Mysterien Theater* (orgies-mysteries theatre) which he has been organizing since the late 1960s. These ritualized events often last several days and involve the slaughter of a number of animals such as sheep, goats, and cattle. The animals' entrails are at times trampled upon and the performance participants are covered in the animals' visceral remains.

More recent examples of animal death in the name of art include a work from 2000 by Marco Evaristti, titled *Helena,* which comprised 10 blenders, each containing a live goldfish. Visitors to the gallery had the option of turning the blenders on, and several people chose to kill the fish, resulting in the gallery director being charged with animal cruelty after a complaint was made by an animal protection organization. In 2003, an exhibition by Nathalia Edenmont was also the target of protests from animal rights groups. Edenmont's exhibition showed photographs of dead animals such as rabbits, cats and mice, often decapitated and wearing Elizabethan style decorative collars. What caused such a fuss was the fact that Edenmont killed the animals herself specifically for the artworks. In 2008, an exhibition by Adel Abdessemed was closed down just a week after it opened at a gallery in San Francisco, after intense lobbying by groups such as In Defense of Animals and People for the Ethical Treatment of Animals. The center of the controversy was a video loop showing six animals—a horse, a sheep, a deer, a cow, a pig, and a goat—being bludgeoned to death with a sledgehammer. While Abdessemed apparently did not kill the animals himself (he is said to have filmed the normal practice of killing animals on a farm in Mexico), the apparently gratuitous presentation of their violent deaths prompted controversy. While the aforementioned artists have all attracted the wrath of animal protection organizations and the general public alike, a work by Guillermo "Habacuc" Vargas, touched a particular nerve. In 2007, Vargas tied up a sick and emaciated street dog as part of a work titled *Exposición No.1* at a gallery in Nicaragua. Not long afterward a petition calling for a "Boycott to the presence of Guillermo Vargas 'Habacuc' at the Bienal Centroamericana Honduras 2008" began to be widely circulated via email, as Vargas apparently planned to remake the work for the Honduran Biennial. Photographs which accompanied many of the emails showed a starving dog, tied by a piece of rope to a wire across a corner of the gallery. On an adjacent wall the words

"Eres lo que lees" ("You are what you read") were spelled out in dry dog food. The international outrage was sparked by reports that Vargas had allowed the dog to die, refusing to give it food or water. While there is no dispute over the fact that Vargas tied up a severely emaciated dog in the gallery as part of his artwork, whether or not the dog died is difficult to substantiate, as the information available is contradictory.

The artworks discussed above inevitably engage with the ethics surrounding the use of animals in art due to the animals' suffering and/or death. Considering that our relationship with animals is currently so firmly intertwined with causing their deaths, either for food, as pests, for sport or simply because they are unwanted, it is perhaps not surprising that animal death and/or suffering for the sake of art is seen as valid by some artists. In those cases where the artwork has required the death of farm or other food animals, it can be argued that the animals were destined for slaughter anyway. Damien Hirst's preserved shark artwork *The Physical Impossibility of Death in the Mind of Someone Living* is particularly interesting in this respect, as not only was the tiger shark ordered to be caught and killed specifically for the artwork, but due to poor preservation techniques the original animal needed to be replaced with another tiger shark, again killed especially for this purpose. From an animal rights/welfare perspective, causing an animal to suffer or die in the name of art is always unjustifiable, regardless of the artist's intentions, and because of this all the aforementioned artists have attracted the attention of animal advocates. As Steve Baker points out,

> Contemporary art, along with literature and non-documentary film, is a field in which the killing of animals can undoubtedly figure as a subject, but where it is not necessarily clear how the field can usefully contribute either to knowledge of the other-than-human or more-than-human-world, or to what might broadly be called the cause of animal advocacy (Baker, 2006, p. 70).

However, Baker has also argued that artists' creative freedom in using animals should not be too heavily restricted, because in using animals this way artists can prompt debate over the ethical issues surrounding human-animal relationships (Baker & Gigliotti 2006, 2–3).

The use of animals in art is not only controversial because of violent acts against the animal. In the case of Eduardo Kac, the controversy is over the fact that he commissioned a scientific laboratory to produce a genetically altered rabbit for the project *GFP Bunny* (2000). The rabbit, which Kac named Alba, had a green fluorescent protein sourced from a jellyfish gene inserted into her genome so that she would glow under ultraviolet light. The genetic alteration of an animal in the name of art opens up a range of ethical questions and has been the subject of much debate. Kac himself has stated clearly that he had the utmost concern and sense of responsibility for Alba's welfare and wanted to care for her in his home (although ultimately the laboratory refused to relinquish her). However, as Baker has pointed out, the technology used to produce Alba is implicated in the deaths of huge numbers of laboratory animals (Baker 2003, 35–36).

There are some artists, however, whose artwork is strongly informed by an animal rights ideology and who use their work to engage the viewer with the

ethical issues surrounding human-animal relationships. Perhaps the best known of these is Sue Coe, whose politically charged paintings, drawings, and prints depict the suffering of animals for meat production as well as in laboratories. Coe has produced several illustrated books on these subjects, such as *Dead Meat* (1995) and *Sheep of Fools* (2005). American artist Mary Britton Clouse not only makes art about animals, but also founded a chicken rescue society and is a founding member of the Justice for Animals Art Guild, which has as its purpose "to oppose art that harms or exploits animals, and explore ways to support artists whose ethics and philosophies value the rights of animals" (Justice for Animals Art Guild http://www.brittonclouse.com/jaag.htm). British artist Britta Jaschinski makes photographs which are based on her concerns about the plight of zoo animals, while New Zealand artist Angela Singer makes work using recycled taxidermy such as trophy heads of deer to highlight the cruelty of hunting. Taxidermy animals are also used by a number of other artists, including Mark Dion, Jordan Baseman and Thomas Grünfeld. However, where Dion has a written a manifesto covering the responsible use of living plants and animals, other artists are not so forthright about what they feel their ethical responsibility is toward the taxidermy animals that are used in their art, prompting questions about how the animals are sourced and presented. The questioning of artists' intentions and ethical stance when they use animals in their work is important, because artists not only reflect how society regards animals, they can also help shape our ideas about animals and how we should treat them.

See also Museums and Representation of Animals

SELECTION OF RECENT EXHIBITIONS WITH AN ANIMAL THEME

- The Animal Gaze, various venues, London, 2008.
- Fierce or Friendly, Tasmanian Museum and Art Gallery, Hobart (Australia), 2007/2008.
- Fierce Friends: Artists and Animals 1750–1900, the Van Gogh Museum, Amsterdam and Carnegie Museum of Art in Pittsburgh, PA, 2006.
- Unsettled Boundaries, visual arts component of the 2006 Melbourne International Festival of the Arts, including the major exhibition, The Idea of the Animal, RMIT Gallery, Melbourne (Australia), 2006.
- Becoming Animal, the Massachusetts Museum of Contemporary Art, North Adams, MA, 2005.
- Animal Nature, Regina Gouger Miller Gallery, Carnegie Mellon University, Pittsburg, PA, 2005.
- Animals and Us: The Animal in Contemporary Art, Galerie St. Etienne, New York, NY, 2004.
- Animals, Haunch of Venison Gallery, London, 2004.
- The Human Zoo and A Painted Menagerie: the animal in art 1600–1930, Hatton Gallery, Newcastle University, 2003.

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Yvette Watt

ASSOCIATION OF VETERINARIANS FOR ANIMAL RIGHTS (AVAR)

The Association of Veterinarians for Animal Rights (AVAR) was founded in 1981 by Nedim C. Buyukmihci and Neil C. Wolff. The term rights, as opposed to welfare, was chosen for the title of the organization because it exemplified the different philosophy of this approach. Although veterinarians are already involved in animal welfare, this is clearly inadequate to protect nonhuman animals' interests.

In veterinary medicine, the standard of caring for nonhuman animals is usually based on what is deemed adequate veterinary care. Nonhuman animals are treated as the property of their owners. Although there usually is a sincere attempt to relieve suffering and improve the quality of life for these animals, there are no meaningful limits to what may be done with them. When one examines the issues without prejudice and with humility, there do not appear to be any morally relevant differences between humans and other animals that justify denying other animals similar rights, consideration, or respect, based upon their interests or upon whether what we propose to do matters to the individual.

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Nedim C. Buyukmihci

AUTONOMY OF ANIMALS

The original meaning of autonomy, as applied to ancient Greek city-states, is self-rule. More recently, the term has

been applied to individuals, actions, and desires. To answer the question "Are any animals autonomous beings who are capable of performing autonomous actions?" requires not only carefully studying animals, but also determining what sorts of actions qualify as autonomous.

Autonomous actions must at least be intentional actions. Every intentional action involves a desire and a belief that help to explain why the action was performed. Tom Regan argues that beings capable of intentional action are capable of one kind of autonomy, what he calls preference autonomy (preference being another word for desire). From this analysis, assuming that a dog can (1) desire a bone and (2) believe, as she trots into the backyard, that she can find a bone there, then the dog is capable of acting autonomously. However, one can be capable of acting autonomously but fail to do so for any of several reasons. For example, physical constraints such as locked doors can prevent a dog from going into the backyard. Force can prevent intentional actions from being autonomous. If you intentionally give money to someone, but only because he threatened you with a gun, your action is coerced, not free or autonomous. Moreover, sometimes we act intentionally, and even freely, but without sufficient understanding of what we are doing for our action to be autonomous. If a hospital patient intentionally and freely signs a form that states agreement to participate in psychiatric research, but the patient believes that the form simply entitles her to therapy following hospitalization, the patient has not autonomously agreed to participate in research.

Autonomous action clearly involves more than simply intentional action. One analysis, favored by Tom Beauchamp, is that actions are autonomous if they are performed (1) intentionally, (2) with understanding, and (3) without controlling influences (e.g., force) that determine the action. But certain other writers, such as Gerald Dworkin and David DeGrazia, would argue that these conditions are not sufficient for autonomous action. Apparently, based on the present analysis, a bird feeding her young would, under normal circumstances, count as acting autonomously (assuming that birds can act intentionally). Because autonomous beings are beings capable of acting autonomously, one's answer to the question "Are any animals autonomous beings?" will depend, in part, upon one's view of autonomous action. Those with relatively undemanding requirements are likely to conclude that many animals are autonomous. The view that anyone capable of intentional action is autonomous implies that all animals capable of having the appropriate sorts of desires and beliefs qualify. Which animals have such desires and beliefs is an extremely complex question, involving difficult conceptual issues in the philosophy of mind and various kinds of scientific evidence regarding animals. Tom Regan somewhat cautiously argues that normal mammals beyond the age of one year are capable of intentional action. David DeGrazia contends that most or all vertebrates and perhaps some invertebrates can act intentionally.

From a multitier perspective, animals are autonomous beings only if they can critically evaluate the preferences that move them to act and sometimes modify them on the basis of higher-order preferences and values. This is a high standard, requiring considerable capacity for abstraction and an advanced form of self-awareness. Perhaps such abstraction and self-awareness require language. There is a strong case that some apes

have achieved language comprehension and production, and that some dolphins have achieved language comprehension. The most suggestive evidence from the language studies of the possibility of animal autonomy may be evidence that apes apologized for such actions as biting a trainer and relieving themselves indoors. Typically, apologies express regret for one's actions, but one might also regret the motivations that moved one to act. At present it seems unclear, from the multitier view, (1) whether autonomy might be possible for those animals which lack language, and (2) whether any animals are, in fact, autonomous beings.

See also Consciousness, Animal

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David D. DeGrazia

B

BEAK TRIMMING

See Chickens

BESTIALITY

Until approximately the 16th century, the term bestiality referred either to a broad notion of earthy and often distasteful otherness or to sexual relations between humans and nonhuman animals.

The earliest and most influential condemnations of bestiality are the Mosaic commandments contained in Deuteronomy, Exodus, and Leviticus. Deuteronomy, for example, declared, "Cursed be he that lieth with any manner of beast" (27:21), and Exodus ruled that "whosoever lieth with a beast shall surely be put to death" (22:19). Besides mandating death for humans, Leviticus dictated that the offending animal must also be put to death—probably because, it was thought, the animal had been polluted by the Devil. It is hard to know the precise intentions of those who originally condemned bestiality, but in Judeo-Christianity, there have been three principal beliefs about the origins of its wrongfulness: (1) it is a rupture of the natural, God-given order of the universe; (2) it violates the procreative intent required of all sexual relations between Christians, and (3) it produces monstrous offspring that are the work of the Devil.

In some societies, such as in Puritan New England from the 1620s until the mid-19th century, bestiality was regarded with such alarm that even the very mention of it was condemned. It was therefore also referred to as "that unmentionable vice" or "a sin too fearful to be named" or "among Christians a crime not to be named." Nowadays, bestiality is variously described as "zoöphilia", "zoöerasty", "sodomy," and "buggery," and its meaning is almost always confined to human-animal sexual relations.

Since the end of World War II, especially, bestiality has been one among several categories of nonreproductive sexual practices toward which society in general has tended to exercise a growing tolerance. Indeed, in the last 50 or so years, those offenders whose sexual activities with animals have been reported to legal or medical authorities have faced considerably lesser charges than they had historically, such as breach of the peace or offending against public order. Instead of criminal prosecution, offenders have typically been sent either for counseling or for psychiatric treatment or, with probably greatest deterrent effect, they have been subject to public ridicule in their local communities.

In the past 10 years, however, there has been a great reversal of how bestiality has been viewed in the Unites States. In 27 or so states, bestiality has been recriminalized and defined as a form of cruelty.

Among these states there is considerable variation in the level of punishment that is attached to sexual relations with animals. In some states the maximum penalty is a fine and imprisonment of one year, and in others the maximum incarceration is five years.

Information about the incidence and prevalence of bestiality is quite unreliable, especially given its private nature and the social stigma attached to it. Bestiality can occur in a wide variety of social contexts. These include adolescent sexual experimentation, typically by young males in rural areas; eroticism (sometimes termed "zoöphilia," practiced by "zoos"), a rare event where animals are the preferred sexual partner of humans; aggravated cruelty, especially by young males or in cases of partner abuse; and commercial exploitation, as in pornographic films or in live shows of women copulating with animals in bars or sex clubs.

The prevalence of bestiality probably depends on such factors as the level of official and popular tolerance, opportunity, proximity to animals, and the availability of alternative sexual outlets. Some sexologists have claimed, with the use of interviews and questionnaires, that eight percent of the male population has some sexual experience with animals, but that a minimum of 40 to 50 percent of all young rural males experience some form of sexual contact with animals, as do 5.1 percent of American females. But because of the poor sampling techniques of such studies, these figures should be treated with great caution.

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Piers Beirne

BESTIALITY: HISTORY OF ATTITUDES

Bestiality refers first to people acting like animals, in a bestial way. However, its second meaning, sexual contact

SEXUAL ASSAULT OF ANIMALS

Historically, sexual relations involving humans and animals have tended to be condemned and investigated—or, in the interests of tolerance, ignored—exclusively from an anthropocentric perspective. Yet sexual relations with humans often cause animals to suffer great pain and even death, especially in the case of smaller creatures such as rabbits and hens.

Today, both the feminist movement and the animal rights movement have started to rethink the moral and ethical status of bestiality. Sexual relations between humans and nonhuman animals are beginning to be seen as wrong for the same reasons we see sexual assault by one human against another human as wrong—because it involves coercion, because it produces pain and suffering, and because it violates the rights of another being.

It is impossible to know whether animals can ever consent to sexual relations with humans, so it is best to treat all such cases as forced sex. Sexual relations involving humans and animals are therefore more appropriately termed animal sexual assault.

between humans and animals, is the most frequent current use of the word. Attitudes about bestiality have changed over time, and these attitudes are revealing of people's general perception of animals.

The early Christian medieval world inherited both texts and traditions that described human/animal intercourse. In the classical Greco/Roman texts, gods in the form of animals had intercourse with humans, and tales drawn from folklore also preserved anecdotes of such sexual contact. Pagan Germanic tradition also preserved tales of bestiality, whether between human and animal, or between humans one of whom took the shape of an animal.

The Christian tradition did not accept bestial intercourse, but there was a change over time in the perception of the severity of the sin. During the earliest prohibitions, bestiality was regarded as no more serious than masturbation. By the 13th century, however, Thomas Aquinas ranked bestiality as the worst of the sexual sins, and the law codes recommended harsh penalties for the practice.

There seem to be two primary reasons for this change. The first is that by the late Middle Ages churchmen became more concerned with the presence of demons interacting with humans. As part of this preoccupation, tales of bestiality increasingly referred to intercourse with demons, the succubi and incubi that seemed ubiquitous. The increased concern with bestial intercourse seems also to reflect a growing uncertainty about the separation of humans and animals. Preoccupation with and legislation against bestial intercourse expressed an attempt to secure the separation of species when it seemed endangered.

As church laws were taken over in the late Middle Ages by kings who wanted to exert more authority over their kingdoms, what had once been identified as sinful then became identified as illegal. It is in this form that laws against bestiality persisted into the modern world.

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Joyce E. Salisbury

BLESSING OF THE ANIMALS RITUALS

It is unclear when Blessing of the Animals rituals first occurred in the Christian tradition, though most likely they reflect a conflated Christian-pagan practice. Certainly as the roles of animals in human culture shift, so do the purposes of animal blessings. By the early 21st century, Blessing of Animals rituals in Western Christianity focused on domestic, companion species (dogs and cats in particular), whereas earlier blessings incorporated work and agricultural animals, such as mules, oxen, and horses. The earliest evidence is visual, including images of Saint Anthony Abbot (a fourth-century Christian holy man) blessing animals along with poor or afflicted humans. St. Anthony, whose feast day is on January 17th, is the patron saint of animals. Documentary evidence shows that this mid-January blessing ritual, in recognition of his feast day, occurred into the early 20th century in cities such as Rome. Reports indicate that humans brought a wide range of animals to the steps in front of Catholic churches throughout the city for the blessing. Written reports, along with images from as early as the 15th century, indicate a tradition of animal blessings connected to the saint. It is also possible that Catholic Rogation Days, which included a blessing of farm fields, also incorporated the blessing of farm animals.

In the 20th century, Blessing of Animal rituals became increasingly prevalent in Western Christianity, from the United States to Canada to Australia and, to a lesser extent, in Europe. These rituals follow a standard pattern. Often geared to attract families with children, they tend to have a human-focused impetus. They are usually held outside, in front of the church building or in a park close to the religious institution, though occasionally they are held in sanctuaries. Many of the large and influential Christian denominations developed these blessings: Roman Catholic, United Methodist, Presbyterian (USA), Disciples of Christ, and the Episcopal Church. However, they also tend, more than many other religious rituals, to be ecumenical or interfaith in nature—even secular in sponsorship at times.

As the position of pets shifts in Western cultures, so does the incorporation of these companion animals into the religious life of the humans who live with them. In other words, as pets become more central to the lives of some humans, these humans seek ways to incorporate their companion animals into all facets of their lives. Thus, Blessings of the Animals/Pets is growing rapidly.

While there is no standard ritual, it is helpful to discuss one in particular, since it might be the catalyst for the growth of these blessings. A large and influential Episcopal Church in New York City, the Cathedral of Saint John the Divine, holds arguably the largest and most impressive Blessing of Animals. It set the stage and provided the model for subsequent rituals. Beginning in the 1980s, the Cathedral

held an annual Blessing of Animals on the Sunday closest to the Feast of Saint Francis (October 4th). As of the beginning of the 21st century hundreds, if not thousands, of these blessings occur annually, mostly in connection with St. Francis's feast day.

The blessing at Saint John the Divine provides a helpful template for understanding the phenomenon. Officially the ritual is titled "The Holy Eucharist & Procession of Animals." Many years the sanctuary is filled to capacity, with over 3,000 humans and as many as 1,500 animals present. Congregants wait in line with their companion animals for hours in order to find a place in the sanctuary. After a formal Eucharistic service, including music and dancing, the central doors of the sanctuary are opened and the procession takes place. It should be noted that these doors are only opened three times each year: Christmas, Easter, and the Blessing of Animals. Myriad animals with differing cultural positions process: camels (exoticized), cattle (usually food in the United States), bees, fish, hedgehogs, and hawks, for examples. Following the Eucharistic liturgy, humans along with their companion animals move outside and are offered the opportunity for an individual blessing for each animal. The entire event takes several hours. In addition to the ritual, a fair is held. Representatives from various animal protection organizations, such as dog rescue groups and farm animal awareness services, come to share information.

Father Rand Frew, left, of St. John the Divine, and Vince Sharp, of the Turtle Back Zoo in West Orange, New Jersey, carry a boa constrictor outside the Cathedral of St. John the Divine during the Feast of St. Francis of Assisi in New York City. Individuals attending the ceremony were invited to bring their pets who were blessed following the service. (AP Photo/Jennifer Szymaszek)

Other Christian—ecumenical and interfaith—as well as secular Blessings take place throughout the year. For example, not-for-profit or municipal entities such as local animal shelters sometimes sponsor Blessings. Often a local clergyperson or group of interfaith leaders presides. Cats, dogs, guinea pigs, ferrets, parrots, turtles, hermit crabs, and snakes are among the ritual participants at these quasi-religious events. In addition to the blessings, many animals up for adoption are brought there, as groups try to find them good permanent homes. This connection to animal welfare issues is becoming increasingly important as part of the annual blessings.

It is difficult to determine the core purpose of the Blessings or to conclude with any certainty why they spread so rapidly in the late 20th and early 21st century. This phenomenon probably

accompanies the growth of the pet industry, the ownership of pets, and other companion animal-related issues of the same time period. However, it should be recognized that the rituals can be problematic, in particular for some of the animals. While ritual, spectacle, and performance are certainly connected, the spectacle and forced performance of companion animals is ethically questionable. It is possible that Blessings of Animals serve no purpose for the animals, but only provide humans with a circus-like atmosphere and a sense that they are expanding their ethical horizons or, of even less value for the lives of animals, these Blessings are simply a way to bring new humans into various religious communities.

Blessings of Animals also fit within the larger environmental or green movement within some forms of Christianity, so animals become symbolic of a commitment to God's creation or to the human stewardship component of creation stories. This is indeed a focus at the Cathedral of Saint John the Divine. In the ideal world—the world of the peaceable kingdom that is prophesied variously in Western religious traditions—other-than-human animals are often included. A number of animal welfare organizations, such as the Humane Society of the United States, suggest that a focus should be on animals in confined animal feeding operations. Public Blessings of these animals could draw awareness to this mass production system that relies on inhumane systems of confinement, among other issues.

However, it could also be argued that Blessing of the Animals rituals suggest a shifting attitude toward animals, specifically in the early 21st century. While they were excluded from sanctuaries for generations, now animals are being invited to return (once a year, anyway). They have sacred significance and are worthy of blessing. This is indeed an expansion of the religious sensibility that dominated the Western world in the post-Enlightenment era. Interpreting the cultural impact will take decades. In the meantime, the numbers and variety of Blessings continue to expand. As the roles of animals shift, so do the roles of Blessings, from those that acknowledge animals' usefulness to humanity to those that also recognize their role as humans' companions and, in some cases, to Blessings that recognize their own intrinsic value.

See also entries beginning with "Religion and Animals"

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Laura Hobgood-Oster

BLOOD SPORTS

Definitions

Blood sports are organized activities in which animals are placed at great risk of injury or death for human entertainment. Among the most common current blood sports are bullfighting, dogfighting, cockfighting, and non-subsistence hunting and fishing. Non-subsistence or sport hunting includes hunting with weapons (rifles, shotguns, bows, etc.) as well as with other animals, such as falcons or dogs. Bullfighting is an example of animal baiting, in which an animal is goaded into aggression through pain,

taunting, cornering, and so on. Dogfighting and cockfighting are typically not considered baiting because the animals are usually not goaded to fight at the time of the event, but rather are trained and bred to fight beforehand.

The animals subjected to blood sports routinely suffer terribly both during the events and during training for fights. Losing animals are often killed. In baiting and fighting, the wounds animals suffer are often intentionally grisly and painful. Fighting animals are chosen for the damage they can do to each other, and they are bred and trained to be relentlessly savage. When using weapons to hunt, sport hunters usually try not to inflict intentionally ghastly wounds on the animals they kill. In most communities, making prey suffer is frowned upon. However, the deaths of animals killed during coursing (using predators to hunt prey) can be more gruesome.

Sport Hunting

Hunting is one of the longest-standing ways in which humans interact with other animals. Much prehistoric art depicts commonly-hunted animals and sometimes even hunting scenes. Hunting in general has greatly affected animal populations and the environment. Hunters themselves have long been quite active on both sides of land and animal management programs: Avid hunters were among the pioneers of land management (and many are still among the most active), and yet poaching (and sometimes other forms of hunting) continues to push animals to extinction in many parts of the world.

Although humans and our ancestors have hunted since at least the Paleolithic era, hunting simply for entertainment probably established itself with the advent of domestication and agriculture. Early sport hunting was largely restricted to the upper class, who had the time and resources for it. These privileged classes typically approached a hunt as they would a battle, and hunting was probably regarded as practice for war. Destroying powerful animals made the royalty appear powerful to their subjects and probably even to themselves.

In medieval Europe and in the East, hunting became associated with land ownership. Although falcons, bows, spears and even swords continued to be used in hunts into the 1600s, hunting with dogs became the most common way to hunt. Coursing dogs were followed as they chased their prey. The hunters usually did not kill the animals themselves; instead they watched as their dogs tore the animal apart. Most types of coursing were illegalized in England in 2004.

As weapons became more effective, complex hunting codes were used to make sport hunting more difficult, in order to ensure that a wounded animal was killed. Nonetheless, the casual cruelty to animals that pervaded many aspects of human life affected sport hunting. Animals were sometimes herded into confined areas and shot wholesale.

Whereas subsistence hunters try to kill an animal as efficiently as possible, sport hunters may not. A sizable minority of sport hunters in the United States, for example, prefer the challenge of hunting with bows or black powder rifles instead of more effective, modern weapons. Sometimes sport hunters use modern weapons, but in ways that make clean kills difficult, forcing wounded animals to die slowly. Bison, for example, were shot en masse from moving trains; in Alaska wolves are currently shot from airplanes.

Historically, hunting, both for food and for entertainment, has taken a heavy toll on animals. Hunting in general led to the extinction of dodos and passenger pigeons. It is also commonly believed that hunting strongly contributed to the extinctions of mammoths, mastodons, Caribbean monk seals, *baiji* (river dolphin), aurochs, steppe bison, Steller's sea cows, giant kangaroos, giant antelopes, great auks, moas, Carolina parakeets, etc. Hunting in general is also helping to push a great many more animals to the brink of extinction: tigers, whales, European minks, Asiatic rhinoceroses, dugongs, some seals, and many fish, to name a few.

At least as early as medieval Europe, animals were imported into areas depleted by hunting and land loss. Later, as animal populations continued to decline overall, hunters contributed to conservation efforts. Indeed, concerned that both their sport and natural treasures were at risk, some sport hunters were among the creators and strongest proponents of land and animal management programs. India created a reserve in 1861. Various African and North American nations began programs shortly thereafter; other countries have since followed this lead. An increasing number of countries regulate both where and what animals can be hunted as well as how the animals can be killed. Although poaching remains a very serious problem in many areas, sport hunters in many regions voluntarily abide by hunting rules.

Animal Fighting

Around the world, many types of animals are forced to fight. Dogs, roosters, horses, kangaroos, camels, beta fish, and various types of insects are some of the current participants. Animal fighting is strongly ingrained in some cultures, often despite laws to protect both people and animals.

It is believed that cockfighting was first practiced in Southeast Asia thousands of years ago. It spread westward via Persia, Greece, and Rome. It also may have begun on its own elsewhere. Roosters are made to fight until one of them is too severely mauled to continue fighting; the loser often dies. Fighting roosters may have their wattles docked (cut off) to prevent them from ripping and bleeding during fights. Sometimes the birds' spurs are covered with longer spikes or blades to make the fight bloodier and quicker. Naked-heel fights conducted without spurs can last for hours—too long for the attention span of most of those who watch this sort of event.

Dogs were commonly used in war by 700 BCE. They may have been forced to fight each other as early as this as well. Indeed, dogfighting was common in Roman Europe, if not elsewhere.

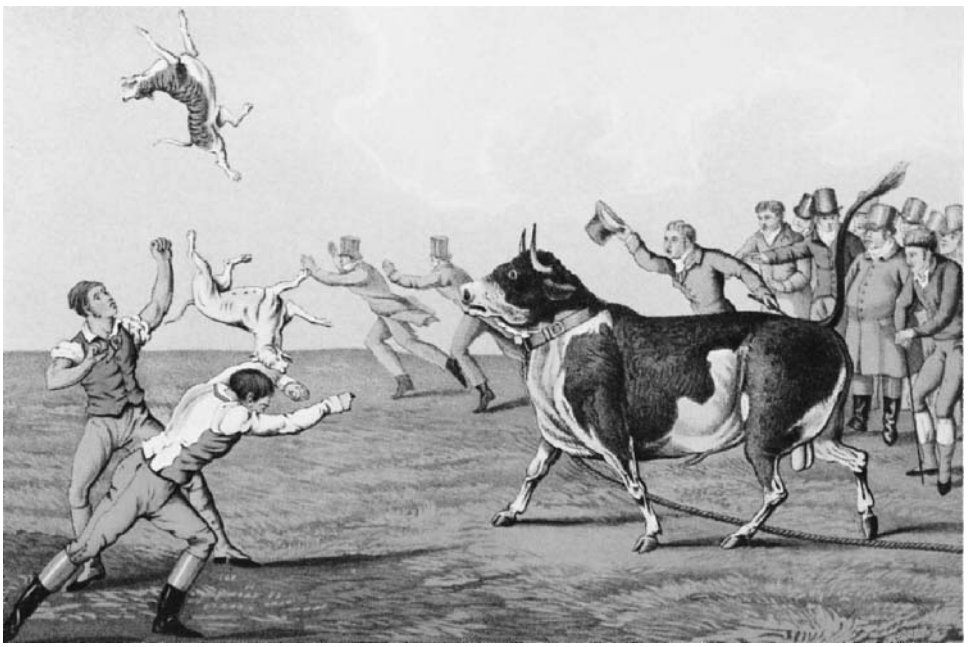
The Romans were not alone in pitting various animals against each other. Dogfighting was practiced in Japan by the Kamakura period (1185–1333 CE). It was promoted among the samurai, many of whom felt dogfighting kept their own ferocity sharp during times of peace. Infamously, the *daimyo* of the Tosa province (present-day Kochi) and Akita prefecture were strong proponents of dogfighting; the fighting dogs bred in these areas are now well known.

The first documentation of cricket fighting comes from China's Song Dynasty (1213–1275 CE). Cricket fighting in China became much less popular after the Communist revolution because of its association with the bourgeoisie. It is illegal in Hong Kong and the Macao Province, but its popularity is unfortunately

increasing in other parts of China, as well as in other countries.

Bearbaiting was popular in Tudor England; Henry VII constructed a large bear garden at Whitehall. Elizabeth I was especially fond of bearbaiting; she was said to giggle like a schoolgirl at the suffering of the animals. Her interest in baiting helped increase its popularity. The fighting pits of her reign also began to stage the brutal deaths of a wider range of animals. Bulls, boars, rats, badgers, and even more exotic animals all died in the pits. To turn the animals into the nasty beasts needed for an entertaining spectacle, they were subject to all sorts of abuse and cruelty. There are reports of bears being whipped, beaten, stoned, starved, and forced to sleep on beds of thorns. Before a fight, bulls might have their noses stuffed with cayenne pepper.

Various groups attempted to outlaw baiting, but it was not until the social revolutions of the Victorian era that efforts to ban animal cruelty and many blood sports started to succeed. An especially grand milestone was the Cruelty to Animals Act of 1835 in England. Strongly lobbied for by the Society for the Prevention of Cruelty to Animals (the first humane organization, now called the Royal Society for the Prevention of Cruelty to Animals), this act amended a previous act (the 1822 Act to Prevent Cruel and Improper Treatment of Cattle). It illegalized cruelty—including fighting and baiting—toward bulls, bears, dogs, and sheep. The ban spread to England's possessions around the world. In 1836, Massachusetts was the first state to ban cockfighting; Louisiana was the last, not banning it until 2008. The American Society for the Prevention



Engraving of a Henry Alken painting depicting a tethered bull being baited with dogs and sticks, ca. 1810. Such cruel blood sports as bull- and bearbaiting were popular in Europe for centuries but were banned in most countries by the 19th or 20th centuries. (Getty Images)

of Cruelty to Animals advanced the protection of animals (including from blood sports) with the passage of an anticruelty law in 1866.

After the Humane Act of 1835, English owners of bullbaiting dogs—bulldogs—focused more on fights between dogs than on fights with bulls. Bulldogs were originally bred to help farmers herd and manage bulls, not kill them. The heavy build and strength that was useful against bulls was not such an asset against other dogs, so it is believed that the bulldogs' owners began crossing them with the swift and equally tenacious terriers, creating bull terriers. Staffordshire bull terriers, pit bull terriers, and American Staffordshire terriers all trace their lineages to these putative bulldog-terrier mixes.

Various forms of animal fighting are still legal in parts of the world. Dogfighting, for example, is still legal in Russian and Japan. Even where it is illegal, it can be popular. Dogfighting and cockfighting are arguably the predominant blood sports today, next to hunting. Cockfighting is popular in parts of the United States, Latin America, Africa, Southeast Asia, the Philippines, Indonesia, and the Near East. The adoption of game-bred dogs by the American pop culture has surely exacerbated its spread (while also letting others learn how loving these animals can be). Dogfighting is no longer a poor, rural problem. The conviction of pro football quarterback Michael Vick in 2007 attests to how far this crime has spread into small towns, cities, and even suburbs.

When the culture and authorities allow, fighting events in many places take on the appearance of a fair, with whole families—young children included—watching. At these events, traditional and professional dogfights and cockfights follow strict rules. These rules do not protect the animals; they simply ensure fair fights. Matches are regulated, and animals are highly trained. There are variations in the ways fights are managed. According to Cajun rules, dogfights are held in pits that are 15 to 20 feet square with 2- to 3-foot walls. Diagonal scratch lines are made in opposite corners 12 feet apart. Before a match, the dogs are weighed and washed. Washing prevents owners from covering their dogs with poison or substances that could make it harder for the other dog to maintain a hold. At the start of a match, the dogs are placed facing each other behind the scratch lines. The referee commands the players to release their dogs. The matches are hauntingly quiet, as the dogs grab and relentlessly rip open each other's mouths, faces, throats, and legs. If a dog moves so that his head and shoulders are not facing his opponent, a turn is called and the dogs are separated and repositioned behind the scratch lines. The dog that turned is held by his owner. The other dog is released and allowed to attack the held dog. If the released dog attacks the held dog, the held dog is released and the match continues. If the released dog does not attack the held dog, the match is over. The match is also over any time a dog stops fighting, dies, jumps out of the ring, or is pulled out by the owner. Losing dogs are often severely beaten, drowned, electrocuted, or hanged to death.

In contrast to regulated dogfights are the casual fights that occur on streets, and in parks and neighborhoods. Whereas traditional matches are organized in advance, fights can now happen between strangers with a simple "Wanna fight your dog?" These dogs are usually not well trained. They may simply be forced to be more

aggressive—toward other dogs, other animals, and people. Because they are less structured, these fights are more chaotic and dangerous to bystanders.

Owners of fighting animals gain prestige among their peers because they are associated with a terrible animal, and are more or less able to control it. It comes as no surprise that people for whom all other avenues of empowerment have been cut off may turn to building their image with a powerful dog who loyally obeys its owner to the brutal end.

Gambling has long been strongly associated with many blood sports, and dog and cockfighting are no exceptions. In addition, when raids and seizures are made of dog or cockfighting rings, authorities very often find illegal weapons as well as drugs. There is also reason to believe that animal fighting is run by organized crime in some areas.

Breeding

Like the wolves from which they evolved, dogs do not naturally fight each other to the death. Normally, dogs will only posture and feint, but not resort to actual fighting. When fights do occur, they are swift and very rarely lethal. This tendency to break off an attack when they see submission cues has been bred out of game-bred dogs. Throughout history, different types of dogs have been forced to fight; one era's fighting dog is another era's loving companion. In addition, fighting dogs are bred not only for gameness: As any owner of a pit bull will attest, these dogs are very loyal. Lineage is important to committed dogfighters. As much money as owners can make gambling, they can make more by breeding their dogs.

Training and Conditioning

Breeding is important to prepare a dog to fight, but it is not enough. In order to fight, dogs must be trained to do so. A fighting dog's training usually starts at a very young age. Separating young pups from their mother and littermates can make them more violent toward other dogs when they grow up. Every opportunity is taken to enhance the aggressiveness and tenacity of these dogs. To build their endurance, dogs are made to run on treadmills or chase a small bait animal that is kept just out of their reach. Bait animals can be squirrels, rabbits, or even stolen pet dogs and cats (as was found in 2004 to have been happening for years in parts of Arizona). After a training session, the dog is usually allowed to rip apart the live bait animal both as a reward and a way to develop the dog's taste for blood. So-called trainers increase a dog's strength by having him wear heavy chains or weights for long periods. The dogs are also made to jump up and hang from ropes by their mouths to develop their lunge and bite. Throughout all of the training, the dog's tolerance for pain is pushed to the limit; it is not so much the stronger dog who wins, but the one who can withstand more pain and damage.

Roosters are trained much as dogs are. They run on treadmills to develop their stamina. They may wear gloves on their feet or have their spurs covered to let them practice fighting without undue injury. They are also set to taunt other roosters to increase their aggressiveness.

The Future

Laws banning blood sports can help save countless animals from horrendous

deaths—when they are enforced. Much progress has been made to prevent these horrific events, but the problem is still extensive. The Humane Society of the United States estimates that there are at least 40,000 professional dogfighters in the United States—a country in which dogfighting is illegal. Law enforcement officers and governments do not always see the importance of these crimes or their association with other crimes. Grassroots advocacy to enforce these laws and pass new ones can only help.

Many of those who turn to animal fighting seem to do so because they have few other ways to create an impressive self-image. In addition to offering economic and educational assistance, communities are finding nonviolent ways for dogs to strut their stuff. Owners can gain satisfaction and pride when their dog's strength wins at a weight pull instead of a deadly fight.

See also Bullfighting; Cockfighting; Dogfighting; Hunting, History of Ideas

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William Ellery Samuels, Lieve Meers, Debbie Coultis, and Simona Normando

BULLFIGHTING

Bullfighting, or *corridas* in Spanish, is considered a form of art and of cultural heritage by its supporters and a severe form of animal cruelty by a growing number of people all over the world. This has led to passionate debates. A popular motto among the participants in anti-bullfighting demonstrations is "Torture, neither art not culture," expressing their conviction that intentionally inflicting pain on an animal for the purpose of entertainment can never be acknowledged as art. They argue that art and culture should imply the promotion of knowledge and excellence in order to enrich us to become wiser, more humane, and compassionate. Neither art nor entertainment should be based on abusing or making fun of the weaker—either humans or animals. Circuses used to exhibit people with deformities or peculiar physical features. Not long ago, there was a type of *corridas* designed for children (*charlotadas*), in which dwarves dressed as clowns or in other funny costumes, hit and jumped over the bull. Some have pointed out that if the same actions performed in bullfighting were done on a domestic animal, it would be considered a felony according to the Spanish Penal Code (Art. 337). The official statistics compiled by the Spanish Government reveal that in 2007 (*Estadisticas Taurinas* 2007) there were 2,622 bullfighting events that used 12,167 animals. A related controversial issue, which has become the target of a tax resistance campaign, is that, according to the advocacy group, Platform Stop Our Shame (SOS), bullfighting is subsidized with more than 560 million Euros of public money annually (*Fundación Altarriba "Dinero público."*). Platform SOS is asking for that money to be in-

vested in social aid, education, or public health instead.

Types of Corridas

Bullfighting exists in various forms in several countries all over the world: Spain, Portugal, France, México, Colombia, Venezuela, Perú, Guatemala and, more recently, the United States. Although there are three main styles (Spanish, Portuguese and French), all of them, even the ones that are called bloodless, are based on exhausting and injuring the bull by using spikes, spears, swords, and daggers to cause immense pain (*I Jornada sobre ganado de lidia*, 1999) and blood loss in order to weaken the bull.

In the Spanish style, the *corrida* is divided into three parts called *tercios* (thirds). In the first part, the bull (already stressed by the transport) enters the ring while bullfighters (*toreros*) wave capes (*capotes*) to try to make the bull charge, and then the *picador* (a horse rider) sticks a *pic* (lance) into his back. The great pain, blood loss and stress inflicted on the animal makes him lower his head, which exposes the neck to the *banderilleros,* who will plant *banderillas* (barbed sticks with harpoon-like ends) on the withers of the bull. They finally run the bull in circles until it is dizzy and stops chasing. In the third part (called quite eloquently "the third of death"), the matador plays with the bull holding the *muleta* (a red cape) and a sword in order to dominate and exhaust him. It is then, when the tortured and completely worn out animal stands with his feet together and his head low that the matador thrusts his sword between the shoulders trying to reach the heart. The bull does not always die immediately, so a dagger is driven into the base of the skull to paralyze him (*descabello*). But sometimes this measure does not work, and the bull remains fully conscious while his ears and tail are cut off as trophies.

Another Spanish style is called *Rejoneo*, in which the bullfighter inflicts the same tortures on the bull, but does so riding a blindfolded horse. Even though the horse has been trained to avoid the bull and it wears padding (a measure taken because the sight of injured horses with their intestines hanging out was too unpleasant for the audience), every year horses are severely injured and eventually die due to the injuries inflicted by the horns of the bull (Vicent, 2001).

The Portuguese style (*corrida de touros* or *tourada*) includes three types: The *Cavaleiro,* where a horse-rider dressed in traditional 18th-century costume tries to stab three or four *bandarilhas* (like the Spanish *banderillas*) into the back of the bull. The second type is called the *Bandarilheiros*—similar to the Spanish *matadores,* who simply play with the bull with a red cape. Finally, there is the *Forcados,* a group of eight men who provoke the bull without any protection or weapon. The front man tries to grab the bull's head, aided by the others, in order to achieve the *pega de touros* (bull catch). The Portuguese style is often viewed as cruelty-free because the bull is not normally killed in front of the audience, but the killing takes place out of the sight of the public. Nevertheless, even though the bull is not killed, the stress that he undergoes in order for the audience to have fun should be taken into account.

The French styles include the *Course Camarguaise* (in the *Camargue* region of Provence) and the *Course Landese* (in the region of Landes, on the French South-Atlantic coast). In the *Course Camarguaise*, the first part consists of a

running of the bulls (*encierro*) and the second part, the course itself, takes place in a portable arena in which the participants (*raseteurs*) snatch rosettes or tassels off the bulls. Once the course is over, the bulls are herded back to their pen. The *Course Landese* is a competition between teams (*cuadrillas*) using cows instead of bulls. Cows have a rope attached to their horns controlled by one man (*Teneur de corde*) while the *entraîneur* positions the cow to face and attack the player. The *écarteurs* will try to dodge around the cow, holding their ground until the last moment, and the *sauteur* will leap over it. The cow is not killed but, again, is being abused, exhausted, and stressed by a hostile environment. Not all bullfighting in France is French-style; the Spanish style is becoming more and more popular, with bulls often killed in public.

Other Bloodsports

Bulls are not only abused in bull rings but also in other *fiestas,* where they are harassed by the public, stressing them and often leading to a painful death. Among the myriad of blood *fiestas* there are some that stand out for their cruelty.

***Toro de la Vega* (Bull of La Vega)** This tournament takes place in Tordesillas, in

An assistant bullfighter stabs a dying bull to death during a Novillero bullfight at the San Isidro festival at the Las Ventas bullring in Madrid, Spain. (AP Photo/Paul White)

Castilla León (Spain) every September, in honor of the Virgin of the Peña. A bull is harassed with spears by the villagers and forced to cross a bridge where they start hurling lances at him. The bull suffers from severe injuries caused by the lances, a terrible agony that can last up to some hours, ending when the eventual winner of the tournament throws the fatal blow. The winner has the right to cut off the bull's testicles and exhibit them at the end of the lance. The intrinsic cruelty of the tournament and the fact that the government acknowledges it as an event of national tourist interest have placed it in the center of anti-bullfighting campaigns. In past years, activists travel every September to ask for mercy for the bulls of *Tordesillas,* where they are confronted by the villagers.

Bull of Coria This event takes place in Coria, Cáceres (Spain) on the 23rd of June to honor Saint John and, together with the Bull of La Vega, represents those considered the most violent of the thousands of blood fiestas all over Spain. The bull is released from the barnyard and the villagers run him to the bull ring. Once in the arena, he is attacked by the public with darts from blowpipes. Spectators try to hit him in the eyes and testicles for several hours until he is finally shot (Fundación Altarriba, http://www.altarriba.org/2/verguenza/caceres-coria-english.htm. FAACE Web site, 2008; Bull of Coria, http://www.faace.co.uk/Coria.htm).

***Bous embolat* or "Fire Bulls"** *Bous embolats* take place in the Comunidad Valenciana region of central and southeastern Spain (including the provinces of Alicante, Valencia, and Castellón) and in the *Terres de l'Ebre* region, though these events are forbidden in many other regions. In this fiesta, several teams compete to see which is the fastest to place and light two balls of fire on the tips of the horns of a restrained bull. Once the balls are lit, the bull is let loose and the public harass it. The bull inevitably suffers, due to the fear of the fire and the burns caused, especially in the eyes. At times, the bull has died from being burned alive.

Attitude Changes to Bullfighting

In recent years there has been a remarkable change in Spanish attitudes toward bullfighting. According to a 2006 Gallup poll, 72 percent of Spaniards have no interest in bullfighting (*Investiga,* 2006: "Interest in Bull Fights") and only eight percent of Spaniards consider themselves supporters. In 1989, a campaign to declare cities as opposed to bullfighting started in Catalonia, and so far 47 cities have joined, achieving a major success in 2004 when Barcelona took a crucial step by agreeing to become an anti-bullfight city.

In Catalonia, animal-protection law prohibits the construction of new bull rings and, in fact, at the time that this essay is being written, it is in the spotlight due to a campaign to officially ask the Catalan Parliament to debate the ban on bullfighting. Additionally, the growing rejection of the mistreatment of animals has even reached the Spanish Parliament, where a group of MPs has created the Parliamentary Association for the Defense of Animals, lobbying against bullfighting and also supporting the ban on cat and dog fur, as well as the ban on seal-derived products within the EU. More evidence that winds of change are blowing comes from the city of Paterna in the province of Valencia, where the

continuation of festivals featuring bulls was rejected in a historic public ballot in a region that was formerly especially fond of bull festivals.

The use of animals in feasts, either as a questionable pastime or as a symbolic combat between the supposed rational and the beast, is definitely facing the beginning of the end; a growing number of people demand a more compassionate society in which animals are no longer the victim or entertainment to alleviate humankind's miseries. Those who support the banning of bullfighting believe that until the bulls graze peacefully in the meadows far away from the suffering that they have undergone over the years, Spain cannot be called a civilized country.

Web Sites with Bullfighting Information

The following Web sites advocate against bullfighting:

Animanaturalis: www.animanaturalis.org

FAACE, Bull of Coria. http://www.faace.co.uk/Coria.htm

Fundación Altarriba, Shame on Coria. http://www.altarriba.org/2/verguenza/caceres-coria-english.htm

Fundación Altarriba, The bull of La Vega.http://www.altarriba.org/2/verguenza/valladolid-tordesillas-english.htm

Investiga, Interest in Bull Fights (*Interes en las corridas del toros*). http://www.ig-investiga.es/encu/toros06/intro.asp

League Against Cruel Sports: http://www.league.org.uk

STOP OUR SHAME: www.stopourshame.com

WSPA: http://www.wspa-international.org

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C

CAGING

See Chickens

CAPTIVE BREEDING ETHICS

Most of our planet suffers from some amount of environmental degradation, and trends suggest that the situation will worsen before it improves, if it improves at all. Consequently, conservationists increasingly focus on restoration efforts, and restoration ecology is a rapidly growing field. Reintroducing animals from captivity into areas where they no longer persist represents one tool in the restorationists' toolkit. This entry focuses on reintroduction, rather than on releasing animals to augment existing populations (restocking) or introductions of animals to areas outside their historical range. The latter two are generally inadvisable, although they can be useful under special circumstances. Reintroduction involves difficult ethical questions that many scientists have raised. These are examined here.

At one time, zoos and aquariums argued that breeding animals in captivity for eventual reintroduction to the wild would grow to become the defining rationale for their continued social relevance and future existence (Reading & Miller, 2001). Today, however, zoos and aquariums recognize that, while important, captive breeding for reintroduction represents a relatively insignificant part of what they do (Reading & Miller, 2001; Hutchins et al., 2003). Snyder and colleagues (1996) caution against relying too heavily on captive breeding and reintroduction for conservation, and instead suggest that conservationists should employ this tool only when other options are unavailable. Still, zoos, aquariums, government wildlife agencies, and other groups likely will increase the amount of captive breeding they undertake as a part of restoration programs. With this increase in captive propagation for reintroduction, it is important to consider the ethical concerns of this approach to conservation.

The ethics of even engaging in captive propagation for reintroduction at all should be considered. Frederic Wagner (1995) asks "Just because we can breed animals in captivity for reintroduction, does that mean we should?" Is reintroduction just a human endeavor to "redecorate nature," as Marc Bekoff (2000, 2006) suggests? Alternatively, Robert Loftin (1995) asks if we have a moral obligation to prevent human-caused extinction; and, if so, is captive breeding and reintroduction justified? After all, humans have already "redecorated nature" extensively through global and local species extinctions and introductions. Do we have any responsibility

to try to prevent extinction and restore nature, at least to some degree, even if doing so in some way mentally or physically "harms" individual animals?

The larger ethical consideration of whether or not to engage in captive breeding for reintroduction often relates to broader worldviews and core (or more strongly held, central) values. In this situation, the main ethical consideration is how we balance the welfare and rights of individual animals against the value of captive breeding to reintroduction programs and our obligations to sustain populations, species, and ecological communities and processes (Norton, 1995). Michael Hutchins and colleagues (2003, p. 964) describe this as " . . . issues of individual animal welfare versus overall species and ecosystem conservation." This is an important consideration, because sometimes actions designed to benefit populations will conflict with the interests of individual animals held in captivity (Wuichet & Norton, 1995).

Tom Regan (1995) suggests that there are three basic worldviews with respect to holding animals in captivity (in particular, he was discussing zoos, not breeding facilities for reintroduction *per se*). These are utilitarianism, animal rights, and environmental holism. Briefly, the utilitarian doctrine, as championed by Peter Singer (1980), argues that we should afford rights to sentient species—those able to experience suffering and pleasure—or we risk engaging in what he calls speciesism (favoring some species, most notably human, over other species). Singer argues that we should engage in actions that result in the greatest good for all sentient organisms. Thus, we must take into account all the costs and benefits of our actions. Tom Regan (1983) argues from a strong animal rights stance which values the individual rights of all animals. He suggests that we should minimize depriving individuals (of all sentient species) of their basic rights. Is subjecting animals to our wants nothing more than environmental fascism (Regan, 1983)? Finally, environmental holism grew out of Aldo Leopold's essay "Land Ethic," which argues that, "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise" (1968L, pp. 224–225). Thus, followers of this worldview believe that the interests of the entire biotic community trump the rights of the individual. Conservationists, for example, often argue from this perspective to justify holding animals in captivity for "the good of the species" (c.f. Hutchins et al., 2003).

What do these different worldviews suggest with respect to captive propagation for reintroduction? Regan (1983) argues that any type of captivity or manipulation of a sentient animal represents a form of "environmental fascism." Are other animals sufficiently different from humans to warrant different treatment? ask Joy Mench and Michael Kreger (1996). As we learn more about other animals, we find fewer distinctions, yet no one, not even Peter Singer or Tom Regan, suggests that we should treat all animals equally. So should different species be afforded different rights? What about species that are not sentient or feel no pain (Bostock, 1993)? One of the great difficulties in evaluating different ethical stances is our ability to assess the impacts of captivity on individuals of other species. Would an individual animal trade greater freedom for the greater security and amenities (such as adequate food, water, and shelter) of captivity? Many humans agree to these tradeoffs, albeit

usually on a different scale (consider the post 9/11 societal changes in the United States and other countries, and the fact that many poor people in former Marxist countries look back with nostalgia at a time when the state ensured their basic needs).

It is important to note that most reintroductions fail, and that other approaches to conservation usually hold greater promise (Griffith et al., 1989; Beck, 1995; Reading & Miller, 2001). In addition, just because we can (or do) breed a species in captivity and reintroduce it does not necessarily mean we should. How do we reconcile the low rates of reintroduction success with issues of animal welfare and rights? Is it humane to reintroduce animals given the fact that most of the animals released will die? Dale Jamieson (1995a) argues that since captive breeding and reintroduction play only a marginal role in conservation, we should instead focus our limited resources on protecting habitat.

If we agree on the importance of captive breeding for reintroduction, additional ethical considerations arise. Is a commitment to the ethical treatment of animals in captivity sufficient if those animals contribute to ecological restoration via reintroduction? Joy Mench and Michael Kreger (1996) argue that most people are concerned that animals be spared pain and suffering to the greatest extent possible, that they have a good quality of life, and are not used for "trivial" purposes. But is simply addressing the concerns that "most people" have sufficient? Michael Hutchins and colleagues (2003) ask, "How far do we need to go in addressing the welfare of animals held in captivity, short of fully replicating nature?" Defining an animal's physical and especially psychological well-being is a very difficult task. Since we can never fully understand other species, John Wuichet and Bryan Norton (1995) suggest that we necessarily fall back on anthropomorphically biased opinions about what the well-being of an individual animal really means.

Wuichet and Norton (1995) believe that our treatment of animals in captivity should strive to achieve a level of physical and psychological well-being comparable to or better than that of life in the wild. In other words, the captive environment should be as authentic as possible. Do we have a moral obligation to maximize survival prospects for individual animals no matter the cost, as Loftin (1995) states? The reality is that resource constraints will always enter into the equation, precluding most, if not all, programs from going as far as they would like in attempting to replace nature on a smaller scale (Snyder et al., 1996). So how far should or must we go?

Research on successful reintroduction suggests that increasing the "naturalness" of a captive environment would also maximize reintroduction success rates. Indeed, reintroductions that use animals from other wild populations (i.e., translocations) usually succeed far better than programs that use animals bred in captivity. Using captive-bred animals for reintroduction requires addressing a host of biological considerations that, in turn, have ethical implications. These include maintaining genetic diversity (and therefore aggressively managing who mates with whom), acclimatizing animals to their release environments, and providing environmental stimuli for adequate development of the full array of important behavioral skills, as well as avoiding habituation to humans (Snyder et al., 1996; Miller et al., 1999; Reading

et al., 2004). But, are captive environments that expose animals to predation and other survival risks morally justified even if they increase the survival of released animals (Beck, 1995)? This brings up the tricky question of how we balance issues of animal welfare with the welfare of species and considerations of different techniques (Wagner, 1995).

The ethical considerations of breeding animals in captivity for eventual reintroduction to the wild are complex. Divergent worldviews argue from different ethical standpoints as to whether or not such activities should even occur. Many people espousing strong animal rights and animal welfare ethics suggest that captive breeding and reintroduction are always morally wrong. Others, arguing from an environmental holism or land ethics perspective, embrace a strong ethical obligation to restore populations extirpated by people, and therefore believe that the interests of the entire biotic community trump the rights of individuals. Yet even those who support using captive breeding and reintroduction in general must judge whether or not such an approach is appropriate, given the circumstances surrounding each individual case. To the extent that captive breeding programs do exist, difficult ethical questions still remain with respect to how far we must go in replicating nature in the captive environment, as well as our obligations to individuals held in captivity and those destined for release back into the wild. Most people agree that we should go as far as resources allow in providing the most realistic captive environment possible. Such an approach would also increase reintroduction success rates. We will likely never fully resolve the difficult ethical questions surrounding captive breeding and reintroduction on our increasingly altered planet.

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Richard P. Reading and Brian J. Miller

CATS

The domestic cat is the most popular companion animal in the United States today, with more than 80 million living in American households. With regard to the welfare of cats in our society, there are three issues of primary concern: the use of cats in biomedical research, the problem of unowned, free-roaming cats, and the high euthanasia rate of cats in animal shelters.

In 1881, British zoologist St. George Mivart published a textbook called *The Cat: An Introduction to the Study of Backboned Animals, Especially Mammals* in which he described the cat as "a convenient and readily accessible object for reference" in studying mammals, including humans. Since the publication of Mivart's book, cats have been used in research primarily to learn about the specific functions of nerve cells and about how the brain processes visual information. Research with cats has contributed to advances in treating various disorders of the eye, including "lazy eye," glaucoma, and cataracts, as well as recovery from damage to the brain and spinal cord from injuries and strokes. Cats also have been used to study particular medical problems they have in common with humans, such as hearing disorders, diabetes, and acquired immune deficiency syndrome (AIDS).

Domestic felines come in many shapes and sizes, including the nearly hairless Sphynx. They are used in a variety of laboratory experiments. (Photos.com)

Research in these areas is contributing to both feline and human health.

Compared to other nonhuman animals, the numbers of cats used for biomedical research is small and continues to decline. In 1995, fewer than 30,000 cats were used for research purposes in the United States, representing only two percent of all research animals used that year, excluding rats and mice. At present, cats reportedly comprise less than one percent of all animals used in research. Furthermore, the institutions conducting research with cats in the United States, Great Britain, and many other countries must comply with strict regulations for animal care and use specified by their respective animal welfare laws.

An issue of even greater concern is the ongoing problem of cat overpopulation, particularly the problem of free-roaming, unowned, feral cats. Although the number of such cats is difficult to determine, estimates of their numbers is as high as 70 million across the United States. Several factors may account for the existence of so many homeless cats. First, many people believe that cats can survive easily on their own and choose to abandon their pets when it is inconvenient to keep them. Also, pet cats with access to the outdoors sometimes stray

from home. Those who are not identified with a tag, microchip, or tattoo and do not return home on their own may become permanently lost. In addition, unneutered pet cats allowed outdoors may mate with stray cats whose litters may be born outside, further contributing to the homeless cat population.

The question of what to do about these free-roaming or feral cats has been hotly debated among the humane community, wildlife agencies, and cat advocacy groups. Two primary management philosophies exist. Some believe that it is better to trap and humanely kill these animals. Those who advocate this policy argue that, even with help from human caretakers, these animals suffer and die a miserable death. They also are concerned about the spread of disease, both within the cat population and to humans, and the impact of these animals on wildlife populations, especially birds and small mammals.

On the other hand, many groups support TNR (trap, neuter, return) as long as there are people willing to feed and provide veterinary care for outdoor cat colonies. The arguments in favor of this method are that neutering the animals will eventually reduce the size of the colony and eliminate problem behaviors such as spraying, howling, and fighting that cause problems in residential areas. TNR advocates also argue that this is a moral issue and, as domestic animals, these cats deserve our assistance. Furthermore, even if a colony is removed, other cats will move into the area.

In addition to the problem of unowned homeless cats, issues regarding cats in animal shelters continue to be of great concern. Of all cats entering United States animal shelters each year, 70 percent are euthanized and only two percent are returned to their owners. In an effort to reduce euthanasia numbers and increase the chances of returning lost cats to their homes, humane organizations advocate spaying and neutering, identifying cats with a tag or microchip, and keeping pet cats indoors.

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R. Lee Zasloff

CHICKENS

The domesticated chicken is derived from the wild jungle fowl of Southeast Asia, and was originally domesticated over 10,000 years ago. The world is now populated with over 16 billion broiler chickens and 5 billion laying hens, with the highest numbers being found in China, Brazil and the United States.

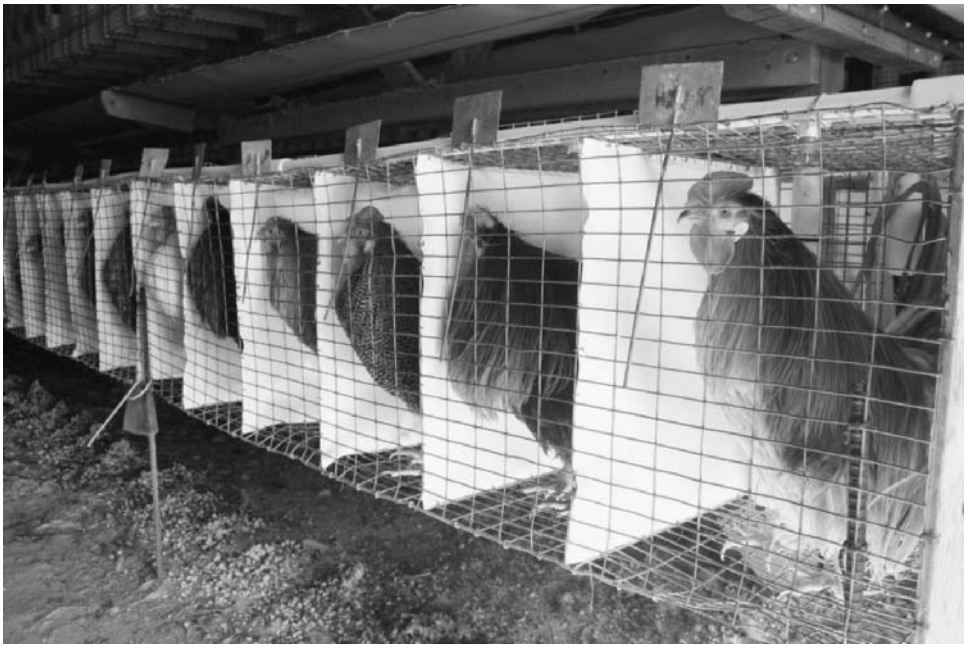
Broilers have been selected for their prodigious appetite, rapid growth, and massive development of the pectoral muscles that provide breast meat. They are usually kept in large mixed-sex flocks in litter-floored housing, and harvested for meat at around six weeks of age. Laying hens, selected to produce over 300 eggs per year, are thinner and more agile than broilers, and have little value as a source of meat. They are kept in flocks of adult females, often in small groups in cages. Chicks of broiler and layer strains are supplied by hatcheries that incubate fertile eggs obtained from breeding flocks.

Close association with humans has made the chicken the most abundant of all bird species, but success at the species level comes at a cost to individual chickens. For the majority of consumers, low cost is the primary determinant when selecting poultry products. To minimize the cost of production, most chickens are given little space or behavioral freedom. Producers defend their housing and management practices on the basis that modern chickens are not well adapted for life in nature, and would not be productive under intensive farming conditions if they weren't healthy and content. Nevertheless, an ability to respond to instinctual urges and learned preferences is undoubtedly desirable from the chicken's perspective.

Cage Housing of Laying Hens

Major controversy surrounds the housing of laying hens in cages. Producers provide the minimum cage space needed to maintain high egg production. This space allocation is determined by the ability of hens to access food and water, and to avoid overheating in hot weather. Genetic selection for group living at close quarters has produced hens that are tolerant of one another, sharing space rather than attempting to defend access to food and water through aggression. Maintaining hens at close quarters in cages is also possible because feces drop through the wire floor of the cage, reducing disease risk from intestinal parasites. Conveying feces away on a manure belt makes it easy to avoid problems with high ammonia concentrations and, because the cage floor slopes so that eggs roll out as soon as they are laid, dirty and cracked eggs are minimized. Furthermore, cages are stacked in multiple tiers so that the vertical space of the chicken house is used efficiently.

Nonetheless, the behavioral restriction of hens in cages has prompted calls for more roomy conditions. Providing additional space allows for greater ease in performing comfort behaviors such as preening and stretching, as well as locomotory behaviors such as walking, running and jumping. Greater activity strengthens bones, making them somewhat less susceptible to fractures when hens are removed from cages and killed



Chickens held in cages at Whiting Farms in Colorado. This farm has about 85,000 chickens who are harvested for feathers that will be used for making fly fishing flies. (AP Photo/John Marshall)

at the end of their productive lifespan. It is unclear how much additional empty space is desirable from a hen's perspective. What is in the space may have greater salience. Thus, the European Union has mandated that, from 2012, hens may no longer be kept in plain cages. Cages must be furnished with a perch, nest and litter material to facilitate expression of perching, nesting, foraging and dust bathing behavior.

Cage-Free and Free-Range Housing

Whether furnished cages provide sufficient behavioral freedom is a matter for debate, and some people favor banning cages outright. In affluent countries, the market for cage-free and free-range eggs is expanding, leading egg producers to replace a proportion of their cage housing with housing comprising a combination of slatted floors and littered areas, or aviaries with multiple wire-floored tiers, with or without access to the outdoors. Litter, nest boxes and perches are provided, although the ideal quantity and layout of these resources has not been well established.

Despite popular opinion, many welfare problems have been encountered in these facilities. Compared to cage housing, these include increased risks of cannibalism, feather pecking, bone fractures, smothering, bacterial diseases, and parasitism. Predation is added to the list for hens given access to free range. The extent of these risks depends on specific details of housing design, genetic strain of chickens, their rearing conditions, and the producer's experience with this type of housing. In particular, strong genetic selection needs to be applied to develop

strains of chickens that are better adapted for living in these facilities. Rearing chickens with access to perches from an early age also mitigates some of these problems. For free-range hens, the welfare implications of unexpectedly being denied access to the outdoors due to inclement weather or disease threats from wildlife (e.g., avian influenza) have not been determined.

To reduce contact with feces, only about one-third of the floor space in cage-free hen housing is covered with litter. In contrast, broilers must be kept on all-litter floors to cushion their heavy bodies and prevent breast blisters. In either case, litter must be kept dry to minimize the release of ammonia from feces, especially in warm weather. Ammonia irritates the eyes and respiratory passages, and can create lesions on the feet and hocks of heavy, inactive broilers. Controlling ammonia depends as much on proper ventilation and management of the drinkers as it does on the space allowance per chicken. If the litter is too dry, ammonia is replaced by problems with dust.

Rapid Growth of Broilers

Broiler chickens have large appetites and grow rapidly, which places them at risk of developing cardiovascular and skeletal disorders. These risks have been reduced to some extent by genetic selection and manipulation of day length to constrain early growth but stimulate rapid growth later on. However, the limited mobility of modern strains of broilers, and the potential for pain from leg and joint disorders, has prompted calls for the use of slower-growing, less productively efficient broilers that display more active behavior, including use of perches.

Broiler breeders would become unhealthy if allowed to eat like broilers for prolonged periods. Therefore, their feed intake is strongly restricted to control growth and promote reproductive fitness in adulthood. The resultant hunger can lead to the development of unwanted behaviors such as spot pecking. Feeding a high-fiber diet partially alleviates this problem.

Induced Molting

Laying hens molt after they have been laying eggs at a high rate for about one year. Until recently, molting was induced by complete feed withdrawal for up to two weeks, prompting loss of abdominal fat and leading to improved survival rates, egg production, and eggshell quality during a second laying cycle. Although this increased the longevity of survivors, it put the lightest hens in the flock at the risk of anorexia and death. Consequently, prolonged feed withdrawal has been outlawed in the European Union and abandoned in the United States, and molting is now induced by feeding a low-nutrient diet.

Beak Trimming

Beak trimming (or debeaking) involves amputating up to two-thirds of the upper beak and less of the lower beak. It is effective in reducing damage from feather pecking and cannibalism, which are serious welfare problems in laying hens and broiler breeder hens kept cage-free in large flocks. By making manipulation of feed more difficult, beak trimming reduces feed wastage, although it may also reduce the ability of hens to remove parasitic mites through preening. Unfortunately, beak trimming causes pain, fuelling bans in Sweden, Norway, Finland, and Switzerland, and a UK ban scheduled for 2011. Pain from the procedure can be

lessened by use of analgesics and limiting beak trimming to the first 10 days of life. However, genetic selection against feather pecking and cannibalism is the most promising long-term solution.

Slaughter

Due to their value for meat, broiler chickens are usually transported only short distances to slaughter. In contrast, end-of-lay hens have little value for meat, compounded by food safety concerns about bone fragments in meat resulting from bone fractures. As such, transportation distances can be great to reach the few slaughterhouses willing to accept these hens, and hens face an elevated risk of dying in transit. Difficulties in marketing mean that hens are increasingly killed on the farm using carbon dioxide gas. Because the hens are killed almost immediately following catching, the duration of suffering is brief.

Controversy surrounds the most humane method of rendering broilers unconscious prior to slaughter. With developments in technology, it is likely that the current practice of hanging chickens upside down on shackles and stunning them electrically will be replaced by stunning using a mixture of carbon dioxide and inert gas.

Future Trends

To promote chicken welfare, there is a growing trend toward introduction of science-based welfare assurance and labeling schemes, either through legislation or under the auspices of various animal welfare organizations, supermarkets, and poultry industry groups. These standards vary in the extent to which they emphasize natural behavior, chicken feelings and preferences, and physical health and productivity, and their implementation depends upon the quality of audits and their appeal to the public. Some consumers have shown willingness to pay more for cage-free and free-range products. However, allowing for greater behavioral freedom has introduced other well-being problems. A holistic approach is needed to that enhances overall well-being, and also takes into consideration impacts on human health and safety, wildlife, and the environment.

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Ruth C. Newberry

CHIMPANZEES IN CAPTIVITY

There are an estimated 2,400 chimpanzees living in captivity in the United States. Approximately 940–980 live in biomedical research laboratories, 270 live in accredited zoos, 625 live in sanctuaries, and an estimated 550 chimpanzees are living in various conditions in the entertainment industry, in roadside attractions, and as people's "pets." There are approximately 370 captive chimpanzees living in Japan, approximately 980 chimpanzees living in zoos in Europe, and about 50 in Australia and New Zealand. Although it is impossible to know the exact number of chimpanzees in captivity worldwide, it is safe to say that the numbers have been decreasing gradually, as importing chimpanzees from Africa is illegal and breeding is very tightly controlled. However, the number of captive chimpanzees in Africa, where chimpanzees live naturally, is on the rise. An increasing number of rescued baby chimpanzees, orphaned as a result of the illegal bushmeat trade, are being protected in seminatural sanctuaries across the continent. Many hope that with efforts to protect habitat, and through educational campaigns to protect native animals, these wild born chimpanzees may be freed from captive existence someday, but that is not possible for the thousands of captive chimpanzees living in the rest of the world.

History of Captivity

Originally chimpanzees were brought into captivity by curiosity seekers and collectors, and the chimpanzee captives did not live long. There are reports of a few young chimpanzees living in captivity in private European collections and used as entertainers prior to the 20th century, but it was not until the early years of the 1900s that more systematic efforts to study chimpanzees in captivity began. Psychologist Wolfgang Kohler, who in 1913 became the director of the Anthropoid Station of the Prussian Academy of Science in Tenerife in the Canary Islands, was the first to study captive chimpanzee insight and problem-solving abilities. At the same time, a Russian comparative psychologist, Nadya Ladygina-Kohts, was documenting the emotional development of an infant chimpanzee named Joni. Both studies were short-lived. A decade later, Robert Mearns Yerkes began what was ultimately to become a very successful effort to create and sustain captive chimpanzees in the United States, but his initial efforts also ended with the early and tragic deaths of Chim and Panzee, both of whom died on separate visits to

the primate collection of Madame Rosalia Abreu in Cuba. By the 1930s, Yerkes was successfully breeding chimpanzees in captivity. The colony that he began with four chimpanzees in New Haven, Connecticut, moved to Orange Park, Florida, and ultimately to Emory University in 1965 with 66 chimpanzees. It now exists as the Yerkes National Primate Research Center in Atlanta, Georgia, and has produced five generations of captive chimpanzees.

Early studies of captive chimpanzees were designed to provide basic physiological and behavioral information that would aid in the maintenance of captive populations. Researchers sought to understand the nutritional needs of chimpanzees and their reproductive habits, as well as to learn about their development, their intelligence, and their distinctive personalities. Yerkes was very clear that while it was important to investigate chimpanzees in order to understand them better, that understanding was ultimately in the service of bettering "man"—in his words "to contribute to the solution of our intensely practical, medical, social, and psychological problems." (Yerkes, 1916, p. 233) To that end, chimpanzees in the early years were used in a variety of experiments including lobotomy research, infectious disease research, radiation exposure, organ transplantation studies, and drug and alcohol addition studies. Infant chimpanzees were also used in deprivation studies that involved removing them from their mothers and depriving them of human contact, contact with other chimpanzees, and natural stimuli including light, sound and, in at least one case, all tactile stimulation.

In the 1950s, chimpanzees were being used in military experiments which involved crash tests, exposure to extreme G-forces, decompression, and radiation. Before sending humans into space, NASA and the Russian Federal Space Agency began sending animals into space, and chimpanzees were among the early space explorers. In 1953, the Holloman Aeromedical Field Laboratory's Space Biology Branch in Alamogordo, New Mexico imported more than 60 chimpanzees from Africa to use in biodynamic and aeronautical research. The chimpanzees were similar enough to humans that it seemed reasonable to use them to reveal the suspected effects of space travel, and they were smart enough to be trained in complicated tasks similar to those that astronauts would need to perform in flight. Because of their similarity to humans, chimpanzees were shot into space on test runs before humans went. On January 31, 1961, Ham, a trained three-and-a-half-year-old chimpanzee, was the first chimp-o-naut. Only after Ham returned did Alan Shepard become the first American to travel in space. The second chimp-o-naut, Enos, a five-and-a-half-year-old, was sent up on November 29, 1961 and, following her success, John Glenn orbited the earth three times in 1962.

As biomedical research on chimpanzees was rapidly increasing in the 1960s, so too was our understanding of chimpanzees as smart, sensitive, and highly social animals. Jane Goodall began her groundbreaking study of chimpanzees in the wild, and behavioral researchers in the United States began teaching chimpanzees to use human language and other symbolic communication techniques to reveal their intelligence. Having seen an early film of researchers from the Yerkes colony attempting to teach a young chimpanzee, Viki, how to speak, Allen and Beatrix Gardner, psychologists at the

University of Nevada in Reno, embarked on a project to teach chimpanzees sign language. In 1966, the Gardners acquired one of the Air Force chimpanzees, raised her as they would a child, and trained her in American Sign Language. That chimpanzee, Washoe, was the first chimpanzee to acquire human language. She is reported to have learned and used over 200 signs. Other language projects also got underway at this time. In 1967, another couple of psychologists, David and Ann Premack, first reported their success in teaching a wild born chimpanzee, Sarah, to use plastic tokens to represent words. These tokens varied in shape, size, texture, and color, and Sarah formed sentences by placing the tokens in a vertical line. Sarah used nouns, verbs, adjectives, pronouns, and quantifiers; over the years she was also taught concepts such as same/different and negation and she also learned how to distinguish "greater than" and "less than." Sarah is probably most well known as the chimpanzee used in the experiments that started the subfield in comparative and developmental psychology called the "theory of mind research," in which nonhumans and nonlinguistic humans were studied to determine whether they understood that others have mental states and what those mental states might be. Project Lana was another chimpanzee language experiment begun at Georgia State University by Duane Rumaugh in 1970. Lana was a chimpanzee born at Yerkes, and she was taught a language system of lexigrams called Yerkish. Lana used an electronic keyboard, and when she pressed a key with a lexigram on it, the key would light up and the lexigram would appear on a projector. Lana learned to create sentences such as "Please machine give juice." When the wrong "word" appeared, Lana would erase it and replace it with the correct word.

In 1970, Washoe moved to the Institute of Primate Studies (IPS) at the University of Oklahoma, where other types of behavioral studies on chimpanzees were being performed. Psychologist Roger Fouts, who did his graduate work with Washoe in Reno, moved with her and began teaching sign language to more chimpanzees. Researchers across the country were becoming more intrigued by these language studies, which at once seemed to provide insights into the minds of our closest living relatives and at the same time threatened to undercut human uniqueness. In 1973, Herbert Terrace of Columbia University decided that he was going to attempt to teach a chimpanzee sign language under highly controlled conditions. Nim Chimpsky, born at IPS, was that chimpanzee. Like Washoe, Nim was raised by humans and pampered by a series of doting human caregivers in New York City. However, each day Nim had to go to the Columbia University lab, sit at a desk, and learn signs. Though Nim appeared to learn about 125 signs, Terrace concluded that Nim did not really understand their meaning and was unable to put them together in any way that resembled grammatical sentences. In 1977, Terrace ended the project and sent Nim back to Oklahoma. Then in 1982, as the Institute for Primate Studies was unable to get funding to continue, Nim and 20 other sign language-using chimpanzees were sent to New York University's Laboratory for Experimental Medicine and Surgery in Primates (LEMSIP), possibly to be used in hepatitis research. Before the demise of IPS, Roger Fouts had taken Washoe to Central Washington State, where she lived until her death in October 2007. Cleveland Amory and the Fund

for Animals ultimately secured Nim's release and retired him to Black Beauty Ranch, where he lived until his death in March 2000, but almost all of the other chimpanzees from Oklahoma ended up in biomedical research laboratories.

From the beginning of the practice of keeping chimpanzees in captivity in the United States, their sale and movement from one laboratory to another was fairly common. Early on, laboratories and zoos would swap chimpanzees back and forth as well. Keeping chimpanzees in captivity is expensive, and many laboratories could not sustain the expense, which was the case in Oklahoma. Sometimes when the funding runs out, a chimpanzee is placed in a laboratory in which similar experiments are being performed. For example, Sarah was moved from the University of Pennsylvania psychology lab to the Ohio State University Chimpanzee Cognition Center. Back in 1965, the Air Force facility in Alamogordo, New Mexico stopped using chimpanzees and was taken over by Fred Coulston, who was then affiliated with the Albany Medical College, which was sold to New Mexico State University in 1980 and, in 1993, with over 335 chimpanzees living at the facility, it was sold again to another Alamogordo facility controlled by Coulston, called White Sands, where an additional 200 chimpanzees lived. The Holliman facility and White Sands combined and became known as the Coulston Foundation, and specialized in toxicology and immunology studies. A few years later, with the closure of New York University's Laboratory for Experimental Medicine and Surgery in Primates (LEMSIP), where many of Nim Chimpsky's cohort had been sent, the Coulston Foundation acquired over 100 additional chimpanzees that were to be subjected to additional types of infectious disease research. With over 650 chimpanzees, the Coulston Foundation controlled the largest number of captive chimpanzees in the world until animal welfare violations were exposed. In 2002, on the verge of financial collapse, Coulston sold its facility and donated its remaining 266 chimpanzees to a sanctuary called Save the Chimps. Some of the chimpanzees that were born in Oklahoma and taught to communicate with sign language, then moved to LEMSIP in New York and exposed to hepatitis, then moved to Coulston in Alamogordo where they continued to be experimented upon, now live on grassy islands in Florida in social groups with other chimpanzees who endured similar experiences.

Though chimpanzees are quite expensive to keep in captivity (current estimates are between $300,000-$500,000 for lifetime care) and finding adequate facilities was never easy, that did not stop laboratories from breeding chimpanzees. In the mid-1970s, chimpanzees were classified as endangered in the wild and as threatened in captivity. What this meant was that importing them from Africa was prohibited, but keeping them in captivity was not. So, laboratories increased their breeding programs to ensure the continued availability of chimpanzees as experimental models. In 1986, the NIH launched a large breeding program to increase the number of chimpanzees available for AIDS research. Ironically, that same year the British government banned the use of chimpanzees in research on ethical grounds, arguing that, given how close chimpanzees were to humans, to treat them as expendable was immoral. By the 1990s, it became clear that chimpanzees were not an appropriate model for HIV research because they did not develop AIDS. But now the government

was faced with a challenge. There was a decrease in the use of chimpanzees for experimentation, but a surplus of chimpanzees that required long-term care. Estimates placed the total number of chimpanzees in laboratories at that time at around 1,800. Since chimpanzees can live 50–60 years in captivity, and simply killing the chimpanzees would have generated a large public outcry; euthanasia was prohibited as a method of population control. The NIH imposed a temporary breeding moratorium and convened a working group to study the captive chimpanzee problem. In 1997, the Chimpanzee Management Program (ChiMP) made a series of recommendations that included extending the breeding moratorium and continued monitoring of the surplus captive chimpanzee problem. The breeding moratorium became permanent in 2007.

The United States remains the only country in the world, except possibly for Gabon, that uses chimpanzees in invasive biomedical research. The last research facility in Europe using chimpanzees stopped in 2004, when biomedical research with chimpanzees became illegal in the Netherlands. Japan ended biomedical experimentation on chimpanzees in 2006.

The Welfare of Captive Chimpanzees

The Animal Welfare Act enacted in 1966 regulated the care and use of animals in laboratory research, in facilities that exhibit animals, in transportation, and by dealers, and that included chimpanzees. Early guidelines outlined minimum space requirements that allowed chimpanzees to be individually housed in single cages that measured 5×5 feet and were only 7 feet high. Chimpanzees are strong, active, highly social animals. Isolation housing, exposure to unavoidable psychological distress, repeated anesthetizations, and exposure to painful procedures, while legal, were contrary to the well-being of the chimpanzees. In 1985, as the result of pressure brought by animal protection groups as well as primatologists, the Act was amended to include providing space for normal exercise and "a physical environment adequate to promote the psychological well-being of primates." But what that meant was subject to debate.

In 1988, the Jane Goodall Institute published a detailed set of recommendations to help provide some specific ways to resolve the debate and promote the psychological well-being of chimpanzees. Some of these recommendations included:

- Chimpanzees should always be housed with at least one other conspecific, unless ill and thus in need of special care.
- Under no circumstances should a chimpanzee be housed without visual and auditory contact on at least two sides.
- All enclosures should have windows to the outdoors, and any newly constructed facility should include an outdoor enclosure.
- Caregivers or scientists working with chimpanzees must be given extensive training in the nature of chimpanzee life and behaviors.
- Caregivers should be selected for their compassion and dedication to the wellbeing of the chimpanzees.
- All handling procedures should be performed in a way that reduces the stress and pain experienced by the chimpanzee.
- No experiment should be initiated on a chimpanzee without the

prior acquisition of funds to provide for the retirement and care of the individual chimpanzee post-experimentation.

- Any chimpanzee no longer in use for biomedical research should be allowed to retire.

While instructive, the full JGI recommendations were not ultimately adopted. Instead, the regulations required each facility that housed chimpanzees to design their own "environmental enhancement plan." In 1999, the vagaries of the regulations were addressed in a new set of guidelines that were a bit more specific, but nonetheless allowed flexibility for the facilities in devising their plans, as long as the plan specifically addressed the social needs of individuals, provided enrichment to prevent self-injurious behavior, and considered the special social needs of infant primates and others with particular physical characteristics. In addition, facilities were to provide sufficient space to allow chimpanzees to engage in species-typical behavior, and enclosures had to contain complexities, objects that could be manipulated, and varying feeding mechanisms to provide environmental enrichment.

Because of the growing awareness of the cognitive and emotional sophistication of chimpanzees and the distress captivity was likely to cause them, discussions of the ethical issues involved in the proper care of chimpanzees in captivity became more pressing. Public commentary on the USDA regulations was extensive. New discussions about care in zoos also become more sophisticated. The American Zoo and Aquarium association established the Chimpanzee Species Survival Plan in order to improve the care of chimpanzees in zoos and to carefully monitor their reproduction, and in the 1990s the international Great Ape Project (GAP) was launched. Scientists, primatologists, and ethicists involved in GAP advocated the expansion of the "community of equals" to include chimpanzees and to grant all great apes the right to life, the protection of individual liberty, and a prohibition on torture. In the summer of 2008, Spain adopted a resolution that would extend these basic rights to great apes and would outlaw using them in experiments, circuses, TV commercials, or films.

In the United States in 2000, concerns about the ethical use of chimpanzees in research and the continual problem of "surplus" chimpanzees led the US government to pass the Chimpanzee Health Improvement, Maintenance, and Protection (CHIMP) Act, which provides lifetime sanctuary for chimpanzees owned by the federal government, and some others that are no longer needed for research. In September 2002, after a competitive selection process, Chimp Haven, a 200-acre state-of–the-art, naturalistic sanctuary in Caddo Parrish, Louisiana, was selected to become the National Chimpanzee Sanctuary System. The first chimpanzee residents arrived in April 2005. When the CHIMP Act was passed in 2000, there was a last minute rider added that allowed for the possibility that chimpanzees could be recalled from retirement if they were the only chimpanzee that could satisfy a specific research need and their removal would not disrupt their social group. In December 2007, the option to remove chimpanzees from the sanctuary was eliminated with the passage of the Chimp Haven Is Home Act. To date over 150 chimpanzees have been retired to Chimp Haven.

In 2008, the Great Ape Protection Act was introduced in Congress. As of this

World-renowned conservationist Jane Goodall gives a little kiss to Tess, a female chimpanzee at the Sweetwaters Chimpanzee Sanctuary. (AP Photo/Jean-Marc Bouju)

writing, it is still pending. This act, supported by animal welfare organizations and some primatologists, would prohibit invasive research on great apes, prohibit funding for such research, prohibit the transportation of great apes for such research, and require that all great apes be retired to sanctuary. Whether or not these efforts are successful, important work remains to be done for all currently captive chimpanzees to ensure that they receive the highest level of care. To promote their psychological well-being, all captive adult chimpanzees must be provided with the opportunity to develop stable social relationships with other chimpanzees. Captive chimpanzees need to live in a chimpanzee community where they can communicate with others of their kind and learn to exhibit species-typical behaviors. At a minimum, providing them with access to the outdoors, space to develop social relations and to avoid conflict, materials to nest, fresh fruits and vegetables, and enrichment to keep their active minds stimulated, are essential for the well-being of captive chimpanzees. Keeping chimpanzees in captivity denies them their freedom, but their wildness remains within them. It is possible, with diligence and care, to respect their wild dignity, and this is what every one of them deserves.

See also Sanctuaries; Sanctuaries, Chimpanzees in

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Lori Gruen

CHINA: ANIMAL RIGHTS AND ANIMAL WELFARE

China's reforming post-socialist state has produced breathtaking economic growth in the last 30 years. While the world applauds the Chinese economic miracle, it has great concern over the sustainability of its long-term development. In addition to the widely recognized problem of environmental degradation, cruelty against animals in China has reached an unprecedented level. In recent years, a vivid and quite confrontational discussion on animal rights and animal welfare, topics rejected as unworthy of serious academic discussion only a generation ago, has erupted in China.

Progressive foreign ideas on animal protection came to China in the early 1990s. Chinese philosophers spearheaded the academic exploration. Why philosophers? In the early 1990s, the issue of animal rights was basically an academic research interest rather than a topic of policy implications. Yang Tongjin, a philosopher at the Chinese Academy of Social Sciences (CASS), an official think tank, published one of the first articles on the Western concept of animal rights (Yang, 1993). However, Dr. Yang's article did not spark further interest. It was not until the mid-1990s that animal rights began to attract attention in China again.

Chinese Proponents of Animal Rights

In 2002, Qi Renzong, a Chinese philosopher at CASS, published a seminal article espousing the ideas of animal protection. Qiu apparently tailored his article to address the several questions that would be evoked by his arguments.

An attitude among most Chinese was that China was not ready for tackling issues of cruelty against animals, because there should be more concern about the many people who were living a hard life. Qiu did not question the importance of human rights advancement, yet he believed recognition and protection of animal rights would only help promote human rights (Qiu, 2004). In response to the view that China was not materially or philosophically ready for discussing or protecting animal rights, Qiu offered the following comments in the article:

> In my opinion, we have the conditions now to discuss animal rights.

> These conditions are rising awareness of the public for environmental and animal protection, media exposure of the maltreatment of and cruelty to animals, experience of animal protection work, rising rights consciousness, and the achievement of a growing prosperous society (Zhao, 2004).

As far as Qiu was concerned, the subject of animal rights could no longer be neglected. He introduced the three key elements of the rights claim: the subject of rights, indirect objects of rights, and direct objects of rights. He highlighted three basic positions related to human-animal relations. These are, first, that humans having no obligation toward animals; second, that humans have an indirect obligation toward animals; and third, that humans have a direct obligation. He then presented the theological, philosophical, Confucian, and ethical arguments for the three positions. In terms of animal liberation, Qiu introduced the concept of speciesism and its various manifestations in animal abuse.

In the end, Qiu brought readers' attention to the three tactics for animal liberation. He rejected the status-quo position, believing it was pessimistic and obstructive. However, he also questioned the abolitionist arguments that, to him, were unrealistic and counterproductive. He called instead for actions to improve animal welfare at the present time. He believed a gradualist approach would better serve the goal of animal liberation in the future.

The Opposing Voices

Zhao Nanyuan, a professor at China's prestigious Tsinghua University, launched a frontal attack on Qiu's article. In his 2004 essay "The essence of animal rights arguments is anti-humanity," Zhao saw ulterior motives behind Qiu's arguments. To Zhao, what Qiu introduced was nothing but a full shipload of "foreign trash" (Zhao, 2004b). Zhao wanted readers to be vigilant, because animal rights advocates were, in his opinion, determined to convert their ideas into policies and actions.

Animal rights, according to Zhao, incorporate misguided ethical arguments. "Ethics allows the talking of nonsense and it, as a result, often makes people astray and acting ridiculously contrary to their original intentions." Ethics limit and inhibit freedom, Zhao charged. Therefore, like famine, plague and wars, moralists who propagate ethical standards are creators of human disasters. This is, according to Zhao, why the intentions of moralists like Professor Qiu were suspicious (Hu, 2004). Zhao rejected the view that nonhuman animals are sentient beings and that they are entitled to rights.

Zhao's most provocative position in this essay was his sweeping attack against rights proponents, animal lovers, and Western animal rights ideology as a whole. To him, the influx of Western animal rights ideas was no accident. Chinese advocates of animal rights, in Zhao's opinion, are treacherous and are serving the West's neo-imperialist objectives in China. They enjoy defaming their own country, Zhao claimed, and helping the West to demonize non-Western civilizations. Zhao calls China's animal advocates a bunch of psychopaths with emotional and personality flaws. In his view, these Chinese, like all other animal rights advocates, are "anti-humanity" elements. He warned these people to stop acting as members of the "fifth column"

of the neo-imperialists. He suggested that they should learn from the South Koreans, who stood firm against Western protests of Korean dog-eating culture (Jie, 2005).

The Intensification of the Debate

Zhao's provocative rebuttal reflects the frustration of these ideologically charged opponents. Zu Shuxian, a rights advocate, made a powerful response by citing scientific evidence and the work of Charles Darwin (Li, 2004). All mammals have emotions, he argued. Not only can many of them imitate others, and make and use tools, they also have memories. To Zu, the mental similarities between humans and nonhuman animals cannot be overemphasized. Arguing that existence is independent of scientific inquiry, Zu rejected Zhao's assertion that science has failed to prove that animals are sentient beings. Refuting Zhao's claim that animal protection advocates are psychopaths, Zu reminded the readers that great scientists like Albert Einstein once called on future generations of scientists "to free ourselves by widening our circle of compassion to embrace all living creatures . . ." With regard to the various charges and accusations made by Zhao, Zu likened them to the character assassination common in pre-reform China between 1949–1978.

Zhao's provocative article was also criticized by Zheng Yi, an overseas writer who published *China's Ecological Winter* (2002). Zheng believes the science of ecology fully demonstrates the fundamental contributions of biodiversity to human survival. As members of this diverse ecological system, Zheng argues, nonhuman life forms deserve human moral consideration, as the latter owes its survival and prosperity to the former.

Animal Welfare Concepts

Animal welfare is also a foreign idea introduced into China in the reform era. China's increasing openness to the outside world, rising animal protection awareness, and increasing media exposure of cases of cruelty against animals in the country underlie the Chinese discussion of animal welfare.

The lot of nonhuman animals in China also divides the interested parties. To the opponents of animal rights, there is no animal welfare crisis in China. Qiao Xingsheng, a college teacher, argues that animal suffering under conditions of mass production is a necessary evil. He denies that the animal welfare problem is developing into a crisis (Li, Xiaoxi, 2004). Qiao Xingsheng praises China's fine treatment of animals under current regulations.

Zhao Nanyuan flatly denies that there is cruelty against animals in China. To him, cruelty against animals is a fabrication by hostile Westerners and Chinese lunatics who, in Zhao's view, love animals more than their fellow human beings. Reported cruel acts, according to Zhao, are sensational stories whipped up by the media or by evil-minded animal lovers (Mang, 2004). To Zhao, Chinese culture is above reproach in its treatment of nonhuman animals. Both Zhao and Qiao conclude that China should do nothing at present regarding animal welfare (Mao, 2003).

Anti-Cruelty in Laws and Regulations

Anti-cruelty is a new subject of policy-making. Today, some 70 laws and

regulations include articles related to animal welfare. Yet most only touch on the issue in vague terms and are not enforceable. In China, there is not yet any comprehensive anti-cruelty legislation.

Why is China so behind the rest of the world in animal welfare legislation? One study found four main obstacles (Mo & Zhou, 2005). First, treatment of animals in general is not a concern for policymakers (Mo & Zhou, 2005). Second, existing Chinese laws are discriminative in coverage. Except for endangered species, most animals fall outside legal protections. Third, existing laws and ordinances are no deterrence to cruelty against animals. Law enforcement is a major challenge. Fourth, articles in the existing laws are mostly overarching principles that have low enforceability.

Animal Welfare Legislation

To its proponents, animal welfare legislation is long overdue. Academics Song Wei and Wang Guoyan agree that there is a void in this policy area in China. China's sustainable development calls for animal welfare legislation to stop, for example, wildlife devastation. China is also more likely to export animal products if it improves farming conditions (Qiao, 2004).

Other proponents expressed similar views on the development and social importance of anti-cruelty legislation. Mao Lei, a *People's Daily* reporter, states: "For the sake of development, our legislative action on animal welfare ultimately serves the interest of us humans in the long run." Legal restrictions placed on humans are worthwhile and necessary (Qiao, 2004). In her legislative proposal to the National People's Congress, Li Xiaoxi called on the national legislature to outlaw cruel hunting and livestock-raising practices. She referred to SARS and bird flu to emphasize the need for legal construction in animal welfare (Qiu, 2004).

Mang Ping's article "Animal welfare challenges human morality: animals should be free from fear and trepidation" touches on both the practical and philosophical aspects of animal treatment. Pragmatically, poor animal welfare causes economic losses. Philosophically, the author argues, as sentient beings, animals should be given moral consideration on farms, in transport, and when their lives end. Rejecting the opposition's arguments that animals cannot fulfill obligations, Mang asks if there is better obligation fulfillment than sacrificing one's own life in return for humane treatment. Mang also rejects arguments that animal welfare legislation does not fit China's conditions. She argues that China has a tradition of kindness to animals (Song & Wang, 2004).

The opposing views are also clear-cut. Qiao Xingsheng sees no ground for animal welfare legislation at the present time. Culturally, he points out, people in China do not see animals as equals. Legislatively, anti-cruelty law is a Western concept and therefore does not suit China. Adopting such laws in China is practically unenforceable (*Song & Wang, 2004).). Liang Yuxia, a researcher at the CASS, agrees that anti-cruelty legislation is too progressive and unenforceable at present (Zhao, 2004b).

In his article "The strange tales and absurd arguments of the animal welfare proponents," Zhao Nanyuan rejects the view that animal welfare impacts human health. He argues that SARS and bird flu have nothing to do with poor animal welfare. Factory farming, he claims, better controls diseases. Animal welfare legislation, Zhao argues, could lead to meat

price hikes, thus affecting people's right to eat meat. Therefore, "advocacy of animal welfare violates human rights." This is, he alleges, an action to be resolutely resisted because it is antihuman. He asks why China would adopt laws that are anti-humanity (Zhao, 2004a).

Nevertheless, actions for animal welfare legislation in China have gathered momentum. In August 2003, a proposal on animal welfare legislation was submitted to the National People's Congress. The proposal called for expanding the list of state-protected species. It suggested that four other types of animals (farm, lab, entertainment, and working animals) should also be protected.

Opposition to the proposal was swift. Chinese author Jie Geng launched a point-by-point critique of the proposal. The fact that anti-cruelty laws exist in the West, he argued, does not mean that China should also have them. He implied that cruelty against animals is not as serious in China as it is in the West. He argued that the outside world can take no actions against China for its lack of anti-cruelty laws. He reminded his audience that Korea has not been excommunicated from the WTO for its dog-eating culture (Zu, 2004).

Conclusions

Chinese exploration of the subjects of animal rights and animal welfare is a new development in this rapidly changing society. The animal rights and welfare debate is a public discussion initiated by independent-minded scholars and activists. Such autonomous societal initiatives were not possible in the pre-reform era.

No intellectual pursuit is value-free. In China, intellectual fervor has always carried normative concerns. The evolving debate on rights and welfare for animals is no exception. Those who have called for attention to animal rights and welfare are calling for policy change in animal-related policy areas. As we have shown, the opponents who reject these calls aim to maintain the policy status quo.

Importantly, the debate is politically significant. Animal advocacy groups will continue to push for policy change. Together with other domestic NGOs, they contribute to the rise of civil society. Their activism, agenda setting initiatives, and success in facilitating policy change will eventually redefine state-society relations on the Chinese mainland.

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Peter J. Li

CHINA: MOON BEARS AND THE BEAR BILE INDUSTRY

Bear bile has been used in traditional Chinese medicine (TCM) for over 3,000 years. The practice of caging endangered Asiatic black bears (known as "moon bears" because of the yellow crescents on their chests) and milking them daily for their bile started in Korea in the early 1980s, and soon spread to China.

It was suggested that bear farming would satisfy the local demand for bile, while reducing the number of bears taken from the wild. However, wild bears are still poached today for their whole gall bladders or as an illegal source of new stock for the farms. Bears are also bred on these farms.

Bears arrive at the Moon Bear Rescue Center in Chengdu, Sichuan Province in appalling physical and mental condition. Bears like Andrew, Freedom, Belton and Frodo have severed limbs as a result of being trapped in the wild. Crystal and Gail have had their canine teeth cut back, exposing pulp and nerves, and paw-tips sliced off to de-claw them, making them less dangerous to milk for their bile. These bears can spend up to 25 years in cages no bigger than their bodies.

Traditional Chinese Medicine

According to Chinese government figures, 7,002 bears remain trapped on

Animals Asia workers and volunteers give an emergency health check to a bear farmed for bile in China. Government wildlife officials defend China's raising of bears on farms to make bile for traditional medicine and have rejected a European appeal to shut down the industry. (AP Photo/Animals Asia)

factory farms, where they are milked daily for their bile.

Today, bile can be replaced with herbal and synthetic alternatives, which are plentiful, cheap and effective. Eminent experts such as Professor Zhu Zhenglin, who ran a TCM clinic in Chengdu, are dedicated to both the culture and usage of TCM, as well as to the end of bear farming. Professor Zhu writes:

> I believe that it is the time now and it is the responsibility of our new generation of traditional Chinese medicine practitioners that we further develop the TCM theories left by our ancestors, and not rely on the old beliefs of bear bile or tiger bone.

Similarly, TCM practitioner and academic Professor Liu Zhengcai, who is renowned throughout China, says:

> If people don't use bear bile, the industry will have no reason to exist. I always tell my patients and students that bear bile is not necessary, and is replaceable. Not using bear bile complies with the TCM theory of "harmony with nature."

Dr Zhu Guifang, a Chengdu businesswoman involved in the TCM tonic industry who recently visited the Animals Asia sanctuary, uses even stronger language:

> I have being selling TCM tonic food for 13 years, including bear bile and

> bear bile wine . . . But after visiting your sanctuary, I am shocked and feel ashamed of having hurt these animals. Starting from today, I will never sell bear products again.

This support gives us hope that, like the Vietnamese government, the Chinese government will agree to outlaw the trade in bear bile. For the bears suffering and dying on the farms right now, freedom cannot come soon enough.

Day after day, their bile is drained through crude metal catheters implanted into their gall bladders, or via permanently open, infected holes in their abdomens. This latter method—the only method permitted in China—is known as the free-dripping technique, which the authorities claim is hygienic and humane.

However, veterinarians have found that bile extraction significantly increases the risk of disease in the bears and must, by the nature of the wound, cause pain. Anyone with a basic understanding of physiology knows that a permanent hole in the abdomen is a perfect vector for bacterial infection.

Some farmers have devised a fake free-drip technique whereby a Perspex catheter is hidden within the hole to prevent it from healing. This allows the farmers to deceive government inspectors by maintaining that the hole is naturally and permanently open, allowing bile to drip freely out as the regulations dictate.

Contaminated Bile

Animals Asia has urged Chinese authorities to look into the possible harmful side effects of contaminated bear bile. This organization has a growing dossier of evidence that the bears tapped for their bile are developing liver cancers at an alarming rate. Moon bears held in captivity rarely contract liver tumors unless they are very old, but almost half of the rescued bears that have died were euthanized because of liver cancer.

The bile is contaminated with pus, blood and even feces. A healthy bear's bile is as fluid as water and bright yellowy-orange to green in color. Veterinary surgeons have described bile leaking from the diseased gall bladders of the rescued bears as black sludge. They also consider it highly likely that cancer cells are present in the bile extracted from bears with liver tumors.

The prized ingredient in bear bile, ursodeoxycholic acid (UDCA), is used by TCM practitioners for a myriad of complaints, everything from hangovers to hemorrhoids. However, UDCA can be synthesized easily under laboratory conditions—the UDCA produced is pure, clean and reliable.

Dr Wang Sheng Xian, a Chengdu pathologist who analyzes the livers of bears that have died from liver cancer, has said: "The more I learn about the extraction of bile from bears, the more I would never recommend this kind of drug to my family and friends. This drug could be harmful to people." There are many effective and affordable synthetic alternatives as well as more than 50 herbal options.

"Although I respect TCM, what I have seen from the samples from caged bears makes me doubt that products like this work. I personally think we had better use alternative drugs and never extract bile from bears," Dr Wang said.

A Vietnamese pathologist has also expressed grave concerns for the health of both humans and bears after conducting clinical examinations of the damaged gall bladders of three moon bears rescued

from Vietnamese bile farms by Animals Asia.

Dr. Dang van Duong, chief pathologist at the Bach Mai Hospital in Hanoi, said he was shocked by the condition of the bears and urged consumers to think twice before taking the bile from such diseased animals. He found a substantial thickening of the wall of the gall bladder, a consequence of the bile extraction process.

In Vietnam, bile is extracted with the assistance of an ultrasound machine, catheter and medicinal pump. The bears are drugged—usually with ketamine—and restrained with ropes, and have their abdomens repeatedly jabbed with four-inch needles until the gall bladder is found. The bile is then removed with a catheter and pump.

In 2007, Animals Asia's veterinary team released the report, "Compromised health and welfare of bears in China's bear bile farming industry, with special reference to the free-dripping bile extraction technique."

The report, which was distributed among conservation groups and Chinese health authorities, stated:

> AAF's veterinarians hypothesize that the etiology of the cancer [in farmed bears] is related to the chronic inflammation, infection and trauma caused by bile extraction. Research is under way to investigate this hypothesis. In another context, consideration must be given to the potential effects on humans of the consumption of bear bile that is so contaminated with pus and inflammatory material.

Two bears that arrived at the rescue center in March 2008 illustrate the state of the bear farming industry today.

Kiki and Chengdu Truth

Kiki was squeezed into a tiny cage, barely breathing, and one of the first priorities for an emergency health check. The staff at the Moon Bear Rescue Center tried to gently rehydrate and medicate him and offered him water and a fruit shake. He desperately wanted to drink, but as soon as he licked the delicious juice, he would frantically paw at his face as if in great pain.

There was terror in his eyes, and when he was anesthetized and staff looked closer, they saw that his right eye was rotten and full of pus, and his left eye was semi-rotten. Kiki was blind.

His teeth were smashed to pieces, and some teeth had also been torn away, together with sections of his rotten gum. He had ulcers on his lips and nose, and a broken jaw. He had a massive wound on his hind leg, with flesh necrotic and rotten to the bone.

In surgery, those caring for him saw that Kiki's abdomen was grossly distended with gas, which had been pressing dangerously and painfully on his heart and lungs. Just as they were deciding what to do first to help him, Kiki died on the surgery table. When he was opened up for autopsy, it was found that he was totally diseased with septicemia and liver cancer. It is impossible to imagine how he had withstood so much pain.

Another bear called Chengdu Truth was in a similarly poor condition. His footpads were hyperkeratotic—cracked and dry—showing he hadn't walked on solid ground for years. The bars of his cage were clearly embedded into his soles. He weighed just 65 kilos, when a healthy adult male should weigh 165 kilos.

In addition to a liver tumor weighing several kilos, he had infected puncture wounds over each shoulder. The farmer who owned him had known this bear was dying and had injected him time and time again with inappropriate antibiotics using unsterilized needles, causing the puncture wounds to fester and rot.

Chengdu Truth was so weak, so sick, and so thin that he could barely lift his head and, once the staff at the center knew he had liver cancer, there was no choice but euthanasia.

What Has Been Learned from the Bears

With 247 bears rescued in China by the end of 2008, The Moon Bear Rescue Center continues moving slowly, but surely, towards its end goal. The rescued bears are ambassadors for hope.

Initially displaying frightening aggression when they arrive at the sanctuary from the farms, the bears gradually discover their true natures. The transition in personality from an animal so violent and fearful of the human species to one that is trusting, inquisitive, and completely at ease with people, can only be described as remarkable.

What they teach those humans working with them and helping them is astonishing. Animals that have probably never before built nests are doing so today, as evidenced by skillfully created bamboo beds deep within their natural forest enclosure. Similarly, animals that have never before climbed trees are shinning up into branches several meters high with ease.

They remember and form close friendships with specific members of the group—often sleeping in twos or even threes in their hanging-basket beds. Some will gang up against another bear, or exclude a newcomer from their special circle of friends.

The bears remember the source and the cause of pain. They recognize individual people and will often huff in caution if a veterinarian steps into the room. They growl or explode with rage if an anesthetic jab stick appears.

Straw piles are collected and transported from one end of their grassy enclosure, up the stairs, and into their basket beds inside the den. One bear will often wait until another is distracted and then steal his or her toys or food. The staff at the Moon Bear Rescue Center knows that Crystal grieved when her best friend, Gail, died. She paced more, she ate less, she was sad, evident to all humans who saw her.

Frolicsome and happy, the bears love to play—either with the toys and enrichment items in their enclosures, or within the enclosed bamboo forests, or simply with each other.

The rescue project and China sanctuary benefit more than just the bears. Bear farmers are compensated with funds to start a new business, provided they close their premises and hand their licenses to us. The project employs over 140 local people, and sources local food and construction materials.

Open house days see the Moon Bear Rescue Center welcoming hundreds of visitors each month, including busloads of school children. Friends of Animals Asia support groups are springing up at universities throughout China. Together with their support, Animals Asia is educating a wider section of the general public about bear farming and the concept of animal welfare in China.

In Vietnam, where bile farming is now illegal—but still widely practiced—the center is preparing to welcome the first of 50 bears into a new sanctuary near Hanoi

before the end of 2008. They will join the 24 bears already rescued.

Legislation to Help the Bears

In July 2000, Animals Asia signed a landmark agreement with the China Wildlife Conservation Association (CWCA) and the Sichuan Forestry Department to rescue 500 bears and work towards ending bear farming. Since October 2000, over 40 bear farms have been closed and licenses will no longer be issued.

In December 2005, members of the European Parliament passed a declaration calling on China to end bear farming. And political support is growing within China; members of the National People's Congress have visited the sanctuary in Chengdu and pledged to help end the industry.

Meanwhile, the staff at the Moon Bear Rescue Center believes that their promise to the rescued bears is that they will care for them for the rest of their lives. They will wake every day with the sun on their backs and without fear in their hearts.

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Jill Robinson

COCKFIGHTING

While the question of how to define the proper relationship between humans and other animals can be fraught with controversy, there is one animal issue that draws near consensus: cockfighting. Across the spectrum, groups from The Humane Society of the United States to leading poultry trade groups like the National Chicken Council condemn cockfighting.

Cockfighting is a bloodsport in which two roosters (called gamecocks), selectively bred for aggression and pitted against one another, fight to the death. While blood flows and feathers fly, spectators stand ringside and gamble on the fight's outcome. A fighting rooster's gameness, or willingness to continue fighting in the face of exhaustion and mortal wounds, is considered a source of pride for cockfighters.

Origins and History

Cockfighting is thought to have originated in Asia. While no one knows when humans first captured wild roosters and forced them to fight for entertainment, cockfighting was likely practiced in some form as early as 2500 B.C.

As cockfighting spread across Asia and into Europe, it became popular in England in the 1700s. Early settlers from England and Ireland brought gamecocks with them into the United States, where the practice took root in all parts of the country. However, cockfighting was never without its critics—for both its animal cruelty and gambling aspects. In 1835, England became the first country to ban cockfighting, along with bull baiting, bear baiting, and other forms of staged animal fighting.

Tools of the Cockfighting Trade

Roosters naturally have a spur on the backs of their legs, which they use in self defense or during squabbles over territory. Cockfighters will usually saw off a gamecock's natural spur and tie a weapon to the bird's heel in its place.

Roosters are matched with others with the same weapons, and birds are within two ounces of the same weight in a match.

The most common cockfighting weapon in the U.S is the gaff. Similar in shape to a curved ice-pick, gaffs are tied to both legs for a fight. Another common cockfighting weapon is the long knife, which can reach three inches, and the short knife, which can range from one to one-and-a-half inches long. In a knife fight, the weapon is tied to the left leg.

In Puerto Rico, cockfighters use a weapon called a *postiza,* an artificial spike which was once made of turtle shell but is now made of hard, sharpened plastic.

Naked heel cockfighting pits the birds against each other without any weapons. However, the absence of sharp weapons does not necessarily reduce animal suffering—and may in fact enhance it. As one cockfighting sympathizer explained to a Congressional committee in May 2006, "The wounds inflicted with a gaff or another type of knife are cleaner wounds and the birds can recover better than with a naked heel."

Details of the Fight

Most cockfights are held in a derby format, with multiple fights throughout the event. Although there is no limit on the number of entrants, most derbies require between three and five roosters per entrant. While most entry fees stand at $100–200, some may be as large as $1,000. Entry fees are pooled and given to the derby's winner, with the money being split evenly if several entrants are tied at the derby's end.

During each individual fight, cockfighters will call out their bets by answering the gambler who has called out the sum he wants to bet. The amount of these bets is left to the discretion of the gambler.

The Opposition's Efforts

The Humane Society of the United States has been the national leader in efforts to stop cockfighting in the United States. Local and statewide organizations that have been very engaged against the cockfighting issue legislatively or otherwise include Animal Protection of New Mexico; the Louisiana SPCA; citizen groups in Arizona, Missouri and Oklahoma, and scores of local humane societies.

Cockfighting has always been criticized by animal protection organizations. After England banned the activity early on, over half the individual states in the United States followed suit in the 1800s, with much of the rest of the country banning cockfighting in the early 1900s. Animal protection advocates continued targeting cockfighting throughout the latter half of the 20th century, with a dramatic resurgence in legislative efforts to eradicate cockfighting beginning in 1998, spearheaded largely by The Humane Society of the United States.

The Final Nail

In 1998, cockfighting remained legal in just five states; Arizona, Louisiana, Missouri, New Mexico and Oklahoma. Elsewhere, it was a felony in 17 states

Cockfighting is a blood sport, now illegal in the United States and most of Europe. People bet on the outcome of fights and the birds greatly suffer and often die as a result of the staged fights. (AP Photo/John Gress)

and a misdemeanor in 28. That year, citizens in Arizona and Missouri gathered enough signatures to place cockfighting bans on their ballots, both of which passed overwhelmingly.

In 2000, animal protection advocates in Oklahoma gathered nearly 100,000 signatures to place a proposal to ban cockfighting on the ballot. Cockfighters went to court to prevent a vote on the issue, but their efforts only delayed a vote until 2002. On Election Day 2002, Oklahoma voters approved the ban, despite the expenditure of over half a million dollars by cockfighters opposing the ban.

Neither Louisiana nor New Mexico allow for citizen-inspired ballot initiatives, so animal advocates in those states focused their battle to ban cockfighting on their state legislatures. With neither state wanting to harbor the distinction as the last refuge of the bloodsport in the United States, newspapers throughout both states ran editorials calling for the legislature to ban cockfighting.

On March 12, 2007, New Mexico's Governor Bill Richardson signed into law a ban on cockfighting. When the Louisiana legislative session convened two months later, a cockfighting ban was high on the legislative agenda. The Louisiana Gamefowl Breeders Association, which had for years held off a cockfighting ban by hiring a top lobbying firm in Baton Rouge, saw the writing on the wall and agreed to a ban, with a phase-out over three years. Animal advocates countered and successfully whittled the phase-out

period down to one year. On August 15, 2008, Louisiana became the 50th and final state to outlaw cockfighting.

During this time period, the U.S. Congress approved a ban on the interstate transport of any animal for an animal fighting venture. While the original language approved by Congress provided for a felony penalty, cockfighters hired former U.S. Senator Steve Symms to lobby on their behalf. Their efforts managed to reduce the penalties to a misdemeanor until 2007, when Congress upped the penalties with the passage of the Animal Fighting Prohibition Enforcement Act.

Looking Ahead

As of 2008, cockfighting is a felony in 37 states, and animal advocates continue efforts to make cockfighting a felony in all 50 states. The Humane Society of the United States has documented that cockfighting remains far more pervasive in the states with misdemeanor penalties. In Alabama, for example, where the maximum penalty is a $50 fine, cockfighters see the punishment as just the cost of doing business.

Despite the fact that cockfighting is prohibited nationwide, three monthly magazines openly serve the cockfighting underworld. *The Feathered Warrior*, *Grit & Steel,* and *The Gamecock* are available by subscription, at some cockfighting pits, and at small feed stores in remote areas.

As testament to the success of animal protection groups, circulation for each of these magazines has dropped by roughly half over the past 10 years, according to circulation reports that all periodicals must file with the U.S. Postal Service.

Shut Down by Scandal

With so much gambling money exchanging hands at cockfights, it is not surprising that payoffs have been made to some local officials. Cockfighting has been repeatedly linked to public corruption.

In 2004, South Carolina Agriculture Commissioner Charles Sharpe was indicted, and later convicted, of taking a $10,000 payment from a cockfighting group and then trying to pressure a local sheriff to leave a cockfighting pit alone.

In the following year, 2005, the FBI raided a large cockfighting pit in Cocke County, Tennessee. It was later revealed that the cockfighting raid was just one part of a larger investigation into the local sheriff's department. FBI agents believed many in the sheriff's department were taking bribes from cockfighters and other criminals. Ultimately, numerous deputies—including the number two man in the Cocke County Sheriff's Department—were prosecuted.

In 2006, the FBI indicted four members of the Honolulu Police Department, after evidence surfaced that officers had tipped cockfighters off about pending raids and had shared sensitive information with cockfight organizers.

In 2007, news reports began to circulate in Virginia that the sheriff of Page County was under investigation for taking bribes from a local cockfighting pit owner. After raiding the Page County cockfighting pit, the U.S. Attorney's Office for the Western District of Virginia initiated an investigation into the local sheriff's department. This led to the indictment of Sheriff Danny Presgraves, in October 2008, on a range of charges, including the allegation that he

had taken bribes from cockfighters in exchange for not raiding a local cockfighting pit.

Cockfighting remains both legal and popular in the Philippines, Mexico, and Puerto Rico, as well as some other places. The persistence of cockfighting in these countries helps keep the dying U.S. industry alive, by providing an overseas market for the breeders of gamecocks. However, pressure on federal authorities to crack down on these illegal shipments promises to ensure that, in the United States, cockfighting is on its last legs.

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John Goodwin

COMPANION ANIMALS

Although often used as a synonym for pets, the term companion animals refers primarily to those animals kept for companionship. Pets is a broader category than companion animals, and includes animals kept for decorative purposes (for example, ornamental fish, birds), those kept for competitive or sporting activities (dog shows, obedience trials, racing), and those kept to satisfy the interests of hobbyists (specialist animal collecting and breeding). In practice, of course, any particular pet may overlap two or more of these different subcategories.

The practice of keeping animals primarily for companionship is certainly very ancient, and may have contributed to the process of animal domestication at least 12,000 years ago. Recent hunter-gatherers and incipient agriculturalists are well known for their habit of capturing and taming wild mammals and birds, and treating them with affection and concern for their well being. Among the native peoples of Amazonia, pet keeping is particularly widespread. The list of species commonly kept includes various monkey and rodent species; coati, opossum, deer, peccary and tapir; wild cats such as margay, ocelot and, occasionally, even jaguar, and a huge variety of birds, especially parrots and trumpeters. Strangely, although many of these animals belong to species that are hunted and killed routinely for food, as pets they are only rarely killed and eaten. In many of these cultures the art of animal taming and pet keeping is cultivated particularly by women, some of whom acquire a considerable local reputation for their skills in this area.

The existence of pet keeping in hunter-gatherer societies raises fascinating questions about the function of this activity. Until recently, it was widely assumed that the keeping of pet animals for companionship was a largely Western pastime associated with unusually high levels of material affluence. Viewed from this perspective, pet keeping tended to be categorized as an enjoyable but unnecessary luxury. During the last 30 years, however, medical evidence has accumulated suggesting that companion animals contribute to their owners' mental and physical health. Close and supportive

human relationships are known to exert a protective influence against many common life-threatening diseases, probably by buffering people from the negative health consequences of chronic life stress. It appears that companion animals may serve a similar function. In various studies it has been found that pet owners exhibit fewer physiological risk factors for heart disease than non-owners, as well as demonstrating improved survival with cardiovascular disease. In addition, pet owners tend to make less use of public health services, and display less deterioration in health in response to stressful life events. The presence of pets also induces short- and long-term reductions in heart-rate and blood pressure in people exposed to experimental stressors. These findings suggest that companion animals provide a means of augmenting the social support people receive from each other, and that this role may be just as important in hunter-gatherer societies as it is in our own.

Despite the apparent contribution of pets to human health and well being, the standard of care provided for these animals by their owners is often less than ideal. Unrealistic expectations combined with ignorance of animals' basic needs are the most common sources of companion animal welfare problems. Many pets are kept in unsuitable environmental conditions, and provided with inadequate diets and insufficient exercise and mental stimulation. Owners' efforts to control

A man and companion dog enjoy a scenic view. (Photos.com)

their pets' behavior can also result in the use of inappropriate and mistimed punishments that may cause the animals considerable distress. The global trade in exotic pets, especially wild birds, reptiles, amphibians and fish, has seriously depleted some wild populations, as well as causing inestimable suffering and death during capture, handling and transport. Since the middle of the 19th century, companion animal breeders have created a wide range of hereditary breed defects, especially in dogs, while pursuing their own arbitrary standards of beauty. Many of these defects condemn the animals to lifetimes of distress and discomfort, and some require corrective surgery. Painful cosmetic mutilations, such as tail-docking and ear-cropping, and elective surgical procedures such as declawing and debarking designed to eliminate behavior problems, are widely performed particularly in North America. The fate of unwanted pets is also a major cause for concern, although reliable figures on the numbers of animals involved are not available. Estimates range from 8 to 15 million dogs and cats lost, abandoned, or disowned by people each year in the United States, of which approximately 30–40 percent are reunited with their owners or adopted. The remaining 60–70 percent are killed humanely after a brief statutory holding period.

These darker aspects of pet keeping have prompted some animal advocates to argue that the entire phenomenon constitutes a violation of animals' rights and interests, and that pet keeping should be abolished alongside other forms of animal exploitation. This position ignores the fact that many human-companion animal relationships appear to be mutually beneficial and rewarding to both human and animal participants. It also tends to discount the potentially positive effect of these relationships on our perceptions of animals in general.

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James Serpell

COMPANION ANIMALS, WELFARE, AND THE HUMAN-ANIMAL BOND

Animal behavior and animal welfare are linked in many ways. The manner in which humans interact with and change animals' behavior, as well as the behavioral outcomes quantifying animal welfare, are intertwined with each other.

Animals have been a part of human civilization for thousands of years, and have been used for a number of different reasons, ranging from food production, to helpers in the hunt, to human companions. While physical stature is often grounds for their use in our society, their behavior is a major reason that we own them for companionship. Their behavior can also be a reason for fracturing the human-animal bond, leading to abandonment and euthanasia.

There are numerous examples in society of humans domesticating animals

for use. Cattle are domesticated for food production, as well as for beasts of burden. Horses are domesticated for beasts of burden, as well as for companionship. Dogs are domesticated for hunting, protection, and herding, as well as purely for companionship.

Not only is innate or natural behavior important, but learned behavior is also important. Currently there is no way to measure which has more influence on the outcome—it's the old nature vs. nurture—but we must understand that no animal lives in a vacuum. Certain breeds may be more predisposed to certain behaviors, but it is necessary to take the learned component into consideration.

Border collies, for example, have historically been bred for herding sheep; their behavior defining who they are. In addition to their selected behavioral ability to herd, they must also be responsive to their human handlers for guidance. Physical conformation plays a role in the dog's ability to perform its job, but without the herding behavior, they would be of little use to a shepherd. On the flipside, the herding behavior can become a problem for an owner who adopts a border collie for companionship in an urban environment.

Animal behavior, learning, and training have been studied for years. In contemporary times, the research of people such as B. F. Skinner and Ivan Pavlov has paved the way to study how animals and humans learn, via classical and operant conditioning.

As an overview, classical conditioning, the emotional aspect of learning and behavior, consists essentially of bringing internal reflexes under the control of a previously unconditioned stimulus. Most people are familiar with Pavlov's dogs (the bell is linked to food, and the dogs then respond to a bell by salivating). But classical conditioning happens with animals all the time, especially when fear responses are taken into consideration. For example, the average dog has not been conditioned to enjoy going to the veterinarian's office. No matter how kind or patient the veterinarian is, the dog is unable to cognitively understand that he or she is there to maintain good health or that the veterinarian has the dog's best interest in mind. The dog learns that the veterinarian causes discomfort with needles, ear cleanings, and anal gland expressions. The dog then becomes classically conditioned to associate the veterinarian's office or white lab coat with fear.

Operant conditioning is the process by which the likelihood of a specific behavior is increased or decreased through reinforcement or punishment each time the behavior is exhibited, so that the animal associates the pleasure (or displeasure) with the behavior. The seminal research was done by B. F. Skinner, with his development of the Skinner Box, where a rat learned that food was released when it pressed down on a lever. With this simple yet elegant study, Skinner was able to expand with more studies evaluating the shaping of behaviors, different models of pairing unconditioned stimuli with reinforcements, and different intervals of reinforcement.

A current example of humane operant conditioning in action is clicker training. The dog is conditioned (via classical conditioning) to understand that the sound of a click means that a piece of food is coming. When the owner observes a wanted behavior, such as when they are trying to teach the dog to sit, the owners clicks, marking the wanted behavior exactly (operant conditioning). The dog will then be more likely to sit. Eventually the owner

pairs a command with the action, and now the dog has learned a new trick!

Even based on these proven methods of modulating animals' behavior, there are people who still heavily rely on more punishment-based methods. These methods can be used successfully in limited circumstances, such as with emotionally-stable military dogs and their well-trained handlers. This being said, the vast majority of average pet owners have a difficult time using these methods, let alone wanting to use these methods if more humane options are offered to them.

Unfortunately, neither the owners who select these trainers to work with their dogs nor the trainers themselves always understand the scientific principles behind operant and classical conditioning, including punishment. Owners may find it difficult to stop a trainer from performing a certain training technique, such as helicoptering (swinging the dog in a circle by its leash and collar), because they just paid a professional dog trainer to help them with their dogs' problem behavior. Also, a lot of these trainers come highly recommended, either by friends or by statements on their websites touting their training prowess. However, since trainers are currently not required by any state to obtain a dog training license (unlike hairdressers and plumbers), there is no governmental oversight of the correctness or humaneness of their training techniques, abilities, or credentials.

Even though these inhumane and scientifically incorrect methods of training are commonly used, there are very few instances of these trainers being charged with animal cruelty or abuse. Organizations that promote humane and scientifically correct training have spoken out against primarily punishment-based training methods (American Veterinary Society of Animal Behavior, 2008). However, trainers have been sued for injuries to dogs in their facilities, as well as charged with animal cruelty.

Owners who choose to use these methods need to understand the principles of behavior modification. For the animal to be punished appropriately, certain rules must be followed: the punishment has to happen immediately (within a few seconds); it cannot not be too aversive (to avoid causing fear and anxiety); it should not directly relate to the owner (to avoid a classically conditioned aversion to the person); and it should work after a few tries. If an owner or trainer has to continually deliver punishment, such as collar corrections, it is not working.

So, with all of these methods in their back pocket, owners can, and do, affect an animal's good and not-so-good behavior in many ways, and this also affects the human-animal bond. For example, a family may reinforce a dog's begging from the table, such as by periodically feeding it from the table. Yet when the dog climbs up onto the chair for food, they get frustrated when the dog won't listen to them. In essence the dog has been listening very well! If the dog performs a certain behavior, whether it is sitting looking cute or jumping on the chair, it is reinforced with food that is much tastier than its dry kibble.

Another unwanted behavior that some cat owners reinforce is the cat waking them up in the middle of the night, either by meowing, pawing at the door, or pawing at their face. The owner may feel guilty. Perhaps they forgot to feed the cat that evening? Maybe they didn't give the cat enough food? So, understandably, they get up and feed the cat. Well, the cat just learned a valuable lesson! The owner continues with this night-feeding

until they are sleep-deprived, even as they remember that they fed the cat a whole bowl of food that evening. The same methods by which these animals learned inappropriate behaviors can be used to train them to learn appropriate behaviors as well.

It has been shown that behavior problems are a primary reason for euthanasia or relinquishment to animal shelters. A lot of the problems can, and should, be addressed in a proactive manner, lest they break the human-animal bond. House soiling, unruliness, and aggression are common reasons for relinquishing dogs to shelters, and inappropriate elimination and aggression are common reasons for relinquishing cats. Not only are these reasons for relinquishment or euthanasia, but they are also reasons for a diminished human-animal bond. Perhaps the cat that urinated outside of its litterbox is now an outside cat, with an increased chance of being severely injured. While the potential primary reason for euthanizing a cat that was hit by a car is its injuries, if the veterinarian digs deeper, the real reason for euthanasia was that the cat was made to be an outside cat because it urinated outside of the litterbox.

But as veterinarians look to solving these problems, they use humane behavior modification methods of classical and operant conditioning. In more recent times there has been an effort to bring this information to owners, shelters, and other organizations, such as those training working dogs. The American College of Veterinary Behaviorists is a recognized specialty of the American Veterinary Medical Association, consisting of veterinarians fulfilling special postgraduate education and research responsibilities. Another organization is the American Veterinary Society of Animal Behavior, a group of veterinarians who share an interest in understanding, teaching and treating behavior problems in animals. The Animal Behavior Society promotes the study of animal behavior, and also has a certifying arm for people who have reached a certain level of academic training. These organizations, among others, have produced position statements on the behavior and welfare of animals in regard to behavioral modification and training. There are other organizations related to dog and horse training, as well as captive and laboratory animal welfare and training. With these organizations, there are a good number of resources for owners to seek help with their pets.

With help from properly trained people, owners can help change the behavior of their pets. What owner wouldn't want a dog to sit when they came home, instead of jumping on them, or a bird who didn't scream when they left the room, or a cat that didn't scratch the furniture? If an owner provides opportunities for an animal to perform the correct behavior, rewards such behavior, and properly uses humane punishment techniques, the animal stops performing the inappropriate behavior and, subsequently, performs the appropriate behavior. The methods of classical and operant conditioning apply to everyday life, not just in the laboratory. We, as humans, are often focused on stopping a behavior, but fail to focus on what the animal does do correctly and reward that behavior.

In conclusion, there is obviously a close relationship between an animal's behavior, its welfare, and the human-animal bond. Owners need to understand their pets' behavior, how they influence it, and how they can change it for the better using humane techniques, in order to decrease relinquishment and euthanasia

for problem behaviors. Humans need to appreciate the uniqueness and wonder of their animal companions.

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Melissa Bain

CONSCIOUSNESS, ANIMAL

There would be no concern for animal welfare and no political movement towards animal rights unless people were convinced that some animals are conscious, sentient beings whose feelings and experiences have the positive and negative subjective qualities that make some experiences pleasurable and others unbearable. What convinces people that this is true? For many it is plain common sense—they believe they can see when an animal is happy or sad. But others have been trained to be skeptical of such appearances, and they seek scientific justification for claims about animal cognition and consciousness. Although consciousness is not the only morally significant property, others might include satisfaction of desires and goals, consciousness is perhaps the most significant for animal ethics. The 19th-century British philosopher Jeremy Bentham summed it up with the question "Can they suffer?" although, perhaps "Can they experience pleasure?" is just as relevant.

The past decade has seen the establishment of the field of animal cognition through the publication of textbooks, anthologies, and a dedicated journal. While much of the work on animal cognition is centered on primates, domestic dogs are rapidly becoming a model species for asking evolutionary questions about cognition, and there is fascinating work on birds, especially members of the crow family, and on insects, especially honeybees, and other species too numerous to mention here. However, most of the scientists contributing to this boom have explicitly bracketed questions about consciousness and have focused instead on cognition, roughly defined as the capacity of animals to flexibly and adaptively exploit the sources of information in their physical and social environments. Many, but not all, of the scientists doing this work share the common sense view about animal consciousness, but most of them believe that the topic is scientifically intractable. Nevertheless, as the range of flexibility and adaptiveness of animal cognition comes into better focus, it is hard to think that this doesn't tell us something about animal consciousness.

Scientific progress in understanding the molecular, neural, genetic, and hormonal mechanisms underlying animal behavior has been even more rapid over the past decade. Because of its clinical significance, pain has been studied intensively, but there has also

been a boom in affective science—the scientific study of feelings and emotions—more generally. In affective neuroscience and behavioral genetics, where the scientific agenda is to discover underlying mechanisms for pain and stress responses, mice and rats are the most common animal models, although rhesus monkeys are also widely used by neuroscientists. Physiological, for example, hormonal, and behavioral approaches to affective science cover a wider range of species, from mink to trout. This diversity is partly due to the agenda of applied animal science for managing animals in agricultural and wildlife settings; hence, even fish have been studied for their responses to painful stimuli. As with animal cognition, most who work in the affective sciences have avoided addressing questions of consciousness directly. This sometimes puts these scientists in the difficult position of arguing that the animal models they study are good models for human emotions and feelings, while arguing that the lack of equivalence between humans and animals justifies the pain and distress that is caused by their experiments. However, by limiting themselves to objective behavioral and physiological measures, most scientists manage to sidestep the topic of consciousness in their professional publications.

There are, of course, many concerned scientists who share the common sense view about animals. Nonetheless, they take a more skeptical stance in their scientific work, evincing a "show me" attitude that refuses simply to go along with common sense. Scientific skepticism has very often trumped common sense (the earth does move!), and it must be taken seriously by those concerned with the ethical treatment of animals, because scientists' opinions are very important in forming laws and rules about how animals should be treated in research and agriculture. Sometimes special interests override consistent scientific treatment in the formulation of these rules. For example, based on the recommendations of a scientific panel, the British Animal Scientific Protection Act draws a line between vertebrates and invertebrates, but makes an exception to give the common octopus the same protection from harmful treatment as any mammal, bird, fish, reptile, or amphibian. Are octopi special among invertebrate animals in having conscious experiences? The United States Animal Welfare Act was amended in 2002 to exempt rats, mice, and birds. Despite the apparent arbitrariness of these lines, it nevertheless seems reasonable to draw a line somewhere, and scientific consensus may draw the line less inclusively than common sense would.

The central question here is the *distribution question:* Which animals are conscious and which ones aren't? Most people think that there's no black-and-white answer to this question. Perhaps earthworms, or goldfish have some degree of consciousness, just not the same as ours. But what would that mean? Could it mean that goldfish see, hear, smell, and taste things dimly (or in pale colors)? Or does it just mean that they are aware of fewer things than we are? We also know of many examples where animal senses are more acute than humans. Honeybees, for example, have five different color vision cones compared to our three, so they can differentiate between flowers that look the same to us. Do they have a higher visual consciousness than humans? Such questions are examples of the *phenomenal question:* What are the conscious

experiences of other animals like? Before discussing the skepticism that many scientists have about such questions, it will be useful to say a bit more about what is meant by consciousness.

Meanings of Consciousness

The word consciousness can have several different meanings. When talking about animal consciousness, only some of these meanings are controversial. There are two senses of consciousness so ordinary that no one disputes their application to many animals. One is the sense in which animals can be awake rather than asleep or in a coma. Another connects to the ability of animals to sense and respond to features of their environment. It can be said that they are conscious or aware of those features. Consciousness in both these senses is identifiable in many different species of animal, and can be studied scientifically. Fish sleep, and earthworms are, in the relevant sense, awake and aware of several things in their environments.

Two other senses of consciousness are controversial when used to talk about nonhuman animals: conscious experience (also called phenomenal consciousness) and self-consciousness. These are also the senses most relevant for animal welfare and animal rights.

Conscious experience is difficult to define, but one way to get at it is to think about what happens when you see, smell, hear, taste, or feel things. Think about looking at a horse, for example. In the presence of a horse, you have more than the abstract knowledge that there's a horse in front of you; the horse *looks* a particular way, it *smells* a particular way, and if you were to lick it, it would *taste* a particular way, too. Because the word consciousness is ambiguous, philosophers also use term *qualia* to describe the experiential qualities of phenomenal consciousness.

Self-consciousness refers to an organism's capacity to understand itself as an individual that is similar to but distinct from others. Of course, every animal normally has some way of discriminating itself from others; animals typically don't eat themselves, for example. But self-consciousness is generally characterized as involving some sort of self concept. The some sort of here is deliberately vague, because it is not at all obvious what that self concept should contain. One idea that has been very important is that a self concept should contain (and may even be derived from) a capacity for thinking about the thoughts (and other mental states) of others. A self concept, in this view, involves the fact that I have certain perceptions, experiences, thoughts, and desires, while you may perceive and think about things differently and have different desires. This is often called having a theory of mind, and because it involves thoughts that are themselves about thoughts, it is also sometimes called higher-order thought.

When people claim that it is impossible to objectively answer the question of whether nonhuman animals are conscious, they are usually indicating the difficulty of gathering good scientific evidence for either phenomenal consciousness or self-consciousness in animals. Some theorists think that these two things are related, that you have to have higher order thought or theory of mind to have phenomenal consciousness, but others think that phenomenal consciousness is a more primitive capacity that doesn't require the complex ability to think about oneself.

Testing Analogical Arguments for Consciousness

Direct evidence for phenomenal consciousness in animals is difficult to obtain. With people, we can ask them to describe their experiences, and although we must always be alert to the possibility of false reports, we can at least establish a degree of within and between subject reliability in their self-reports under various conditions, which gives us some confidence that they are describing something real. In the absence of such a rich means of communicating with animals, arguments for animal consciousness depend ultimately on analogies between humans and animals. Analogy arguments that are based purely on behavioral, anatomical, and physiological similarities have an inherent weakness: critics can always exploit some dissimilarity between animals and humans to argue that this is the relevant factor the animals are lacking. Stressing evolutionary continuity between humans and other animals may help a bit, but evolution occasionally produces novel traits, so there is no logical requirement that even our closest relatives have some trait just because humans have it. In the absence of more specific theoretical grounds for saying that animals are conscious, the combined argument is still vulnerable to objections based on specific dissimilarities. One way to get beyond the weaknesses in the similarity arguments is to try to give a theoretical basis for connecting what we observe about animals to phenomenal consciousness.

A theoretical connection would perhaps be possible if we could say what phenomenal consciousness is for by specifying its biological function(s). A good functional account would bring physiology, anatomy, and behavior together, showing how the mechanisms serve the functions by making specific behavior possible. In defending his higher-order thought theory of phenomenal consciousness, the philosopher Peter Carruthers argues that it evolved to represent the mental states of others, and he cites the absence of evidence that other animals, except perhaps chimpanzees, can do this to argue that they probably lack phenomenal consciousness. However, there are other possible functions of phenomenal consciousness in certain kinds of learning and flexible cognition, which would support a broader answer to the distribution question.

An article such as this perhaps raises more questions than it answers, but the topic would be of little philosophical interest if it were otherwise. And despite the fact that there have been centuries of argument about animal minds and consciousness, recent developments in the neurosciences and animal cognition that are yet to be fully integrated make this an exciting time for philosophers to be working in this area.

See also Affective Ethology; Animal Subjectivity; Whales and Dolphins, Sentience and Suffering in

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Colin Allen

CONSERVATION ETHICS, ELEPHANTS

He was orphaned at three when he saw his family shot to death. In the ensuing chaos, he was grabbed and taken to a compound several hours away. There, he was able to join up with a few others sharing similar fates and, despite the odds, managed to survive. However, the early brutality and losses experienced left a legacy. When he and two peers reached teenagehood, a violent rampage began that ended in the eventual killing of over one hundred. The fact that all victims were from a completely different ethnic group raised fears about the beginnings of a civil war. Authorities were called in and, within weeks, the three youths were gunned down. The incident appeared quelled, but soon it became evident that the incidents were part of a wider disturbance.

A scene that could fit any number of places around the world—Belfast, Jerusalem, a Native American reservation, or Kosovo, to name only a few. Yet however poignant, this tragedy does not seem relevant to conservation. Not so. Indeed, the three youths are African elephants, and their victims threatened white and black rhinoceros. They have been diagnosed with posttraumatic stress disorder (PTSD), a condition that often develops in humans who have experienced the trauma of war or abuse. The young bulls' story and their diagnosis signal the dramatic change taking place in science, society, and conservation.

We have entered a new paradigm that brings humans and all other animals under the same scientific and ethical umbrella. Theories and data have finally accumulated to the point where even skeptics agree that the differences between humans and other species are small relative to what we share. Down to neuronal detail, human and elephant minds and brains function in much the same way. Mammalian cortico-limbic structures and mechanisms are highly conservative evolutionarily. From rodents to humans, we all share specific areas in the brain responsible for coordinating stress-response behavior, analysis of visual coding and processing, and auditory, somatosensory, and memory-sensory integration. While there are species-specific differences, all mammals share the same generalized emotional brain that includes the prefrontal cortex, cingulate cortex, amygdala, insula, hypothalamus, brainstem and associated physiological (e.g., autonomic, cardiovascular, immunological, analytical), psychophysiological, and behavioral traits (e.g., extinction learning, fear conditioning; attachment and social bonding, pain, aggression; anxiety, and facial recognition). Furthermore, cerebral lateralization of a variety of adaptive capacities has been documented in

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Part of this essay is drawn from material appearing online in the *Stanford Encyclopedia of Philosophy* (Edward N. Zalta, ed.) in the entry on "Animal Consciousness." Copyright by Colin Allen.

diverse vertebrates: fish, amphibians, reptiles, birds, and mammals.

Like the human brain, the elephant brain is large. In adulthood, the elephant brain attains a weight of 5000g (.17 ounces), compared to 1400g (.03 ounces) for humans. Elephants exhibit processes reflective of social brain structure and functions found in other highly social animals. Again, similar to those of humans, primates, and dolphins, elephant brains at birth are only a fraction of the size they attain in adulthood. At birth, an elephant's brain is approximately 35 percent adult size and characterized by a high encephalization quotient, a well-developed neocortex, a large complex temporal lobe and, significantly, a cortico-limbic system which includes the fornix, hippocampus, inferior parietal lobe, amygdala, ventromedial thalamic nucleus, and the gyrus cinguli and orbitofrontal cortices that are involved in social attachment, the processing of social, emotional, and visual information, long-term memory, empathy, and stress regulation. A variety of cognitive capacities including tool-use, exceptional long-term and episodic memory, intentionality, complex chemosensory and auditory communication, contextual learning, reasoning, problem-solving capabilities, and the ability to perform premeditated acts have been found in elephants.

Similarities extend to culture and social processes. All young mammals depend on adults, which means that their brains are very sensitive to the surrounding environment as they mature. When the young bulls saw their families killed and had to learn how to survive on their own, their brains were affected. What they experienced is not that much different neuropsychologically from what occurs in human children who experience a similar violent loss of family and community and face an uncertain future alone. Elephant and human brains are rightfully described by a unitary model of brain, behavior, and mind.

None of this is really new. Tragically for animals, this kinship has been exploited. Countless victims have suffered in captivity and at the hands of biomedical experimentation, testing, and research because of the similarities between their physiology, behavior, and brains and those of humans. On one hand, the full spectrum of the animal kingdom—planaria, fruit flies, chimpanzees, sting rays, cats, rats, frogs, and myriad other species—has been considered sufficiently comparable to humans to use as experimental surrogates. On the other hand, ethical parity has been denied. Elephant grief, tool-use, vocal learning, and self–recognition—all capabilities that define what it means to be human—have been ignored when it comes to recognizing elephant rights. However, the new trans-species science compels a parallel revision of ethics, research and conservation based in animal rights.

In the past, animal rights and conservation have been separate. Animal rights insist on a parity among species where animals are deserving of the same ethical and legal considerations given to humans. Protectionism does not generally support the sacrifice of individual wellbeing in favor of the larger group, or of one species for another based on an artificial hierarchy of value. In contrast, conservation focuses on populations and species, and has tended to be more anthropocentric, in the sense that reasons for protecting species are shaped by Euro-American cultural priorities and the structure of the great chain of being. But this disciplinary and political separation is literally killing wildlife.

An elephant strolling through the dusty Tsavo East National Park. (AP Photo/Karel Prinsloo)

The efforts of many notwithstanding, conservation is failing. In 2008, predictions were that 25–36 percent of all mammals were threatened with extinction. As former editor of the premier conservation science journal, *Conservation Biology,* Reed Noss states that it is not for lack of science but of political willpower to put into practice what we know. Elephants are a case in point.

Today, only remnants of elephant society are found in Africa. It is well-known that human-caused starvation, hunting, mass culls, and poaching have reduced elephant numbers in Africa from over 10 million to less than a few hundred thousand. Human encroachment has shrunk elephant habitat to a fraction of its original continental expanse. Such extensive and intensive impacts have even caused genetic change. Elephants lacking tusks have been documented outside Uganda. In 2002, out of the 174 elephants at Addo National Park, South Africa, 98 percent of the females were without tusks.

The threat of elephant extinction is very real, in terms of pure numbers, and in consideration of the degree to which land and animals are pressed to change. And there is something more dire. In Kenya, the heart of elephant lands, the human population has jumped from 8.6 million in 1962 to over 30 million in 2004, and between 1973 and 1989 elephant numbers plummeted from 167,000 to 16,000. As a result, there are no places in Africa or Asia that can claim elephant herds even remotely resembling those of two

centuries ago. Even in Amboseli, Kenya where, at a very localized scale, social structure is relatively intact, elephant family life cannot what it used to be at all. Gone is the continent-extending octopus of anastomosing elephant groups. Habitat fragmentation and the pressures of poaching, on the heels of widespread genocide during the first hundred years of colonization, impose an ever-present sense of impending death.

In North Luangwa National Park, Zambia, 93 percent of the population has been killed, and traditional herds composed of mothers and allomothers are virtually absent. According to studies by Delia and Mark Owens, females reproduce at much younger ages (48 percent of births were by females less than 14 years, compared with a normative mean age of first birth at 16 years). Thirty-six percent of groups have no adult females, one quarter of the units consist only of a single mother and calf, and seven percent of groups are sexually immature orphans. In Mikumi, Tanzania, 72 percent of the population was similarly affected, and in Uganda, elephants live in semi-permanent aggregations of over 170 animals, with many females between the ages of 15–25 years having no familial association or hierarchical structure. Infants are largely reared by inexperienced, highly stressed single mothers without a detailed knowledge of the local plant ecology, leadership, and support that a matriarch and allomothers provide. Disoriented teenage mothers raise families on their own without the backbone of elephant society to guide them. They are expatriates in their own land, lacking even the meager protection that refugee camps can sometimes afford to their human neighbors. Parks, which might be considered the equivalent of refugee camps, offer no sanctuary from marauding soldiers and villagers hungry for ivory and machine-gun sport. Like the majority of remaining elephant habitat in Africa, in all of Asia, the total population is estimated to be as low as 35,000 and dwindling fast.

Yet despite the science, the recognition of widespread elephant genocide, and the charismatic spell that elephants cast, conservation continues to use methods that undermine elephant wellbeing and culture. Culling or systematic killing has now been reinstated in South Africa after a 10-year moratorium, even though a scientific team gathered to make a formal assessment could not provide statistically significant evidence for either elephant-caused human deaths, crop damage, or a threat to ecosystem integrity. Human overpopulation and overconsumption have pushed elephants and other wildlife into tiny remaining parcels of land.

Decreased protection and a revival of the ivory market have led to an increase in elephant massacres and displacement. Along with South Africa, Namibia, Zimbabwe, and Botswana are participating in a United Nations-sanctioned auction of more than 100 tons of stockpiled ivory for exclusive purchase by Japan and China. The sale started on October 28, 2008 with one million tons from Namibia and continued into November of that year. The decision to permit the sale was approved by the Convention of Trade of Endangered Species (CITES). Conservationists predicted that this would escalate the dramatic increase in illegal poaching that is decimating herds as a result of more widespread impoverishment and chaotic violence in elephant habitat lands. One prediction estimates that elephants may very well be extinct in about a decade. Without improved conservation and enforcement of anti-poaching laws, the

majority of large elephant populations are predicted to be extinct by 2020. When an international ban on ivory was introduced in 1989, African elephant mortality rate from poaching was 7.4 percent. Today, it is eight percent. Even if numbers are ignored, the fact is that elephant culture is already bending to the point of breaking socially and psychologically. The present and future for elephants is dire.

If, as science dictates, elephants and all animals have hearts, minds, and brains like ours, then culls, translocation, and forced confinement in zoos and restricted parks are the same as genocide, relocation, incarceration, and ghettos, with the same effects no matter what the species. Elephants have sustained nothing less than repeated genocidal ethnic cleansings since colonial occupation. We know how violence transmits across generations in humans neurobiologically and culturally. Now we realize that animals are vulnerable, too. The angry young bulls are only the tip of a deep and broad iceberg. What is happening to elephants is happening to all wildlife. Already cougars, moose, deer, lions, and bears have shown symptoms of trauma. A new conservation is needed.

Along with cognitive ethology, transspecies psychology is a new field that has begun to lay down the foundation for an animal protection conservation. Transspecies psychology is the formal study of how animals think, feel, and behave. In contrast to conventional psychology, the neologism signifies that a common model of psyche applies for all animal species, including humans. It uses the same language and concepts used to study and achieve human wellbeing for all species. How do we move this new animal protection conservation forward?

The first essential step is the creation of an elephant conservation based on principles of human rights and health. This entails abolishing culling and eliminating the social engineering of elephant society, as for example by translocation. The new trans-species science brings ethical and legal standards to bear on elephants and other animals to match those granted to humans. Elephant conservation is designed to protect all aspects of elephant life—that is, the psychological, social, physical, and emotional wellbeing of individuals and society.

Second, a multistep strategy needs to be developed to help move toward the ultimate goal: humans and elephants, indeed all wildlife, learning how to coexist as they once did before colonial occupation. A number of intermediate solutions have been suggested. While not perfect, they would take the immense pressure off elephants: well-protected connecting corridors between parks, expansion of parks to mega-parks, education and financial incentives for people who are most affected by or live off poaching. This will also help elephant groups that exist in scattered pockets across the continent to reconnect and restore their former culture.

Philosophically and politically, animal protection conservation is also tied to indigenous human rights. Traditionally, many tribes, such as the Acholi in Uganda whose totem is the elephant, related very differently to elephants and other wildlife. The rich diversity of wildlife that existed before European colonization is testimony to this. Further, many tribes have, like elephants, been forced from their traditional lands and suffered war and severe disruptions to their cultures. Steve Best, a professor at the University of Texas, speaks about the parallels between human and species apartheid in South Africa:

> Apartheid was a brutal system of class and racial domination maintained by repression, violence, and terror, whereby a minority of wealthy and powerful white elites exploited and ruled over the black majority . . . . [but] under the pseudo-progressive guise of progress, rights, democracy, and equality, leftists, communists, democratic humanists, black nationalists, and community activists murder animals no different than white, racist, Western, capitalist, imperialists. Consider, for instance, the Zimbabwe "Campfire Conservation Association" that lobbies the United States Congress for funds to kill elephants for community benefit. Through a blatant discourse of objectification, Campfire member Stephen Kasere unashamedly reveals his speciesist outlook: "We just want the elephant to be an economic commodity that can sustain itself because of the return it generates. Ivory is a product that should be treated like any other product." (Best, http://www.drstevebest.org/Essays/TheKillingFields.htm)

Animal protection conservation includes a restoration of these ancient bonds and ways of interacting. As Nelson Mandela wrote, "A new society cannot be created by reproducing the repugnant past, however refined or enticingly repackaged" (Mandela, 2003, p. 510). Neither can a new conservation be merely a repackaging. Conservation, like human rights, needs to be decolonialized in concept and practice to create an ecocentric elephant conservation—one based on trans-species ethical parity and service to one another.

A trans-species vision and way of life is simpler than it might first appear. Human rights activists Myles Horton and Paolo Freire put it best: "We make the road by walking," in this case, by envisioning what we need ourselves to be able to live in peace with friends and family, for other animals. But there is also another important example. Dr. Daphne Sheldrick, D.B.E., who has rescued over 80 orphaned elephants writes:

> During the 50 plus years that I have been intimately involved with Elephants in Africa, and the rearing of over 80 orphans, I am astounded about how forgiving they are, bearing in mind that they are able to recollect clearly that their mother, and sometimes entire family, have perished at the hands of humans. Our Elephants arrive wanting to kill humans but eventually protect their human family out in the bush, confronting a buffalo, or shielding their surrogate human family from wild, less friendly peers. That is why I say that they are amazingly forgiving, because there can be nothing worse in life for an Elephant than witnessing the murder of those they love. And since Elephants never forget (which is a fact), they demonstrate a level of forgiveness that a human would in all likelihood have difficulty in achieving.

To conserve a vital elephant culture, we needn't look farther than the elephants we seek to save. To recreate a comparable vital human culture, we only need to start thinking like an elephant.

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G. A. Bradshaw

COSMIC JUSTICE

According to the principle of *cosmic justice,* humans are not the only beings in the world whose fortunes matter in considerations of fairness. Proponents of cosmic justice argue that human beings have obligations to treat other living beings such as animals, and perhaps plants and ecosystems, justly. According to critics of the idea of cosmic justice, even if human beings have some moral obligations toward animals and perhaps toward some nonsentient living beings such as plants, the notion of justice applies only to human beings and it makes no sense to say that human beings can do anything unfair to nonhuman beings.

The controversy surrounding the principle of cosmic justice is a controversy over whether nonhuman animals and perhaps some other living beings are the kinds of beings that can be said to merit inclusion in our considerations of fairness. Traditionally, justice has been conceived as a sphere of relations among rational beings who have rights and obligations in relation to other rational beings. To be rational is to be able to reflect on one's own interests, the interests of other beings, the potential conflicts that can arise between these interests, and the appropriate means of resolving these conflicts. Beings that are capable of reflecting on these sorts of matters are considered to be agents, in the sense that they take an active role not only in thinking about the various rights and responsibilities that they and other agents possess, but also in resolving the inevitable conflicts that arise between the interests of different agents in the community.

In the traditional view, the community is conceived as consisting primarily of rational agents, those beings who can take an active part in the process of reflection and in the making of choices that have implications for justice, where justice is understood in terms of fairness. In the traditional view, only human beings are rational; hence only human beings are genuinely agents, and all other living beings are excluded from the sphere of justice. The only exceptions to the traditional view are so-called marginal cases, human beings such as infants, comatose individuals, and the severely mentally impaired, who lack the necessary rational capacities but who by virtue of being human are nonetheless included in the sphere

of beings toward whom obligations of justice are assumed to be owed. Agents are able, when principles of morality or justice call for it, to subordinate their own personal interests to the interests of other individuals or to the community. For example, it may be in my interest to take someone else's property without permission when I am in need and unable to acquire the property through legal means, but principles of justice impose on me an obligation to respect the other person's ownership of the property, and to seek to obtain that property by obtaining the consent of the owner. To be an agent is to be able to recognize and respect the rights of other agents, as well as to recognize and seek to protect my own rights.

In this traditional view, nonhuman beings such as animals are excluded from the sphere of justice on the grounds that they are fundamentally incapable of the rational reflection needed to consider and evaluate actions and their consequences and the rights and obligations that characterize justice relations. Some philosophers have argued that because nonhuman beings such as animals cannot be rational agents, they cannot enter into contractual relationships. Nonhuman beings cannot give the consent that is required of any party to a legally or morally binding agreement, hence such beings can properly be said neither to have taken on any obligations toward others nor to have entered into the sort of reciprocal relationship of rights and obligations that would entitle them to assert rights against humans or any other beings. At best, in the traditional view, nonhuman beings are moral patients rather than moral agents, in the sense that they can be affected in ways that are wrong or unfair but cannot be held responsible for their behavior. Such beings can be wronged or treated unfairly, but they cannot act rightly or fairly. In the traditional view, because reciprocity between moral agents and moral patients is lacking, moral patients cannot be said to be beneficiaries of justice. Strictly speaking, nothing we do to moral patients, which is to say nothing we do to nonhuman beings, can be considered to be unjust in the sense of being unfair.

Throughout the history of Western thought, and particularly in recent years, philosophers have challenged this traditional viewpoint and have argued that animals and perhaps some other nonhuman beings are indeed owed obligations of justice even though they cannot take on reciprocal obligations toward moral agents. Proponents of justice toward nonrational (nonhuman) beings argue that agency is neither necessary nor sufficient for membership in the sphere of justice, and that what must be focused on instead is the capacity of living beings to flourish according to their natures or realize their natural potential. Where justice has traditionally been conceived in social terms, that is, as a set of relations that prevail among rational beings in human society, proponents of cosmic justice argue that nature, the world of living beings as a whole, is the proper unit of measure for considerations of morality and fairness. Where the cosmos rather than human society is construed as the sphere within which relations of justice arise, a new dimension is added to our considerations of fairness, namely the rights enjoyed by moral patients and the obligations that moral agents have toward moral patients.

The principles of cosmic justice require human beings, when reflecting on possible choices and their consequences, to take into consideration the interests not

only of other human (rational) beings, but also the interests of beings such as nonhuman animals and perhaps also nonsentient beings such as plants and ecosystems. For example, when considering the material consequences and the fairness of destroying a forest to build a housing tract, or when reflecting on the consequences and the fairness of converting a wetland area into a spot for human recreation, we must take into consideration not only the welfare and the rights of all the human beings involved, including, for example, those of any humans who might own the land to be used and who might be personally opposed to selling it or handing it over to the government, but also the welfare and the rights of all the nonhuman beings involved as well, in particular the fortunes of the animal species that will be displaced and possibly rendered extinct, and perhaps also the fortunes of nonsentient living beings such as the indigenous plant species whose lives would be disrupted and possibly destroyed by such human activities.

Debates surrounding the ideal of cosmic justice focus in particular on three key questions. The first is whether it makes sense to attribute any kind of moral status to nonsentient beings such as plants or ecosystems. In maintaining that moral agents are not the only beings that merit consideration in matters of justice, proponents of cosmic justice implicitly raise the question whether a given being need possess *any* kind of consciousness in order to qualify as a beneficiary of justice. For if a being need not be able to reflect on itself as a self with specific interests in relation to other specific selves who possess their own interests, why suppose that a given being must be capable of any awareness of its interests in order to deserve protection of those interests? Why not accept the proposition that a being can have interests without being aware of those interests, and that it deserves to have its interests protected just as any conscious being does? Some opponents of cosmic justice argue that it simply makes no sense to attribute interests to beings that are incapable of being aware of those interests, and hence that such beings are not proper objects of concern, inasmuch as justice is a mechanism for protecting those interests of individuals which may come into conflict with the interests of other individuals. Any animal that cannot grasp its interests as interests cannot really be said to have interests, any more than, say, a car engine or a sewing machine can be said to have interests and, given that, to the best of our knowledge, all beings in the plant kingdom categorically lack consciousness, plants absolutely cannot be said to have interests. If a being has no interests, then there is no way in which that being can be harmed; hence that being is properly a beneficiary neither of moral consideration nor of justice.

Proponents of cosmic justice argue that the ability to grasp one's interests explicitly as objects of contemplation is not necessary for inclusion in considerations of justice. All that is required is that the being possess the capacity to flourish in accordance with its nature. All such beings are susceptible to harm or interference, and the requirement that a being be conscious of its interests in order to be a beneficiary of justice is simply an anthropocentric, speciesist prejudice that privileges the capacities and the interests of human beings in the sphere of justice.

Proponents of cosmic justice differ on the question of whether a being must be sentient in order to be a beneficiary of justice. Some argue that sentient beings, those beings capable of sense experience

and in particular of experiencing pain, can be harmed in ways that are qualitatively different than the ways in which nonsentient beings can be harmed. Those who think along these lines see a special significance in the capacity to suffer; thus they are willing to include sentient animals in considerations of justice while excluding nonsentient animals such as oysters, which have no central nervous system and hence seem to be incapable of experiencing states such as pain, and all plant life. Other proponents of cosmic justice see values such as environmental integrity and biodiversity as values that are worth protecting, not simply because protecting such values benefits human beings, but because doing so protects nature as a whole. In this view, nature itself and its various parts, such as particular ecosystems, are beneficiaries of justice. Even among these sorts of proponents of cosmic justice, there are disagreements regarding whether rationality entitles human beings to any special status in matters of justice, or whether rationality simply confers on human beings a stewardship role and hence obligations to protect and conserve nature.

A related question is whether individual organisms or entire species are the proper objects of concern in considerations of cosmic justice. According to the traditional view of justice as a social relation, individuals are the proper beneficiaries in considerations of fairness, inasmuch as only an individual can have an interest, in the sense of being aware of it. Some proponents of cosmic justice retain a hint of this reasoning in arguing that only sentient beings matter in considerations of justice. It is possible to injure a sentient individual, but nonsentient beings can merely be damaged. Hence we need have no compunction about using nonsentient nature to satisfy human desires. Other proponents of cosmic justice resist what they consider to be the speciesist, anthropocentric character of this reasoning and maintain that all living beings are susceptible to injury and hence deserve full consideration in matters of cosmic justice, whether or not they possess any capacity for conscious awareness.

A third question in debates surrounding the idea of cosmic justice is how we are to understand the relationship between moral obligations and the notion of justice. Is it possible to have moral obligations toward beings but not have obligations of justice toward them? Morality has traditionally been construed to concern itself with matters of right and wrong, while justice has traditionally been construed to pertain to matters of fairness in situations in which the respective interests of different beings come into conflict with one another. In the human sphere, there is a great deal of overlap between the two spheres. In dealings between human and nonhuman beings, some thinkers have argued that we may have moral obligations toward animals but that we have no obligations of justice toward them. One ancient thinker to argue along these lines was Plutarch, who early in his life argued that we have obligations of justice toward animals, but who softened his position later in life and argued that we have no obligations of justice toward animals, although we do have moral obligations of compassion or pity toward them. The contemporary philosopher John Rawls argued along similar lines in maintaining that animals have no part in considerations of justice, inasmuch as animals are incapable of entering into the sorts of contractual obligations that would bind them together with humans in the sphere

of right. Nonetheless, Rawls argued, we may well conclude that we have moral obligations to feel compassion toward animals. Thus we might consider ourselves morally obligated to treat animals humanely, but considerations of fairness would not form part of the basis for such humane treatment. Strong proponents of cosmic justice reject Plutarch's and Rawls's reasoning, and argue that considerations of fairness demand that we extend equal consideration to the interests of humans and animals alike, and perhaps to nonsentient living beings as well.

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Gary Steiner

CRUELTY TO ANIMALS AND HUMAN VIOLENCE

The belief that one's treatment of animals is closely associated with the treatment of fellow humans has a long history, but despite the popular acceptance of this concept, until recently there have been few attempts to systematically study the relationship between the treatment of animals and humans. In the early 1900s, case studies by Krafft-Ebbing and Ferenczi began to explore sadistic behavior toward animals associated with other forms of cruelty. However, single case histories do not provide much insight into the origins of animal abuse and its connections to other violent behavior. In 1966, Hellman and Blackman published one of the first formal studies of animal cruelty and violence. Their analysis of the life histories of 84 prison inmates showed that 75 percent of those charged with violent crimes had an early history of cruelty to animals, fire setting, and persistent bed wetting. Several subsequent studies looked for this triad of symptoms in other violent criminals, with mixed results. Later research found that these three behaviors by themselves do not necessarily predict future violence, unless the animal abuse is particularly aggressive and includes some or all of the following features:

- The child is directly involved in the perpetration of the animal abuse, not just a witness
- The child is impulsive and shows no remorse following the abuse
- The child engages in a variety of acts and victimizes different species
- The child is cruel to valued animals, such as dogs

The concept became more widely appreciated within law enforcement circles following a number of studies of criminal populations. FBI interviews of serial killers and other sexual homicide criminals initiated in the 1970s by Ressler and his colleagues found that 36 percent of these violent criminals described instances of participating in animal mutilation and torture as children, and 46 percent described such activities in adolescence. Prevalence rates of early animal cruelty of 25–50 percent have been described in several detailed retrospective studies of aggressive prison inmates, female offenders convicted of assault, convicted rapists, and convicted child molesters. Questions regarding animal maltreatment have now become standardized in many investigations of violent crime and juvenile fire setting. A major study conducted by the Massachusetts SPCA examined the criminal records of a large sample of 153 animal abusers and a matched control sample of nonabusers over a 20-year period, finding that the animal abusers were significantly more likely to be involved in a variety of crimes, including violent crime, theft and drug offenses. The study supported a notion of deviance generalization in the animal abusing population, rather than an escalation from crimes against animals to crimes against people.

In the 1980s, additional attention began to be given to instances of animal cruelty as part of the dynamics of child abuse and domestic violence. A review in one community in England of 23 families with a history of animal abuse indicated that 83 percent had also been identified by human social service agencies as having children at risk of abuse or neglect. A report on 53 pet owning families in New Jersey being treated for child abuse or neglect indicated that at least one person had abused animals in 88 percent of the families with physical abuse. In two-thirds of these cases the pet abuser was the abusive parent. Recently, several studies have examined the incidence of animal cruelty in families of women seeking protection in shelters for battered partners. In one such survey in Utah, Ascione found that 71 percent of the women with pets who sought shelter reported that their male partner had threatened to kill or had actually killed one or more of their pets. Similar results have been obtained from other surveys throughout the United States and Canada.

Recognition of the significance of the interconnections between violence against animals and violence against people has led to a number of significant changes. A growing number of states have escalated extreme forms of intentional animal cruelty from misdemeanor to felony offenses. Larger fines, longer jail terms, and/or required counseling have become more commonplace in animal cruelty cases. Many areas have begun to train animal care and control officers in the recognition and reporting of child abuse, and some animal shelters have begun to work closely with women's shelters to provide emergency housing for the pets of women and children at risk.

The concept of a link between animal cruelty and other forms of violence has not been without critics. For example, Piper and Myers urge a cautious and critical approach to reviewing the literature before it is applied to public policy, particularly in child protection.

Many advocates for animals and others hope that a better understanding of how cruelty to animals is related to other forms of violence may help in developing tools for prevention and intervention.

See also Cruelty to Animals: Enforcement of Anti-Cruelty Laws; Cruelty to Animals: Prosecuting Anti-Cruelty Laws

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Randall Lockwood

CRUELTY TO ANIMALS: ENFORCEMENT OF ANTI-CRUELTY LAWS

Special police departments devoted to enforcing animal cruelty laws strike many as a very modern concept, but they have 19th-century origins. Creating animal police forces followed the development of humane societies in Boston and New York. After George Angell founded the Massachusetts Society for the Prevention of Cruelty to Animals (MSPCA), and Henry Bergh the American Society for the Prevention of Cruelty to Animals (ASPCA) in 1866, they both successfully lobbied for anti-cruelty laws.

Enacted in 1868 and revised in 1909, the Massachusetts animal protection law primarily focused on the abuse of horses. Although somewhat antiquated today, the code still stands. To enforce this law, and its parallel in New York, the MSPCA and the ASPCA created small police departments within their organizations. Little is known about the nature of early animal police work other than what has been recorded in the annual reports of humane societies having such departments. For the most part, these brief records only note the numbers and kinds of cases prosecuted by officers. Humane agents, empowered as police officers, primarily investigated cruelty to horses, since the urban infrastructure required these animals to be well tended and healthy. One typical entry catalogued the ASPCA's work in New York, saying that agents carried out 768 prosecutions, of which 446 involved the mistreatment of horses, with offenses such as beating, abandoning, starving, overloading, driving until they fell dead, and working sick, lame, or worn-out horses. Other prosecutions

involved dog and cockfighting, rat baiting, feeding cows swill and garbage, keeping cows in filthy conditions, refusing to relieve cows with distended udders, cruelty to cattle, dogs, cats, and poultry, and maliciously killing, mutilating, and wounding animals with knives and other instruments. The only other information is the rare commentary about the work of humane law enforcement agents. In one cases, the ASPCA report noted how discouraging it was for agents to be criticized for overzealousness.

By the middle of the 20th century, the makeup and organization of humane law enforcement departments in cities like Boston and New York resembled their present day form. The MSPCA's department is made up of 16 staff members, including 11 investigative officers, a consulting veterinarian, two dispatchers, a director, and assistant director. Except for the dispatchers, all have been appointed as Special State Police Officers by the State of Massachusetts, although they are restricted to the enforcement of animal protection laws and regulations. They do, however, conduct investigations, obtain and execute search warrants, make arrests, and sign and prosecute complaints. Officers are assigned throughout the state to investigate whether individuals and, less often, organizations, have been cruel or neglectful. The bulk of their cases involve everyday animals—the strays, pets, vermin, and small-farm livestock—that are neglected or sometimes deliberately mistreated by individuals. These officers also visit and inspect stockyards, slaughterhouses, race tracks, pet shops, guard dog businesses, hearing ear dog businesses, horse stables that rent or board horses, kennels, and animal dealers licensed by the U.S. Department of Agriculture. During a typical year, MSPCA officers conduct approximately 5,000 investigations and 1,000 inspections involving more than 150,000 animals. Since such complaints are also lodged with other organizations in the state, estimates of abuse complaints easily surpass 10,000 annually in Massachusetts, and show evidence of steadily rising over time. Of course, this increase may be due to growing public sensitivity to animal welfare, greater visibility of humane law enforcement departments, or simply improved record keeping.

According to the MSPCA's official job description, the primary purpose of officers' work is:

> to prevent cruelty to animals, to relieve animal suffering, and to advance the welfare of animals whenever and wherever possible. Such purposes are to be achieved through the pursuit and implementation of a combination of activities, including, but not necessarily limited to, the enforcement of Massachusetts anti-cruelty and related laws, and the dissemination of animal protection/welfare related information.

To do this work, prospective employees are expected to have a number of skills, the first of which is "humane sensitivity, with affinity for, and ability to empathize with animals and respond with compassion and objectivity."

When investigating cruelty complaints, rookie officers think of themselves as a brute force, because they believe that they have legitimate authority to represent the interests of abused animals. They see themselves as a power for the helpless, a voice for the mute, representing and speaking for animals when their welfare or lives are in jeopardy.

With more time on the job, this view changes. Although they are expected to represent the animal's side when investigating cruelty complaints, officers encounter a number of problems that make it difficult to do this. For the rookie officer fresh from training, these problems can be confusing and discouraging. They are hired in part because of their humane sensitivity; this strong concern for animals plus their recent police training creates a number of expectations in them. Rookies expect to handle complaints against animals that violate the legal definition of cruelty as well as their own standards, to observe animals to ascertain the nature and extent of cruelty, to counsel respondents or perpetrators when necessary to improve the treatment of their animals, to prosecute those who commit egregious acts of cruelty or who do not comply with advice, and to be understood and respected as both police and humane officers. These expectations are quickly shattered as rookies begin investigating complaints.

First, professional identity is a problem. Rookie officers experience a disparity between how they see themselves and how others see them. On the one hand, officers see themselves as professional law enforcers and animal protectors. As one officer said of the department's general job expectation: "They want you to be a humane officer, but have the authority or the presence of a police officer. It's hard to do both." On the other hand, one reason why it is "hard to do both" is that friends, family, strangers, and other professionals are often confused by this combination, and either have no idea what humane officers do, or relegate them to the level of dogcatcher.

Second, officers must enforce a problematic law. Massachusetts, like other states, has an anticruelty code specifying that animals should not be deliberately mistreated. The law prohibits many types of abuse and neglect that threaten the safety and well-being of animals, including but not limited to beating, mutilating, or killing them, as well as failing to provide them with proper food, drink, and protection from the weather. Those convicted of violating this law can be fined up to $1,000 and imprisoned for as long as one year or both. Newer animal protection laws have classified cruelty as a felony, thereby increasing the maximum prison sentence to as much as five years.

Officers find it difficult to enforce the law, because of vague use of terms such as neglect, abuse, proper care, necessary veterinary care, and suffering. Nor can officers fall back on more general cultural conceptions of suffering, since these, too, are vague and contested by different groups. This problem forces officers to interpret the meaning and application of the law on a case by case basis, a point made by Walter Kilroy, the former director of the MSPCA's humane law enforcement department, who noted the "continuing absence of a widely accepted definition of cruelty to animals. Every activity that threatens the well-being of animals . . . must be challenged and overcome on a largely individual basis."

Third, there is a problem with evidence. The best witness to the abuse of humans is the victim; their testimony certainly facilitates, although it does not guarantee, successful prosecution. Yet animals obviously cannot report or articulate their harm. Rookies must learn how to figure our whether an animal has been mistreated, relying on indirect evidence in order to tell the story of an act of abuse. Rookies discover that a large part of this indirect evidence comes from investigating humans. In fact, this human side of animal cruelty

often becomes the deciding factor in handling and resolving complaints.

Finally, there is a problem with enforcement and prosecution. Rookies encounter very few clearcut cases of animal cruelty that lead to prosecution and punishment. Instead, they encounter respondents whose behavior toward their animals does not violate the law, but falls short of what officers would prefer to see. Without a technical violation of the cruelty law, officers feel that they have little, if any, authority to force respondents to improve their treatment of animals. When they meet respondents whose acts violate the law, officers see their advice ignored. Rather than giving up entirely at these times, rookies must learn how to get their message across to respondents and, if necessary, take them to court. This final option can also be particularly frustrating, especially for rookies, as they encounter a judicial system that seems indifferent or hostile to the concerns of animals.

Most officers learn to cope with these problems by developing an attitude of humane realism. With little legitimate authority to enforce the law, officers become humane educators who try to make abusers, or others they meet on the job, into responsible animal owners. With few victories in court, they discover alternative ways to be effective in their fight against cruelty, and, in the face of public confusion about, or derision for, the role of humane law enforcement, they emphasize the police side of their work without forgetting their commitment to animal protection.

See also Cruelty to Animals: Enforcement of Anti-Cruelty Laws

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CRUELTY TO ANIMALS: PROSECUTING ANTI-CRUELTY LAWS

Animal cruelty prosecutions have become daily events that attract widespread public and professional interest. Several trends demonstrate the increasing focus on enforcement of anti-cruelty laws:

- Television shows such as "Animal Precinct," which highlights the efforts of the Humane Law Enforcement division of The American Society for the Prevention of Cruelty to Animals (ASPCA) in New York City, are extremely popular, with numerous spin-offs showcasing similar efforts in Houston, Detroit, Miami, San Francisco, Philadelphia and elsewhere
- The number of law schools offering courses in animal law rose from 9 in 2000 to 92 in 2008
- The American Bar Association (ABA) and many state bar associations now have active animal law committees
- Prosecutors in many jurisdictions have established task forces to work with a variety of local agencies to specifically address crimes against animals
- The number of states with felony-level penalties for some forms of animal cruelty has grown dramatically in the last two decades from 5 in 1988 to 43 in 2008

Systematic prosecution of animal cruelty cases did not begin until there were well-defined laws protecting animals, as well as agencies with the authority to enforce these laws. In England, the first comprehensive animal protection law was the Act to Prevent the Cruel and Improper Treatment of Cattle in 1822, which also protected horses, sheep, cows and mules, providing for fines of up to five pounds and up to three months in prison for mistreatment of such livestock. The Society for the Prevention of Cruelty to Animals (SPCA) was founded in England in 1824 to ensure that this legislation would be enforced. It funded its own constables and eventually earned the support of the Queen, becoming the Royal SPCA in 1840.

Inspired by the success of the RSPCA in England, Henry Bergh and his associates founded the American SPCA in 1866 to promote the enforcement of new laws in New York similar to those in England. The animal cruelty law was revised in 1867 to apply to any living creature, a major move away from concern only for animals with commercial value and the first step in protecting pets and wildlife from cruelty. The law was applied regardless of ownership of the animal, recognizing that people are capable of cruelty to their own animals. The list of illegal acts was expanded, until it looked very much like most state anticruelty laws today. It also made all forms of animal fighting illegal for the first time, including bull, bear, dog, and cockfighting. The law comprehensively addressed neglect, and imposed a duty to provide "sufficient quality of good and wholesome food and water," and empowered any persons to enter premises to provide for these needs. Most significantly, the law gave the ASPCA arrest powers to enforce these provisions. Bergh himself acted as a special prosecutor, successfully bringing many cases to court.

In the United States, it has been difficult to assess the impact of the rapid increase in the number of stronger laws on the actual number of prosecutions, since there is no centralized tracking of animal cruelty arrests. In some states where data have been available, rising arrest rates have been related primarily to stronger animal fighting statutes. As of 2008, dogfighting is now a felony in every state in the United States

Successful prosecution of crimes against animals often requires specialized knowledge not only of the relevant laws, but also of veterinary medicine, veterinary forensics, animal care, and the practices used against animals in organized crime, such as dog-fighting and cockfighting. Animal care and control agencies, humane societies and SPCAs, and veterinary associations are important allies to prosecutors in successfully investigating and pursuing animal cruelty cases. These cases are given an unusually high degree of scrutiny by the general public. Prosecutors often receive tens of thousands of letters in support of the prosecution of high-profile animal cruelty crimes.

The effective prosecution of animal abuse has many benefits. It can provide an early and timely response to those who are, or who are at risk of becoming, a threat to the safety of others. It can provide an added tool for the protection of those who are victims of family violence. Finally, it can provide an opportunity for prosecutors to develop new, strong, and helpful allies in the protection of their communities and in helping build a truly compassionate society.

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D

DEEP ETHOLOGY

The term deep ethology carries some of the same general meaning that underlies the term deep ecology, in which it is asked that people recognize that they are not only an important part of nature, but also that they have unique responsibilities to nature as moral agents. Deep ethological research pursues a detailed and compassionate understanding of the unique worlds of nonhuman animals in order to learn more about their points of views—how they live, what they want, and how they experience various emotions, pain, and suffering. The development of what are called species-fair tests take into account the different sensory worlds, emotional lives, and cognitive abilities of animals, and allow humans to learn more about how all animals deal with their social and nonsocial environments, including pleasurable and painful or stressful stimuli. Recognizing animals as sentient beings or beings with intrinsic or inherent value will allow for an expansion of our compassion footprint.

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Marc Bekoff

DEVIANCE AND ANIMALS

Social scientists typically understand deviant behavior in two ways. Deviance, on the one hand, is a characteristic of how people act. If the behavior violates social norms—the basic guidelines for behavior that are known and obeyed by well-socialized members of a society—then it is, by definition, deviance. In contrast, some sociologists speak of deviance as a subjective or personal phenomenon. From this view, a behavior is deviant or not depending on who does it, for what reason, and who finds out about it.

Deviant animals are usually displayed in the media in much the same way as

deviant humans. At times they are shown to be threatening and dangerous because they are innately evil, like, for example, the shark in *Jaws*. At other times, animals are presented in the media as behaving in deviant ways because they are mad (e.g., the dogs in *Cujo* and *Man's Best Friend*) or because they have been trained by humans to do evil things (e.g., the rats in *Ben* or the guard dog in *White Dog*). Like the human deviants portrayed in the media, deviant animals are easy to recognize because they are slimy, foam at the mouth, bare their teeth, or in other ways physically display their malevolence. It is likely that the fear that many people have for pit bull terriers, bats, snakes, and other definably ugly animals has its roots in our cultural connection of appearance and deviance.

Another common connection between animals and deviance is seen in the tendency for animal terms to be used in most, if not all, cultures as labels that diminish the importance of the person so labeled. In our society, for example, a person can be degraded by calling him or her such things as "animal," "pig," "chicken," "snake," or "dirty dog." ' These animal labels are intended to demonstrate that those to whom they are applied are less than real human beings.

Related to this use of animal terms to label certain individuals as inferior, the symbolic connection of animals to entire groups of people in order to cast them as being outside the bounds of social normality—and, therefore appropriate objects of discrimination—has been common. For example, Fine and Christoforides (1991) describe how in the mid-19th century the English sparrow was used by American politicians and in the media as a metaphorical stand-in for immigrants. According to this construction, the birds were dirty, foreign, in competition with native birds, and should be excluded from association with American birds. In short, nativists linked the English sparrow to the presumed deviant characteristics of foreign immigrants and the social problem some saw immigration presenting at the time.

From the Middle Ages until the 18th century, it was common in Europe for nonhuman animals to be seen as being able to choose how they behaved. This meant that animals were often put on trial for such things as murder, assault, and destruction of property. If they were judged guilty, the animal defendants were usually executed. One writer recorded 191 judicial proceedings involving such animal defendants as bulls, horses, pigs, dogs, turtledoves, field mice, flies, caterpillars, and bees.

Bestiality is one type of behavior involving people and animals that is seen as a serious violation of the norm. A far more common and less controversial example of the relationship of animals and deviance is seen in the everyday lives we share with companion animals. In some ways, training a dog or breaking a horse may be seen to be forms of socialization. We typically teach animals to abide by certain rules—not to relieve themselves in our homes, not to jump up on visitors, not to make unnecessary noise, and so forth. As is the case with humans, animal companions often break the rules we would like them to obey. When this happens, their misbehavior is usually either ignored or steps are taken to control the deviant behavior.

One study by Sanders (1994) focused on how doctors in a veterinary clinic defined and responded to violations by their

animal patients. Typically, the misbehavior of animals was not seen as being their fault, but as being caused by the stress of being in the clinic or the pain the animals were experiencing. While patients' unruliness usually was not interpreted as being due to moral failings, veterinarians were rarely as charitable in their evaluations of owners. The bad behavior of patients was commonly seen as the fault of bad (ignorant, weak, overly permissive) clients.

Social control—the mechanisms employed in order to maintain individual behavior within the bounds of social norms—is directly related to the issue of deviance and is associated with the relationships between people and animals. Dogs, horses, and other animals have been, and continue to be, used in law enforcement as tools or weapons to assist in the maintenance of social order. In a study of K-9 officers and their patrol dogs, Sanders (2006) stresses the ambivalence of this relationship, as officers are torn between regarding their dogs as tool or weapons (and thereby expendable) and as friends and partners in crime control.

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Clinton R. Sanders

DISASTERS AND ANIMALS

Any catastrophic event that affects people on a large scale will also affect animals. Pets, wildlife, livestock, and captive animals face risks from floods, hurricanes, and earthquakes. Fire, drought, and disease can affect wild animals. Animals also face risks in technological disasters such as nuclear accidents, oil spills, terrorist attacks, and chemical leaks. In addition, large-scale disease outbreaks, such as avian flu, SARS, and foot-and-mouth disease, can devastate livestock populations and local economies. Moreover, many diseases are zoonotic, meaning they can spread between humans and animals. The intensive agriculture practices widely used today present ideal environments for the rapid spread of livestock disease. The close confinement and transportation of birds and animals destined for slaughter means that a disease outbreak in one facility can quickly escalate into a regional or national disaster that devastates the economy. Animal stakeholders of all kinds, including pet owners, breeders, zoo keepers, farmers, veterinarians, and others face unique challenges in planning and response.

The difference between a disaster and an emergency is a matter of scale. In both cases, the response begins locally. In an

emergency, the existing local authorities, such as police and fire departments, can take action and meet the immediate needs created by the event. In contrast, a disaster overwhelms local resources and often makes it difficult for outside help to arrive. A request for assistance activates a network of government and nonprofit agencies at the federal, state, and regional levels. The response to a disaster that affects animals will usually begin within the local framework and involve animal control departments, animal shelters, veterinary associations, and livestock organizations. Local animal control and law enforcement agencies often seek the help of national nonprofit animal welfare groups that have disaster response programs, such as the American Humane Association and the Humane Society of the United States. In most events, large numbers of volunteers donate time and money.

Depending on the type of incident and the numbers and species of animals affected, various government agencies may assist with the response. In a large-scale incident within the United States, the Federal Emergency Management Agency might activate Veterinary Medical Assistance Teams to assist when a disaster compromises an area's veterinary infrastructure. The Department of Agriculture and the Fish and Wildlife Service each have many branches that play roles when animals are involved. The Department of Health and Human Services, which oversees the Centers for Disease Control and Urban Search and Rescue, could also participate. At the state levels, offices of emergency management and departments of agriculture and wildlife can enter the picture. However, state and federal agencies get involved only after requests from the local level.

In disasters, animal issues are associated with matters of public safety, the human-animal bond, public health, the economy, and ethical and moral issues.

Public Safety

People will risk their lives to protect their pets, horses, and livestock. They will consequently jeopardize the lives of others by refusing to evacuate or by reentering evacuated areas. A common reason for evacuation failure (along with fear of looting) is the inability or unwillingness to evacuate animals. When people remain in unsafe buildings or reenter them to rescue pets, emergency responders often have to rescue them, using time and resources that are always in short supply during a disaster. This public safety risk is not limited to pet and horse owners, but occurs with those who own and work with livestock as well.

Numerous issues surround the evacuation of animals, including property rights, contamination, evidence preservation, and infrastructural hazards. In 2005, following Hurricane Katrina, rescuers entered many properties without permission to rescue stranded pets. Some homeowners objected to what they saw as breaking-and-entering. Moreover, rescuers encountered sewage, oil, gas leaks, and other chemical hazards because of their efforts to save stranded pets, who were also contaminated. After a disaster, the scene must be maintained for insurance documentation. When people enter damaged areas, they can compromise the integrity of the evidence needed for insurance claims through their movement and by moving debris.

A dramatic example of the public safety risk when people reenter evacuated areas

U.S. Army flight surgeon Capt. Devry C. Anderson, of HHC 2-4 Aviation, 4th Infantry Division out of Fort Hood, Texas, holds a small dog named Chip after he was rescued with his owner, Friday, September 2, 2005 in New Orleans. (AP Photo/Haraz N. Ghanbar)

comes from a chemical spill in Weyauwega, Wisconsin. Early in the morning on March 4, 1996, 35 cars of a train derailed while passing through the town. Fifteen of the cars carried propane, and five of these caught fire. At 7:30 AM, residents of 1,022 households were ordered to evacuate because of the risk of explosion. Emergency managers anticipated that the response would take several hours. The effort instead took over two weeks, reflecting the unpredictability of disaster response. Half of the 241 pet-owning households left their pets behind. Others who were not at home at the time had little choice. Shortly after the evacuation, pet owners began to reenter the evacuation zone illegally to rescue their pets, at considerable risk to their own safety. Following protocol, emergency managers prevented residents from entering their own homes. In response, a group of citizens made a bomb threat on behalf of the animals, which directed considerable negative media attention at the response. Four days after the evacuation, the Emergency Operations Center organized an official pet rescue, supervised by the National Guard and using armored vehicles.

The Human-Animal Bond

Approximately 70 percent of American households now include pets, which exceeds the numbers that include children. The majority of pet owners consider their pets members of the family. Thus, the human-animal bond is a powerful presence in our society. Interaction with animals has positive effects on people's mental health and physical well-being.

During disasters, the human-animal bond can be either a source of support for the victims of disaster or a source of significant stress, anxiety, and even depression. Failure to consider this bond in disaster response creates substantial concerns among the public. Consequently, disaster planning at all levels must take animals into account. In 2005, Hurricane Katrina brought this need to public attention, which called attention to the importance of including pets in evacuation plans.

One year after Hurricane Katrina, President George W. Bush signed the Pets Evacuation and Transportation Standards Act into law, which requires that state and local emergency planners address the needs of individuals with household pets and service animals in their disaster preparedness efforts. When Hurricane Gustav struck the Gulf region in late August 2008, plans provided for the housing of animals and transporting evacuees with their pets. The aftermath of Gustav offers a dramatic and positive contrast to that of Katrina.

Public Health

The roles that animals play in public health seldom come to mind when people think of disasters. However, animal and human health issues are closely connected. Many diseases, known as zoonoses, can affect both humans and animals. Some, such as rabies, are transmitted directly through human contact with an animal. Others, such as Hendra virus, require reservoir hosts, such as bats, who suffer few if any symptoms. Other examples of zoonoses include Lyme disease, Nipah virus, sleeping sickness, West Nile virus, Severe Acute Respiratory Syndrome (SARS), avian flu, HIV, and monkey pox. In addition, some animal diseases, such as anthrax and plague, could serve as weapons of mass destruction. Animal diseases could also become weapons in agroterrorism, in which an agricultural disease outbreak causes economic damage and loss of citizen confidence in authorities. Many experts say the new strain of avian flu, H5N1, has the potential to be much worse than SARS.

In addition to natural disasters, animals face hazards of other sorts.

The Economy

Animal issues in disasters have economic impact not only because of the costs of the recovery efforts themselves, but also because of the role of animals in the economy. For example, when wildfires and drought affect wildlife, local and state economies feel the impact in their tourism, hunting, and fishing industries. The economic impact is particularly notable with livestock disasters, such as widespread disease outbreaks. In the United States, livestock production directly contributes over $100 billion to the economy annually, and multiple times that value indirectly. Disease threats to livestock, either accidental or intentional (as in agroterrorism), could devastate the economy and the nation's food supply. Great Britain serves as an example of the impact of livestock disease. Britain's first cases of foot-and-mouth Disease (FMD) appeared in 2001, only five years after the outbreak of bovine spongiform encephalopathy (BSE) or mad cow disease.

The 2001 outbreak of FMD paralyzed Britain's agricultural infrastructure and cost the equivalent of 12 billion U.S. dollars. The outbreak resulted in the killing of over four million cows, pigs, and sheep, the majority of whom lived in the affected areas but did not have the

disease. The economic impact included direct costs such as lost animals, carcass disposal, and response and eradication efforts. Slaughterhouse workers lost jobs. The outbreak also affected peripheral industries. Hauling companies reporting a large downturn, and the rendering industry, which had previously produced economically valuable raw materials, essentially became a waste disposal industry in response to the massive slaughter. The outbreak also caused significant indirect costs to tourism and trade in Britain and Western Europe. Travel was significantly restricted to control the spread of the disease. Many small businesses, such as pubs and inns, in the affected areas closed down. In addition, the outbreak brought significant nonmonetary and moral consequences. Some herds in Great Britain were legacy herds, raised by particular families for generations. The outbreak meant the loss of lifestyle. Many farm families were ostracized within their communities, and over 80 suicides were reported among farmers and other animal stakeholders affected by the outbreak of FMD.

Today, severe economic problems for people in the United States and elsewhere, especially when they lose homes due to foreclosure, are forcing some either to give pets up to shelters or to abandon them. Compounding problems for shelters and other rescue organizations are the decreases in donations to these groups, as people lose jobs or take lower-paying jobs.

Ethical and Moral Issues

Ethical and moral issues enter into disaster response, because humans are responsible for animals in so many ways. We bring them into our homes and include them in our families. Therefore, they depend on us when they are in danger. We house food animals in extremely crowded conditions with little chance of escape when barns catch fire, collapse, or become flooded. On a more basic level, human beings are responsible for bringing many species of animals into existence in the first place. When we domesticated animals, we took on the responsibility for their care.

The impact of oil spills illustrates the ethical issues involved in disasters and the ensuing response efforts. Estimates indicate that 380 million gallons of petroleum make their way from various sources into the world's oceans each year. Oil is so toxic that many animals die from ingesting it. Oil is also carcinogenic to fish, birds, and mammals. Seals and sea lions often drown because of the weight of oil on their coats. Some of the high-profile spills illustrate the scope of the issue. In 1978, the tanker *Amoco Cadiz* ran aground and split in two off the coast of Brittany, spilling 223,000 tons of heavy crude oil into the Atlantic Ocean. Rescuers recovered 20,000 dead birds. Marine life in the area suffered tremendous mortality. In 1989, the *Exxon Valdez* spill killed an estimated quarter of a million birds, as well as countless sea otters, harbor seals, salmon, and creatures in the supporting food chain. In 1999, the tanker *Erika* broke in two and sank off the French coast, affecting an estimated 77,000 birds. In 2000, the freighter *MV Treasure* sank off the coast of South Africa, contaminating over 20,000 African penguins, whose worldwide numbers are estimated at only 180,000. In 2002, the sinking of the crude oil tanker *Prestige* off the coast of Spain and Portugal topped the *Exxon Valdez* as the worst spill and possibly the worst ecological disaster in

history. As many as 300,000 sea birds died as a result.

Although most spills result in massive efforts to rescue, clean, and rehabilitate birds and animals, the effort might not always pay off. The birds and animals experience stress during the rescue and cleaning, in addition to the trauma and injury due to the oil itself. Studies of sea birds found that most did not survive the rehabilitation efforts. Others found that cleaned birds died soon after release back into the wild. One study of sea otter rehabilitation efforts following the *Exxon Valdez* spill determined that the cost of capture and rehabilitation was $18.3 million, or $80,000 per otter. The high costs and low survival rates raise questions about what we should do for wild birds and animals affected by oil.

Planning for Disasters

Disaster planning on a large scale takes place at the governmental level, but individual households must also make plans. Animal stakeholders such as veterinary clinics, breeding facilities, boarding kennels, shelters, and farms must also have plans in place. Whereas some disasters require evacuation, others necessitate "sheltering in place," or staying put until the risk has passed. Depending on the disaster, animal stakeholders might have to evacuate their facilities or take in evacuated animals. Consequently, preparations must consider various scenarios.

Disaster planning begins with assessing the risks in a given area. A region that is vulnerable to hurricanes and flooding probably faces little risk of blizzards and ice storms. Wildfires do not threaten urban areas. The type of response necessary will depend on the potential threat. However, there are many equal opportunity risks. For example, railroad tracks intersect most regions, and there are numerous homes within a mile of tracks. Trains regularly transport hazardous chemicals, posing risk in the event of derailment, such as the incident in Weyauwega.

Planning at the household level usually means anticipating the needs of pets. Experts suggest designating a cupboard, shelf, or container for emergency supplies for pets. At minimum, households should have sufficient food, water, litter, bedding, and other necessities to last at least 72 hours. Pets should have up-to-date identification and vaccinations. A waterproof plastic bag can hold copies of vaccination records and any licenses. It can be helpful to include one or two photos of the pets, ideally with family members, in the emergency supply kit. If an animal is lost, the photo can supplement a description and also verify that a found animal belongs with a particular family. If the incident requires evacuation, rather than sheltering in place, dogs' leashes must be easily located. Cats and smaller dogs must have travel carriers. An adequate supply of any medications must accompany the animals. Because most emergency shelters do not allow pets to be housed with people, animals and their guardians will most likely be separated during the evacuation period. This highlights the importance of up-to-date identification.

Horses and livestock bring additional issues to consider in planning. Experts note that owners must have sufficient, operable trailers and transporters. Moreover, horse owners should practice loading their horses into trailers so that they can do it quickly and safely when necessary. Horses and livestock are often evacuated

to local farms and ranches, but they are also housed at fairgrounds and similar facilities that have barns. The need for identification also arises with livestock. Brands on livestock and tattoos on horses link owners with animals, and all owners should ensure that their animals have current identification.

In addition to preparing to shelter in place, individuals and families should locate animal-friendly accommodations outside the immediate area in case emergency managers call for evacuation. Know ing where to find pet-friendly motels before the incident occurs, or having friends and family who can house pets, can save lives and prevent separation from pets.

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Leslie Irvine

DISASTERS AND ANIMALS: LEGAL TREATMENT IN THE UNITED STATES

In the United States, the law treats nonhuman animals as personal property, making them vulnerable during disasters. Governmental policies for evacuation, shelter and rescue during disasters place priority on saving human lives, with a secondary focus on protection of property. Since nonhuman animals are property, the welfare of nonhuman animals during hurricanes, floods, and other disasters is less important than the welfare of humans. As a result of this status as property rather than as living beings with inherent value, large numbers of nonhuman animals, including companion animals, stray and feral domesticated animals, livestock, and wild animals, are left behind and suffer or die during disasters and their aftermaths.

The treatment of nonhuman animals hinges upon the value that humans place upon the these animals. Household pets, or companion animals and service animals, which have direct bonds with individual humans, are treated differently than livestock and wild animals. Livestock, as commodities that provide food and fiber, are generally considered only for their economic and subsistence value to humans, with disaster policies focusing on issues such as the maintenance of the food supply rather than on the preservation of individual animals. Disaster policies for wild animals, both those captive in zoos and other manmade facilities, and those in natural habitat, primarily discuss these animals in terms of danger to humans during disasters; these animals will either be kept captive or left

in the wild to use their own instincts for survival in a disaster. This is not to say that either livestock or captive wild animals are ignored by disaster policies and plans, but these categories of animals are not treated as a priority for evacuation or rescue.

In contrast to livestock or wild animals, companion animals (also referred to as household pets) and service animals have a special relationship with humans and are afforded a measure of protection in disasters that livestock and wild animals are not. Humans will make greater efforts to protect and rescue their companion and service animals than they will livestock or wild animals. However, all animals are faced with the possibility of abandonment, destruction, or removal if considered to be endangering human health and safety during a disaster, whether by possible attacks on humans, by exposure of humans to biohazards, or by use of limited resources including food, water, and space in transportation and shelters.

While wild animals and livestock are handled by entities such as animal control or other governmental entities in disasters, the general approach to the evacuation, rescue, and care of companion animals and service animals during disasters has been one of personal responsibility by animal owners. Rescue organizations and government agencies continue to emphasize the need for humans to be prepared to handle disasters that might require evacuation. Proposed advance plans from the Red Cross and the U.S. Department of Homeland Security include identification of pet-friendly lodging, health certificates for animals so they can be sheltered or transported out of state, a proper carrier, and sufficient food and water for several days.

During Hurricane Katrina in 2005, many people did not have private transportation available to them or funds to pay for shelter; without private vehicles, these people had to rely on public evacuation systems, which did not provide the means to evacuate nonhuman animals. Disaster plans did not offer options for evacuation of companion animals with humans; shelters for people would not accept animals for health and hygiene reasons. As a result of the lack of options available to people in New Orleans in 2005, an estimated 250,000 pets, including dogs, cats, birds, and fish, were stranded in the hurricanes and the flooding.

Prior to Hurricane Katrina, federal and state law had focused on the proper handling of animals in disasters to preserve the health and hygiene of humans. No federal statutes dealt with animal evacuation. Federal laws and regulations that dealt with animals in the event of a disaster focused on proper handling of animal carcasses and biohazards and looked at ways to prevent disease and other harm to humans. For similar reasons, state health and safety regulations prohibited sheltering of animals with humans or the transport of animals with humans. Even transport of animals from the disaster area was limited by laws and regulations prohibiting movement across state lines. While humans were transported over state lines to neighboring states for refuge from the storm and its aftermath, nonhuman animals were not allowed unfettered transport out of the states affected by Hurricanes Katrina, Rita and Wilma. For example, states outside the disaster area, such as Massachusetts (which issued an emergency order concerning importation of animals from Louisiana, Mississippi, and Alabama in September 2005), declined to accept animals from

the disaster area for fear of diseases such as heartworm.

Following Hurricane Katrina, the dangers to people of governmental failure to provide for evacuation of companion animals became clear. People who refused to evacuate without their animals endangered themselves by remaining in an unsafe situation. Rescue workers were endangered when trying to save people who had stayed or who tried to return to unsafe areas to protect their companion animals. Rescue workers also faced the dangers of trying to capture abandoned animals, who were often terrified or aggressive and difficult to remove. In addition, animals who were left alone sometimes turned to foraging for food or died in houses or in the streets, causing safety, health, and hygiene problems for people returning to the area.

The dangers to people prompted legislators to make companion animals and service animals the subject of governmental evacuation and rescue laws and policies. While livestock and wild animals are generally still left to their own devices during disasters, with at best minimal efforts at rescue and, at worst, execution to protect humans from potential harm, companion animals and service animals are now the focus of federal and state statutes and regulations affecting evacuation during disasters.

In 2006, Congress passed the first federal legislation to address evacuation issues for nonhuman animals during disasters. The legislation amended the Stafford Disaster Relief and Emergency Assistance Act, which provides for federal government assistance to the states in times of disaster. The Pets Evacuation and Transportation Standards Act of 2006 (PETS Act) requires that state and local emergency preparedness plans take into account the needs of people who have household pets and service animals if the state is to be eligible to receive Federal Emergency Management Agency (FEMA) funds. The Act also allows federal agencies to provide assistance to protect property by providing rescue, care, shelter, and essential needs to individuals with household pets or service animals and to those pets and service animals.

In October 2007, FEMA released Disaster Assistance Policy 9523.19, which sets out the costs related to emergency pet evacuations and sheltering activities by state and local governments that may be reimbursed by FEMA following a declaration of a major disaster or emergency. This policy defines a household pet as a "domesticated animal, such as a dog, cat, bird, rabbit, rodent, or turtle that is traditionally kept in the home for pleasure rather than for commercial purposes, can travel on commercial carriers, and be housed in temporary facilities." Under the policy definition, "reptiles (except turtles), amphibians, fish, insects/arachnids, farm animals (including horses), and animals kept for racing purposes" are not household pets and are not be covered by the policy.

State legislatures also reacted in the aftermath of Katrina, passing their own laws to require inclusion of animals in state disaster plans. In 2006, Louisiana amended its disaster act to require that the Governor's Office of Homeland Security and Emergency Preparedness assist in the formulation of parish emergency operation plans for "humane evacuation, transport, and temporary sheltering of service animals and household pets in times of emergency or disaster." The Louisiana act made a distinction between service animals and household pets. Under the act, provisions must be made for a service

animal to be evacuated, transported, and sheltered with the person served, while household pets (defined as "any domesticated cat, dog, and other domesticated animal normally maintained on the property of the owner or person who cares for such domesticated animal") are to be protected by the agency providing assistance in identifying suitable temporary shelters and providing guidelines for admission to those shelters and by enabling, whenever possible, evacuation of pets and pet owners for disabled, elderly, special needs residents, and all other residents when the evacuations can be done without endangering humans. The act also provided that pets in cages or carriers are to be allowed on public transportation during an impending disaster, when doing so does not endanger human life, and that the agency may provide separate transportation for pets that are not allowed on public transportation.

While the PETS Act was the first federal legislation to address evacuation of companion animals, some states had already included animals in their evacuation and rescue planning as a consequence of previous disasters. Following Hurricane Floyd, which hit the east coast of the United States in September 1999, North Carolina developed a public/private interagency animal response team model that provides coordination of efforts to address animal-related issues during disasters. The State Animal Response Team (SART) model, which is dependent upon cooperation among local, state, and federal agencies and private organizations, has been or is being adopted by about one-half of the states, many of them having adopted or begun to develop a version of the model since Hurricane Katrina. Unlike the PETS Act, the SART model does not restrict coverage and consideration to companion animals. Under the section on animal protection in North Carolina's March 2008 Emergency Operations Plan (NCEOP), the stated purpose is to "protect domesticated and wild animal resources, the public health, the food supply, the environment, and to ensure the humane care and treatment of animals during disasters." The protection is "aimed at all animals (whether owned, stray, domestic) that may need help during disaster situations." Although the purpose and scope of the plan note the goals of protection, humane care, and treatment of animals during disasters, the stated policies in the EOP place priority on "saving human lives and protecting property, in that order" and place responsibility for sheltering and protection of companion animals and livestock on their owners, while wild animals are to be "left to their own survival instincts." Wild animals who pose a threat to themselves or to humans will be handled by local animal control or wildlife management personnel and returned to their natural habitats.

While the legislation and policies that are currently in effect may be aimed at the protection of humans rather than at the protection of nonhuman animals, the legislation does give those interested in the welfare of nonhuman animals a seat at the table and an opportunity to offer recommendations in the planning process that will affect animals in future disasters. State and local disaster planning processes now include representatives from animal welfare organizations, and offer the possibility of more careful thought regarding the needs of animals, and not just the needs of humans affected by the inability to take their pets and service animals with them in the event of a disaster.

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Marsha L. Baum

DISNEYFICATION

The Disneyfication of animals refers to the assignment of some human characteristics and cultural stereotypes to the animals. Although this practice is best shown by the way cartoon characters and animals are pictured in Walt Disney movies, it is not restricted to the Disney Corporation, but is widespread as a marketing strategy. The most noticeable human characteristic projected onto animals is that they can talk in human language. Physically, animal cartoon characters (and toys styled after them) are also most often deformed in such a way as to resemble humans. This is achieved by showing them with human-like facial features (eyebrows, expressive lips) and altered forelimbs to resemble human hands (although with a smaller number of fingers). In more recent animated movies, the trend has been to depict the animals in a more natural way. However, they still use their limbs like human hands (for example, lions can pick up and lift small objects with one paw), and they still talk with an appropriate facial expression. A general strategy that is used to make the animal characters more emotionally appealing, both to children and adults, is to give them enlarged and distorted childlike features.

Probably the most significant aspect of Disneyfication of animals is the projection of cultural stereotypes onto animal behavior. The members of the animal kingdom are often used as a means of presenting male-dominated societies with stereotypical gender roles. Racist attitudes are subtly conveyed not only through the choice of the physical characteristics of bad animal characters, but also through the use of language with accents and characteristic expressions indicative of racial or ethnic background. In Disney's 1994 best selling *The Lion King*, the members of the royal family speak with British accents, whereas the voices of hyenas resemble those of urban black and Latino populations.

Disneyfication is widely used in popular visual culture, including everything from video games, television, and film to amusement parks and shopping malls. Its effects on the formation of the individual and collective identities of children and youth are not yet fully understood. One of the direct effects of misrepresentation of animals is that animals and their behavior tend to be misinterpreted by children, sometimes with tragic consequences. Objectification of animals promotes the pet industry and the view of animals as goods to be bought. This strategy may lead to the formation of adult personalities incapable of functioning outside of stereotypical frameworks modeled after their childhood experiences.

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Slavoljub Milekic

DISSECTION IN SCIENCE AND HEALTH EDUCATION

Medical and veterinary schools have largely phased out the practice of having students dissect animals, and yet animal dissection continues across the United States as a widespread practice for children in intermediate school science classes. This practice was introduced in the 19th century at the same time that it became a national goal to provide science education with laboratory experience for all children in the United States. When science education became universal, it was modeled on the teaching style that had been used for hundreds of years for medical students. Medical students had typically been provided experience with human cadavers, but providing hands-on experience to all children required a shift to animal bodies for laboratory instruction. The emphasis shifted somewhat to animal biology, reflecting that the dissection focused on the frog, cat, or guinea pig. Perhaps it seems paradoxical that laboratories for medical and veterinary education have shifted to newer methods, whereas pre-college instruction has not changed and still emphasizes animal dissection.

History of Human and Animal Dissection and Science Education

Dissection was used in the Middle Ages as a method for illustrating Galen's ancient texts, and later became a method for discovering the anatomical and physiological aspects of humans and other mammals. Human dissection was most informative and productive for learning and teaching, with other mammals used for supplementary work reflecting a shortage of human cadavers. Demonstrations of human dissection were conducted in a theater setting as a special occasion, typically in winter when the cold slowed the rate of decomposition of the cadaver. Vesalius in the 16th century, and those following him, began using dissection to investigate the human body and also to make anatomical and physiological discoveries. The use of human bodies for dissection was controversial, and violated religious concerns regarding the need to be resurrected with an intact body. Even when dissection became an accepted part of medical education, gaining access to a sufficient number of bodies was challenging, sometimes resulting in grave robbing. Furthermore, being dissected was considered to be an even worse fate than hanging.

With the widespread establishment of science education for children in the 1850s, for which laboratory exercises were a valued part of instruction, it became common practice to use dissection of small animals to support the teaching.

Dissection of animals was adopted as a convention to illustrate and provide children with hands-on experience of the body systems as a surrogate for the human body, a practice that remains common today. This practice, like the dissection of human bodies, has been controversial, at times having both strong advocates and dissenters.

National and State Standards, Plus Legislation and Regulation, for Science and Health Education

Learning goals and objectives for the course material that is to be taught at various grade levels is officially defined by national and state education standards, and further spelled out in individual frameworks. The content related to body systems is addressed in the 7th grade science standards and appears again with a more physiological emphasis in the standards for high school biology. The health standards include some discussion of certain diseases and practices affecting health and offer prescriptive recommendations for maintaining good health.

Although standards are defined at the national and state level, schools are considered to be locally governed. State and local legislation may constrain the content to be taught, or add specific requirements for what must be taught. The teaching of health is particularly subject to regulatory and policy requirements, such as mandatory instruction on the use of alcohol and tobacco. In some cases, local or state laws specify the minimum or maximum classroom time to be spent on certain content such as reproduction or sexual activity, or state a requirement for parental permission for children to participate in instruction on certain topics. Teaching of health can be less than optimal when not presented within a biological framework by teachers who have majored in science. Teaching certificates for health are a part of the physical education curricula rather than biology coursework, and health teachers may have limited backgrounds in basic science content. Integration of biological science and health, with an emphasis on the human rather than nonhuman, can better prepare children for managing their lifelong health. Most children in the United States have their last biology instruction in the 7th grade, making this an important opportunity to prepare them in biology and health.

Since dissection is a teaching method, not a subject area with informational content, nor pertaining to teaching objectives and goals, it is not discussed within either the national or state standards for science or health, or in the frameworks. There are no official recommendations for teachers concerning the presence or absence of dissection as a laboratory experience, nor is there much discussion of dissection in the professional education literature. Hence, teachers receive little guidance with regard to using dissection as a laboratory exercise, or implementing other resources that could provide similar learning experiences.

Testing and Funding

National funding for schools, which is based on the results of required testing, currently sets policy for local school districts and demands that teachers give their primary attention to preparing children for standardized tests. The results of this mandatory testing of children, such as the requirements legislated by the No Child Left Behind Act of 2001, are linked with high-stakes consequences,

affecting the funding provided to school districts. Students' capability to perform well on tests affects and can reduce the funds available for teaching resources in a particular school district. Teachers are obliged to devote a significant portion of classroom time to helping children succeed in tests that have far-reaching implications for the district as well as for the students personally.

Challenges for Teachers

Teachers seek to inspire their students, a goal that provides rewards and usually accounts for their choice of teaching as a profession. To be effective, teachers seek out learning opportunities to continually increase their mastery of ever-expanding subject matter and incorporate new teaching methods. Most science teachers face various challenges, including small budgets to purchase laboratory equipment and supplies that could enhance their teaching. Many use personal funds to purchase laboratory supplies. They must spend valuable classroom time teaching and testing to national and state standards. Teachers strive to find ways to offer laboratory experiences that will motivate their students. Dissection offers a riveting experience that fully engages students, and is something that students tend to remember, often with some combination of excitement, fear, and revulsion. An additional feature is that dissection is familiar to teachers, is not intimidating, and does not require extensive new learning for them.

Resources for Human Health and Science Education

Medical and veterinary schools have invested during the past couple decades in creating new laboratory teaching resources that draw on new technologies for learning, including computer software, plastination of tissues, and reusable prosections. In contrast, major initiatives have not yet been made to modernize pre-college laboratories. Hence, current biology laboratory curricula in pre-college classes seem more likely to rely on dissection than those in college or professional school laboratories.

Recently, some outstanding software on human biology has become freely available on the web. For example, National Geographic, the British Broadcasting Corporation (BBC), and the Public Broadcasting System (PBS), among others, have produced some fine instructional materials concerning the systems and major organs of the human body. While some of these are fine resources that are visually appealing and informative, they do not fulfill teachers' needs for materials that would stimulate children to solve problems and interact with the subject matter rather than rote learning. The most gifted and motivated teachers are looking for webquests, materials that engage students in interacting with the information.

The technological capabilities evidenced in computer games and Hollywood films have yet to be brought to educating our children concerning their own bodies and health. While some recent web-based resources on the human body are promising, much more can be done to support health promotion and knowledge of the human body by using the full range of web technology to engage children and adults in learning.

See also Alternatives to Animal Experiments; Student Objections to Dissection

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Lynette A. Hart

DISTRESS IN ANIMALS

Distress denotes mental suffering and may be reflected in a change in molecular receptor binding in the central nervous system (e.g., benzodiazepine, opioid, serotonin, noradrenalin). It may be an integral part of other aspects of suffering. An animal in pain from a broken leg may be fearful of being moved or touched, as well as being distressed by its inability to move normally. Such changes in receptor binding in the central nervous system may lead to stereotypic behaviors.

In a physiological sense, it means that an animal is no longer able to cope with its environment, usually over a long period of time, and is becoming hormonally deranged, that is, homeostasis is lost. Most animals can adapt to short-term minor stressors, and this is an important part of survival and retaining fitness to live and reproduce, but when the stressors are severe or prolonged so that animals are unable to adapt, they can be described as physiological distress.

David B. Morton

DOCKING

Docking refers to the removal of varying amounts of the tail. Docking is done for reasons of fashion (dogs, horses), protection of some animals from diseases where other preventative measures are impracticable (lambs, hill farming of sheep against fly-strike), convenience

of the stockperson (dairy cattle swishing their tails in the face of the person milking it), to prevent tail biting in pigs, which is most often caused by poor farming conditions (e.g., overstocking in barren environments). Occasionally, it is done therapeutically for the benefit of the individual animal.

David B. Morton

DOGFIGHTING

The arrest and imprisonment of Michael Vick, star quarterback for the Atlanta Falcons, for dogfighting in 2007, focused international attention on a brutal blood sport which thrives in a netherworld devoted to pain and suffering. As currently practiced, fights feature two dogs attempting to inflict maximum damage on each other for the entertainment and profit of spectators and owners, who frequently bet heavily on the outcome. Ranging in length from minutes to two hours, matches end when one dog can no longer continue due to loss of will, exhaustion, injury or death. Owners are known to kill or simply abandon losers, generally for lacking gameness, the drive or quality that dogfight trainers believe compels a dog to attack its opponent head-on and continue fighting until it is killed or kills. Winners often suffer serious injury and are seldom unscathed.

The Humane Society of the United States estimates that 40,000 people nationally participate in organized dogfighting rings that sponsor high-stakes matches where tens of thousands of dollars are wagered on a single fight. An estimated 100,000 participants, the majority of them disaffected urban youth, fight their dogs opportunistically in less structured matches, often for little more than bragging rights. The total number of participants worldwide is unknown.

But evidence indicates that dogfighting is a global problem. Even where it is legal, or at least officially ignored, dogfighting is tied to issues of caste and class; to urban decay and rural decline; to gangs and other criminal groups, especially those trading in guns and drugs; to gambling; to alcohol abuse; to animal cruelty; to alienation and socially deviant behavior; and to violence against women and children.

Dogfighting is closely related to other blood sports involving animals that are rooted in antiquity and flourished in medieval and Renaissance Europe. Bull and bear-baiting, in which dogs attempt to maul and kill a tethered bull or bear, were popular among commoners and aristocrats. Queen Elizabeth I herself sponsored bull and bear-baiting spectacles. Other animals were baited as well, particularly badgers and wild boars. Hog dogfighting, where a dog is sent to fight a caged boar, is a contemporary variation.

As religious and social reform groups voiced increasingly strident opposition to blood sports involving animals and other atrocities against humans and animals throughout the 17th century, pit dogfighting gained popularity in England and America.

In 1835, with a major push from the newly organized Royal Society for the Prevention of Cruelty to Animals, England became the first country to outlaw dogfighting, bull and bear baiting, and other blood sports, as well as the use of dogs as beasts of burden. English blood sports shifted to dogfighting, which could be staged in a tavern's back room, in barns, or other private spaces, unlike a bear- or bull-baiting, which required

The scarred face of Lucas, a pit bull used in the Michael Vick dogfighting operation, is shown at Best Friends Animal Sanctuary, north of Kanab, Utah, in January 2009. A year after some experts left them for dead—in fact said they should die—many of these dogs are alive and thriving at the Best Friends Animal Sanctuary, rewriting myths about who pit bulls really are and who they can be. (AP Photo/Jae C. Hong)

larger venues. (Rat killing competitions also flourished, until they fell victim to better urban rodent control.) To legitimize their sport, the dogmen established rules dictating the dimensions of the pit in which the fight takes place, how the dogs should engage, how a break is enforced, and a winner determined.

In America, dogfighting flourished among gamblers, grifters, bar hoppers, sportsmen, and gentlemen with and without portfolio through the 19th and into the 20th century. The American Society for the Prevention of Cruelty to Animals was founded in 1866 in New York City, and the next year the City outlawed dogfighting and bull-baiting as part of a campaign to control stray dogs and clean up slaughterhouses. Bull-baiting—using dogs to harass, catch and hold bulls by the nose while the butcher bled them to death before throwing unwanted scraps into the gutter full of contending dogs—was still common, justified by the belief that an animal terrorized in that fashion produced more tender meat. With each state responsible for its own animal laws, legislation was a patchwork of poorly enforced laws, until dogfighting itself went out of vogue. The United Kennel Club published its last U.K.C. Pit Rules in 1940, and ended its sanctioning of the blood sport.

Still, dogfighting was not outlawed in all 50 states until 1977. In the United States, animal law resides with the states, unless interstate commerce is involved, and the federal government in 2007 strengthened its statutes forbidding the transport of animals for fighting. Most other countries in Western Europe and among former British colonies have

followed England's lead over the past two centuries, and even in nations where dogfighting is popularly considered legal, like parts of Central and South America, Russia, Afghanistan, and Japan, it often exists in a netherworld just outside rarely enforced laws against animal cruelty, if its existence is officially recognized at all.

Each culture follows its own dogfighting tradition, including the choice of dogs. Russians and Afghans, for example, use big sheep dogs like the Caucasian *Ovcharka*. Argentineans are said to prefer the *dogo de Argentina*. In Japan, where dogfighting dates at least to the 14th century, large mastiff-like *Tosa inu* are fought, as are pit bulls, reportedly more for honor and prestige than money. Anglo-Americans favor purpose-bred pit bulls.

Following the principles of scientific breeding then coming into vogue, 19th century dogmen created the new pit fighting dogs from terriers and the big, mastiff-like *bandogges* that had been used to guard the Tower of London and in bull- and bear-baiting, according to Johannes Caius, a Cambridge physician, in his 1576 classification of English dogs, *A Treatise of Englishe Dogges.* The butcher's dog, with its shortened, brachycephalic muzzle for catching and holding bulls for slaughter, might also have figured in the mix, as dogmen sought animals that were quick and relentless on the attack but sturdy, possessed of a low center of gravity, great strength, a high tolerance for pain, and an inability to understand canine body language.

The bull terrier, Staffordshire bull terrier, American Staffordshire terrier, American pit bull terrier are all pure breeds with their roots in the 19th century Anglo-American dogfighting, that through World War II, were also acceptable companion dogs, for men. General George S. Patton, for example, had a bull terrier throughout the war. In the 1980s, when pit bulls purpose-bred to fight became an urban scourge, the bull terrier was deemed safe because it was the same breed as Spuds McKenzie, star of a national Budweiser beer advertising campaign. Thus, when Miami-Dade County in South Florida became the first major metropolitan area in the United States to ban a specific type of dog—the pit bull or pit fighting dog in all its guises—bull terriers were specifically exempted.

Breed-specific bans have proliferated around the world, largely because of the epidemic in dog bites and the association of fighting pit bulls with disaffected urban minority youth and violent criminals. Yet members of the Fancy, who breed the bull terrier, Staffordshire bull terrier, and American Staffordshire terrier, claim they have bred their dogs away from aggression and maintained them as companion animals. Dogfighters do, in fact, maintain their own bloodlines, independent of registration with any kennel club. Defenders of pit bulls, even non-fighters, argue that the dogs can be gentle with people, but their message frequently gets lost in the violence and negative publicity.

In some jurisdictions, legal bans on pit bulls have led dogfighters to adopt other breeds and cross breeds, including the *dogo de Argentina*, Rottweiler, and *Presa de Canario*.

The pit gives the dogs their name. It is a square with sides at least 14 feet long, except when space limitations require it to be smaller, and walls 2.5 to 3 feet high. Any dog jumping out of the pit is disqualified. Scratch lines, behind which the dogs are held, are drawn seven feet from the opposing corners.

Rules governing the preparation of dogs, scratch, and turn, and other aspects of the fight, are intended to make fair an event tainted with the aura of cheating in the form of illegal use of steroids, and of poisons on the coat of the dog. Essentially dogs are expected to cross the scratch line within 10 to 30 seconds at the beginning of the match and after each break, called when one contestant turns its head and forequarters away from the other. The dog who turns first must scratch first, that is, prove itself still game. The dogs alternate all subsequent scratches, regardless of which one turns. Break sticks are used to pry a dog's jaws apart and off its opponent when necessary.

Investigators have identified several types of dogfighters, more than 90 percent of whom are male, according to a Humane Society of the United States survey: professionals who make their livings breeding, training, buying and selling, and fighting dogs at matches that can carry $100,000 prizes. Results are published in magazines devoted to the sport. A dog with five straight wins is a grand champion.

It is not unusual for these individuals to have well over a dozen dogs bound by heavy three-foot chains to a stake or car axle in a dog yard when not traveling, training, or fighting. Professionals often maintain their own bloodlines; forced breedings at rape stands are used to make sure the desired dogs mate. Semiprofessional dogmen participate in organized fighting on a smaller scale and not as a full-time preoccupation.

In the 1980s, pit bulls began to appear in urban neighborhoods, among gang members and street drug dealers, who used them as protection, and eventually among young men embracing through hip-hop and rap music the violent culture that was their home. Where pit bulls went, dogfights followed, abiding by street rules, which were dismissed by professionals.

But street fighting appeared to be a growing international phenomenon among the urban poor, and occasionally one of its former practitioners, like Michael Vick, moved to enter the ranks of major players. He started his own Bad Newz Kennels on property he bought for that purpose in Smithfield, Virginia, bought, bred, trained, and fought his dogs while gambling on them. He and his dog handlers used treadmills, suspended tires, and stray and stolen cats and dogs as training aids. Vick admitted that he participated in killing eight dogs by drowning and hanging because they had failed to show proper gameness when rolled or tested in a fight with an older kennel dog. Others were shot and electrocuted. Vick and three others were convicted of federal charges and imprisoned, and Vick was suspended by the NFL, losing lucrative endorsements as a result. As many of his dogs as possible were taken in by rescue organizations.

Vick's dogfighting kennel may have been unusual because of his financial resources. In other regards, it was like other kennels, a place defined by the cruelty and violence of the dogfighting culture that breeds more cruelty and violence in people and animals.

See also Blood Sports

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Mark Derr

DOGS

Over the years, dogs have been widely used in biomedical research to investigate heart disease, bone injury, hearing loss, blindness, lung disorders, infectious diseases, the effects of lethal poisons, and other conditions that have relevance to human health. They are also used to study the nutritional value of dog food. In the United States, the number of laboratory dogs used peaked in 1979 at 211,000 animals per year. Recently, the numbers have declined so that in 1995 the number had dropped to 89,420 per year. In 2006 more than 87,000 dogs were used for research, a sharp increase from previous years in which 65,000–70,000 dogs were used annually (http://www.aavs.org/researchDogs.html; see also http://www.hsus.org/animals_in_research/species_used_in_research/dog.html). To put these figures in perspective, dogs comprise a relatively small fraction (less than about one percent) of all animals used for research. Nevertheless, the use of any dogs for research has always been controversial. Dogs are a well-loved species and public sympathy for dogs runs high.

Controversy over the use of domesticated dogs for research has a long history. In the early days of animal experimentation, the 19th-century French physiologist Claude Bernard encountered fierce public criticism because he performed painful experiments on dogs. On one occasion, he was reported to have experimented on the family pet, which caused his wife and daughter to become antivivisectionists. In those days, there were no commercial breeders of laboratory animals, and it was hard for researchers to obtain suitable animals for their work.

In the 20th century, as the volume of animal experiments increased, researchers found a ready supply of dogs and cats for their work from shelters and pounds. Shelters and pounds are places where lost, stray, and abandoned animals are temporarily housed. By law, shelters have to retain animals in their care for a certain number of days so that owners have an opportunity to reclaim their pets or, alternatively, adoptive homes are sought. If a suitable home is not found, the dogs are often euthanized.

In 1945, a lobbying group for animal researchers was formed whose primary purpose was to work for passage of state laws to permit researchers to have access to unwanted and unclaimed animals in shelters. These efforts persist to this day. However, these efforts are strongly resisted by members of the animal welfare and animal rights movement, who hold that shelter animals should not be used for research. Leading humane societies including the Animal Welfare Institute, the Humane Society of the United States, the American Humane Association, and others have been involved. Currently, state laws are mixed. Some states, notably Minnesota, Utah, and Oklahoma, specifically require shelters to hand over their animals to research, whereas 17 other states prohibit this practice (http://www.

Dogs confined in a very small, but legal cage. Dogs are used in a variety of laboratory experiments. (Shutterstock)

hsus.org/animals_in_research/species_used_in_research/dog.html). In states where there is no law, shelters operated by humane societies usually will not permit their dogs or cats to go to research. But city pounds, whose responsibility it is to keep stray animals off the streets, do not share the same compunction about the eventual fate of former pets, and so are often glad to sell dogs to labs.

The rationales for these opposing viewpoints of researchers and members of the humane movement are as follows: Researchers argue that shelter animals are unwanted and are doomed to die anyhow, so why not use them for a socially useful purpose? Also, the animals are less expensive than animals bred specially for the purpose of research, thus saving research dollars. The animal welfare/rights view is that human beings have a profound moral responsibility to domesticated animals and this cannot be forsaken at any point in those animals' lives. Shelters should be sanctuaries for animals, and not a supply line for biomedical researchers. From a dog's viewpoint, a humane death may be a better choice than a longer life as the subject of a painful experiment. Animal welfarists hold that overpopulation of pet animals should not be exploited for the benefit of researchers. Animals for research should be a different population of animals than those that were once pets.

This clash of viewpoints has been somewhat lessened by the fact that, since the 1980s, commercial breeders for

laboratory dogs have become well established. It is a profitable business. Commercial (Class A) breeders can supply animals who are healthy, and of known age and genetic make-up, and who are more reliable experimental subjects than so-called random source dogs obtained from shelters or from Class B breeders, of which there are about 15 remaining in the United States (http://www.hsus.org/animals_in_research/animals_in_research_news/Class_B_Dealers.html). As of the late 1990s, researchers obtained about half their dogs from commercial suppliers and the other half from shelters. Increasingly, researchers are finding that so-called purpose-bred animals obtained from Class A breeders are scientifically preferable to using random source animals. However, Class B breeders also are used as a source of dogs for research by some research facilities, despite the fact that they often sell dogs that are lost, strays, or have been stolen or obtained from auctions, flea markets, or pound seizures (http://www.hsus.org/animals_in_research/species_used_in_research/dog.html).

Public Health Service Policy protects dogs that are used in federally funded research. Pending legislation entitled The Pet Safety and Protection Act (S. 451) (http://www.hsus.org/animals_in_research/animals_in_research_news/pet_safety_and_protection_act.html) would ensure that any dog or cat used by research facilities was obtained legally. It specifically targets Class B breeders.

Dogs are the only animals required to have exercise under USDA standards. USDA standards also require that dogs housed without sensory contact with other dogs must be provided with "positive physical contact with humans at least daily" (http://www.hsus.org/animals_in_research/species_used_in_research/dog.html). Updated information about the use of dogs in research can be found at these websites: http://www.hsus.org/animals_in_research/species_used_in_research/dog.html; http://www.hsus.org/animals_in_research/animals_in_research_news/Class_B_Dealers.html; and http://www.aavs.org/researchDogs.html.

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F. Barbara Orlans and Marc Bekoff

DOLPHINS

See Whales and Dolphins

DOMESTICATION

In the Western world today, animals are divided into three basic groups, the wild, the tame, and the domestic, but these divisions are fluid and more interchangeable than they seem at first. It is difficult to define what is a wild and what is a domestic animal. A wild animal is usually thought of as one that is fearful of humans and runs away if it can. But this fear of humans is in itself a behavioral pattern

that has been learned from experience of human predation over countless generations. A wild animal that has no contact with humans has no fear of them and can be quickly exterminated, as was the dodo on Mauritius. This large flightless bird evolved without any predators, so when Portuguese sailors landed on the island for the first time in about 1507 they only had to knock the dodos on the head to get much-needed fresh meat. However, for perhaps the past 150,000 years, humans have become so supremely successful at killing other species that there are rather few wild animals left on Earth that do not attempt to escape from us as the master predator. On the other hand, it is remarkable how many species of wild animals can be tamed, and taming is not a modern phenomenon. It has probably always been a very important and essential part of human behavior and an adjunct to hunting. Young animals whose mothers were killed in the hunt would have been nurtured and reared by people, and it is not only in modern times that wild animals were captured and tamed as symbols of status, as shown by this anecdote recorded by the Greek writer Diodorus Siculus and written in the first century BC (Oldfather, 1979, pp. 2,187). It is about the capture of a python for King Ptolemy's zoo in ancient Egypt in the middle of the third century BC:

> Observing the princely generosity of the King in the matter of the rewards he gave, some hunters decided to hazard their lives and to capture one of the huge snakes and bring it alive to Ptolemy at Alexandria. . . . They spied one of the snakes, 30 cubits long, as it loitered near the pools in which the water collects; here it maintained for most of the time its coiled body motionless. . . . and so, since the beast was long and slender and sluggish in nature, hoping that they could master it with nooses and ropes, they approached it the first time, having ready to hand everything which they might need. . . . but the beast, the moment the rope touched its body whirled about and killed two of the men.
>
> Nevertheless the hunters did not give up. . . . They fashioned a circular thing woven of reeds closely set together, in general shape resembling a fisherman's creed and in size and capacity capable of holding the bulk of the beast. . . . and so soon as it had started out to prey upon the other animals as was its custom, they stopped the opening of its old hole with large stones and earth and digging an underground cavity near its lair they set the woven net in it and placed the mouth of the net opposite the opening. . . . And when it came near the opening which had been stopped up, the whole throng, acting together, raised a mighty din and so it was caught.
>
> When they had brought the snake to Alexandria they presented it to the king. . . and by depriving the beast of its food they wore down its spirit and little by little tamed it, so that the domestication of it became a thing of wonder. (Bk III, p. 36)

The Process of Domestication

In one sense it can be said that a domestic animal is just one which has lost its fear of humans, like that snake, but true domestication involves much more than this.

The process of domestication is subject to two profound overriding and interlocking influences, the biological and the cultural (Clutton-Brock, 1999a). The biological process of domestication begins when a small number of animals are separated from the wild species and become so tame that they have lost all fear of the humans around them and are said to be habituated. For domestication to follow from taming, the animals have to go through a series of morphological and behavioral changes, which in mammals broadly follow the same pattern in succeeding generations, irrespective of the species. In general what happens is that the characteristics of the juvenile animal are retained into the adult state, a process that is known as neotony. Thus domestication of the wolf, the wild cat, the wild sheep, or the wild boar all led in the initial stage to reduction in size of the skull, skeleton, and brain. This was followed in succeeding generations by an increase in the proportion of fat to muscle in the body, to changes in the coat, in the carriage of the ears and tail, and to loss of the wild temperament.

When a small population of animals that has undergone the first stages of domestication is bred over many years in isolation from the wild population, it may form a founder group which is changed both in response to natural selection under the new regime of the human community and its environment, and by artificial selection for economic, cultural, or aesthetic reasons.

Once a species of animal has become fully domesticated, say the domestic dog, *Canis familiaris,* new breeds are produced by further reproductive isolation. The founders of the new breed contain only a small fraction of the total variation of the parent species, and they become a genetically unique population, which continues to evolve under natural and artificial selection. At any point the process can begin again, and further new breeds can be developed by crossbreeding. A breed can be defined as a group of animals that has been bred by humans to possess uniform characters which are heritable, and distinguish the group from other animals within the same domestic species.

There are many anomalies in the interface between the wild and the domestic. For example, domestic rats, mice, and rabbits can be adored animal companions or laboratory animals that are highly valued for medical research, but their wild counterparts are universally treated as vermin and killed on sight.

The Cultural Process of Domestication

The second fundamental side to the process of domestication is the equally important cultural process, which affects both the human domesticator and the animal domesticate. Domestication begins with ownership. In order to be domesticated, animals have to be incorporated into the social structure of a human community and become objects of ownership, inheritance, purchase, and exchange. The relationship between human and animal is transformed from one of mutual trust, in which the environment and its resources are shared, to total human control and domination.

The process of taming a wild animal, whether it is a wolf or a wild goat, can be seen as changing its culture. The term culture has many meanings, but here it can be defined as a way of life imposed over successive generations on a society of humans or animals by its elders. Where the society includes both humans

and animals, then the humans act as the elders.

The animal is removed from where, in the wild, it learns from birth either to hunt or to flee on sight from any potential predator. The tamed animal is brought into a protected place where it has to learn a whole new set of social relationships, as well as new feeding and reproductive strategies and, under domestication, this culture is passed down from generation to generation.

A domestic animal is a cultural artifact of human society, but it also has its own culture, which can develop, say, in a cow, either as part of the society of nomadic pastoralists or as a unit in a factory farm. Domestic animals live in many of the same diverse cultures as humans, and their learned behavior has to be responsive to a great range of different ways of life. In fact, so closely do many domestic animals fit with human cultures that they seem to have lost all links with their wild progenitors. The more social or gregarious in their natural behavioral patterns are these progenitors, the more versatile will be the domesticates, with the dog being the earliest animal to be domesticated (around 14,000 years ago), and an extreme example of an animal whose culture has become humanized.

It is not fully understood why the broad domestication of livestock animals, these being sheep, goats, cattle, pigs and equids in the Old World and camelids in South America, occurred progressively from 8,000 years ago, but this was the basis of the so-called Neolithic revolution when the fundamental change in human societies occurred, and groups of hunter-gatherers became farmers and stock-breeders. Archaeologists in the past have hypothesized that there was a natural progression first from generalized or broad-spectrum hunting in the Paleolithic era, at the end of the last ice age, to specialized hunting and herd following of, for example, reindeer or llama. It was believed that this stage was then followed by control and management of the herds, then to controlled breeding, and finally to artificial selection for favored characteristics. However, the sequence would very rarely have been so smooth, for the social implications of ownership by a social group of hunter-gatherers are a bigger hurdle to domestication than they may seem. Many hunter-gatherer societies that could have domesticated animals never did so, and this was probably for cultural as much as for many other complicated reasons. Why, for example was the bighorn sheep never domesticated in North America?

Tim Ingold has argued that for hunter-gatherer societies there is no conceptual distance between humanity and nature, and the boundary is easily crossed. The animals in the environment of the hunter act with the hunter in mind and present themselves to him. The hunter believes that if he is good to the animals they will be good to him, and if he maltreats them, the animals will desert him. Animals to be hunted are not seen as wild, but as individuals that allow themselves to be taken. The best known survival of this belief is seen among the Ainu of Hokkaido, Japan, who still practice a bear sacrifice in which a bear cub is nurtured for months and then killed in an elaborate and ancient ritual.

In the pre-domestication world, humans and animals lived in mutual trust, but all is changed by the herding of animals and even more so by full domestication. Herdsmen do care for their animals, but it is quite different from the care of the hunter, because equality is lost and domination takes over from trust. By

8,000 years ago, domination of the natural world was already well under way, and by the period of the ancient Egyptians and the capture of the python described above, agriculture and the breeding of livestock were the established foundations of all the ancient civilizations of the Old World. The transformation in attitudes toward the animal world from those of the hunter-gatherer to those of the farmer and stock-breeder was epitomized by Aristotle (384–322 BC) who wrote about more than 500 kinds of animals all of which, he believed, existed for the sake of men (Clutton-Brock, 1999b). This belief that the world exists for the benefit of humans has persisted until the present day, and is imbued in the worldwide sport of hunting. But the wild places and their fauna are shrinking fast and, increasingly in the future, biologists will have to tackle the great problems of their conservation and management. Whether these fauna include African elephants, Asian lions, or giant tortoises, they are all becoming increasingly hedged in. In order to survive, the wild will have to merge with the tame, and as a result of morphological and behavioral changes brought about by human ownership and control, wildlife may even become domesticated.

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Juliet Clutton-Brock

DOMINIONISM

According to one dictionary, the word dominion means "a supremacy in determining and directing the actions of others. . . . the exercise of such supremacy." Dominionism is the West's basic ideology, one that views the world and all of its life forms as God-given property to serve human needs and whims. Dominionism drives science and technology to take ever-increasing power and control over the living world so that some human beings, at least, may have safety, comfort, convenience, longer lives, and other benefits. Dominionism is older than the Judeo-Christian ideology. As farmers, humans stepped up ways to use some plants and animals while they subdued the competition, the plants and animals of the natural world. As farmers, humans learned to take the laws of nature into their own hands. In time, agrarian peoples regarded the living world less as a divinity and more as an enemy. Nature was not to be held in awe; it was to be subdued, outwitted, and controlled. Animals, who had long been regarded as the souls and powers of the mysterious living world, became tools, goods, and pests. With their relegation to inferior status, the much older sense of kinship and continuity with the living world broke up, and the agrarian sense of human supremacy and alienation set in.

See also Anthropocentrism; Evolutionary Continuity; Religion and Animals—Christianity; Religion and Animals—Disensoulment

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Jim Mason

DONKEYS

The story of the donkey makes an important contribution to the complex and contradictory history of human and nonhuman animal relationships. Donkeys were one of the earliest animals to be domesticated, and their history with humans is long and close, but it is almost invariably a story of cruel exploitation. It is ironic that the domestic donkey, designed by humans to carry their burdens as cheaply as possible, was relegated to low status and associated with the world's poorest societies. The social construction of donkeys has generally been as unfeeling beasts of burden, ignored, abused, and derided. They have embodied a variety of social, cultural, symbolic, and religious meanings. Donkeys have, in many ways, acted as mirrors to the human condition, standing between us and our sense of ourselves. In *Don Quxiote,* for example, Sancho Panza's beloved donkey is both true companion and humble and steadfast mirror to his master.

The story of the donkey began in Africa and Asia, where they ran free as wild asses before their domestication by humans over 10,000 years ago. As donkeys made the long journey from Africa and Asia to Europe and on to the United States and Australia in the service of humans, their physical journeys were accompanied by their changing fortunes in terms of their treatment by humans. Thus the history of the donkey is irrevocably tied to human history. Archaeologists and anthropologists, for instance, have discovered where and when donkeys were first used by people. They have found that this event marks an important cultural shift from a sedentary lifestyle to a more mobile society that enabled humans to extend their worlds, to travel, and to trade with different cultures. Despite their valuable contribution to human society, however, very little is known about the process of donkeys' domestication or their welfare over time. It is as though they are beneath consideration or interest.

Throughout the world, donkeys have been used for innumerable tasks, mainly as pack animals, during times of peace and of war. By 1000 BCE, donkeys were the main means of transport throughout Egypt and western Asia, as the horse was in the rest of Asia and Europe. Extensive wear on the joints of 5,000-year-old excavated donkey skeletons show that they were used for heavy transport. This was at the dawn of the Egyptian empire, which was built on the backs of donkeys. There were times during their association with humans when donkeys were considered valuable and had a high status. The Egyptians, who exploited donkeys as beasts of burden, for example, were at the same time proud of their large, valuable and graceful white donkeys.

However, donkeys were used for more than practical purposes. They have had religious significance for humans since the start of their domestication. In

Egyptian history, for instance, the donkey is identified with the god Set, a god of the desert depicted with a donkey's head. The worship of the early Christian God was associated with the donkey that Jesus rode into Jerusalem, and there are strong associations with donkeys in the Christian, Jewish and Muslim religions. Despite the connections between donkeys and religion, however, other traditions and customs have had a greater effect on the way donkeys are perceived. Donkeys played an important but often shameful part in the customs of the Middle Ages. Enemies were often placed on donkeys, facing backwards, as a typical form of humiliation. The backwards ride of the criminal to the gallows on a donkey was also used as a form of pre-execution disgrace. Shaming people in this way is evident in many cultures; a recent example was reported from Afghanistan in 1990.

Donkeys came to Europe before the second millennium BCE, most probably to accompany the introduction of viticulture. Their further distribution through Europe took place with the Roman army in the first century BC. The supply trains of the expanding empire consisted in the main of droves of pack donkeys. Later, they were used in agriculture in Roman colonies, and in the new vineyards that the Romans planted as far north as France and Germany. Cruelty to animals in 19th-century Europe was common. Donkeys were abused, starved, and thrashed. They have generally been dismissed as stupid and unfeeling beasts of burden and their very nature—patient, humble, loyal, and accepting—reinforces this perception. Harsh treatment continues in Third World countries today, where donkeys are abused and accorded little care or status.

Donkeys carrying plastic water jugs, on the outskirts of Kandahar, Afghanistan. (AP Photo/ Eugene Hoshiko)

Donkeys arrived in the United States with the Spanish and in Australia with the British. Without the service of these animals, it would have been difficult to colonize these continents. Their hardiness in harsh and inhospitable conditions was invaluable to the pioneers. However, the success of European humans and their animals in colonizing new lands led to many unforeseen consequences. One of those consequences is that some of those animals, the descendants of which are now running wild in vast numbers, having successfully adapted to their environment, are causing problems for the descendants of the humans who brought them there.

When donkeys were no longer considered of any economic value, they are socially constructed as pests, feral, exotic invaders, and even vermin. They are targeted for eradication when they compete with livestock for resources, destroy cultivated or wild environments, and threaten humans economically. Although they were previously shot in the United States, there was an outcry from some sections of the public. In 1952, legislation was passed making it illegal to shoot wild donkeys in Death Valley in California, where the greatest numbers roamed. A sanctuary was also set up for their safety.

In 1971, the US Senate and House of Representatives passed the Wild Free-Roaming Horses and Burro Act, which protected wild horses and donkeys from harassment and death. In fact, wild donkeys have been removed from National Parks, and agencies for and against the donkey still battle in various states; however, it would seem that those who wish to preserve the donkey as an important player in America's history are winning with their "Adopt a wild horse or burro" scheme, run by the Bureau of Land Management. Despite attempts to revoke the protections afforded by the Act of 1971, it was reaffirmed unanimously in the House of Representatives in May 2006, with the passage of an amendment prohibiting taxpayers' money from being used to sell or slaughter America's wild horses and burros. In Australia, on the other hand, government agencies are intent on the eradication of feral donkeys. There have been public outcries whenever it is reported that brumbies (wild horses) are to be slaughtered, so it would be more hopeful for the remaining wild donkeys if, as in the United States, they were considered equal to wild horses, and recognized as important players in Australia's European history, rather than slaughtered as vermin.

Within government and scientific communities, ethical issues regarding the suffering of donkeys is of secondary consideration to the management of feral animals. Many believe that, as a society, humans must decide the moral standing and significance of nonhuman animals and the duty of care afforded to them. An anthropocentric ethic prevails, where environmental, agricultural, and economic considerations override the value of the individual animal. Questions like these have been asked: Is it morally defensible to assign value to a native animal and death to a non-native animal? Are donkeys, who have served humans for thousands of years, somehow less worthy now that they have become overly abundant when we no longer need them? If we decide that it is ethically defensible to slaughter them, then we must be very sure of our reasons, and ensure that the killing is humane.

Those who are concerned about the mistreatment of donkeys believe that

these animals have the right to respectful treatment. The labels assigned to them, such as pest, exotic invader, and feral have no relevance outside human constructions. Many believe that all species and all individual animals, regardless of the value humans may place upon them, positive or negative, have an equal right not to be harmed. Critics of the destruction of donkeys point out that such policies support the premise that humans have the right to destroy elements of nature whenever they choose. Donkeys are caught between a rock and a hard place, literally and philosophically, as they are gunned down from helicopters in isolated rocky outcrops in northern Australia, their bodies left to rot where they fall.

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Jill Bough

DRAIZE TEST

See Toxicity Testing and Animals

E

ECOFEMINISM AND ANIMAL RIGHTS

Ecofeminism, or ecological feminism, is the view that there are important connections between what is characterized as oppression of women and the domination of nature. These connections may be historical (causal), experiential (empirical), symbolic (literary and religious), theoretical (conceptual, epistemological, and ethical), political, and/or practical. One connection, for example, is that Western culture inherits a belief system based on mastery; this in turn supports racism, sexism, and exploitation of animals. Ecofeminists are concerned about broad questions of the ethical and epistemological quality of relationships between humans and other animals, as well as the connections between animal oppression and the oppression of women, people of color, and the natural world. While not all ecofeminists agree about how connections may be drawn, all agree that any feminist theory or environmental ethic that fails to recognize some connection is inadequate.

Some critics of ecofeminism object to drawing connections between women, animals, and the rest of nature. This, they say, appears to essentialize women, ignoring important differences among and between women. Critics also are wary of views that make women appear inherently closer than men to nature and animals, believing that this connection makes women inferior and less valuable. Ecofeminists reject these dualisms and argue that being close to animals is a problem only if animals are seen as less than human.

A particular strength of ecofeminist writing is its critique of the way that animals are often excluded from environmental ethics and politics, which often focuses on generalized protection of nature. Many environmentalists justify killing individual animals or eradicating entire populations of invasive species in order to protect ecosystems. Some ecofeminists argue that individual animals matter, whether they are domestic animals or nonnative species, and that animal interests should not be ignored in order to promote broader environmental values.

Many ecofeminists have begun to develop theories and practices linking ecofeminism to animal defense. Part of this work involves highlighting parallels between the specific ways that women and animals are oppressed. Two examples are the ways that female farm animals have their reproductive labor exploited, and the way U.S. doctors encourage menopausal women to use the drug Premarin, produced through large-scale exploitation of pregnant horses. Ecofeminist animal defense theories draw on traditional animal defense theories, such

as the rights approach of Tom Regan and the utilitarian approach of Peter Singer, and emphasize the importance of animal suffering. However, ecofeminists are cautious about using traditional concepts of rights, which are based on a dualistic notion of rationality, understood as distinct from emotions. Accordingly, some ecofeminists stress the need to develop an ethic of care towards other animals that emphasizes attentiveness to animals' interests, feelings, pain, and ability to flourish.

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Lori Gruen and Lynda Birke

ECOLOGICAL INCLUSION: UNITY AMONG ANIMALS

The Concept of Ecological Inclusion

Ecological inclusion as a concept is an evaluative process to better review exploitative practices, to gauge the degree of disconnectedness that results from those practices, spatially, temporally and contextually, and to formulate moral, ethical, and practical responses to how exclusion may be overcome or, if not, largely minimized. The overriding objective of ecological inclusion is to establish the foundations for a new interrelationship between animals and humans that is more respectful and caring on the part of humans, and one that may help alleviate some of the ecological problems that result from practices and policies of exclusion.

Ecological inclusion is both a simple prescription and an alternative worldview that all humans, individually and/or collectively, can potentially apply to all interrelationships with nonhuman animals. It allows humans to apply appropriate inclusive solutions to various exclusionary interrelationships in an effort to eliminate, or at least alleviate, exploitation. Solutions may need to be justified on certain ecological criteria and by looking at the total environment, as well as on moral and ethical grounds, such as offered by animal welfare or rights theory.

Furthermore, the practical application of the concept of ecological inclusion will always be dependent upon place, time, and context and, therefore, solutions will vary. For example, killing domesticated animals that have escaped and established themselves in ecologically destructive nonendemic wild populations should only occur if it can be justified scientifically, culturally, ethically, and morally. That justification is dependent on the protection of, for example, an endangered species in an area where that species has little chance of survival, and only upon ensuring that the nonhuman animals killed would not suffer in any

way. Taking the life of any individual is in reality a denial of their intrinsic value, and denying such value in any individual should not be taken lightly. Making decisions regarding the life of individuals is also potentially reductionist and mechanistic. An inclusive framework seeks to address such conundrums.

Ecological inclusion involves reviewing those exclusionary practices that humans have imposed on nonhuman animals over time with a view to ultimately providing a holistic and less discriminatory worldview. The concept involves gauging the degree of exclusion that results from exploitative practices and formulating ethical and practical responses as to how humans might establish better interrelationships and enhance the greater whole within which all reside.

Given the heavy reliance upon nonhuman life, it is perhaps not surprising that human utilization and dependence upon other forms of life has become so overexploitive and exclusionary of nonhuman animals. If humans are to become less exploitive and more inclusive of nonhuman animals, then new interrelationships need to be established. A number of fundamental ethical and moral principles and precepts have developed over the centuries which, to varying degrees, have attempted to do just that. That has not been enough; there too many barriers have been erected that prevent humans from better engaging with other life forms. The overall objective of ecological inclusion as a concept, therefore, is towards overcoming those barriers by acting and thinking inclusively, with both individuals and collectively, in all our relationships with nonhuman animals.

The sciences of biology and ecology have allowed humans to develop an understanding that what links human and nonhuman animals is their shared evolution and the overall interconnectivity of planetary life. This understanding is implicit within the concept of ecological inclusion, that is, that the entire planetary ecology is invariably holistic. Some theocentric and atomistic concepts were devised to provide better outcomes for nonhuman animals and for the interrelationships between human and nonhuman animals. However, such concepts more often than not fail to give enough credence to the complexities associated with evolution and ecology, and are either bound to fail, or are not about seeking better outcomes for nonhuman animals at all, but in fact about providing ongoing justification for the *status quo.* Concepts such as stewardship, utilitarianism, rights and duties, based as they are on individualistic foundations, can only ever offer piecemeal solutions to much more complex problems. Nonetheless, they do offer some solutions.

Fundamental Philosophical Principles of Commitment, Respect, and Compassion

Aldo Leopold's land ethic, Albert Schweitzer's reverence for life, and Charles Birch's postmodern ecological worldview offer important insights for a worldview that is more ecologically inclusive. Leopold stressed a deeper, more holistic approach to nature. He extended collective moral considerability to the entire land community. Whether it was Leopold's intent to extend moral considerability beyond the realm of the individual and thereby capture all individual nonhuman animals within that consideration, or to extend it to include all individual

members of wild nature, is a point that has led to much debate.

Undoubtedly, Leopold recognized that individual nonhuman animals are active members of the land, a "community of interdependent parts" (1970, p. 239), and stated that humans can be "ethical only in relation to something we can see, feel, understand, love, or otherwise have faith in" (1970, p. 251). Leopold undoubtedly believed that humans should seek to understand and love individual nonhuman animals, as well as have a high regard for their value, in order to be truly ecological.

Whereas Leopold believed that humans must think and act ecologically, Schweitzer extended the notion that it is human nature to revere life. Schweitzer believed that all human actions that affect life must be judged on necessity, that all life forms are morally or ethically considerable and deserve a sense of reciprocity. Schweitzer believed humans need to act in ways conducive to the overall maintenance of life itself; as Schweitzer said, "If I save an insect from a puddle, life has devoted itself to life, and the division of life against itself is ended" (Schweitzer, 1987, p. 313).

In the pursuit of the good, Schweitzer believed that everyone must adhere to principles similar to that of the Jaina principle of ahimsa a total worldview of right thought, word, and deed (1959). Schweitzer's simple prescriptions and basic principles, contained within the Jaina ecologically-imbued ethic and lifestyle, should lie at the center of any human thought or intended action involving nonhuman animals.

Birch's philosophy is built on strong Christian and panentheist precepts (1991, 1993). He maintains that God is both within and independent of nature, and that all human and nonhuman animals are subjects that belong to a community of individual beings. Yet Birch's postmodern ecological worldview should not be seen as limited to a Christian or stewardship foundation; this would be far from Birch's intention. He strongly contends that humans need to bridge the gap between their inner intentions and outer acts, that a "sense of at-one-ment" (1991, p. xvi), or wholeness, between humans and the rest of the universe should be a constant objective. Such a holistic worldview is also implicit in the ideas of Leopold, and in other philosophies such as deep ecology.

What makes Birch's ethic inclusive is his insistence that life, and other components of nature that are not living but critical to life, be afforded respect. It is only when humans feel love and compassion for both humanity and nature that they can act in ways and be committed to lifestyles that are truly inclusive. The concept of ecological inclusion supports Birch's view, but widens his idea of inclusiveness to encapsulate Leopold's holism, which incorporates the entire ecological community of "soils, water, plants, and animals, or collectively: the land" (Leopold, 1970, p. 239).

Further, in the spirit of Schweitzer, if humans are committed to protecting or caring for the land beyond the human self, then humans should revere all life. Not to revere all life, or to love and respect it, as Birch suggests, would mean that any action to correct the damaging results of exploitative actions, or to justify the continuance of actions aimed at achieving a greater good, would more than likely fail. In revering all life, humans could then negotiate ways of engaging with nonhuman life and live ecologically-imbued lives, and acknowledge their

place within nature, that they are subjects within a community of countless individuals.

Ecological inclusion is thus both a metaphysical and a practical response to the human interrelationship with nonhuman animals and is applicable to all life. If a human has reverence for life, then that human has the potential to commit to an ecologically-imbued lifestyle, a respectful and compassionate interrelationship with all individual life forms, and the whole of the environment. That interrelationship is thereby inclusive of the life of all individuals and the ecological integrity of the whole.

Thinking and Acting Inclusively

Implicit within an ecologically inclusive worldview is the recognition that, no matter what perceptions of nature may be held by any human individual, there is an overarching oneness or unity within nature, and all life forms have an inherent worth or intrinsic value. Such worth or value is an importance that cannot be quantified in any human sense as a degree of usefulness to humanity. Further, all individuals can potentially contribute to the fecundity and well-being of the whole; appositely, their inherent worth or intrinsic value also relates to their potentiality as fecund and/or contributive individuals within the greater whole.

Every individual human and nonhuman animal, whether they be cognizant of it or not, is also in and of themselves ecologically significant to the integrity and maintenance of the whole. Thus, all individuals should have the right to have their inherent worth or intrinsic value upheld, whilst having the ability to pursue their individual ecological and evolutionary paths, as long as that does not impinge on the biological and ecological integrity of the greater whole.

Yet, human lives and their interrelationships with nonhuman animals are more temporally and spatially complex than any prescription for exclusionary practices can possibly remedy. Humans perceive nature and engage with nonhuman animals in countless ways, from the most caring and respectful of relationships to the most destructive and exclusionary forms of exploitation. Yet, if humans acted in ways that were less exploitative and exclusionary, then survival rates for threatened individuals and habitats would improve.

Further, humans act in ways which equate individual nonhuman animals with their species, as environmentalists and conservation biologists do when they stress the need to eradicate the inappropriately-labeled invasive species; such ideas justify continued exploitation and exclusion. As ecological inclusion as an alternative worldview does not support any action that excludes or exploits nonhuman animals, then it should not automatically advocate such reductionist and mechanistic prescriptions as eradicating invasive species. However, problems do occur with some forms that become overly abundant and/or ecologically destructively. In such cases, and after careful consideration of all possible alternatives, eliminating a life form from a certain locale, by death or relocation, might be justified if the survival of a particular life form is under direct and serious threat from the overabundance of another. Other examples of ecosystemic reductionism include whether nonhuman animals should be utilized in invasive medical research or as food.

As human/nonhuman animal interrelationships are so extraordinarily complex,

so must the solutions to the most problematic of situations be. The responses that humans undertake to impact upon nature are by implication complex, and are also time and scale dependent. They also need to be based on the context in which problems need resolution. Hence, to be ecologically inclusive, humans must take great care and consideration as to the possible impacts that actions may have over smaller and larger scales, and over time.

Any small action that humans take to enhance human interrelationships with nonhuman animals might result in massive changes to the way humans behave towards nonhuman animals. Such actions could result in a welcome positive reengagement with our nonhuman animal kin, or result in tremendous harm. To achieve or enhance the possibility of positive outcomes, humans need to think and act in certain ways to which they are not accustomed, and that includes thinking and acting in ways that are ecologically inclusive. Humans have a personal and societal obligation to commit to a worldview that is both respectful of and compassionate towards nonhuman animals and the total environment. Also, there must be an underlying commitment by all humans to view all components of nature as morally considerable.

See also Anthropocentrism

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Rod Bennison

ELEPHANTS

See Conservation Ethics, Elephants

EMBRYO RESEARCH

The study of nonhuman animal embryos has provided a wealth of information about normal embryonic development. A variety of questions has been asked concerning how sperm fertilize eggs, how early embryonic nervous systems develop, and how arms and legs develop. This basic research has important clinical relevance. For example, research on fertilization in sea urchins and mice has provided the data needed to develop methods for *in vitro* fertilization in humans. This technique is used by many infertile couples to allow them to have children. Studies of the development of the nervous system in frogs have permitted researchers to identify the processes involved in a serious human birth defect, spina bifida, in which the spinal cord does not form normally. Limb development is another developmental process that has been extensively studied in nonhuman animal models. Basic research on chicken embryos first identified the importance of retinoic acid in limb formation. These studies made it clear that drugs containing forms of retinoic acid, often used in formulations designed to treat acne and wrinkling of the skin,

are potentially dangerous to the unborn fetus.

As mentioned above, a wide range of organisms is used in embryological studies, ranging from invertebrates such as sea urchins and fruit flies to vertebrates including frogs, chickens, mice, and primates. The choice of animal model for a particular embryological question depends on several factors. For example, fruit flies are an excellent model for examining how genes control the formation of the basic body plan, and for asking questions such as where the head will be and where the dorsal and ventral will be located. On the other hand, sea urchins have been widely used for studies of fertilization, because in them the processes are easily visualized. Later studies were then able to confirm that many of the same mechanisms are used in mammals, and identify the specific processes that are different. The advantage of using invertebrates such as fruit flies and sea urchins is that they are available in large numbers at low cost, they are small in size, and relatively easy to house in a laboratory. On the other hand, the disadvantage is that the relevance of the mechanisms used in invertebrate embryonic development to those used in humans is not always immediately clear. The use of vertebrates, and particularly mammals such as mice and primates, has the advantage that the results are likely to be more directly relevant to human development. However, smaller numbers of embryos are typically available, they are larger in size, and cost more to maintain. As a result, research is often first carried out in animals that are less closely related to humans. Once mechanisms are understood there, then more targeted research can be carried out on vertebrates and, finally, mammals.

The ethics of using nonhuman animal embryos in research has not been widely discussed. This is most likely because the vast majority of embryonic research takes place in the newly fertilized egg and early embryo, because most of the major organ systems are developed very early in embryonic development. Therefore, the stages studied most often occur before the nervous system is functional, so that neither pain nor consciousness are an issue. In contrast, the question of whether human embryos should ever be used in research has generated a great deal of controversy. However, even here, most people agree that prior to neural tube closure, even human embryos are "too rudimentary to have interests or rights and thus cannot be harmed when used in research" (Robertson, 1995).

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Anne C. Bekoff

EMPATHY WITH ANIMALS

Empathy is a term used to describe the tendency that most people have to be emotionally affected by witnessing the emotions, for example, suffering or distress, of another person. On the whole, the more empathetic we are, the more likely we are to show compassion and concern, and to offer help to someone in distress.

Psychologists studying empathy have long assumed that people who are strongly emotionally affected by the distress of another human being will also be strongly emotionally affected by the distress of a nonhuman animal, and this has recently

received some confirmation from researchers. A study which showed participants video clips of humans, primates, other mammals, and birds in victimized circumstances found that those who were highly empathetic with humans also showed more empathetic responses to the suffering of animals, and a questionnaire survey found positive correlations between people's self-reported empathy with humans and with animals. However, this association was not as strong as might have been expected. There were still plenty of people who showed high empathy with humans but low empathy with animals, and others who were very concerned about animals but showed no greater concern than average about people. So although there does appear to be some association, feeling empathy with or compassion for animals seems to be a process that is not entirely the same as feeling empathy with or compassion for people.

From a developmental perspective, there is a traditional belief that children who are brought up to love and care for animals will develop into adults who love and care for people as well. This is exemplified by stories told about public figures such as Florence Nightingale, the famous British nurse, who cared for injured cats and dogs as a child, before graduating to caring for sick and injured humans in later life. The notion seems to be that looking after someone smaller, weaker, and more dependent than oneself during childhood will instill an enhanced sense of empathy or compassion that can later be applied to the weaker and more dependent individuals in human society. However, the mere existence of a few well-known tyrants and mass murderers (for example, Hitler) who were also pet lovers seems to weaken the idea that keeping pet animals alone can lead inevitably to enhanced empathy with humans.

Another popular hypothesis is the idea that people who keep pets will tend to show greater empathetic concern for the welfare of all animals, not just the species kept as companions. Historically, there has certainly been a correlation between the rise of pet keeping and the rise of concern for animal welfare and animal rights. And a number of questionnaire-based studies have supported the idea that an association between pet owning and concern for animal welfare continues to exist today. One survey of university students found that a lower proportion of pet owners than non-owners found the use of animals in biomedical research acceptable. Another found that students who had pets in their childhoods that they considered to have been important to them (mostly the more interactive pets such as cats and dogs), showed significantly more concern about a variety of animal welfare issues. The mechanisms by which these associations arise has not yet been elucidated, but it seems probable that by living with animals in the home setting, we are more likely to classify them as like us, or as members of our in-group, thereby granting them a more humanlike moral status as creatures deserving of our empathy and compassion.

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Elizabeth S. Paul

ENDANGERED SPECIES ACT

Out of concern for native plants and animals imperiled "as a consequence of economic growth and development untempered by adequate concern and conservation," the 93rd Congress of the United States created the strongest species protection statute in the world, the Endangered Species Act (ESA). Congress was inspired to action by the nation's brushes with species loss: the disappearance of the passenger pigeon, and the near-extinction of the whooping crane, black-footed ferret, gray wolf, and American alligator. President Richard Nixon signed the ESA into law on December 28, 1973, describing the rich array of animal life as a vital part of the country's natural heritage (Rosmarino, 2002).

The ESA's explicit purpose is to conserve imperiled species and the ecosystems upon which they depend. To achieve this, the law directs the federal government to classify imperiled species as endangered or threatened, to designate critical habitat for listed species, and to develop recovery plans that actively conserve and restore listed plants and animals. The law requires federal agencies to proactively conserve endangered and threatened species, to avoid jeopardizing them or adversely modifying their critical habitat, and to protect listed species from take (for example, killing and harassment) by private individuals and public agencies (Rosmarino).

The ESA has many precautionary facets, erring on the side of protecting wild flora and fauna in the face of scientific uncertainty. A wide variety of life forms are eligible for protection, including species, subspecies and, for vertebrate species, distinct population segments. The ESA not only protects wildlife on the brink of extinction—endangered species—but also those on the road to becoming endangered—threatened species. Moreover, the law provides for plants and animals to be listed based on the best available science, rather than mandating a higher threshold of scientific certainty. Acting on the best available data makes addressing suspected risks to species the priority, rather than allowing species to languish during largely unachievable quests for perfect knowledge.

Congress authorized citizen enforcement of the ESA in the event that the federal government violated the law or failed to enforce it against nongovernmental violators. This is particularly important when administrations are hostile or indifferent to species protection; citizens can step in, holding the government accountable to the ESA's charge.

The need for a strong ESA is clear, considering the diversity of life in the United States and the threats to this diversity. Scientists have documented 200,000 species existing in the nation, and the actual number may be twice this amount. This diverse tapestry of life derives from the nation's large size and its varied terrain and ecosystems (Stein et al., 2000). The United States includes more biome and ecoregional types than any other nation. Richly varied plant and animal life forms find niches in these diverse habitats. However, rapid development, including massive urban sprawl and fossil fuel extraction, is taking its toll on these life forms, as is climate change, continued widespread livestock grazing, crop agriculture, logging, mining, recreation, and over-allocation of rivers.

The U.S. biodiversity crisis is a microcosm of the global human-caused Sixth

Extinction, with current extinction rates at least 100–1000 times higher than natural rates of extinction. Possible causes of the first five mass extinctions include volcanic eruptions, climate change, and asteroids colliding with the Earth. This time, the extinction crisis is human-caused (Leakey and Lewin, 1995). Extinction rates during some of the previous mass extinctions topped 75 percent. The current extinction rate is the highest it has been in 65 million years (Leakey and Lewin, 1995), and there is a growing international scientific consensus on biological catastrophe resulting from lost biodiversity (Ehrlich and Ehrlich, 1996). In the United States, the ESA can provide a defense against the Sixth Extinction.

Endangered Species Act Implementation

Passed almost unanimously by Congress in 1973, the ESA continues to be very popular. University researchers have documented that 84 percent of the American public supports the current or an even a stronger ESA (Czech and Krausman, 1999). Scientists have also reported that the law is effective. Research shows that 227 species might have gone extinct had it not been for ESA protection (Scott et al., 2006). Only nine species (of more than 1,350 listed) have gone extinct after being listed under the ESA (USWFS, 2009), which means this law is over 99 percent effective in preventing extinction.

Despite the ESA's popularity and efficacy, it has been enshrouded in controversy since the late 1970s. Controversies involve private and public lands. Private property rights groups have continually claimed that the law erodes property rights by restricting actions that harm species on private land. Despite the rhetoric, the ESA has been only lightly applied to private lands (Rosmarino, 2002). However, the law's reach to private land is fundamental to the goal of preventing species extinction. The former General Accounting Office (now the Government Accountability Office) issued a report estimated that 75 percent of listed species find the majority of their habitat on private land, and some 90 percent find a significant portion of their habitat on private land. In addition, the ESA can curtail ecologically destructive activities being permitted on federal land or by federal agencies by requiring that federal agencies not permit or engage in actions that result in jeopardy to listed species or adverse modification of critical habitat (Rosmarino, 2002).

Other critics of the ESA include industry interests, state wildlife agencies, federal agencies, and pro-industry administrators and politicians at all levels. Given the law's capacity to curb ecologically destructive economic activities, there have been sustained efforts to weaken the ESA for more than a decade, and these efforts have reached a crescendo in recent years (Goble et al., 2006).

Industrial interests have long been hostile to the ESA's purpose of tempering economic growth with adequate concern and conservation, claiming that it harms economic growth.

While it has endured many sets of amendments over the past three decades, the ESA has emerged fairly intact (Rosmarino, 2002).

The most focused attack in Congress has been on the critical habitat provisions of the ESA. Given that 85 percent of species listed under the law are at least partially imperiled due to habitat degradation (Wilcove et al., 1998), the ESA's

strong safeguards for critical habitat have resulted in significantly increased rates of species recovery. Plants and animals with such designations are twice as likely to be recovering as those without (Taylor et al., 2005), yet most listed species in the United States lack critical habitat designations (*Ibid*.).

Because citizens can and have used the ESA to protect endangered species, federal agencies and federal administrators themselves often seek to weaken the law. The George W. Bush administration added only eight listings per year, all as the result of citizen lawsuits. This is compared to 58 listings per year under President George H. W. Bush and 65 per year under President Bill Clinton (Eilperin, 2008). Meanwhile, as of February 2009, over 300 species awaited listing as candidates and proposed species (USFWS, 2009).

Some species have waited on the candidate list for decades, and delays in protection have led to the extinction of dozens of species (Greenwald et al., 2006). Moreover, in the 2000 book *Precious Heritage,* 6,460 species in the United States were identified as imperiled or vulnerable (Stein et al., 2000), and the majority of these were not even candidates for listing. Ironically, the majority of endangered species in the United States are not protected under the nation's Endangered Species Act.

The bottleneck on listings under George W. Bush was second only to that under the Reagan administration, which was also generally opposed to regulatory protections for endangered species. Administrative hostility to the ESA was evident in the George H.W. Bush Administration as well (Rosmarino, 2002). George H. W. Bush characterized the law as a "sword aimed at the jobs, families, and communities of entire regions" (Houck, 1993). And while the number of species listed per year was higher in the Clinton Administration than in all other administrations after Jimmy Carter's, most listings still resulted from litigation, and listing delays were common (Greenwald et al., 2006).

Other ways the George W. Bush Administration weakened the ESA administratively include cutting funding for endangered species programs, designating far less critical habitat than biologists have recommended, political appointees overruling biologists' recommendations to list imperiled species, and approving regulations that dramatically reduce the ability of federal wildlife agencies to protect endangered species from federal projects (See, e.g., Winter, 2009).

Citizen Enforcement of the ESA

Citizens have long played an important role in ESA enforcement, including petitioning for species to be listed, for critical habitat designations to be revised, and to sue any party that violates any section of the ESA. An early high-water mark for controversy over the ESA was the Tellico Dam issue in the late 1970s. A citizen lawsuit stopped this dam from being completed on the Little Tennessee River due to its threat to critical habitat of the snail darter. In the 1978 landmark opinion by the U.S. Supreme Court in *Tennessee Valley Authority v. Hiram Hill* (437 U.S. 153 (1978)), the majority of the justices found that, given the incalculable worth of endangered species, it would be inappropriate for the court to weigh the economic costs of protection against the value of protecting a species. Consequently, the Supreme Court affirmed the injunction against the Tellico

Dam, a $100 million dollar project that was 90 percent complete, because its completion would jeopardize the snail darter, a three-inch long fish, in its critical habitat on the Little Tennessee River (Rosmarino, 2002).

As a result, many in Congress were up in arms about the ESA. While the statute itself remained essentially intact, the Tellico Dam was ultimately completed, via an appropriations rider heard for a mere 42 seconds on the House floor. A similar end-run around the ESA and citizen participation unfolded in the 1990s in the context of the threat to the Northern spotted owl from logging in the Pacific Northwest. A nondescript rider was attached to a Senate general appropriations bill, and it briskly passed through Congress and overrode a court injunction that had stopped the logging of old-growth forests on U.S. Forest Service land. This was one of several riders used by the Pacific Northwest delegation to avoid logging prohibitions intended to minimize threats to the owl (Rosmarino, 2002),

More recent examples of citizen enforcement of the ESA include efforts to address the impact of livestock grazing on listed species inhabiting federal lands in the Southwest, such as the Mojave Desert tortoise and the Mexican spotted owl. Citizen groups are also pushing for better river management to address water needs of endangered fish in U.S. rivers, for example, salmonids in the West and the Rio Grande silvery minnow in the Southwest. In the Rocky Mountains, citizens continue to challenge logging and ski resort expansions because of their impact on the Canada lynx and other forest wildlife. In the Intermountain West, citizens have sought the listing of the greater sage grouse, to protect the bird and its habitat in the Sagebrush Sea. Hotspots of species imperilment include California, Hawaii, and Florida, and active citizens' campaigns are working to protect species, their habitat, and native ecosystems in these states.

The importance of citizen ESA enforcement is underscored by the fact that federal agencies are not just allowing land uses and actions by private parties that jeopardize imperiled species and harm their habitat, they are also themselves committing actions that are harmful to species on the brink. For instance, a division within the U.S. Department of Agriculture, misleadingly named Wildlife Services, kills millions of animals every year, both wild and feral. In 2007, this agency killed 2.2 million animals, including gray and Mexican wolves, which are listed under the ESA (WildEarth Guardians, 2009).

The ESA in Perspective

The ESA was visionary when Congress passed it almost unanimously 41 years ago, and it remains at the vanguard today. The law's architects and supporters argued for a strong biodiversity statute based on moral, ecological, and utilitarian reasons, and from the perspective that imperiled species represent unwilling canaries in a coal mine. Most of Congress in 1973 agreed that we ignore the onward march of species extinction at our own peril (Rosmarino, 2002).

That warning still rings true. Two-time Pulitzer Prize winner E. O. Wilson argued in *The Future of Life* that we are literally mortgaging the Earth by continuing down the path of unsustainable economics. Rather than merely living off the interest that the Earth's natural capital provides, we are drawing down the

capital, and our bank account will soon be empty (Wilson, 2002).

Continuing on this path ensures both economic and ecological collapse. Economists estimate that intact natural systems provide us with $33 trillion annually in ecosystem services (Costanza et al., 1997). Whether it is the maintenance of the atmosphere, the creation of clean air, recycling of rainfall by forests, pollination by insects and animals, or myriad other functions, these are the processes of nature that make the Earth habitable to humans.

Yet estimates of the monetary value of a living planet are likely to be gross underestimates. We generally cannot replace ecosystems once they are in tatters (Ehrlich and Wilson, 1991). Monetary measurements also do not address the intangible aesthetic, spiritual, and moral rationales that are important components of support for endangered species protection. The ESA honors these widespread attitudes.

As John Muir put it, "When we try to pick out anything by itself, we find it hitched to everything else in the universe" (Muir, 1911). By requiring caution when economic growth and human activities overstep nature's bounds, the ESA protects the diverse plants and animals in the United States and the ecosystems of which they are a part, and can guide us to a more sustainable future.

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Nicole Rosmarino

ENDANGERED SPECIES AND ETHICAL PERSPECTIVES

Few persons doubt that humans have obligations to endangered species. People are helped or hurt by the condition of their environment, which includes a wealth of wild species, many of which are currently under threat of extinction. Whether humans have duties directly to endangered species is a deeper question, part of the larger issue of biodiversity conservation, but many believe so. The United Nations World Charter for Nature states that, "Every form of life is unique, warranting respect regardless of its worth to man." The Biodiversity Convention affirms "the intrinsic value of biological diversity." Both are signed by over a hundred nations.

Many endangered species have no resource value, nor are they particularly important for the usual humanistic reasons: medical, industrial, agricultural resources, scientific study, recreation, ecosystem stability, and so on. Many environmental ethicists believe that species are good in their own right, whether or not they are good for anything. The duties-to-persons-only line of argument leaves deeper reasons untouched.

Questions are at two levels: (1) facts (a scientific issue, about species), and (2) values (an ethical issue, involving duties). Sometimes species can seem questionable, since some biologists regularly change their classifications as they attempt to understand and classify nature's complexity. From a more realist perspective, a biological species is a living historical form, an ongoing lineage expressed in organisms and encoded in the flow of genes. In this sense, species are objectively there—found, not made up.

Responsibility to species differs from that to individuals, although species are always exemplified in individuals. When an individual dies, another replaces it. As it tracks its environment, the species is conserved and modified. Extinction shuts down the generative processes, as a kind of superkilling. This kills forms (*species*) beyond individuals, and kills collectively, not just distributively. To kill a particular animal is to stop a life of a few years or decades, while other lives of such kind continue unabated; to superkill a particular species is to shut down a story of many millennia, and leave no future possibilities.

A species lacks moral agency, reflective self-awareness, sentience, or organic individuality. An ethic that features humans or sentient animals may hold that specific-level processes cannot count morally. But each ongoing species defends a form of life, and these forms are, on the whole, good.

The wrong that humans are doing, or allowing to happen through carelessness, is shutting down the life stream, in the most destructive event possible. One argument is that humans ought not play

Sumatran tigers, unique to the Indonesian island Sumatra, are smaller than Indian tigers. Because some forms of Asian medicine prize tiger body parts, the species, despite being endangered, continues to be hunted. (Photos.com)

the role of murderers or superkillers. The duty to species can be overridden, for example, by pests or disease organisms. Increasingly, humans have a vital role in whether these species continue. The duties that such power generates no longer attach simply to individuals, but are duties to the species lines, kept in ecosystems, because these are the more fundamental living systems, the wholes of which individual organisms are the essential parts. In this view, the appropriate survival unit is the appropriate level of moral concern.

It might seem that for humans to terminate species now and again is quite natural. Species go extinct all the time. But there are important theoretical and practical differences between natural and anthropogenic (human-generated) extinctions. In natural extinction, a species dies when it has become unfit for its habitat, and other species appear in its place; this is a normal turnover. By contrast, artificial extinction shuts down speciation. One opens doors, the other closes them. Humans generate and regenerate nothing in this extinction; they dead-end these lines. Relevant differences make the two as morally distinct as death by natural causes and murder.

Humans appear late in the scale of evolutionary time. Even more suddenly, they have increased the extinction rate dramatically. What is wrong with such conduct is the maelstrom of killing and the insensitivity to forms of life that it creates. What may be required is not just prudent preservation of resources, but principled responsibility to the Earth.

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ENRICHMENT AND WELL-BEING FOR ZOO ANIMALS

Environmental enrichment may be defined as the actions taken to enhance the wellbeing of captive animals by

identifying and providing key environmental stimuli. Well-being is a notoriously slippery concept that is difficult to define and measure, but it generally includes good health and biological functioning, the ability to maintain physiological homeostasis, and—the most difficult to measure—good psychological health.

Early in the 20th century, zoo professionals were the first to express concern about what today would be called *psychological well-being,* noting that animal behavior in zoos often seemed abnormal compared with that observed in the wild. The practice of enrichment to address these problems started in zoos and later spread to more intensively managed captive settings, such as farming and animal laboratories. Largely due to public concern for animal welfare in all these settings, governments began to legislate minimum standards for animals held in captivity, many of which involve enrichment.

In comparison with the wild, captive environments are often unchanging, that is, lacking novelty, spatially limited, stimulus-poor or lacking in complexity, and generally provide the inhabitant with little control over its environment. The result is animals with a great deal of time with nothing to do. Without opportunities to engage in species-typical natural behaviors, many animals show signs of poor wellbeing, such as stereotypy—highly repetitive behaviors, invariant in form, with no obvious function. Pacing is the stereotypy most frequently seen in many mammal species.

Types of Enrichment

Visitors to zoos are likely to see enrichment in action when, for example, they witness cheetahs sprinting after mechanical rabbits, monkeys sifting through piles of straw for food tidbits, or a bear endeavoring to extract peanut butter from crevices in a log. Other forms of enrichment do not necessarily involve food rewards, relying instead on the animal's natural curiosity to explore novel and interesting changes in their environment. Something as simple as a burlap bag stuffed with straw can keep a giant panda entertained for hours. But successful enrichment strategies involve much more than tossing a random mix of interesting items into an animal's enclosure.

Types of enrichment have taken many different forms in the literature. In one prevalent schematic, enrichment may be divided into five categories:

1. Occupational enrichments are those efforts that try to keep the animal busy, for example, encouraging the animal to work for food or providing some sort of exercise equipment.
2. Physical enrichment attempts to improve the quality of the enclosure through permanent changes or temporary introduction of novel objects. The enclosure may be enlarged or made more complex, and climbing structures, water pools, soft substrate, or vegetation may be added. In one of the most highly visible types of enrichment, animals are given novel toys that encourage exploration and play, which in addition to providing psychological benefits to the animal are sure to entertain the zoo-going public.
3. Sensory enrichment can be similar to novel object enrichment, but the

aim is to activate the senses with visual, auditory, olfactory, or other stimuli.

4. In nutritional enrichment, animal caretakers attempt to introduce more natural variation to diet and feeding schedules. Rather than plopping down a bowl of processed, quickly consumed food once a day, they scatter feedings at various times throughout the day and present the food in ways that encourage the animal to use its natural foraging behavior, for example, by hiding it in the crevices of logs and rocks. They may also provide a more varied diet and include food items that are more challenging to consume. Giraffes may be given browse (tree branches) instead of hay, and lions may be given bones or whole carcasses instead of ground meat.
5. Finally, social enrichment can provide endless opportunities for challenge and change, and can meet species needs for social interaction. Overlap among these types of enrichment is inevitable, but these distinctions are useful when devising a well-rounded, holistic enrichment program.

Why Use Enrichment?

Why is enrichment necessary and when is it used? Most often, unfortunately, enrichment is introduced or improved when animals in our care show signs of poor wellbeing. Sometimes poor reproduction or health, or physiological signs of stress, alert zoo animal caretakers to the possibility of poor well-being, but most often it is the readily observable abnormal behaviors such as stereotypies that key us into a developing problem. Stereotypies can take several forms. Reviews of the literature on zoo animals suggest that pacing is the most common, followed by oral stereotypies such as tongue-flicking, and other repetitive movements, for example head bobbing. Although we may never fully understand the subjective experience of another species, the scientific evidence is clear that stereotypies are more often than not associated with poor well-being. Sometimes stereotypies can continue as a scar from past poor environments even after improvements have been made, so stereotypic behavior is not a foolproof measure of an animal's current psychological state or the quality of its environment. Thus, it is recommended that stereotypies alone not be used to infer psychological well-being, though in actuality they often are. One interpretation of stereotypies, with some supporting evidence, is that they are used to cope with suboptimal environments. Thus, the goal of management should not be to prevent the stereotypy itself, but to recreate the environment to meet the animal's needs and obviate its reliance on stereotypy as a coping mechanism.

Documented Benefits of Enrichment

Does enrichment really work or does it just make us humans feel better about keeping animals in captivity? In fact, a great deal of science has shown clearly that animals do benefit from enrichment. Much of this research has taken place outside the arena of zoos, because zoo researchers often cannot achieve the level of experimental control necessary to rigorously test the effects of enrichment, and because they typically avoid research

methods that are invasive and potentially harmful to the animals.

Several studies have demonstrated a variety of positive developmental effects on brain function. Animals reared in more enriched environments have heavier brains with more synaptic connections between neurons and enhanced levels of neurotransmitters, all indications of a more effective and efficient brain. These animals are better learners, adapt to change more readily, and show less hormonal evidence of stress. The benefits of stress reduction are significant, because stress can suppress immune system function and reproduction. Thus, enriched animals are less prone to disease and reproduce better. Enriched environments also promote a greater diversity of species-typical behaviors and fewer abnormal behaviors. Literature surveys of published zoo enrichment studies indicate that the typical enrichment program reduces stereotypies by more than half. However, the ultimate goal of completely eliminating stereotypies, once developed, has not yet been fulfilled.

The weight of evidence from these and other studies also suggests a clear role for enrichment in maintaining animals in captivity for conservation purposes, one of the main goals of today's zoos. In addition to creating a better atmosphere for conservation education, enrichment promises to increase successful mating and rearing of offspring, and promote the development of more behaviorally competent candidates for reintroduction to the wild. In fact, enrichment is playing an increasing role in specifically preparing captive-bred endangered species for release back to the wild.

Studying Enrichment and Well-being

How we employ science can facilitate or compromise our goal of discovering the secrets of optimal animal well-being. The answers we get are only as good as the science we use to address the questions. The zoo environment provides exceptional challenges to carrying out good science, but with greater effort zoo research can approximate that found in the more controlled settings of the laboratory. Zoo environments often offer little experimental control. Researchers need to work more closely with animal care personnel to reduce the number of confounding variables that may affect the results. Where possible, husbandry practices should be held constant during the course of an enrichment study. Sample size, essential for legitimate statistical analysis and interpretation of results, is another problem plaguing zoo research. When a zoo has only a few members of a species, researchers may need to collaborate with other zoos to obtain a sufficient sample size.

One frequent failing of zoo enrichment research is the tendency to use the everything-but-the-kitchen-sink approach. Here enrichment practitioners make so many changes to the environment at the same time, with the reasonable hope that at least something will help their animals, that it is impossible to determine which changes had beneficial effects. In these cases, we learn little about the underlying motivation that led to improved well-being, and we are ill equipped to provide guidance to others who need to know which enrichments work best. For scientific purposes, one thing needs to be changed at a time, so that we can draw a conclusion about its

effects. However, this does not mean that animals should be kept in barren environments and given one measly enrichment item at a time. Enrichment programs should always be holistic, but scientific studies need to measure the effects of simple changes to the program that may or may not provide incremental improvements to well-being.

Another important point to consider when testing enrichment strategies is that the goal should be to understand the motivational factors underlying poor and good attempts to improve well-being. By understanding motivation, we are better able to predict when well-being will suffer elsewhere, and we will be better able to address it with appropriate enrichment. This has consequences for the experimental design used to test enrichment efficacy. For example, an enrichment study may find a significant reduction in stereotypic behavior, but this may result from the simple fact that the animals used the enrichment and therefore had less time left over to perform stereotypies. If, after the animal tires of the enrichment, it returns to stereotyping at the same rate, have we really affected its motivation or done anything to enhance its well-being? The goal of enrichment is to reduce the *need* to perform stereotypic behavior by making the environment less aversive. A careful experimental design, such as measuring the rate of stereotypy in the aftermath of an interaction with enrichment, can help us determine whether the motivation to perform stereotypies has been reduced.

The importance of detailed descriptions of the forms of stereotypy, the enrichment, and the behavioral response to enrichment, cannot be overemphasized. Too often researchers omit these details from their publications, leaving the reader guessing. These details are important for a variety of reasons. Significantly, the form of the stereotypy can provide insight into the cause that motivates it; for example, oral stereotypies may be related to a thwarted desire to forage, whereas pacing may be related to the need to express natural ranging behavior. It is also important to describe precisely the enrichments used and even attempt to quantify the properties of enrichment, because it is the properties that determine how animals will use enrichment. For example, with novel object enrichment it is important to know if it is moveable, manipulable, destructible, or stimulating to the senses. Is the object complex, does it respond unpredictably, and does it allow the animal to exercise control? These factors and more will determine whether and how the animal uses the enrichment. Moreover, each enrichment item may evoke a unique suite of behaviors that map on to its properties, underscoring the importance of also recording the behavioral details of how the animal interacts with the enrichment. This information is important not just for academic purposes, but essential to understand why some enrichments work better than others, and how enrichment can be designed to more effectively target the animal's needs. If properly understood, the right combination of enrichments may act together to meet all of an animal's psychological needs.

There are ways to tackle animal welfare problems other than enrichment. Low-stereotyping animals may be bred to produce a population free of stereotypy, but does this address the underlying problem of insufficient well-being, or does it eliminate one of the animal's most important mechanisms for coping with an

aversive environment? Similarly, drugs can be used to eliminate stereotypic behavior, obstacles can be placed to prevent the behavior, or animals can be trained not to rely on stereotypy. The advantage that enrichment has over all these alternative methods is that it addresses the root cause of the observable behavioral problem, not the symptoms. In fact, many enrichment advocates argue that enrichment is *the* key concept for maintenance of captive animals, on a par with food, water, and shelter.

See also Stereotypies in Animals; Zoos: Roles; Zoos—Welfare Concerns

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Ronald R. Swaisgood

ENTERTAINMENT AND AMUSEMENT: ANIMALS IN THE PERFORMING ARTS

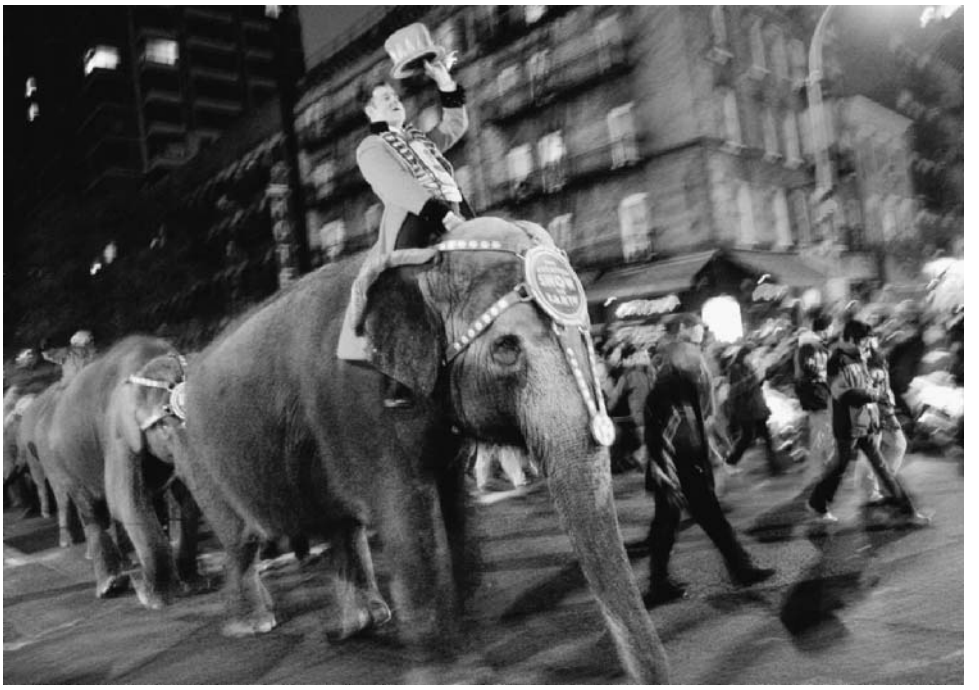
Defenders of the use of animals in entertainment must contend with one argument beyond all those that arise in the context of other uses of animals: that this use is utterly without necessity or utility. Unlike the use of animals in science and agriculture, where clear benefits to humans, and sometimes even to animals, can be claimed, animals who are made to perform in any genre or venue whatsoever are being used purely to fill leisure time, to provide human beings with amusement and distraction and, some would argue, to implicitly assert human dominion over other species. No human or animal lives are saved or even demonstrably improved by capturing wild animals and teaching them to jump through flaming hoops. No diseases are cured or hungers reduced by having stallions prance in unison or elephants rear up on their hind legs.

Several common rejoinders are made to this charge of inutility and human self-indulgence. First, it is pointed out that the use of animals in entertainment is an age-old and universal practice and, as such, is deeply entwined with cultural values and identities. In recent years, this argument has frequently been offered, for example, in defense of bull-fighting, with the implication that opposition to this sport is tantamount to cultural insensitivity or even disrespect.

There is no doubt that animal performance has a long history, expansive geography, and deep cultural roots. While

organized circuses, dating at least as far back as imperial Roman times, are the best-known form of animal performance, more specialized animal acts are found all over the world, ranging from such admired institutions as the Lipizzaner Stallions to the often desperate dancing bears, drumming monkeys, and undulating cobras used in the street performances of organ grinders and snake charmers. A similarly vast range of venues and presentation styles makes animal performance difficult to conceptualize and analyze coherently. From the cosseted biblical animals of Radio City Music Hall's annual Christmas Spectacular to the listless alligators forced to behave threateningly for tourists in Florida's Everglades; from the white lions and tigers in Siegfried and Roy's glitzy Las Vegas magic show to the inscrutable felines in such bizarre and idiosyncratic acts as the Moscow Cats Theatre, animals appear in every genre and level of performance. Whether this ubiquity in itself is testimony to the value, naturalness, or necessity of animal performance is an open question. Certainly the reform or rejection of such practices, while it might alter some traditional formulations of national identity, could hardly hurt humans more than it will help animals.

A second defense of the use of animals in entertainment is the claim that human beings, especially children, who witness the awe-inspiring prowess or amusing



Elephants from the Ringling Brother's circus walk through the streets of Manhattan on their way to Madison Square Garden in New York City. Elephant trainers use chains and metal-tipped prods called bull hooks to train and control the elephants in this and other circuses. (AP Photo/Seth Wenig)

antics of creatures they had previously dismissed as instinct-driven and uncreative will begin to understand, appreciate, and respect animals in new ways. From this point of view, animal performance is far from being a useless exploitation of animals; rather, it is a long-delayed recognition and most salutary celebration of their extraordinary capacities. This argument is similar but not identical to the familiar defense of zoo as a means of fostering public knowledge of and respect for animals.

The third, most ingenious and therefore most challenging defense of the use of animals in performance is the claim that animals actually enjoy participating in many of the activities we make them do for our entertainment. Far from being victims of our selfish need to amuse ourselves, they are, according to this perspective, benefactors of our expertise as their artistic collaborators. The idea that animals are often willing and eager partners to their human handlers and trainers was given philosophical credibility by the late Vicki Hearne, who made a persuasive case for human-animal collaborations based on her observations of horse- and dog-training practices. Hearne's insights have recently been creatively extended by philosopher of science Donna Haraway into a challenging new conception of human-animal relationship she terms companion species. However, both Hearne and Haraway are careful to restrict their theorizations only to those animal species, mainly dogs and horses, whose biological histories are deeply entwined with ours and whose behaviors undeniably evince an interest in interacting with us.

The most common objection to the use of animals in performance is simply that such use frequently involves cruelty and enjoins unnecessary suffering. In recent years, animal advocacy organizations have uncovered a host of specific abuses in the training, housing, maintenance and care of performing animals, including the use of goads and prods, painful restraints, undersized cages, and poor nutrition. In the case of wild animals, there is growing consensus that the very fact of captivity is cruel, and there is a steady growth of legislation all over the world banning the use of wild animals for entertainment. That performing animals suffer stress will come as no surprise to any human who has ever had to perform, but the boredom that defines the life of performing animals between acts is unimaginable to their human counterparts. Finally, there is the issue of degradation and indignity that arises when one group, in this case, humans, gets to dictate and choreograph the performance behavior of another group. The cigar-smoking apes, tutu-wearing elephants, and boxing kangaroos that have amused generations of spectators have also implicitly reinforced the anthropocentric conviction that nonhuman animals are our inferiors, and as such they are ours to do with as we please.

If practices that degrade animals without physically hurting them are within the purview of animals ethics—because it can be argued that such practices contribute to speciesist thinking and behavior by derogating animals—then inquiry into the ethics of using animals in performance must move beyond those instances in which actual animals are or were present when the work was created. The performing arts frequently bypass the living animal and instead make use of its likeness, either as subject-matter, or imagery or, as often in performance, through costume and physical imitation. The ethical stakes of this kind of representation,

that is, the ethics of what we could call virtual, as distinct from actual, animal performance, are very hard to determine, because its capacity for harming or improving the lot of actual animals is mediated through such variable and subjective factors as the artist's intention and skill, and the spectator's response and interpretation. Theorizing the existence of an animal apparatus in performance, Michael Peterson writes:

"How are animals made to *perform*"? Collars reins, bits, whips, good, treadmills are part of this apparatus [. . .] "How are animals made to *mean*?" is a more difficult question, and beyond basic questions of semiosis, this involves abstractions like wildness, nature, freedom, servility, and even "the great chain of being," or the concept of the soul.

Thus the ethics of animal performance must be understood in terms of a vast continuum ranging from such unambiguously pro-animal pieces as Rachel Rosenthal's *The Others,* which featured 40 actual animals and their human companions, to such obviously destructive or sacrificial pieces as Kim Jones's *Rat Piece,* in which three live rats were burnt to death in front of an audience. Between the two extremes one finds everything from the magnificent, soul-stirring horses and other animals of the French company Zingaro, or Martha Clarke's *Endangered Species,* to the mischievous dog performances of Oleg Kulik, to such deeply disturbing and morally essential human-animal tragedies as Peter Shaeffer's *Equus* and Edward Albee's *The Goat.*

Performance intersects most directly with animal rights and animal welfare in the area of pro-animal activist performance. Perhaps the best known examples of this genre are the actions of PETA, the international animal advocacy organization known for its inventive and sometimes outrageous use of costumes, props, and human bodies to get its message across. PETA activists deploy both the revelatory and the confrontational powers of performance: the former to unveil and expose the hidden abuses of animals in zoos, circuses, factory farms, and laboratories, and the latter to awaken people to the consequences of their unquestioning acceptance of many cultural animal practices. For example, in a recent action described on the PETA website, "one of our activists lay on a 'grill' on a busy sidewalk, her skin painted to mimic the charred flesh that some people still happily consume at barbecues." Such performances may seem superficial, but they are in fact brilliantly encapsulated uses of such key elements of performance as embodiment, presence, live interaction in actual space and time, and imaginative engagement with persons, situations, and stories. As such, they can inspire conventional and mainstream artists to address animal issues in their performances.

Debates around the representation of animals in performance of both actual and virtual kinds often center around a phenomenon that has also recently sparked new and important debates in the sciences: the issue of anthropomorphism. While developments in ethology have shaken the longstanding scientific prohibition against ascribing mental states and emotional responses to animals, the arena in which such attributions have always been customary, if not obligatory, that of the arts, has of late evinced growing awareness of the fact that anthropomorphism is often an innocent-seeming foundation for anthropocentrism and speciesism. This awareness parallels the critique of philosophical anthropomorphism that underlies the new

interdisciplinary academic field of Animal Studies. A seminal text of that field, John Berger's "Why Look at Animals?" initiated the reappraisal of anthropomorphism in art and culture, characterizing Disney's talking animals as the vanguard of modernity's colonization of actual animals by such monuments to their disappearance as cartoons, toys, pets, and zoo animals. More recently, Steven Baker's writings on the animal figure in contemporary art have drawn attention to a style he calls botched taxidermy, deliberate distortions of animal form that have the effect of exposing and disrupting the sentimentalism or smugness that often lurks behind traditional anthropomorphic representations. Theater groups like Forced Entertainment and individual performance artists like Edwina Ashton and Nina Katchadourian combine botched form with talking animals to explore new, more complex, critical, ironic and, most importantly, non-anthropocentric, modes of anthropomorphism.

The call for an enlightened anthropomorphism to be reflected in and encouraged by the arts comes partly from recent developments in continental philosophy as well as phenomenology. In the last decades of life, the late French philosopher Jacques Derrida applied his signature method of analysis, deconstruction, to the human-animal binary, which he regarded as the tenacious foundation of all hierarchical systems of thought and of the oppressive practices they enabled. The link to performance comes with Derrida's notion of the animal as an interruptive encounter in real time and space, an event, as Derrida says, rather than as the conveniently malleable concept it has always been in Western thought. The idea of animality as encounter resembles the idea of animality as process found in another abstruse but academically popular theoretical formulation, the Becoming-Animal of French philosophers Gilles Deleuze and Felix Guattari, a neo-Nietzschean and vitalist affirmation of the transformative potential of human and nonhuman animality. Offering a nonmimetic and nonliteral mode of animal performance, the idea of becoming-animal has been widely influential among contemporary artists, critics, and curators. Another recent formulation which holds equally great promise, especially for the performing arts, is phenomenologist Ralph Acampora's notion of corporal compassion, an interspecies ethos based not on sympathy but on symphysis, the felt commonality of bodily being shared by humans and animals.

These philosophical developments could point to a heightened role for performance in the next phase of human-animal relationship. If the renewal of the ancient and shamefully frayed bonds between human and nonhuman animals are to be healed, individuals and cultures will need to employ modes of inquiry and attention that go beyond the rationalist reliance on thought and language. They will have to devise more intuitive, emotional, and embodied explorations of animal life, and in this endeavor the performing arts and performance in general could play a significant role.

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Una Chaudhuri

ENTERTAINMENT AND AMUSEMENT: CIRCUSES, RODEOS, AND ZOOS

Animals have entertained people for centuries. From the gladiatorial contests of ancient Rome, to modern day circuses, rodeos, and zoos, they have been held captive for the amusement of crowds.

Animal Circuses

There can be few people who are not aware of the controversy caused by the use of animals in circuses. From Australia to Norway, Russia to Peru, animal rights campaigners have highlighted the conditions these animals may endure in the name of entertainment. Increasingly, governments are responding to public demand: several countries, including Austria and Israel, have banned the use of all wild animals in circuses.

To some, a circus is not a circus if it has no animals. The majestic elephants walking across podiums and powerful tigers jumping through hoops may provide the only opportunity many people have to see these creatures. But does a few minutes in the ring justify the hours that elephants—who in the wild may walk up to about 43 miles a day—spend chained by their legs, or tigers—solitary predators—are confined to a cage on the back of a truck?

Some say that an elephant born in the circus knows nothing different and does not need a large herd of other elephants; rather she is happy with her human trainers. The same people argue that big cats, primates, and bears caged on the backs of large trucks are fine as it means they have the comfort of being transported in their own homes.

How comfortable is life for these performers? One study revealed that elephants spent between 72 percent and 96 percent of their time chained, big cats were confined in cages for 75–99 percent of their time, and horses spent up to 98 percent of their time closely tethered in a stable tent (Creamer and Phillips 1998).

Research used frequently by defenders of animal circuses actually supports the view that animals suffer in these conditions. It found that all species examined showed abnormal behavior patterns, indicative of prolonged stress or suffering. For elephants, this behavior occupied up to 25 percent of the animals' time; with bears, prolonged or undirected pacing occupied 30 percent of their time (Kiley-Worthington 1990).

Circuses claim to train animals through reward and repetition, and by having "trust and a personal relationship with the animal" (ECA 2004). Yet, undercover investigations of circuses around the world show that animals are whipped, kicked, and hit with sticks on a daily basis. When famous animal circus trainer Mary Chipperfield was prosecuted for cruelty after

being exposed by undercover investigators, the industry rallied to her support. Despite viewing film of a crying young chimpanzee being kicked and thrashed with a stick, and a sick elephant being whipped, another circus director, appearing as a defense witness in court, said he saw nothing wrong with this and would do the same thing himself (ADI 2006).

People often show greater concern for the elephants, lions, and bears than domestic animals. However, horses and dogs are subjected to the same constant transportation, restricted movements and training as their co-performers. As Lord Hattersley (2006) said: "I would be opposed to circuses exploiting performing animals [even] if every dog which ever walked round a ring on its hind legs lived in conditions approved by a joint committee of the RSPCA and Dogs Trust with Saint Francis of Assisi in the chair. Animal acts are demeaning—not to the animals which perform them but to the grown men and women who enjoy the spectacle."

While the ethics of zoos have been the subject of a great deal of discussion, less has been written about circuses from an academic perspective. Moral philosopher Dr. Elisa Aaltola (2008) suggests that "this is possibly because animal circuses are seen to be so blatantly at odds with animal welfare and value that it is not even necessary to point out that they would have negative implications on the way we conceptualize and treat nonhuman animals."

Rodeos

Beginning in 1869 as a skill contest between cowboys, rodeos are billed as "showmanship and hard work," showcasing a contestant's "skill with a rope or his ability to ride a bucking animal" (PRCA 2008).

Described by participants as "man versus beast" (Rodeo Productions 2008), electric shock devices, bucking straps, and spurs are all used to assist the human competitors.

Quintessentially American, rodeos actually take place around the world, including Brazil, Australia, New Zealand, and parts of Asia and Europe.

A range of events make up a rodeo, usually consisting of chasing and catching animals or riding bucking bulls. Calf-roping is considered one of the cruelest: three- to four-month-old calves are lassoed around the neck while running at very high speeds. Sometimes they are pulled over backwards in what rodeos call a "jerk-down," a brutal snapping back of their heads. They are then picked up and slammed to the ground, stunning them while their feet are tied together.

Other events in the rodeo game involve crashing a steer to the ground by twisting his horns and roping a speeding steer in such a way that the 500- to 600-pound animal flips over in the air and smashes to the arena floor (IDA undated).

Most animals used in rodeos—bulls, steers, and calves—are completely domesticated and not naturally aggressive, and those used in bareback riding often need some extra encouragement to buck. Electric prods, spurs and bucking straps are used to irritate animals and put on a good show for the crowds; 6,000 volts into the body certainly makes an animal buck.

Bucking (or flank) straps are leather straps tightened around the lower abdomen, a very sensitive area on a horse's body. For bulls it is tightened across the urethra, adding to the pain (TVT 2005). A veterinary study reported that many horses on whom these straps were used

"showed stressed facial expressions," and "the flank strap has to be seen as a cause of suffering and as a potential cause of pain" (TVT 2005). Horses stop bucking once the strap is removed.

Injuries are common, including paralysis from spinal cord injuries, severed tracheas, as well as broken backs and legs (MFA 2003), despite organizers' assurances that great care is taken to provide for the animals' welfare.

Rodeos are now being challenged wherever they exist. In the United States, major companies have pulled their sponsorship of rodeos; in New Zealand, campaigners have prevented individual events taking place; and in Portugal, activists have disrupted attempts to promote rodeos by taking legal action under animal welfare laws.

Zoos

"Ambassadors for their species" is how zoos refer to their animals, as if they had volunteered to be put in cages on display to visitors. Similar euphemisms are used in relation to other animals in entertainment, which to some observers hides the realities in which these animals live. Joan Dunayer (2001) writes, "deceptive language perpetuates speciesism, the failure to accord non-human animals equal consideration and respect."

The managers of zoos maintain that they are about more than entertainment, that they are essential for conservation and education. Yet, Dale Jamieson (2003), Professor of Environmental Studies at New York University notes that "zoos are still more or less random collections of animals kept under largely bad conditions." The vast majority of animals in zoos are not threatened species (only 11% are, according to a UK study) (Casamitjana and Turner 2001). Critics have also pointed out, however, that conservation is not about how many individual animals are in captivity, but about the protection of ecosystems so that species can survive in their natural habitats.

Captive breeding is heralded by zoos as essential for the protection of threatened species but is considered by some conservation scientists to be a diversion from the reasons for a species' decline, giving "a false impression that a species is safe so that destruction of habitat and wild populations can proceed" (Snyder et al 1996).

Redirecting money to protecting natural habitats, instead of confining animals, benefits all species of fauna and flora. Measures to protect giant pandas' habitat, for example, also helps support hundreds of species of mammals, at least 200 birds, dozens of reptiles and over half of the plants known to exist in China (Viegas 2007).

Captivity is increasingly offered as the better alternative to the dangers of the wild. "Some species do absolutely great in zoos—they get great food, they get it every day, they have great veterinary care, says one leading zoo scientist, adding "for some species, the zoo trumps the wild" (Stern 2008). Yet many scientists point out that wild animals are uniquely adapted to their own environment and occupy specialized places in their ecosystems, so are they really better off in a cage? "Who needs the wild when we have zoos?" seems to be the message given here.

In their natural habitats, animals face infinite challenges that opponents of zoos claim cannot be provided by a cage. Zoo enclosures are tiny compared to natural home ranges (those for polar bears are one million times smaller) (Sample 2003).

Many animals spend their time pacing up and down or rocking backwards and forwards, abnormal behaviors indicating the boredom and frustration captivity brings. Those lions who pace in zoos spend 48 percent of their time doing it (Mason and Clubb 2004).

Animals in zoos live longer than in the wild, zoo supporters state. Critics wonder if this is an adequate justification for a caged life, or if it is true.

Forty percent of lion cubs die before one month of age—in the wild only 30 percent of cubs are thought to die before they are six months old and at least a third of those deaths are due to factors that are absent in zoos, such as predation. (Mason and Clubb 2004). Elephants in zoos live on average 15 years—half the age of those in timber camps and less than a quarter of the life expectancy in the wild (Clubb and Mason 2002). It is not only the length of life, but the quality of life that is important, and the latter is increasingly questioned.

Zoos describe themselves as "excellent centers in which to inform people about the natural world and the need for its conservation" (WAZA 2005). One critic, novelist Terence Blacker (2008), replies that "the idea that children are educated by gawping at miserable wild animals is an insult to the intelligence. If anything, all they learn is that it is fine to treat wild animals as a show."

The circuses, rodeos, and zoos of today may seem very far removed from the animal baiting of the Romans, or the traveling "freak shows" of the early 1800s, but are they? Or are they just a continuation of what Professor of English Randy Malamud (1998) calls "spectatorial attractions with a related heritage"?

Defenders of animal use in entertainment believe they should have freedom of choice, whether to watch a bear balancing on a ball in the circus, see a three-month-old calf slammed to the ground by a rodeo contestant, or to stare at a gorilla in a zoo cage. But those who question the use of animals in entertainment wonder why humans' freedom of choice, when it results in the suffering or death of another sentient being, should be any more important than the freedom of the subjects of their entertainment.

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Craig Redmond and Garry Sheen

ENVIRONMENTAL ETHICS

Anthropocentric environmental ethics bases concern for the nonhuman natural environment, including animals, on the benefits it provides humans. It treats only humans as of direct and intrinsic moral concern. Taking care of a pet or a park is done solely because it is useful to humans. Anthropocentrism is often defended by appeals to biblical passages that give humans "dominion over . . . every living thing that moves upon the earth" (Genesis 1:28). In contrast, nonanthropocentric environmental ethics bases protection of the environment on its intrinsic value. It conceives of nonhuman nature as important in ways that surpass its instrumental value to humans.

A sentiocentric environmental ethic holds that sentient creatures—those who can feel and perceive—are morally important in their own right. Some of the best-known defenders of animals accept this environmental ethic, including Peter Singer. Because it is likely that only vertebrate animals—mammals, birds, fish, amphibians, and reptiles—consciously feel and perceive, a sentiocentric environmental ethic treats nonvertebrate nature as solely of instrumental value for sentient creatures. Such an ethic protects trees and ecosystems, for example, not for their own sake, but because they provide habitat and other benefits for sentient creatures.

Sentiocentrism breaks down the boundaries of the traditional human-only moral club and is likely to have radical implications for animal agriculture, animal experimentation, hunting, and other human uses of animals. Nonetheless, from the perspective of a broader

environmental ethic, sentiocentrism is but a small modification of the traditional, human-centered ethic. It extends moral concern beyond humans only to our closest cousins, the sentient animals, and it denies direct moral concern for 99 percent of living beings on the planet, as well as species and ecosystems. Sentiocentrists respond that it makes no sense to care directly about trees or ecosystems for their own sake because they don't matter to themselves, and experiencing and pursuing one's own good is what brings into the world the kind of value that we ought to directly morally consider.

Biocentric environmental ethics views all living beings as worthy of direct moral concern. Biocentrists contend that although plants and invertebrate animals do not have preferences, they nonetheless have benefits of their own that we should morally consider. Although a tree does not care if its roots are crushed by a bulldozer, crushed roots are still bad for the tree, and not just for the homeowner who wants its shade, or for the squirrel whose nest is there. Insentient living beings have a welfare of their own that should be part of direct environmental concern. Albert Schweitzer's reverence-for-life ethic is an example of biocentrism.

Ecocentric environmental ethics holds that entire species and ecosystems are morally important in their own right. Ecocentrists reject the idea that only individuals, for example, a particular animal or plant, are appropriate objects of direct moral concern. They believe that whole ecosystems and species are intrinsically valuable, not simply the individuals in them. Aldo Leopold's concern to preserve the integrity, stability, and beauty of the biotic community is an example of an ecocentric ethic. These broader environmental ethics view concern for animals as only a first step toward extending moral concern beyond humans to include the natural, nonhuman environment. This broadening of concern creates conflict. For example, hunters and fishermen can show great ecocentric concern for the perpetuation of species and ecosystems while placing little or no moral value on the lives and welfare of individual animals. Conversely, defenders of sentient animals can have great concern for the well-being of individual animals while placing little or no direct moral value on the protection of plants, the perpetuation of species, or the preservation of ecosystems.

These conflicts are not simply theoretical. Feral goats have been shot to protect rare plants. Conservation of endangered species like the California condor often involves captive breeding programs that harm individuals for the sake of the species. Preservation of ecosystems often calls for the elimination of exotics, as when lake trout introduced into Yellowstone Lake are poisoned to protect the integrity of the ecosystem. Restoration of ecosystems sometimes involves bringing back predators. This not only disrupts the lives of the predators, but puts responsibility for the suffering of their prey in the hands of humans.

Broader environmental ethics and animal ethics may also diverge on the alleviation of animal suffering in the wild. Some defenders of animals say that only human-induced suffering and death are bad things that should be prevented. It is human violation of animal rights that needs to be prevented, not natural suffering and death in the wild. However, if one believes that animal rights are logically analogous to human rights, then humans are responsible for failing to assist an animal in distress, just as we are culpable when we fail to assist a human in distress.

The worry that a consistent commitment to protect the lives and welfare of animals would involve massive human intervention into natural systems has led some to claim that defenders of animals cannot be environmentalists.

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Ned Hettinger

EQUAL CONSIDERATION

Equal consideration, whether for humans or animals, means in some way giving equal moral weight to the relevantly similar interests of different individuals. By itself this is very vague and abstract, yet it is extremely important. Aristocratic, feudalist, Nazi, and other elitist worldviews have often denied that human beings are subject to any sort of basic moral equality. Moreover, to extend equal consideration, in any reasonable interpretation of this idea, to animals would represent a major departure from common thinking and practice throughout the world.

At an abstract level, equal consideration for animals would rule out a general discounting of animals' interests, an across-the-board devaluing of their interests relative to ours. An example of such devaluing would be the judgment that a monkey's interest in avoiding pain is intrinsically less important than a human's interest in avoiding pain. At a practical level, equal consideration for animals would rule out the routine overriding of animals' interests in the name of human benefit. While equal consideration is in agreement with numerous ethical theories, it is not in agreement, if extended to animals, with any view that sees animals as essentially resources for human use and amusement.

Assuming that humans are entitled to equal consideration, then unequal consideration for animals is justified only if there is some morally relevant difference between humans and animals. Peter Singer has argued that there is no such difference between all humans and all animals, so that denying equal consideration to animals is speciesism.

Among leading philosophical arguments for a crucial moral difference between humans and animals are the following. Contract theories typically argue that only those who have the capacity to form contracts are entitled to full, equal

consideration; such theories are often motivated by the belief that morality is constructed by humans primarily for human benefit. A somewhat related view is that only moral agents, that is, those who can have moral obligations, are entitled to equal consideration. In these views, only humans qualify as potential contractors and moral agents. A different approach appeals to social relations: How much moral consideration one is due depends on how closely or distantly moral agents are socially related to one. As bond-forming creatures, we human moral agents are much closer to other humans than to animals. Yet another argument appeals to the comparative value of human and animal lives. Equal consideration would require giving equal moral weight to the relevantly similar interests of humans and animals. According to the argument, a dog's life and a human's life are relevantly similar, that is, equally important to the dog and the human, respectively, so equal consideration implies that a dog's life is as morally valuable as a human's. A final argument appeals to the alleged authority of moral tradition. Because our moral tradition, the only source of moral authority, has always given animals' interests a subordinate place, there is no compelling reason to grant animals equal consideration.

The debate over equal consideration remains open because the issues are complex. Two points deserve mention. First, defenders of equal consideration generally deny that this principle means that human and animal lives are of equal value, but their supporting arguments have been incomplete at best. Second, defenders of unequal consideration for animals need to contend with the so-called problem of marginal cases. Any criterion that supposedly marks a relevant difference between humans and animals, for example, moral agency, will seemingly fail to apply to all humans, with the apparent suggestion that the exceptional humans are not due equal consideration.

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David D. DeGrazia

EUTHANASIA

The major differences between veterinary medicine and human medicine are not biological, but ethical and economic; in no way is that more evident than in decisions and policies regarding euthanasia.

The term euthanasia comes from two Greek words: *eu* (good, well) and *thanatos* (death). Euthanasia is a central concern in human-animal relations, as several million animals are euthanized by people each year in animal shelters, veterinary clinics, and research laboratories. That number reaches the billions when food animals—to whom the word *slaughter* is more often applied than *euthanasia*—are added.

The definition of euthanasia differs in veterinary medicine and human medicine in important ways. In human medicine, the term is restricted to mercy killing, ending the life of a patient where death

is a welcome relief from a life that has become too painful or no longer worth living. Not all forms of killing humans deserve the good death label of euthanasia; capital punishment, for example, no matter how painlessly performed, is not euthanasia.

Human euthanasia is controversial for many reasons. Critics of legalized human euthanasia and its close relative, assisted suicide, fear that seriously ill or old people could be coerced into having their lives ended. In that case, death would not be an act of mercy for the person being killed, but one of convenience or economics for the survivors.

Veterinarians are familiar with the euthanasia ideal of mercy for the suffering patient, as well as with the call to end animals' lives for such reasons as convenience and economics. Veterinarians often euthanize patients with serious or incurable diseases, in cases where death really does seem the animal's best option. However, veterinarians may also be called upon to end the lives of animals who are destructive in the home, or are inconvenient, or aggressive, or simply unwanted. Shelter workers are similarly required to end the lives of healthy but unwanted animals. In the middle, between the mercy killing of incurably suffering animals and the destruction of unwanted animals, are those animals who are suffering but not from untreatable conditions; these animals, too, may be put to death if their human decision-makers cannot or will not devote the time and money to their health needs.

How Animals Are Euthanized

Because the reasons for killing animals are so broad, the meaning of the word *euthanasia* in veterinary medicine is similarly broad. What makes euthanasia a good death, when speaking of animals, is not that it is better than continued life, but that the death is caused without pain or distress to the animal. It is method, not motive, that has traditionally defined animal euthanasia.

Human euthanasia comprises both active euthanasia (actions such as drug overdoses that kill patients) and passive euthanasia (withholding or stopping treatments, such as ventilators, that could sustain life). In veterinary medicine, withholding or withdrawing treatment is not typically referred to as euthanasia. Many veterinarians are distressed when animals' human guardians choose to let a suffering pet die slowly of disease when fast, painless, active medical euthanasia is an available option. Thus, passive euthanasia is not part of the veterinary ideal of euthanasia.

Not all methods of killing animals can be considered euthanasia, a truly good death. The American Veterinary Medical Association first published guidelines for animal euthanasia in 1963 and has updated them six times, most recently in 2007. Primary criteria for the evaluation of euthanasia techniques are the physical pain and psychological distress experienced by the animal. Other criteria include the emotional effect on humans who are present; the availability of appropriate drugs; and the compatibility with the subsequent examination or use of the animal's body and tissues. Strangely, the veterinary guidelines only cover methods of euthanasia, not issues of why, when, or whether specific animals should be euthanized. They offer no real guidance for veterinarians on how to advise clients whether or not to euthanize an animal.

The preferred method for euthanizing individual dogs or cats has not changed in

Racehorse Eight Belles is restrained on the track after breaking both front ankles at the 134th Kentucky Derby. She had to be euthanized moments later. (AP Photo/Brian Bohannon)

the 40 years in which the AVMA has published its guidance. Then, as now, a rapid injection of an anesthetic overdose, usually a barbiturate such as pentobarbital, is chosen, because it induces unconsciousness rapidly and painlessly. Only once the animal is peacefully anesthetized does the drug go on to stop the breathing and the heart. Sometimes the veterinarian recommends a tranquilizer several minutes before the anesthetic overdose, making the process even easier for animal and human. Often human caregivers choose to be present during the euthanasia of their companion animal and are relieved to see how a suffering animal can leave the world so peacefully.

The AVMA's guidelines have been updated so many times not because euthanasia of a loved, ill animal has changed, but because other circumstances are more challenging. What is the least painful way to euthanize very large animals such as zoo elephants or stranded whales? What is the best way to euthanize dangerous wildlife? How do we process the dozens of animals a busy animal shelter euthanizes every day? How do we euthanize laboratory rats and mice in a way that minimizes pain and distress while leaving their tissues suitable for study? The AVMA gathers a panel of veterinarians and scientists to review the available science and update recommendations for how to humanely kill these varied animals.

The 2007 edition of the AVMA's guidelines did not update any information relative to animal euthanasia at all. Rather, it clarified that AVMA guidelines were for nonhuman animals only, not for lethal injection of humans (a form of

capital punishment in the United States). The AVMA guidelines strongly discourage the use of neuromuscular blocking agents that paralyze respiration, except in some defined emergency situations. Critics of human capital punishment by lethal injection have sought guidance from the AVMA guidelines, arguing that if the risk of pain and distress with these drugs is too great for animal use, it is too great for human use as well. Some forms of lethal injection that have been used on humans would not meet the AVMA's standards if performed on nonhumans.

Making the Euthanasia Decision

One of the hardest decisions for an animal's guardian is when and whether to euthanize an ill or aging animal. How can we know when it is the right time? This author believes there is no such thing as *the* right time, given the range of factors at play.

The euthanasia decision is only partly a medical decision, but it should certainly be made with a veterinarian's input. The veterinarian can do his or her best to provide a medical diagnosis of the animal's condition. But even a diagnosis of an incurable illness does not mean immediate euthanasia is warranted. A combination of good medical and nursing care may keep animals with certain terminal illnesses comfortable for months or years. Conversely, a diagnosis of some treatable injuries and illnesses may still result in the animal's euthanasia. This may be because of the cost of the treatments, since insurance coverage for payment of veterinary bills is not common, the time demands of some treatments, or the significant suffering that an animal would likely go through before starting to feel better.

Veterinarians can help animal guardians predict what the animal will experience with a particular illness. Not all heart diseases, for instance, are equal. Some heart disease may result in sudden death, some in decreased exercise tolerance, some in a distressful inability to breathe comfortably. From the animal's perspective, these are three very different heart conditions. Sudden death is sad, but the animal does not suffer in the months leading up to it. Decreased exercise tolerance means the animal will run and play less, but may be content to limit his or her activities without significant suffering. The inability to breathe comfortably, however, may be severely distressing for weeks or months on end. A veterinarian can help the guardian understand not just whether the condition is treatable, but how much suffering it causes.

As with heart disease, so with other life-limiting illnesses. Some cancers may be excruciatingly painful, while others are barely noticed until they are very advanced. Kidney disease can make animals feel extremely ill, but with dietary management and supplemental fluids, they may remain in relatively good health for several months.

There will be medical uncertainty. Veterinarians can give parameters for how the average case progresses, but not how an individual patient will. People want to know, "Is this animal suffering?" Like human patients, animals have better and worse days. Veterinarians can help the caregiver learn how to recognize the major signs of an animal's quality of life: interest in food, ability to eat and drink, the ability to move about or to sleep comfortably. None are particularly mysterious, but they require careful observation.

Rarely, however, is euthanasia solely a medical decision, which is why the decision rests with the animal's caregiver, not the veterinarian. The caregiver must decide how much time, energy, and money she or he can devote to end-of-life care for an animal. But even given infinite resources, she must assess when she considers the animal's life is somehow no longer worth living. This includes value assessments of how many good and bad days will tip the balance toward euthanasia. Moreover, a person's beliefs about the value of life and the possibility of an afterlife for an animal will affect the course chosen. One person may feel that a half an hour a day of apparent comfort and happiness means that the animal's life is still worth living. Another may believe that half an hour a day of serious sickness or pain makes that life intolerable. Most will believe somewhere in the middle.

Is there an animal equivalent of assisted suicide? It is impossible to know for sure what an animal is thinking, but it is clear that animals sometimes feel far too sick to eat or drink on their own, and that this can lead to their death. Most veterinarians will treat this anorexia as a clinical problem that can be managed and treated, just as fever, infection, and broken bones are treated; most do not treat this as the animal's attempt to end his or her own life.

Grieving

Pet guardians often grieve the euthanasia of a loved animal just as we grieve the death of our loved human friends and family. Social workers and therapists recognize this important response to animal death. They work to help people come to terms with this loss, rather than trivializing or ridiculing it. Some books on the topic are listed at the end of this article. In addition, following the lead of the University of California at Davis's veterinary college, various pet-loss support hotlines have been established, most of them associated with veterinary colleges.

Support during grief for the loss of an animal is important, as many people may find that their friends and family do not really understand. For many people, the love and companionship of their animal is a central part of their life, and the loss is devastating. This can be true for adults as well as children, but it may be ridiculed as immature or inappropriate by people who are less animal-focused.

Grief over the euthanasia of a companion animal is complicated by the animal guardian's knowledge that she or he made the conscious decision to end the animal's life. This decision is rarely easy, and many people will guiltily second-guess their decision in the following days and months. Not only must the decision-maker come to terms with the fact that she made a decision that may later feel wrong, but she must also decide how to discuss this with others, possibly including small children.

Loving pet guardians are not the only people who may feel grief and distress in connection with animal euthanasia. There are also professionals for whom killing animals is part of a day's work: veterinarians, veterinary technicians, research workers, and animal shelter workers. All participate in animal euthanasia, some as part of the decision-making, others powerless to make the decisions but required to perform the euthanasia procedure. Thus, euthanasia training for shelter workers includes not just technical training, but also seminars on dealing with the

tragic irony that responsible animal care sometimes includes killing animals.

See also Laboratory Animal Use—Sacrifice

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Larry Carbone

EVOLUTIONARY CONTINUITY

One hundred and fifty years after the publication of Charles Darwin's *On the Origin of Species,* humanity has yet to come to grips with the meaning of evolutionary continuity. Through a plethora of evidence, arguments, and examples, Darwin showed that all organisms are related by common descent. For example, zebras and horses evolved from a common ancestor, as did chimpanzees and humans, and wasps and ants. All six of these animal species also evolved from a common ancestor, only that ancestor existed and became extinct even further back in time. Species emerge like branches growing out of other branches on a single tree, all originating from the same root.

Before the Darwinian revolution, the dominant notion in Western culture was that animals were specially created and organized hierarchically according to a great chain of being. Mammals were positioned at the top of this hierarchy, with humans at the apex; then came birds, reptiles, and amphibians—that is, vertebrates, animals with a backbone like human beings. Invertebrates, which include insects, were placed at the bottom of the hierarchy. Instead of having a skeleton inside their bodies, like we do, insects wear their skeletons on the outside, a protective adaptation, and this is only one of the ways insects are different from us. Other ways they differ is that they are much smaller, they sense the world in totally unfamiliar ways (for example, bees see ultraviolet light), they communicate in ways we find hard to imagine (for example, by using chemicals), and they look almost alien to our eyes, causing many people to be afraid of them.

Invertebrates were positioned at the bottom of the hierarchical ladder for the arbitrary reason that the less an animal resembled human beings, the lower its place. Darwin, however, showed that the reason animals can appear unlike one another is not because they are lower or higher on some imagined scale, but because they have different adaptations. Because of their common descent, all living beings are related and interconnected, varying only in their manifest forms.

Through his discovery of evolution as a process of descent from common ancestors, with new species shaped through encountering novel conditions, Darwin destroyed the human conceit of the great chain of being. In its place he gave us a world in which there are no discontinuous leaps between species; all animals are bound together, and to all other organisms, by the single, very long story of life on Earth. Today we know that life has persisted on Earth for 3.8 billion years. Darwin went to great lengths to demonstrate this unbroken continuity at every level, not only in anatomy and physiology, but also in behavior and mental characteristics. His understanding of evolution has been supported and enriched through countless scientific discoveries since the late 19th century.

Despite the dismantling of the hierarchical chain of being, in our practices and ideas we continue to uphold a radical break between vertebrates and invertebrates. We resist the idea that invertebrates can feel pain, experience suffering, have intelligence, or lead lives that are meaningful to them. We underrate their critical importance in the health of ecosystems, and show little consideration for their intrinsic value as members of the biosphere. All these attitudes, be they conscious or unconscious are, from an evolutionary perspective, unfounded and anthropocentric.

Critically dissecting our attitudes towards all living beings is especially important today, as the Earth is in the midst of an anthropogenic mass extinction. Species, many of them invertebrates, are disappearing at unprecedented rates. By taking the fact of evolutionary continuity seriously, and embracing the oneness of all organisms, we may yet stem the losses of life caused by the destructive forces of human arrogance and ignorance.

See also Anthropocentrism; Dominionism

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Eileen Crist

EXOTIC SPECIES

Debates about animal rights have traditionally focused on the exploitation of animals for human food, clothing, transportation, medical research, and entertainment. Recently controversy has also arisen about the extermination of exotic

animals to protect not only human interests, but also the interests of other animal or plant species.

For animal and plant species, the term exotic is used interchangeably with the terms nonnative, non-indigenous, alien, foreign, and immigrant. Related but not synonymous terms are *introduced* and *invasive.* Although exotic and the other terms are used widely in scientific, government, and popular publications, precise definitions remain elusive. There is general agreement, however, that the terms designate species whose spread beyond their historical native range has been assisted, either intentionally or unintentionally, by human activities. The term invasive is used particularly to designate species that significantly alter the environment.

Intentional Importation, Unintentional Dispersal

Humans traveling to new areas as colonists have transported animals for food, clothing, and labor. European colonists brought cattle, sheep, pigs, and horses to the Americas and Australia. Some of these animals escaped from human management and reproduced. Animals whose ancestors have a history of domestication, but who live apart from human management, are called feral animals. The wild horses of the American Southwest are both feral and exotic.

Humans have imported non-domesticated animals for economic gain, but then lost control of their movement. Gypsy moths, whose larvae have defoliated large areas of forest in the American East, were introduced from Europe into the Cape Cod area in 1868 in an attempt to promote an American silk industry.

Humans import wild, exotic species as household pets, and sometimes lose or abandon them. Burmese pythons and Asian walking catfish, now thriving in the Everglades and competing with native species, were imported into Florida as pets.

Intentional Importation and Dispersal Humans have imported and dispersed non-domesticated animals for economic gain. In the late 1930s, Edward McIlhenney imported 13 nutrias from Argentina to Louisiana to establish a fur industry. After being released into a marsh, the nutrias reproduced at such an astounding rate that, within a few decades, their numbers had grown to an estimated 20 million. They have consumed enormous amounts of vegetation needed by native animals, and caused extensive soil erosion.

Human immigrants have introduced exotic species while attempting to recreate familiar environments. In 1890–91, Eugene Scheiffelin released about 100 English starlings in Central Park, New York, as part of a plan to bring to the United States all the bird species mentioned in the works of William Shakespeare. By 1940, starlings were found in California. Their population in North America now numbers about 200 million. Starlings encroach upon the nests of other birds and compete with them for food.

Humans have also introduced one exotic species in an attempt to eradicate or control another exotic species. The mongoose, a native of southeast Asia, was brought to the Hawaiian Islands in 1883 from Jamaica, where they had been imported in 1872, to destroy the population of exotic rats that were eating cultivated sugar cane.

Unintentional Importation and Dispersal Many animal species have been transported through the unintentional

agency of humans. A host of exotic animals have hitched rides in the cargo containers of ships, trucks, trains, and airplanes. The rats that arrived in Hawaii were stowaways on boats. The zebra mussel, a thumbnail-sized mollusk native to the Caspian Sea, reached North America in the mid-1980s when the ballast water of a transatlantic freighter was discharged into Lake St. Clair, Michigan. The zebra mussels quickly colonized the Great Lakes and the Mississippi River basin, and their population in some areas may now be as high as 70,000 per square foot.

Human-Assisted Dispersal All of the above species can be designated as imported, because they were transported by humans to an area in which they did not evolve. Some species, however, can be considered exotic, but not imported. These are species whose dispersal was assisted by disturbances to the environment caused by humans. The coyote evolved in the American Southwest, but now inhabits urban, as well as rural, areas as far east as the Atlantic coast. It has profited from humans' eradication of its competitors, such as the wolf, and from the availability of food which human habitation brings. Similarly, the cattle egret migrated on its own from Africa to South America in the 1870s and, by the mid-1940s, to North America. Its dispersal can be considered human-assisted because it benefited from the alterations that humans made to the American landscape, particularly the dedication of vast areas of the land to raising cattle.

The majority of exotic species do not survive if deprived of human care. Of the few that do thrive (perhaps as few as two percent), some are of little concern to humans. The opossum, a marsupial native to the American Southeast, was imported to the San Francisco Bay area of California, around 1890, to provide a new target for hunters. Because opossums do not harm humans or stress native species, their dispersal throughout California has been tolerated by humans. The cattle egret has also been easily accommodated in its new environment, albeit an environment that has been altered significantly by human activities. The egret has proved useful and therefore welcome to humans, because it feeds on insects attracted to human-managed cattle, another exotic species.

Some exotic species, however, are considered pests because of their impact on human industry, economics, health, safety, and recreation. Another concern is the stress they place on native species.

Industry and Economic and Health and Safety Problems Rabbits introduced to Australia for hunting multiplied rapidly and began devouring both native plants and the exotic crops planted by farmers. The economic impact has been enormous in terms of crop destruction, loss of forage for livestock, and costs of largely unsuccessful attempts to control the rabbit population through poisons, viruses, warren demolition, and fences. Zebra mussels clog the water-intake pipes of factories and choke agricultural irrigation pipes, increasing the costs of raising human food. Masses of them in American waterways clog water-intake structures and reduce pumping capacity, threatening human water supplies and power generation.

Feral horses in the American Southwest graze on land that ranchers want to reserve for their livestock, and rats transported to Hawaii eat into the

profits of plantation owners. Rats also concern humans because they can carry disease.

Recreation Problems Zebra mussels clog the engines of recreational boats. The round goby, a fish which, like the zebra mussel, is native to the Caspian Sea area and was introduced to the Great Lakes in the 1990s by the discharge of the ballast water of a transatlantic ship, is larger and more aggressive than most fish species native to the Great Lakes and has threatened species prized by sport fishermen.

Environmental Problems The few species that do successfully colonize areas new to them succeed because they are resilient, have high reproductive rates, are generalist feeders, that is, they eat a wide variety of foods, and have no predators in the new area, and because their food sources or competitors for food have not yet developed defenses against them. In a relatively short time, they can alter an environment extensively. The voracious Nile perch, imported into Lake Victoria in Africa in the mid-1950s as a food fish, is thought to be responsible for the extinction of about 100 species of native fish. Species of animals and plants that evolved on isolated islands are particularly vulnerable. Mammals introduced to New Zealand by Europeans, and also by Polynesian colonists over 1,000 years ago, caused the extinction of many native, ground-nesting flightless bird species that had evolved on the remote islands. Rabbits in Australia have destroyed several native plant species and caused soil erosion by denuding the land; they also endanger native animal species that cannot compete with them for food, or whose habitat has been destroyed by their activities. The mongoose, which was introduced to the West Indies and the Hawaiian Islands for rat control, prefers to prey on native species of reptiles, amphibians, and birds.

Categorizing animals as exotic, nonnative, and invasive is a controversial matter. Although one criterion for designation as an exotic species is dispersal beyond one's native range or place of evolution, it is rarely possible to determine spatial or temporal boundaries for any species. Dispersal and colonization of new areas have always been naturally occurring phenomena. It is therefore appropriate to ask how long a species must inhabit an area before it is considered naturalized. Some scientists reserve the terms exotic, alien, and nonnative for species whose dispersal took place in the modern period of European exploration and migration, beginning about 1450. For the Americas, the dividing line is the arrival of Christopher Columbus in 1492. Species inhabiting these continents in the pre-Columbian period are considered native and indigenous; those that arrived after 1492 are nonnative. However, using European migrations as the line of demarcation between native and nonnative would mean that the species brought to the Hawaiian Islands by Polynesians from about 400 AD on should be considered native, a point which many biologists would dispute. Some scholars, therefore, focus on the element of human-facilitated dispersal as a key to distinguishing native from exotic. Human-facilitated dispersal is thought to be unnatural, in the sense that it has moved species much farther and more quickly than they would otherwise have moved, and has moved them across natural boundaries, particularly oceans and mountain ranges, which they would not otherwise have crossed. However,

calling human-assisted dispersal unnatural is problematic, because we consider the migration of humans to be a natural human behavior, and when they move, humans take their biological possessions with them. The transport of animals, even across oceans, is thus a natural occurrence. It is, moreover, difficult to reconcile that humans, whether Europeans in the Americas or Polynesians in New Zealand, are considered naturalized, but the biological items intentionally transported by them are categorized as alien or exotic. And categorizing as alien and exotic animals *unintentionally* transported by humans is also problematic. If a rat, attracted by human-cultivated food on a ship, is transported to a place where its species has not before been, is this method of dispersal logically less natural than if the rat, while scavenging wild food, was carried on a floating tree limb?

Some scholars argue that the terms exotic, alien, nonnative, and invasive reveal an anthropocentric bias. They are not applied to humans who have dispersed across the planet with their domesticated animals and crowded out native species. Moreover, nonnative species that are judged to have a negative impact on human economic, health, or recreational interests are targeted for eradication, while other nonnative species, considered useful to humans or benign, are not. The concern is thus not the exotic origin of a species, but rather its perceived interference in how humans want to use an area into which they have dispersed.

The use of terms such as alien and invasive has an influence on the way people think about these species. Invasive conjures up images of invading armies. Militaristic metaphors abound in contexts where humans are describing species that they believe must be exterminated. In 1999, for example, Agriculture Secretary Glickman declared an "all-out battle" against the spread of alien species in the United States. Humans speak of undertaking assaults on alien species and waging war against invasive species. Such metaphors prompt people to conclude that dispersal is a hostile act on the part of the animals, when in reality the animals are simply following their natural behavior in their efforts to survive. In addition, framing the issue as a war then seems to justify—and even encourage—the harsh methods of extermination that are employed. On the Channel Islands of southern California, species imported by European ranchers two hundred years ago are now being killed by guns, traps, poisons, and fires.

Proponents of such methods argue that they need to eradicate resilient invasive species as quickly as possible. Animal protectionists, however, protest that the methods are inhumane (even sharpshooters often leave injured animals to endure lingering deaths) and indiscriminate, because poisons, traps, and fires kill non-targeted species as well. Even if animal protectionists are persuaded that eradication is justified, they advocate the use of nonlethal methods of population control such as sterilization. They raise two moral issues: the infliction of pain and distress, and the termination of life. They believe that humans have a moral obligation to refrain from doing harm or causing death, and that each individual animal has a right not to be harmed or killed by a human. Nonetheless, among people who protest eradication, there is generally more sympathy for vertebrates than invertebrates, and for mammals than for fishes or reptiles.

Supporters of eradication contend that it is both a natural behavior and a moral obligation of humans to protect the economic and health interests—the

very survival—of their own species and, consequently, to destroy creatures whose habits threaten those interests.

In recent decades, another reason for eradication has been advanced: to save other species, both animal and plant, from extinction. European and Asian species now dominate landscapes far from their original point of evolution. Proponents of eradication argue that humans have a moral obligation to preserve biodiversity; it is humans who are responsible for transporting exotic species across oceans and mountains, and who have the intellectual capacity to recognize the consequences of their actions. The moral intuition that there is value in biodiversity and, correspondingly, in landscapes that have not been altered by human activities, is a recent phenomenon, and it conflicts with the values of earlier generations of humans. Throughout their history as agriculturalists, humans have promoted the development of monocultures, that is, cultivated areas devoted to the production of one crop, such as wheat, rice, or cattle. In our efforts to alter the environment to suit our purposes, we have eliminated other species and considered that a landscape had value only if it served our needs.

Advocates of biodiversity, however, argue that species and landscapes have an intrinsic value that is independent of human needs. They maintain that exotic species degrade or harm the environment. Again, it is important to analyze the rhetoric of the statements. *Degrade* and *harm*, like *invasive*, are pejorative terms, intended to influence the way we think about a species. In truth, exotic species do not degrade or harm an environment; they change or alter it (more neutral words). If they cause the extinction of other species, the extinction is a permanent change, but the surviving organisms and relationships continue to evolve. Even staunch conservationists now recognize that ecosystems are always in flux and that disturbance and change are persistent features of biocommunities. Nonetheless, it is undeniable that human-facilitated migrations of animals have altered ecosystems much more quickly and extensively than any nonhuman activity.

In traditional eradication programs, proponents and opponents disagree on whether human interests must always be given priority—whether, for example, the human interest in beef production justifies the elimination of wild horses from western American range lands, which they graze with cattle. Environmental restoration programs, however, focus on the interests of nonhuman species. Their proponents and opponents can therefore both rightfully claim to be protectors of animals, although their value systems differ. Proponents defend the harsh methods they employ to kill exotic species by maintaining that they place a high value on biodiversity and are trying to ensure the very survival of native species of animals and plants. Opponents respond that they assign the highest value to compassion and are concerned about the pain, distress, and death caused by humans to each individual animal. The development of humane methods of controlling animal populations, in particular methods of contraception and sterilization, would offer a resolution to the ethical issues raised by restoration practices.

See also Endangered Species Act; Endangered Species and Ethical Perspectives

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EXPERIMENTATION AND RESEARCH WITH ANIMALS

Despite over a century of animal rights and antivivisectionist protest, scientists, regulatory agencies, and others have remained convinced that experiments on animals yield important scientific and medical discoveries. At this time, animal experimentation is not only permitted by American laws, it is actively required. For example, before most drug studies can proceed to clinical trials in human patients, animal testing must first be performed. Animal use still seems to be increasing, despite its high cost, tight regulation, and the availability of cell cultures, advanced imaging procedures, and other technologies that can replace some animal studies.

A very wide variety and large number of animals serve in experiments. Great apes, such as chimpanzees, are used in small numbers in laboratories. *Drosophila* fruit flies, *Caenorhabditis* nematode worms, and other invertebrates are also common laboratory inhabitants. Also numerous are mice, rats, zebra fish, frogs, and others. Exact numbers of laboratory animals are impossible to come by in the United States. The U.S. Department of Agriculture publishes an annual report, including the numbers reported for the handful of species covered by the Animal Welfare Act. In 2006, they reported the use of 1,012,713 dogs, cats, primates, and other covered species (http://www.aphis.usda.gov/animal_welfare/downloads/awreports/awreport2006amend.pdf). This number excludes and is dwarfed by the vast numbers of mice, rats, fish, and frogs for which there is no required reporting. This author has estimated that some 80–100 million mice and rats are bred for use in laboratories annually. Comparing these numbers to vertebrate and invertebrate animals used for human food is difficult. This author has estimated that approximately one hundred mammals or birds are killed for food each year in the United States for every one laboratory mammal or bird, but this is a very, very rough estimate.

The variety of animal species used in the laboratory are derived from a number

of factors. All things being equal, scientists are under an ethical and regulatory obligation to choose the least sentient species that will serve the scientific purpose. This is rarely the sole criterion in choosing an experimental animal, however. Fruit flies, for instance, might generally be considered better for genetic studies than chimpanzees or mice because they are thought to be less sentient, but their shorter life cycle, simpler genetic make-up, small size, and the ease with which they are kept in the lab are all also points in favor of choosing fruit flies for genetic studies. For genetic studies of uniquely mammalian traits, mice, rather than chimpanzees, are chosen to replace the fruit flies, not because they are less sentient than chimps, but because they are small and cheap, have short generation cycles, have a well-defined genome, can be easily genetically reengineered, are not an endangered species, and are less thoroughly regulated by the government. Despite the challenges and expense of working with them, however, the genetic closeness of chimpanzees and monkeys to humans, and their complex mental abilities, sometime make them a scientist's first-choice of study animal.

The overwhelming majority of animals used in laboratories are bred specifically for use in laboratories. Laboratory-bred animals, in general, are less likely to carry infections, are less likely to be distressed by life in the laboratory, and may be more genetically uniform. Most of the exceptions to this general rule raise ethical concerns. Laboratory-bred *Xenopus* or African clawed frogs are the most numerous frogs used in laboratories, but wild-caught frogs of other species are also used, and over-collection of species causes conservation problems. Wild-caught nonhuman primates are used in some laboratories, raising serious concerns about conservation of species, as well as welfare concerns of capturing these highly social animals and removing them from their group. Overwhelmingly, the most controversial acquisition of laboratory animals is the use of so-called random source dogs and cats. The 1966 Laboratory Animal Welfare Act was passed largely to prevent theft of companion animals for sale to laboratories. People who work in laboratories, such as this author, believe companion-animal theft for laboratories to be rare; nevertheless, purchase of random source animals is still permitted in many states, and some of these animals can include former household animals that were rescued by or donated to animal shelters.

Animal Research: Critiques and Defenses

Animal research has long been controversial. Criticism comes in two main forms. First, there is the scientific claim that studies on animals are not only useless, but downright misleading. Critics claim that information gleaned from animal studies rarely applies well to humans, and that it is difficult to tell when animal studies would apply to humans and when they would not. They further warn that animal studies may result in falsely labeling a dangerous drug as safe or, conversely, that animal studies may lead a scientist to abandon a particular line of research because animal studies incorrectly show it to be useless. For example, if the study of penicillin had relied on guinea pigs, for whom it is often fatal, it would never have been developed. In other words, some critics say that animals

are too different from people to serve as models of human health and biology.

The other criticism is more clearly moral: whether or not animal studies make scientific sense, it is wrong to inflict illness and pain on sentient animals solely for human benefit. Critics holding that view would say that even if a cure for a devastating disease could assuredly be found by harming a small number of animals, it would still be immoral to conduct that research. Most of these critics focus on traits that humans and animals share, such as some degree of consciousness, sentience, or the ability to feel pain and suffering as the basis for arguing that if it would be wrong to do something to a person, it would likewise be wrong to do that thing to an animal. In other words, animals are too much like people for us to justify using them in experiments.

These two arguments against animal research often work together. If moral critics believe it would take an extraordinary effort to justify some limited animal research but are convinced that the science of animal studies is weak, they will, of course, conclude that most animal research should be stopped.

Defenders of animal research tend to argue that animals are sufficiently different from people that it might be acceptable to use them in studies, as long as scientists are careful to do their best to limit their pain and distress in the laboratory. These research defenders mostly argue that animals may feel pain, but they do not have sufficient consciousness and self-awareness to be placed on a moral level with people. On this side of the argument there are also extreme views, such as the view that humans have no duties to animals whatsoever, or that, while animals are similar enough to humans to make research worth doing, they are too dissimilar to raise qualms about harming them.

The most consistent defense of animal research is that, in the eyes of most scientists, it works. Virtually every modern medical and surgical advance has involved some use of laboratory animals in its development. That claim is not necessarily the same as saying that there could not have been any other route to these advances which did not involve animals. That argument also, more importantly, does not rule out the day when medical advances will no longer require animal studies. Science would not stop if animal use, or even only harmful uses of animals, stopped, but it might be very different. Many projects might not be able to be accomplished. Others might be done in different ways. Still others might be largely unchanged.

At this point in time, the compromise position, as represented by laws such as the Animal Welfare Act, is that animal research is permitted by law, and even sometimes required by law, but only with systems of oversight to try to minimize the amount of pain and distress animals in laboratories experience. Scientists, animal care and use committees, regulatory agencies, and funding agencies all perform some sort of comparison of costs and benefits in using animals. The benefits are most often seen in terms of medical advances for human health. It is important to recognize that these are *potential* benefits, and that not all experiments will lead to cures for human diseases. If scientists knew in advance the results of their experiments, there would be no reason to do the research. Even experiments that yield hoped-for results must be seen in context, where any one finding is just part of the very large puzzle of how the body

works. It would be incredibly rare to be able to say, "This is the crucial experiment that eradicated Disease X."

Just as the human benefits of animal research are potential and hard to predict, likewise there can be uncertainty in the cost of such research, cost measured in terms of animal suffering and death. Veterinarians and others must be able to predict the degree of pain and distress anticipated, make recommendations for ways to decrease the pain (by changing how the experiment is done or by adding more painkillers for the animals), and then make their best assessment of how the animals are actually faring.

See also all three alternatives

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EXTINCTION AND ETHICAL PERSPECTIVES

Extinction is one of the most significant problems facing many wild animal species today. The English word extinct was originally applied to the extinguishing of a flame, and later to a human family or race that had died out and left no living representative; eventually the word was applied to species of animal or plant. The first example of this use given by the *Oxford English Dictionary* is from A. R. Wallace's *Island Life* (1880): "the most effective agent in the extinction of species is the pressure of other species." The extinction of animals, together with the appearance of new forms of life, has been occurring for millions of years. Following the publication of Charles Darwin's theory of evolution in the mid-19th century, the phenomenon has generally been seen as a response to environmental conditions and competition from more adaptable species. Extinction, then, can be perceived as the result of a species' developmental inadequacy and a natural or inevitable occurrence.

Before humans inhabited the Earth in great numbers, extinctions happened slowly, but in the last 100,000 years the rate of disappearance has accelerated, and it is believed that we are currently witnessing an extinction event. Scientists such as Richard Leakey and Roger Lewin forecast that up to 20 percent of all living animal populations will disappear within 30 years, and that human practices and actions are the major reason for this increase. In the face of this scenario, important ethical issues are raised regarding the obligations of humans toward animals. Many animal rights and welfare ethicists would agree that, as beings endowed with

reason and emotion and the dominant species on earth, humans have duties to those who are powerless in the face of their actions. However, some believe that ethical issues arise not only when humans cause or contribute to the exploitation, suffering or death of another species, but also when an individual or species is threatened for any reason. Either way, when human activities result in the complete annihilation of another species of animal, it would seem to constitute an extreme form of unethical behavior.

In the 1980s, Paul and Anne Ehrlich outlined four arguments for the preservation of animal species: first, compassion: the right of animals to exist; second, the argument from aesthetics: the beauty, cultural and spiritual value or intrinsic interest of animals; third, the economic value of animals; and fourth, the argument from biodiversity. Biodiversity is a key concept in the discussion of extinction, because biologists consider it essential to maintain the Earth's variety of plants, animals, microorganisms, and ecosystems. This reinforces the Ehrlichs' other arguments. For example, in instrumental terms, diversity is the primary source of humanity's needs, such as food, medicines and industrial products and, as all life forms are interdependent, it provides a basis for the ability of every living thing to adapt to changing environments. The removal of one species, or even significant numbers of a localized population, can have radical effects on an entire ecosystem and shut down the processes by which diversity can be regenerated. Ecologist Aldo Leopold has stressed the transutilitarian value of wildlife by contending that humans and animals are part of a biotic community, while environmental philosophers and ethicists such as J. Baird Callicott and John Muir have maintained that the conservation of biological diversity has intrinsic value. Ultimately, the utilitarian stance of ethicist Peter Singer, which is based on consideration of the aggregate benefit or harm of an action, is supported by the argument from biodiversity. But it would seem that Tom Regan's position, which leans more toward the rights of individual animals, is also upheld if maintaining diversity is in the long-term interests of each and every member of a particular species, as well as each species as an individual entity.

However, the actions that result in animal extinctions and the processes involved in their occurrence are varied and complex and raise a number of more specific ethical issues. Although the extermination of many species has been deliberate, some are accidental, and eradication programs are often considered necessary for economic progress, food production, or lifestyle improvement. Modern extinctions primarily arise from human-driven changes to the environment through habitat destruction, such as forestry practices, industrial development and other management of the land; urban sprawl; pollution of the air, water, or ground through the application, release, or concentration of chemicals that can cause a chain of disappearances; the transportation or introduction of new or invasive species; the harvesting of a species' food source; or the dispersal of animal populations. Some of these actions cause genetic transformations that occur over a considerable time, or a species gradually loses out in the competition for food with another species. Extinctions also occur as a result of the killing of species deemed pests, or through the overhunting of seemingly abundant species. To complicate the issue further, the moment when the last member of a species

disappears may be difficult to determine. In many cases the range or numbers of individuals is uncertain or a species has not even been recorded. There may be closely related animals or subgroups that are hard to define; a small or widely dispersed breeding population, or one with low genetic diversity, may mean a species is effectively extinct before all members are gone. Species may be extinct in the wild, although individuals survive in captive situations. Ultimately, extinctions of tiny organisms or remote populations may go undetected and, occasionally, a species believed to be extinct is discovered in a remote location.

The results of human practices that cause extinction and highlight ethical issues can be seen in the histories of hundreds of species of animal that disappeared in the course of European colonial expansion. The North American passenger pigeon is believed to have once been the most abundant bird in the world, with massive flocks that blacked out the sun and nesting roosts that could span 100 miles. Yet in the space of 200 years this pigeon, sold commercially as game, was wiped out through a variety of killing methods. The term stool pigeon comes from the practice of using a decoy bird tied to a perch to attract others. Human actions resulted in shrinking the flocks, resulting in inbreeding and finally mortality from other predation, which affected the viability of the species. The dodo from the island of Mauritius was also a member of the pigeon family, but this larger bird was flightless and nested on the ground. Humans did not find the species particularly good to eat, yet from the late 1500s onward successive settlers on the previously uninhabited island caught and killed these relatively docile birds. Widespread destruction of habitat on the island as well as the introduction of pigs, monkeys, and rats, destroyed the dodo's eggs and hastened the disappearance of the species in 1660.

Wolves have born the brunt of blame for attacks on livestock for centuries, and due to the implementation of bounties they were extinct in most European countries by the beginning of the 19th century. In America and many British colonies wolf-like animals were, and often still are, targeted in the same way. The Falkland Islands dog came into the water to greet sailors in the 18th century, but fur traders and sheep farmers killed large numbers until the last known individual died in 1876. In 1889 on the Japanese island of Hokkaido, the Ezo wolf disappeared after American advice to use strychnine-poisoned bait to reduce the species' numbers on horse and cattle ranches. In Japanese myth and legend, this animal was a benign creature and seen as a watchdog or guardian of travelers. On the island state of Tasmania, the striped, dog-like marsupial *thylacine,* called the Tasmanian tiger, disappeared in 1936 after successive private and government bounties were placed on the species because of failures in the sheep industry. Yet there is sparse evidence of stock predation by the *thylacine,* and recent research suggests that the species was adapted to kill much smaller native prey.

Much less obvious extinctions have occurred in these and other countries during the last 200 years through causes that can be traced to human practices. The effects of climate change can be seen in a decrease in populations of tiny animals such as frogs, insects, and organisms that live in coral reefs. The disappearance of animals often invisible to the human eye breaks links in the food chain and causes

unpredictable effects on larger animals in an ecosystem. But animals can also be adaptable and resilient. Through their own agency, many species begin to eat different foods, to colonize new and unfamiliar human habitats such as urban areas, and to develop accommodating behaviors. Some species are better at adapting than others, and animal rights and welfare sympathizers stress the responsibility of humans to care for and protect vulnerable species. Difficulties arise when these views are incompatible with environmental philosophies and wildlife management practices. For instance, culling animal populations is sometimes considered necessary to preserve a habitat or save other species, particularly when animals invade or proliferate areas in which they are not native. Introduced species can devastate farms and forests, impede waterways, and affect human health. To complicate the issue, eradicating species such as these with poison baits or spraying can result in damage to non-target animals, while the introduction of a pest's traditional prey has also caused unforeseen problems for native wildlife. There is also the question of whether any species is such a threat to humans or other animals that its extermination is justified. In many parts of the world, mosquitoes pass disease from one animal species to another, including humans. The Asian tiger mosquito spreads encephalitis, yellow fever, and dengue fever, and the Anopheles mosquito transmits malaria. The latter kills millions of humans, with an estimated 515 million cases of infection per year. Some philosophers argue that if it is in the interests of species to evolve in response to environmental pressures, then allowing a species to die out if critically endangered is a right. They contend that human interference in the extinction process does not demonstrate respect for beings based on their intrinsic value, particularly if artificial means or human manipulation are used or if their is a human-centered motivation for the crisis.

Recently, advances in genetic technology have resulted in attempts at reversing the extinction of some animals through cloning. None of these projects have been successful, largely because of problems associated with degraded or fragmented DNA, but with accelerating progress in genetic technologies many of these difficulties may someday be overcome. However, there are ethical issues related to reviving extinct species. Animals suffer and die in attempts at cloning. A large number of genetically varied individuals needs to be produced to create a viable population. Complications often arise for the surrogate mother, and there are many health problems with the animals produced by these methods. They may endure confinement and suffering if used for display or future research purposes, and there are often problems associated with reintroduction into the wild, especially when habitat is increasingly degraded. With the inevitable publicity that surrounds cloned animals, few would be likely to be released into their natural environment to live undisturbed lives. Genetic technologies may be better employed in identifying areas of low genetic diversity in wild populations and then establishing insurance populations; in the establishment of banks of tissue samples, eggs, sperm and frozen embryos to ensure the preservation of gene pools; in noninvasive reproductive technologies such as animal husbandry used in zoos, reserves, or with semi-captive native species, thus providing the mechanisms for animals to

respond to environmental change. A less invasive form of extinction reversal has been achieved through selective breeding both in captive situations, such as zoos, and in reserves. An animal that resembles the South African quagga, a sub-species of the Plains Zebra that has stripes only on the front of the body, has been rebred over the course of 15 years. However, this project has raised questions about what gives an animal its identity, its genetic makeup, history, behavior, and habitat. If quaggas can be returned to their original habitat in the South African Karoo, it is thought that the problems encountered will be balanced by raising awareness of extinctions and encouraging programs that protect species before they disappear.

See also Endangered Species Act; Endangered Species; Wild Animals

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FACTORY FARMS

Americans seem to have an insatiable appetite for animal products. We each eat, on average, about 220 pounds of meat, (U.S. Department of Agriculture, 2008) 255 pounds of dairy products, (U.S. Department of Agriculture Economic Research Service, 2008) and 260 eggs every year, (U.S. Department of Agriculture, 2008) a huge increase from just a few decades ago.

As people have been eating more and more animals, they have also become distanced from farming operations. Less than two percent of Americans live on farms, (U.S. Department of Agriculture Cooperative State Research, Education, and Extension Service,2008) and most urbanites' only contact with farm animals occurs when they consume them.

Yet many care about animal welfare and are appalled when confronted with acts of cruelty. Most people accept that farm animals are individuals with their own needs and interests, just like their companion animals, and their pleasure and suffering is worthy of moral consideration. This awareness is fueling a growing opposition to factory farms.

What Is a Factory Farm?

Since the mid-20th century, animal agribusiness has mutated from small farms to factories, massive indoor facilities that can confine hundreds of thousands of animals in a single small location. Our storybook version of Old MacDonald's Farm has been replaced with industrial operations focused on maximizing the amount of product while minimizing costs and making the most profit from animals.

As a result, factory farms in the United States are now responsible for raising and killing nearly 10 billion animals each year (U.S. Department of Agriculture NASS, 2008; U.S. Department of Agriculture National Agricultural Statistics Service, 2008). And as our oceans' fish populations plummet, underwater factory farming has exploded, producing billions more aquatic animals annually.

There are thousands of factory farms across the country, and some experts believe they abuse animals on a scale and with an institutional ferocity unprecedented in human history. Critics also maintain that these farms poison the environment and mistreat their employees, who are often especially vulnerable due to poverty or immigration status.

Laws Affecting Farm Animals

There is no federal law regarding the treatment and welfare of animals on farms. Most states' cruelty codes exempt common agricultural practices, which means that if abuse is the industry standard, there is next to no protection in most states. So farm animals routinely endure cruelties

that would warrant felony charges if they were inflicted upon a dog or cat.

The Humane Methods of Slaughter Act applies to animals in their final moments, and it requires that companies render farm animals insensible to pain before slaughter. However, the U.S. Department of Agriculture is responsible for enforcing this law, and the agency excludes chickens, turkeys, and many other animals from its protection. Since these are the vast majority of animals we kill for food, the USDA renders the HMSA nearly meaningless.

Worst Welfare Problems with Factory Farms

Slaughter Even at USDA-inspected plants, rampant slaughter abuse can be the norm. In January 2008, an undercover Humane Society of the United States investigation documented shocking cruelty (Weiss, 2008) at a Southern California slaughterhouse. Footage caught workers torturing downer dairy cows—animals too sick or injured to walk—by dragging them with forklifts, jabbing them in the eyes, electrically shocking them, and simulating drowning by forcing high-pressure jets of water into their nostrils in vain attempts to get them to stand and march to their own death. The USDA had multiple inspectors on the premises and had even awarded the plant with a Supplier of the Year distinction, as it was a top supplier of the National School Lunch Program.

As bad as things are for cows and pigs during slaughter, chickens have it even worse, and they comprise the vast majority of animals killed for food (U.S. Department of Agriculture NASS, 2008);. Workers unload them from transport crates and shackle them upside down while they are fully conscious. They are stunned by being moved through electrified water, and then their throats are slit. Many of them miss the blade and are still fully conscious when they're immersed and finally drown in tanks of scalding-hot water used to loosen their feathers.

Cages and Crates Critics believe that one of the worst abuses in raising animals for food involves cramming hundreds of millions of egg-laying hens, breeding sows, and veal calves into cages that are so small they can hardly move for months on end.

Factory egg farms confine about 280 million laying hens inside battery cages (United Egg Producers, 2008), tiny and often filthy enclosures, where they cannot even spread their wings or walk, much less nest, perch, or dust bathe. Multiple birds are stuffed into a file drawer-sized cage, where each hen has less space than a sheet of letter-sized paper in which to spend her life of up to a year and a half. Undercover investigations (Miller and Ghiotto, 2008) have revealed hens impaled on cage bars, trapped without food and water access, packed into cages with dead and rotting birds, and suffering from a litany of painful health problems.

About four million breeding sows, used to produce meat pigs, endure similarly intensive confinement. Breeding facilities restrict them for pregnancy after pregnancy to individual two-foot wide metal gestation crates that prevent them from turning around or walking. For up to four years, they live on concrete floors above suffocating manure pits.

Like breeding pigs, about 750,000 calves raised for veal each year are packed into narrow individual crates barely larger than their bodies. From the time they're one or two days old until they reach

Pigs at Doug Ruth's factory farm operation Downing Missouri. Ruth built his feeding operation in Scotland County—just 100 feet from the county border—because the regulations in neighboring Schuyler County would make it almost impossible for him to build there. (AP Photo/Al Maglio)

market weight at about five months, they cannot turn around, lie down comfortably, or meaningfully interact with their mothers or other calves.

Rapid Growth More than nine billion chickens are killed each year (U.S. Department of Agriculture NASS, 2008), their numbers dwarfing all other farm animals combined. Bred to reach market weight in an ever-shorter amount of time, chickens are ready for slaughter at only 45 days of age. Since they gain weight so unnaturally fast, these animals endure often painful, sometimes fatal metabolic and skeletal disorders that cause a tremendous amount of suffering.

Dairy As the above slaughter investigation revealed, dairy cows' final moments can be horrific. Slaughter isn't the only problem with dairy production; many cows at the plant involved in the scandal were already so ill or crippled they couldn't walk by the time they arrived at the slaughterhouse.

Factory farms typically confine the nine million U.S. dairy cows (U.S. Department of Agriculture NASS, 2008) slaughtered annually inside concrete-floored sheds for about four years. Like all mammals, cows don't lactate unless they've given birth, so dairies remove their newborn calves and often sell them to veal producers or beef cattle ranchers.

Dairies often inject cows with bovine growth hormone to further increase milk yield, which can cause or exacerbate a number of health problems. Many of these operations mutilate cows by cutting off their horns and tails.

Underwater Factory Farms

Aquaculture now accounts for about one-third of all aquatic animal production, and it involves problems similar to those found in industrialized farm animal production. Underwater factory farms confine animals in restrictive, unnatural enclosures, where they can develop painful injuries and problems such as lesions, infections, deformities, parasitic infestations, and more. Producers may starve fish for several days before slaughter—a process that can take up to 15 minutes. Often fish are completely conscious when their gills are slit and they bleed to death.

The Environmental Cost of Meat Production

The evidence is strong that animal agribusiness is among the most serious causes of environmental destruction. A United Nations Food and Agriculture Organization report concludes that raising animals for food is a greater contributor to global warming than automobiles, with the author stating, "Livestock are one of the most significant contributors to today's most serious environmental problems" (Food and Agriculture Organization of the United Nations, 2006).

Each year, these animals produce about 500 million tons of manure, which can pollute our soil, air, and water. And factory farms are resource-intensive. These massive operations are responsible for a large share of domestic water use, and nearly three-fourths of our grain harvest is used to feed farm animals. Meat production also uses a significant amount of raw materials and fossil fuels.

Water and air pollution can also threaten the health of workers and nearby residents. The American Public Health Association has called for a moratorium on factory farms (American Public Health Association, 2003).

The Human Cost of Factory Farms

Pollution threats aren't the only social justice problem that animal agribusiness creates. Worker safety is often abysmal at factory farms and slaughterhouses, which together employ more than half a million workers. many of whom are especially vulnerable because they're poor, unaware of their rights, and sometimes unable to speak English.

Slaughterhouse line speeds have increased, and workers spend long days doing dangerous work with sharp knives and equipment. They're sometimes untrained or undertrained, and they can develop crippling repetitive strain injuries and be cut, stabbed, dismembered, or worse. Slaughterhouse and factory farm workers can be exposed to a number of illnesses by inhaling blood, feces, dirt, pesticides, and other particulates. And of course, bacteria and viruses can enter the food supply.

When workers do develop illnesses or injuries, management may intimidate them to prevent them from reporting the problem. High turnover means that workers often don't accrue sick time or obtain insurance coverage.

In the midst of all the problems cited by critics of large industrial farms, however, there is some good news.

Hope for the Future

Because of the work of animal advocates across the country, Americans have approved legislation in a few states to prevent some of the worst abuses.

On November 5, 2008, California voters approved Proposition 2: The Prevention of Farm Animal Cruelty Act, in a landslide. This landmark citizen ballot initiative criminalized, with a phase-out period, the confinement of animals in battery cages, gestation crates, and veal crates. Despite an agribusiness-funded campaign opposing the modest requirement to provide animals with enough space to stand up, lie down, turn around, and extend their limbs, more than 63 percent of the California electorate voted in favor of Prop 2, in the nation's top agriculture state, no less.

California is in good company. Since 2002, Florida and Oregon have passed laws against gestation crates, while Arizona and Colorado have banned both gestation crates and veal crates. Although these improvements won't prevent every problem with using animals for food, they're a step toward ending the worst confinement abuses, and they've sparked major changes at the corporate level.

Over the past several years, retailers and restaurants, including Safeway, Whole Foods, Burger King, Wolfgang Puck, and even animal producers such as Smithfield Foods, have begun to move away from supporting the use of crates and cages on factory farms.

They're also catering to the growing number of Americans who demand vegetarian and vegan foods that are more humanely produced, sustainable, and socially responsible. Plant-based meat, dairy, and egg alternatives are exploding in popularity and are readily available at nearly every supermarket.

Gourmet restaurants are increasingly featuring vegetarian and vegan options as haute cuisine, and exclusively vegetarian eateries are now commonplace. Even fast-food chains that used to be vegan wastelands offer menu choices, and many restaurants happily accommodate vegan customers. Finally, vegan and vegetarian cookbooks have flooded the bookshelves, proving that plant-based cooking is accessible, easy, and delicious.

See also Food Animals, Ethics and Methods of Raising Animals

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Erin E. Williams

FACTORY FARMS AND EMERGING INFECTIOUS DISEASES

The first major period of disease since the beginning of human evolution likely started approximately 10,000 years ago with the domestication of farm animals (Armelagos et al., 2005). Human measles, for example, which has killed roughly 200 million people over the last 150 years, likely arose from a rinderpest-like virus of sheep and goats (Weiss, 2001). Smallpox may have resulted from camel domestication (Gubser et al., 2004), and whooping cough may have jumped to us from sheep or pigs (Weiss, 2001). Human influenza may have arisen only about 4,500 years ago with the domestication of waterfowl (Shortridge, 2003), and leprosy may have originated in water buffalo (McMichael, 2001). Rhinovirus, the cause of the human cold, may have come from cattle (Rodrigo & Dopazo, 1995). Indeed, before domestication, the common cold may have been common only to them.

Over the last few decades, there has been a dramatic resurgence in emerging infectious diseases, approximately three-quarters of which are thought to have come from the animal kingdom. The World Health Organization coined the term zoonoses, from the Greek *zoion* for "animal" and *nosos* for "disease," to describe this phenomenon (Mantovani, 2001). This trend of increasing zoonotic disease emergence is expected to continue (WHO/FAO/OIE, 2004), and the U.S. Institute of Medicine suggests that without appropriate policies and actions, the future could bring a "catastrophic storm of microbial threats" (Smolinski et al., 2003).

Animals have been domesticated for thousands of years. What new changes are taking place at the human/animal interface that may be responsible for this resurgence of zoonotic disease in recent decades?

In 2004, a joint consultation was convened by the World Health Organization, the Food and Agriculture Organization of the United Nations, and the World

Organization for Animal Health, to elucidate the major drivers of zoonotic disease emergence (WHO/FAO/OIE, 2004). A common theme of primary risk factors for both the emergence and spread of zoonoses was the expansion and intensification of animal agriculture associated with the increasing demand for animal protein.

Strep Suis

In 2005, China, the world's largest producer of pork (RaboBank International, 2003), suffered an unprecedented outbreak in scope and lethality of *Streptococcus suis,* a newly emerging zoonotic pig pathogen (Gosline, 2005). *Strep suis* is a common cause of meningitis in intensively farmed pigs worldwide and presents most often as meningitis in humans as well (Huang et al., 2005), particularly those who butcher infected pigs or handle infected pork products (Gosline, 2005). Due to involvement of the auditory nerves connecting the inner ears to the brain, half of human survivors of the disease become deaf (Altman, 2005).

The World Health Organization reported that it had never seen such a virulent strain (Nolan, 2005) and blamed intensive confinement conditions as a predisposing factor in its sudden emergence, given the stress-induced suppression of the pigs' immune systems (World Health Organization, 2005). The U.S. Department of Agriculture explains that these bacteria can exist as a harmless component of a pig's normal bacterial flora, but stress due to factors such as crowding and poor ventilation can drop the animal's defenses long enough for the bacteria to become invasive and cause disease (U.S. Department of Agriculture, Veterinary Services, Center for Emerging Issues, 2005). China's Assistant Minister of Commerce admitted that the disease was "found to have direct links with the foul environment for raising pigs" (China View, 2005). The disease can spread through respiratory droplets or directly via contact with contaminated blood on improperly sterilized castration scalpels, tooth-cutting pliers, or tail-docking knives (Du, 2005). China boasts an estimated 14,000 confined animal feeding operations (CAFOs) (Nierenberg, 2005), colloquially known as factory farms, which tend to have stocking densities conducive to the emergence and spread of disease (Arends et al., 1984).

Nipah Virus

The 2005 *Strep suis* outbreak followed years after the emergence of the Nipah virus on an intensive industrial pig farm in Malaysia. Nipah turned out to be one of the deadliest of human pathogens, killing 40 percent of those infected, a toll that propelled it onto the United States' list of potential bioterrorism agents (Fritsch, 2003). This virus is also noted for its intriguing ability to cause relapsing brain infections in some survivors (Wong et al., 2002) many months after initial exposure (Wong et al., 2001). Even more concerning, a 2004 resurgence of Nipah virus in Bangladesh showed a case fatality rate on par with Ebola, 75 percent, and showed evidence of human-to-human transmission (Harcourt, 2004). The Nipah virus, like all contagious respiratory diseases, is a density-dependent pathogen (U.S. Central Intelligence Agency 2006). "Without these large, intensively managed pig farms in Malaysia," the director of the Consortium for Conservation Medicine said, "it would have been extremely difficult for the virus to emerge" (Nierenberg, 2005).

Bovine Spongiform Encephalopathy

Global public health experts have identified specific dubious practices used in modern animal husbandry beyond the inherent overstocking, stress, and unhygienic conditions that have directly or indirectly launched deadly new diseases (Phua & Lee, 2005). One such misguided practice is the continued feeding of slaughter plant waste, blood, and excrement to farm animals to save on feed costs (Stapp, 2004).

A leading theory on the origin of BSE, also known as mad cow disease, is that cattle, which are naturally herbivores, became infected by eating diseased sheep (Kimberlin, 1992). In today's corporate agribusiness, protein concentrates, or meat and bone meal, euphemistic descriptions of "trimmings that originate on the killing floor, inedible parts and organs, cleaned entrails, fetuses" (Ensminger, 1990) are fed to dairy cows to increase milk production (Flaherty, 1993), as well as to most other farm animals (*Economist*, 1990). According to the World Health Organization, nearly 10 million metric tons of slaughter plant waste is fed to farm animals every year (WHO/OIE, 1999). The recycling of the remains of infected cattle into cattle feed was likely what led to the British mad cow epidemic's explosive spread (Collee, 1993) to nearly two dozen countries around the world in the subsequent 20 years (U.S. Department of Agriculture and Animal and Plant Health Inspection Service, 2005). Dairy producers can use corn or soybeans as a protein feed supplement, but slaughter plant byproducts can be cheaper (Albert, 2000).

Multidrug-Resistant Bacteria

Another risky industrial practice is the mass feeding of antibiotics to farm animals. The Union of Concerned Scientists estimate that up to 70 percent of antimicrobials used in the United States are utilized as feed additives for chickens, pigs, and cattle for non-therapeutic purposes (Mellon, 2001). Indeed, the use of growth-promoting antibiotics in industrial animal agriculture may be responsible for the majority of the increases in antibiotic-resistant human bacterial illness (Tollefson et al., 1999), the emergence of which is increasingly being recognized as a public health problem of global significance (Moore et al., 2006).

Alarmingly high rates of methicillin-resistant *Staphylococcus aureus* (MRSA) detected in farm animals and retail meat in Europe, for example, have led to increased scrutiny of the agricultural use of antibiotics. The Dutch Agriculture, Nature, and Food Standards Minister, Cees Veerman, was recently reported as saying that "the high usage of antibiotics in livestock farming is the most important factor in the development of antibiotic resistance, a consequence of which is the spread of resistant micro-organisms (MRSA included) in animal populations" (Soil Association, 2007). The 2008 discovery of MRSA in the majority of pigs tested in Iowa and Illinois suggests that the potential public health risk attributed to farm animal-associated MRSA may be a global phenomenon (Goldburg, 2008).

Avian Influenza

The dozens of emerging zoonotic disease threats must be put into context. SARS, which emerged from the live animal meat markets of Asia (Lee & Krilov, 2005), infected thousands of humans and killed hundreds. Nipah infected hundreds and killed scores. *Strep suis* infected scores and killed dozens.

AIDS, which arose from the slaughter and consumption of chimpanzees (Hahn et al., 2000), has infected millions, but there is only one virus known that can infect billions—influenza.

Influenza, the "last great plague of man" (Kaplan & Webster, 1977), is the only known pathogen capable of truly global catastrophe (Silverstein, 1981). Unlike other devastating infections like malaria, which is confined equatorially, or HIV, which is only fluid-borne, influenza is considered by the Centers for Disease Control and Prevention's Keiji Fukuda to be the only pathogen carrying the potential to "infect a huge percentage of the world's population inside the space of a year" (Davies, 1999). In its 4,500 years of infecting humans since the first domestication of wild birds, influenza has always been one of the most contagious pathogens (Taylor, 2005). Only since 1997, with the emergence of the highly pathogenic strain H5N1, has it also emerged as one of the deadliest.

H5N1 has so far only killed a few hundred people (World Health Organization, 2008). In a world in which millions die of diseases like malaria, tuberculosis, and AIDS, why is there so much concern about bird flu?

The risk of a widespread influenza pandemic is dire and real because it has happened before. An influenza pandemic in 1918 became the deadliest plague in human history, killing up to 100 million people around the world (Johnson & Mueller, 2002), and that 1918 flu virus was likely a bird flu virus (Belshe, 2005) that made more than one-quarter of all Americans ill and killed more people in 25 weeks than AIDS has killed in 25 years (Barry, 2004). Despite the harrowing effects of that influenza nearly a century ago, the case mortality rate in 1918was less than five percent (Frist, 2005). H5N1, in comparison, has so far officially killed half of its human victims (World Health Organization, 2008).

Free-ranging flocks and wild birds have been blamed for the recent emergence of H5N1, but people have kept chickens in their backyards for thousands of years, and birds have been migrating for millions. What has changed in recent years that led us to this current crisis? According to Robert Webster, the "godfather of flu research," it is because

> farming practices have changed. Previously, we had backyard poultry . . . Now we put millions of chickens into a chicken factory next door to a pig factory, and this virus has the opportunity to get into one of these chicken factories and make billions and billions of these mutations continuously. And so what we've changed is the way we raise animals . . . That's what's changed. (Council on Foreign Relations, 2005).

The United Nations specifically calls on governments to fight what they call factory-farming: "Governments, local authorities, and international agencies need to take a greatly increased role in combating the role of factory farming [which, combined with live bird markets] provide ideal conditions for the virus to spread and mutate into a more dangerous form" (United Nations, 2005).

Michael Osterholm, the director of the U.S. Center for Infectious Disease Research and Policy and an associate director within the U.S. Department of Homeland Security, tried to describe what an H5N1 pandemic could look like in one of the leading U.S. public policy journals, *Foreign Affairs.* Osterholm suggests that policy makers consider the devastation of

the 2004 tsunami in South Asia: "Duplicate it in every major urban centre and rural community around the planet simultaneously, add in the paralyzing fear and panic of contagion, and we begin to get some sense of the potential of pandemic influenza" (Kennedy, 2005).

"An influenza pandemic of even moderate impact," Osterholm continued, "will result in the biggest single human disaster ever—far greater than AIDS, 9/11, all wars in the 20th century and the recent tsunami combined. It has the potential to redirect world history as the Black Death redirected European history in the 14th century" (Kennedy, 2005).

It is hoped that the direction world history will take is away from raising birds by the billions under intensive confinement, so as to potentially lower the risk of our ever being in this same precarious situation in the future.

According to a spokesperson for the World Health Organization, "The bottom line is that humans have to think about how they treat their animals, how they farm them, and how they market them—basically the whole relationship between the animal kingdom and the human kingdom is coming under stress" (Torrey & Yolken, 2005). Along with human culpability, though, comes hope. If changes in human behavior can cause new plagues, changes in human behavior may prevent them in the future.

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Michael Greger

FIELD STUDIES AND ETHICS

While there are many obvious ethical concerns that need to be addressed in studies of captive animals, there are also ethical issues associated with the study of wild animals. Nonetheless, it is important to stress that field studies of many animals contribute information on the complexity and richness of animal lives that has been, and is, very useful to those interested in animal rights and animal welfare. Students of behavior want to be able to identify individuals, assign gender, know how old animals are, follow them as they move about, and possibly record various physiological measurements including heart rate and body temperature. Animals living under field conditions are generally more difficult to study than individuals living under more confined conditions, and various methods are often used to make them more accessible to study. These include activities such as handling, trapping using various sorts of mechanical devices that might include using live animals as bait, marking individuals using colored tags or bands, and fitting individuals with various sorts of devices that transmit physiological and behavioral information telemetrically, such as radio collars, other instruments that are placed on an animal, or devices that are implanted in the animal.

Trapping is often used to restrain animals while they are marked or fitted with tags that can be used to identify them as individuals, or equipped with radiotelemetric devices that allow researchers to follow them or to record physiological measurements. However, the trapping and handling of wild animals is not the only way in which their lives can be affected, for just being there and watching or filming them can influence their lives. What seem to be minor intrusions can really be major intrusions. Here are some examples:

1. Magpies, which are not habituated to human presence, spend so much time avoiding humans that this takes time away from essential activities such as feeding
2. Adélie penguins exposed to aircraft and directly to humans showed profound changes in behavior including deviation from a direct course back to a nest and increased nest abandonment. Overall effects due to exposure to aircraft that prevented foraging penguins from returning their nests included a decrease of 15 percent in the number of birds in a colony and an active nest mortality of eight percent. There are also large increases in penguins' heart rates. Trumpeter swans do not show such adverse effects to aircraft. However, the noise and visible presence of stopped vehicles produces changes in incubation behavior by trumpeter females that could result in decreased productivity due to increases in the mortality of eggs and hatchlings
3. The foraging behavior of Little penguins (average mass of 1,100 grams) is influenced by their carrying a small device (about 60 grams) that measures the speed and depth of their dives. The small attachments result in decreased foraging efficiency. However, when female spotted hyenas wear radio collars weighing less that two percent of their body weight, there seems to be little effect on their behavior. Changes in behavior such as these are called the instrument effect.
4. Mate choice in zebra finches is influenced by the color of the leg band used to mark individuals, and there may be all sorts of other influences that have not been documented. Females with black rings and males with red rings had higher reproductive success than birds fitted with other colors. Blue and green rings were found to be especially unattractive on both females and males
5. The weight of radio collars can influence dominance relationships in adult female meadow voles. When voles wore a collar that was greater than 10 percent of their live body mass, there was a significant loss of dominance
6. Helicopter surveys of mountain sheep that are conducted to learn more about these mammals disturb them as well as other animals, and greatly influence how they use their habitat, and increase their susceptibility to predation as well as nutritional stress

While there are many problems that are encountered both in laboratory and field research, the consequences for wild animals may be different from and

greater than those experienced by captive animals, whose lives are already changed by the conditions under which they live. This is so for different types of experiments that do not have to involve trapping, handling, or marking individuals. Consider experimental procedures that include visiting the home ranges, territories, or dens of animals, manipulating food supply, changing the size and composition of groups by removing or adding individuals, playing back vocalizations, depositing scents or odors, distorting body features, using dummies, and manipulating the gene pool. All of these manipulations can change the behavior of individuals, including their movement patterns, how they utilize space, the amount of time they devote to various activities including hunting, antipredatory behavior, and various types of social interactions including caregiving, social play, and dominance interactions. These changes can also influence the behavior of groups as a whole, including group hunting or foraging patterns, caregiving behavior, and dominance relationships, and also influence non-targeted individuals. Lastly, there are individual differences in responses to human intrusion.

Field workers are becoming more sensitive to how their presence and methods of study influence the animals they are studying. In a study evaluating long-term capture and handling effects on bears, wildlife researcher and veterinarian Marc Cattet and his colleagues discovered that we really do not know much about bears, and we could be gathering spurious data in the absence of this knowledge. Bears captured for research are more prone to injuries and death. One bear suffered from such "a severe case of capture myopathy—a kind of muscle meltdown some captured animals suffer when they overexert themselves trying to escape—that its chest, bicep and pectoral muscles were pure white and as brittle as chalk." Blood analyses of 127 grizzlies caught in Alberta between 1999 and 2005 revealed a significant number of those animals showed signs of serious stress for alarmingly long periods of time after they were processed and released back in the wild and about two-thirds of the animals caught in leg-hold traps suffered muscle injuries.

Animal activist and carnivore expert Camilla Fox has shown that there are extensive negative effects of trapping many different species that significantly compromise their wellbeing and thus their behavior, and produce misleading results. Consider what she wrote about trapping aquatic animals in the *Encyclopedia of Animal Behavior:*

> Leghold and submarine traps act by restraining the animals underwater until they drown. Most semi-aquatic animals, including mink, muskrat, and beaver, are adapted to diving by means of special oxygen conservation mechanisms. The experience of drowning in a trap must be extremely terrifying: animals have displayed intense and violent struggling and were found to take up to four minutes for mink nine minutes for muskrat, and ten to thirteen minutes for beaver to die. Mink have been shown to struggle frantically prior to loss of consciousness, an indication of extreme trauma.

Because most animals trapped in aquatic sets struggle for more than three minutes before losing consciousness,

wildlife biologists have concluded that these methods did not meet basic trap standards and could therefore not be considered humane. Fox concluded, "For an activity that affects millions of wild animals each year, it is astounding that so little is known about the full impact of trapping on individual animals, wildlife populations and ecosystem health."

While Cattet and other researchers are not ready to give up wildlife research it is heartening that he concludes that we can do much more:

"I think that a number of things can be done to perhaps minimize restraint times and capture-related injuries," Cattet said. "We could use motion activated video cameras at trap sites that would allow researchers to assess animals' reactions to capture. I think that what this study underscores is that the status quo is not the answer. It also underscores the reality that it is not only bears that suffer. There's every reason to believe that other animals are suffering too when they are captured and released."

I have personally experienced the good use of noninvasive field research. When I visited elephant expert Iain Douglas-Hamilton and his coworkers, who have been studying elephants in Samburu National Reserve in Northern Kenya, I had the pleasure of collecting elephant dung with George Wittemyer. Samples of dung are collected, then sent off for genetic analyses that help George and his colleagues further understand the elephants at Samburu. By analyzing fecal hormones, information can also be gathered on stress levels. It is known that stress hormones increase when a matriarch is killed, and are higher in areas where there are high levels of poaching.

Research ecologist Robert Long and his colleagues recently published a book titled *Noninvasive Survey Methods for Carnivores* that will surely help the animals and be a win-win for all involved in field research. John Brusher and Jennifer Schull have developed nonlethal methods for determining the age of fish using the characteristics of dorsal spines. Many researchers realize that they don't have to kill animals to study them, and we can look forward to the development of more and more noninvasive techniques for studying a wide variety of animals. Admittedly, it's a difficult situation, because we need to do research to learn more about the animals we want to understand and protect. But we can always do it more ethically and humanely and be sure that the information we collect truly reflects the behavior of the animals, and that we don't harm them while we pursue this knowledge.

While we often cannot know about various aspects of the behavior of animals before we arrive in the field, our presence does influence what animals do when we enter into their worlds. What appear to be relatively small changes at the individual level can have wide-ranging effects in both the short and long term. On-the-spot decisions often need to be made, and knowledge of what these changes will mean to the lives of the animals involved deserve serious attention. A guiding principle should be that the wild animals we are privileged to study should be respected, and when we are unsure about how our activities will influence their lives, we should err on the side of the animals and not engage in these practices until we know the consequences of our acts. By being careful about what we do in field work, we will

also collect more reliable data that can be used in future studies.

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Marc Bekoff

FIELD STUDIES: ANIMAL IMMOBILIZATION

Immobilization, in the context of animal ethics, is the forced restriction of movement of all or part of an animal's body, either by physical or chemical means. It is used to impose management of some kind, for human and/or animal benefit. Immobilization is a common practice in many animal management procedures. Here we'll examine the impact of immobilization on animal welfare, outline the ethics of use in different situations, and consider ways of improving standards in these areas.

Physical immobilization methods usually involve traps to restrain the whole animal (e.g., pitfall traps, cage traps, box traps, crush cages, plastic tubes, restraint boards, restraint chairs), or part of the animal (e.g., snares, leg-hold traps, chutes, head-holding devices) or just use of direct handling restraints.

Chemical immobilization is achieved using drugs, which have a range of intended effects, from those which produce

a widespread muscular paralysis while the animal is fully conscious, to those which produce unconsciousness with anesthesia (lack of sensation, e.g., of pain).

Immobilization Is a Welfare Issue

Immobilization of an undomesticated or anxious animal may cause considerable stress. When animals are immobilized, they may undergo some or all of a series of acute stressors including pursuit, restraint, pain, fear and anxiety, all of which are capable of inducing harmful responses and pathological changes. Repeated stressors, such as are imposed on some laboratory and wild animals, are likely to result in very poor welfare outcomes.

Animals in physical traps experience stress similar to that of being caught by a predator, but their struggle to escape may continue until released from the trap. Traps may be remote from the human who set them, and a trapped animal may be left unattended for long periods. Physical injury is also a risk. For example, steel-jaw leg-hold traps, widely condemned as inhumane, cause high levels of fractures and tissue necrosis in target and nontarget species. A good account of capture and physical restraint techniques for zoo and wild animals is given by Todd Shury (2007), and a general veterinary account by Sheldon et al. (2006).

With chemical immobilization there are different welfare issues. Immobilizing drugs have the potential to disturb normal regulatory systems, particularly respiratory and thermoregulation, which in turn can lead to negative outcomes such as respiratory depression, overheating (hyperthermia), lowered blood pH (acidosis), and oxygen deficit (hypoxemia). These in turn can lead to neurological or myocardial problems and multi-organ failure. A chase by ground or air to dart an animal can lead to extreme muscular activity and hyperthermia, as well as a potentially fatal outcome, capture myopathy syndrome, which can lead to death in minutes to weeks after the inciting event. Drugs may behave differently in combination, and in individual animals, depending on their physiological status. Dosages often have to be estimated for animals of unknown weight, and where drugs are remotely delivered by unpredictable darts to a moving target animal, delivery of the correct dosage is very difficult to control. These scenarios would present a nightmare for a human anesthetist, as would the resulting morbidity and mortality rates, but both can be routine in situations where wild or untamed animals are immobilized.

While these stressor situations are much less common under controlled conditions, for example, in the immobilization of laboratory or companion animals, there are welfare issues for each animal being immobilized.

Immobilization Is Also an Ethical Issue

Perhaps the majority of us think of animal immobilization in the context of veterinary procedures conducted on companion animals, exhibit or zoo animals, or valuable sports animals, for example horses. Here, under controlled circumstances and with primary emphasis on the welfare of the animal, immobilization standards are usually high and improved technologies rapidly adopted.

Ethical concerns around the immobilization of farm animals are very different, with the prime concern being the economics of production. Cattle, sheep

and pigs are routinely immobilized for management procedures such as castration, dehorning and Caesarian section. Immobilization techniques range from humane to highly unethical and stressful techniques such as electro-immobilization (EI). Many immobilization procedures for mutilation, such as castration, tail docking, beak trimming, teeth-clipping etc., are carried out on young animals using physical restraint without anesthesia. All evidence shows that these cause unnecessary pain and distress. The organization Compassion in World Farming gives more information at www.ciwf.org.

The sheer numbers of immobilizations undertaken prior to slaughter, primarily for the meat and byproducts industries, outweigh those in all other categories combined. In 2005, in the United States alone, 10 billion land animals were immobilized and then slaughtered for the food/byproducts industry (U.S. Department of Agriculture, 2006). Welfare standards for chickens and turkeys, which comprise more than 95 percent of all animals slaughtered in the United States each year, are the poorest. They are unprotected by existing legislation in either the United States or Britain. Electric immobilization is the standard method of preparation for slaughter, and causes a wide range of animal welfare, economic, and worker-safety problems. More information can be obtained from People for the Ethical Treatment of Animals at http://www.peta.org. Temple Grandin, a professor at Colorado State University, has done much work to improve the standards of immobilization for other meat animals (http://www.grandin.com/references/humane.slaughter.html) although, as she has pointed out, standards that are applied still depend to a large extent on the personal ethics of the slaughterhouse manager rather than legislation. In particular, the use of religious slaughter, involving immobilization by physical restraint of the animal prior to blood-letting, has also been the subject of much ethical debate. VIVA, the Vegetarians International Voice for Animals has published an online account of this controversy (http://www.viva.org.uk/campaigns/ritual_slaughter/goingforthekill01.htm), and the UK government agency DEFRA has online information relating to their stance on this issue http://www.defra.gov.uk/animalh/welfare/farmed/slaughter.htm#religiousslaughter.

Laboratory animals are routinely immobilized for various procedures in research. Just over 3.2 million scientific procedures on laboratory animals were started in the UK in 2007, the majority of which entail some restraint or immobilization. Around 39 percent of all procedures used some form of anesthesia (UK Government Home Office, 2007). When laboratory animals are subject to repeated immobilization, they begin to learn the preparatory stimuli, which entails increased stress. This is particularly serious in highly intelligent animals such as primates, who respond badly to repeated physical immobilization. Many researchers now question the validity of data gathered using stressful techniques, because they undoubtedly affect the normal physiology and behavior of the animal (Baldwin, 2007), and their emotional welfare (Bekoff, 2007).

Wildlife researchers may need to immobilize wild animals to mark them for later identification, to provide veterinary treatment, or to relocate them from dangerous or overpopulated areas. Marking may involve mutilation, such as ear-notching, digit or tooth removal, etc.,

tagging and banding, or external or internal radio-transmitter attachment. In the last 20 years, the immobilization of wild animals for the fitting of tags and markers has increased dramatically, to the point where this is the starting point for many monitoring studies.

Wildlife immobilization increasingly employs chemical means. The immobilization of large or potentially dangerous wild animals may pose huge challenges, with risks for both operators and target animals. Drug choices and combinations must be of proven safety for each species and calculated for the weight, age, physiological and reproductive status, body condition, and presence of young or companions with the target animal. If the onset of anesthesia effect is slow, this increases the risk of physical injury such as lacerations, limb injuries, head trauma, etc. It isn't surprising that capture- and immobilization-related mortalities in wild animals are more frequent and more serious than in domestic animals. Arnemo & Caulkett (2007) detail useful precautions which can be taken to help reduce the effects of stressors.

Evidence for the negative effects of immobilization for marking is beginning to emerge in several areas of wildlife research (Murray & Fuller, 2000). It is no longer the case that survival of a wild animal through the process of immobilization implies the safety of that procedure. Longer-term views of capture and handling are beginning to reveal problems. Cattet et al. (2008) showed negative effects of immobilization on ranging behavior and body condition in grizzly and black bears in Canada, and similar effects have been suggested for polar bears (Dyck et al., 2007). Immobilization may also negatively impact the fertility of target species. Alibhai & Jewell (2001) reported a negative effect of repeated immobilization for radio-collar fitting and maintenance on the fertility of female black rhinoceros. While these findings and others often give rise to heated debate among wildlife researchers, most domestic animal veterinarians would not expect their patients to sustain a pregnancy, or perhaps even survive, under similar circumstances. Some authorities (e.g., the government of New South Wales, Australia) have now begun to issue ethical guidelines for wildlife research: http://www.agric.nsw.gov.au/reader/wildlife-research/arrp-radio-tracking.htm

The physical trapping of animals for research or killing is an area in which the quality of immobilization is of ethical and welfare importance. A good account of trapping and marking terrestrial vertebrates for research is given by Roger Powell and Gilbert Proulx (2003). Some of the more responsible hunting and trapping authorities issue ethical guidelines, for example, in the United States, by the Pennsylvania Game Commission: http://www.pgc.state.pa.us/pgc/cwp/view.asp?a=514&q=168724.

First, the need for immobilization can be reduced. Many of the conditions described above are consumer-driven, and could be avoided if demand was reduced. In wildlife research, the ethics of some practices requiring prior immobilization, e.g., radio-telemetry, can be questioned when there is a high failure rate of collars and/or transmitters (Alibhai & Jewell, 2001), and an accepted, but also poorly documented, potential for injury (see illustration). Training laboratory animals can avoid the need for immobilization in some circumstances; nonhuman primates can be trained to present themselves for routine blood-sampling without restraint (Reinhardt, 1995).

Second, current techniques can be replaced with those which provide better welfare. The UK National Centre for the Replacement, Refinement and Reduction of animal in research (NC3RS), (http://www.nc3rs.org.uk/news.asp?id=924) has begun this process. Better husbandry and management conditions in farming, and the adoption of noninvasive techniques for wildlife monitoring, including camera-trapping and biometric techniques such as footprint identification (Alibhai et al., 2008) and coat-pattern identification (Burghardt et al., 2008), can be considered.

Third, research can be prioritized into reduction or replacement. The Dr. Hadwen Trust for the replacement of animals in medical research does excellent work in this field: (http://www.drhadwentrust.org.uk/).

Lastly, standards of immobilization can be regulated by developing and monitoring protocols and legislation as a foundation for change. Much unnecessary stress in immobilization is imposed by economic time constraints on the competitiveness of commercial practitioners. Legislation and consumer-awareness campaigns could greatly improve conditions for animals undergoing the stressful process of immobilization.

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Zoe Jewell
Sky Alibhai

FIELD STUDIES: ETHICS OF COMMUNICATION RESEARCH WITH WILD ANIMALS

A Personal Essay

For many years I have been using music in an attempt to communicate with the orcas that reside off the north coast of Vancouver Island. Trying to meet another species halfway tends to make one perceive them differently than a researcher who views them as the cool subject of objective observation. For one example, the whales swim past our cove several times a day in their matrilineal pods consisting of a grandmother, offspring and mates. The younger orcas, juveniles, as biologists refer to them, vocalize with us whenever they wish. It seems appropriate that our own human family groups conduct communication research with their family groups. So, for many years, our research group has had a similar percentage of children involved in the activity as the orcas have in the water.

We chose the orcas for our experiment in interspecies communication because, in contrast to almost all other dolphin species, orcas vocalize nearly all the time in a frequency range within the confines of human hearing. They also vocalize loudly, and we sometimes hear them fifteen minutes before we see them swimming our way. These whales cruise close to shore. Biologists refer to them as residents, which simply means they live here, and the whales we played with yesterday are the same whales we hear today.

These residents signal one another in two modes: the frequency modulated whistle and the pulsed click train. Frequency modulated means melodic. The pulsed click train is rhythmical. In other words, the orcas use musical concepts to communicate among their own kind. To hear these orcas calling back and forth to one another, and then interact with them, I have assembled a sound system with underwater recording and transmitting capabilities built inside a comfortable boat which is anchored just offshore. A single switch powers up a keyboard, microphones, and an electric guitar, all of which are run through an amplifier and output to underwater speakers. This sound system is basically a telephone line to the whales. If we like the conversations we hear, we record them for posterity.

If it's little children using our orca telephone, the whale's innate loudness and edgy abruptness breeds both excitement and fear. Some parents who come aboard assume that these large dolphins will naturally be drawn to children, invoking a naive view of this charged border between species as a Peaceable Kingdom where innocence is celebrated and hard

work unnecessary. Whales are compassionate and wise. They love us. They love our children even more.

But when the orcas fail to respond, these parents wonder what might be wrong with their ideal. Maybe the studio isn't child friendly? They turn up the thermostat. Hide the synthesizer. Lead the kids in a rendition of "Row, row, row, your boat." It makes no difference. The whales' rubbery, bone-jarring screams remain child-unfriendly and aloof.

Playing music with orcas is better understood as an expression of conceptual art than a variation of an Edward Hicks painting. To keep going at this work, musicians must revel in counterintuitive phrasing, dissonance, and nearly unbearable stretches of silence. The slightest hints of synchronized rhythm become the measure of our correspondence. Those who persevere for more than an hour, more than a week until, finally, we visit this whale habitat every summer for two decades, celebrate a radical paradigm that insists animals are sentient beings both capable and amenable to an aesthetic interaction. Most people feel no such motivation. Most musicians find the sonic rewards too few and far between, and the intellectual rewards too unmusical.

We hear the orcas vocalizing through the speakers, like a cross between an elephant and an soprano sax. They are still a mile up the strait. I turn on the switch and let anyone play what they like. To limit the experience seems prejudicial and pompous. We have uncovered no evidence that a whale responds better to Bach played by a virtuoso than to some determined girl singing "Come little orca, sha-lalalalala-la-la." We've tried it both ways. Sometimes one gets a response, sometimes the other.

My rationale to permit children and musicians access to the sound system is sometimes judged unprofessional by objectivists who insist we attach scientific rigor to this long-term study. They insist we control our transmissions to a specific few notes, or better yet, focus pure tones from a sine wave generator, and monitor on an spectrogram. It all seems worthy. I would gladly fit any valid experiment into our schedule if someone would just administer it, and also agree not to interfere with the music-making regimen. Therein lies the problem. Scientific control is like virginity. You either have it or you don't.

That our work prospers without control is the reason our research attracts musicians, not cognitive scientists and behavioral biologists. We are laypeople whose relationship with the whales is more an affair of the heart, the ear, and the gut, than of the mind and the spreadsheet.

Those of us who have observed many different people play with the whales over several years have reached an admittedly unverifiable conclusion about the orca's response. While the orcas display no special interest in virtuosity—for example, a soloist rendering Mozart with precision—they seem highly attuned to soloists and ensembles who play with soulfulness. These whales are attracted to music-makers who are having a good time. Musicians refer to this as getting into the groove. The mechanics of rhythm, harmony, and timing take on a substance greater than the sum of its parts. What affects the players likewise affects the audience, turning the sensuous experience communal. The groove is, apparently, capable of mitigating the species barrier as easily as it cuts through the performer/audience barrier.

At Orcananda, we impose a few rules to guide interspecies etiquette. First, we

conduct our musical experiment only after dark. One does not presume to play and record underwater music with orcas during daylight without contending with considerable noise pollution from boat motors rumbling and whining along the freeway of the strait. Second, we never chase the whales. We play our music from a boat anchored at the same spot year after year. If the whales choose not to come to us, the interaction cannot happen. Third, our objective is interspecies communication, so we never transmit recorded music into the water. Although a whale may certainly respond to a recording, a recording cannot respond to a whale. Fourth, we never retransmit whale sounds, reflecting an orca call back into the water. Such technology offers nothing vital to the communal ground we nurture.

Over the years, musicians have discovered techniques to facilitate interspecies music-making. Foremost is the routine of adding rhythmical silent spaces to an improvisation as an invitation for a whale to fill in the hole. If the orca vocalizes only in the allotted space, it may be a response. However, congruency is not always what it seems. For instance, a player may hear an orca call a phrase, and respond by repeating the same notes. Back and forth it goes.

Except that the whale would have made the same sounds even if the musician hadn't played anything. This simultaneity of response is of the same ilk as Paul Winter's affable studio compositions that include animal calls as overdubbed elements.

Pointing this out to a musician can lead to dispute. "What do you mean I wasn't communicating? I heard it!"

One may well ask why players confuse orca Karaoke with real-time communication. The mistake is mostly a function of a charged playing environment. Our studio is a boat in a wilderness cove. The sessions occur late at night, often with rain pounding on the roof. The candlelight we favor to conserve electricity casts an eerie glow over the proceedings, contorting shadows. When the wind comes up, the boat rocks, sometimes enough to knock a musician from one wall to the other. The underwater speakers resound with colossal gurgles, oddball kerplunks, the obscure croaking of bottom fish. The total effect is disorienting. Certain water sounds can prompt listeners to examine their clothing for signs of wetness.

From faraway, orca whistles resound through the speakers like horns playing a bebop refrain. Certain calls rise above the fray, slithering and soaring with the abandon of a Charlie Parker solo. Other calls balance this boldness; they fold in upon themselves like a flower closing its petals. A musician plays a few tentative notes. The whales turn silent for a minute. When we hear them vocalize again, it is much louder, a sure sign they have moved closer. If they come close enough, the orcas echolocate the boat. At two hundred feet, the clicks remind us of a woodpecker knocking on a tree. At twenty feet, they sound like a machine gun firing at the boat cabin.

Now the orcas are whistling at such a volume that their calls explode into the darkened room. The sensation is not so much that the orcas are close by but, rather, that one of them has inhaled the boat. When they vocalize at the volume of a loud rock band, every sound an orca makes, and some it doesn't, suggests linkage. When a skilled musician mimics their calls with aplomb, no one is left unaffected. By the time the whales take

their exit, everyone feels spat out, exhausted . . . and witness to a bona fide encounter. At that moment, the question of whether the dialogue was genuine or counterfeit seems moot, a sorry attempt to superimpose an analytical frame over a profoundly emotional and spiritual experience.

One might imagine it takes a little practice to tell the difference. It takes more than that. These respondents really are whales, a truth that confounds a player even as it hints of a secret knowledge. Although I have devoted twenty summers of my life to exploring music with orcas, I did not learn the difference between interaction and simultaneity by paying attention to the sessions on the boat. I learned it, instead, by studying the recordings in the comfort of my home studio. The knowledge came to me in a rush, like glimpsing a face hidden within the textures of a surrealistic painting. The moment I heard the difference, I heard it ever after. Unfortunately, the distinction defies a literal explanation.

Though describing the truth of interaction may be difficult, the techniques that foster communication are straightforward. A sense of courtesy is fundamental. Start off playing quietly. Treat the music as an invitation. Visualize the moment as a sanctuary filled with music. Feel what it means to get on whale time. If the orcas start to leave, give them up immediately. Don't *try* to communicate; it's a contradiction in terms that impedes bonding. Keep aware that beautiful music is a species-specific presumption. The sounds a musician casts into the water may be interpreted by an orca as an intrusion or, even worse, as the acoustic analogue to poisoned meat set out for coyotes. Some orcas in these waters possess bullet scars; reminders of violence perpetrated by fishermen who perceived the salmon-eating whales as a threat to their livelihood. Fortunately, the advent of whale-watching has put an end to such wanton gunfire.

I have discovered a simple technique to test my thesis of interaction versus simultaneity. The notes D-C-D describe one orca phrase heard in these waters. Playing the riff a whole tone higher opens a door of opportunity. About once in every ten tries, a whale will rise to the occasion by mirroring the alteration: E-D-E. About once in every five hundred tries, a whale has treated my tonal variation as the start of a pattern, responding another whole tone up: F#-E-F#.

I also discovered that it was not the orcas playing with me, but two specific whales that often gravitated to our boat. One was a young male, the other was his mother, named Nickola by local biologists. Nickola was generally regarded to be the most outgoing whale in the strait. Over several years the male, A6, developed into an inspired soloist, inventing melodies that occasionally attained a fluidity reminiscent of a jazz solo. There were nights the two whales remained to vocalize with us long after the rest of their pod had departed the immediate area.

The question has been posed whether this music with orcas is interspecies communication or just avant-garde music. In fact the latter derives from the former. The best examples of communication express recognizable harmony, rhythm, and melody, and are, therefore, the most *musical*. Music also evokes unquantifiable concepts such as emotion and community. As a recorded medium, music demonstrates a capability to engage the listener as intensively as the players. To deflect the covert criticism of the just music label, I have learned to hand the

critic a recording of orca sessions with the comment, "It's music. So if there is communication, you're going to hear it. Right?" To this bold statement I would add one caveat. Whatever the verdict may be, there is nothing avant-garde about it. Indigenous people have been talking and singing with animals since before history.

Jim Nollman

FIELD STUDIES: NONINVASIVE WILDLIFE RESEARCH

The status of global wildlife populations is of grave concern to conservation biologists, with members of the order Carnivora (e.g., wolves, bears) at particular risk in many parts of the world. Terrestrial carnivores typically require large areas of habitat to meet their needs for food, mating, and dispersal, and are vulnerable to persecution when they are forced to live in close proximity with people. Thus, as habitat loss and fragmentation continue to increase against a backdrop of global climate change, a growing number of carnivore populations are in urgent need of protection.

Given the above scenario, it is more critical than ever for wildlife researchers to acquire information about the distribution, habitat use, and general ecology of carnivores. Unfortunately, the elusive and wide-ranging nature of these species, which also tend to exist in low densities, makes them notoriously challenging to study. Although radio telemetry and other traditional, live-capture based methods can produce valuable data pertaining to carnivore movement, survival, and related measures, such methods are labor-intensive, costly, and potentially hazardous for the animals of concern.

In recent years, a new suite of noninvasive survey techniques has become available to carnivore biologists. These techniques do not require the handling or even the direct observation of wildlife, but rather allow for the remote collection of biological samples (e.g., hair, feces—hereafter called *scat*) and other information (e.g., photographs, tracks). Beyond the advantage of requiring no physical contact with study animals, these methods are extremely effective if used appropriately. For example, survey devices can be deployed across large remote areas, and can be left in place for days or weeks without requiring researchers to return to them. This attribute can make noninvasive methods more affordable and efficient than alternative methods for collecting certain types of data. Further, the ability to use these methods across expansive terrain increases the number of animals that can potentially be surveyed. Finally, some noninvasive methods (e.g., scat detection dogs, tracking) permit animals to be studied without luring them with bait or other attractants. This can help to reduce some of the biases that may result when wildlife are drawn to locations that they might not otherwise visit, or when a subset of individuals in the population (e.g., males, young animals) is less likely to respond to attractants.

At their most basic level, noninvasive field methods probably date back to primitive humans, who no doubt engaged in tracking wildlife for food and

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This entry was adapted from *The charged border: Where whales and humans meet* (New York: Henry Holt, 1999), by Jim Nollman.

other resources. Indeed, tracking and the interpretation of animal signs have long been fundamental tools for the field naturalist, and early published accounts of wildlife tracks and trails (e.g., Murie, 1954) served as an important foundation for wildlife biologists. But it wasn't until the mid-1990s that noninvasive survey methods for carnivores began to explode (e.g., Zielinski and Kucera, 1995), with newly emerging photographic and laboratory technologies helping to fuel the revolution.

Today's genetic techniques allow for the identification of an animal's species, sex, and genotype from noninvasively collected hair and scat samples containing adequate amounts of high-quality DNA. Coupled with modern statistical and computer modeling methods, genetic sampling potentially allows researchers to make inferences about the distribution and abundance of species across extensive survey areas and, if surveys are conducted repeatedly over time, to monitor changes in the status of populations. Scat samples in particular can also yield detailed information about the diet, health, and reproductive status of the source individual. Not surprisingly, hair and scat samples are in high demand by carnivore researchers, who continue to develop innovative techniques for their collection in the field.

Described below are several of the noninvasive survey methods currently being used by students, biologists, and other researchers who seek to better understand the population status and habitat needs of terrestrial carnivores. These methods and their various applications are discussed at length in Long et al., 2008, as well as in a growing body of peer-reviewed literature.

Tracking and Track Stations

Modern field biologists use tracking techniques very similar to those of our ancestors to determine which animals are present, where they have traveled, how many are in the area, and what types of habitats they are using. Following track trails in snow, mud, or other natural substrates can also be a good way to locate recent kills, scat, or hair samples. In some cases, researchers create special track stations to collect tracks from certain species at targeted locations. Such surveys require the special preparation of a tracking surface, such as sand or soil, in which animals leave foot impressions as they pass through. Tracks can also be collected on baited track plates, thin plates of wood or metal coated with soot, chalk, or other media. Surveys for mid-sized carnivores (e.g., fishers) often enclose track plates in box-like cubbies to protect them from the elements. Track plates advantageously provide permanent records of tracks, which can be removed from the field and studied in a laboratory setting.

Remote Wildlife Photography

Film cameras with motion-sensitive triggers have been used for decades to record photos of wildlife visiting trails, bait sites, or natural features (e.g., watering holes). Remote cameras, which are generally attached to trees or posts at field sites, can be used to document the presence of even very rare species, and provide permanent, visually compelling records of the animals of interest. Recently, advances in digital camera technology and camera designs have made this survey method much more reliable

and effective. Digital technology permits cameras to collect thousands of images before reaching capacity, as opposed to the maximum of 36 photos that can be captured with a film camera. This increased capacity translates into researchers needing to visit digital camera stations far less frequently than film camera stations, thus significantly reducing labor costs. In addition, rapid-fire settings can be used to take multiple photos with very short (e.g., one-second) delays between images, resulting in pseudo-video that can be valuable for studying animal behavior.

Hair Sampling

Despite their relatively minute size, hairs from wildlife contain an amazing amount of information. For example, DNA extracted from the tiny root of an animal's hair can potentially be used to genotype or genetically fingerprint the individual so that it can be distinguished from the remainder of the population. Wildlife researchers have devised numerous creative methods for collecting hair samples. Some methods use attractants (e.g., rotten fish) to entice animals to slide under a strand of barbed wire or sticky tape, which captures small samples of hair much the way a comb does human hair. Other approaches take advantage of natural behaviors, such as when bears rub on trees and leave hair samples behind. Meanwhile, mid-sized carnivores (e.g., pine martens) can be lured into small cubbies containing bait, where they inadvertently rub hair onto small brushes affixed to the side of the enclosure while they're enjoying a free meal. Once hair samples are collected, they must be handled carefully to ensure that their DNA remains intact.

A pine marten visits a tree cubby device designed to snag a hair sample when the marten climbs inside to get the bait. (Western Transportation Institute)

A scat detection dog awaits her reward for locating a marten scat. (Western Transportation Institute)

Scat Detection Dogs

Domesticated dogs, like their wild ancestors, have highly sensitive noses. Conservation biologists have learned how to harness this sensitivity to find carnivore scats in forests and other natural settings (e.g., Long et al., 2007). With training methods similar to those used for narcotics and search-and-rescue dogs, scat detection dogs are taught to associate an enticing toy, a rubber ball on a string, for example, with scat from a particular species. Dogs can search for scats over huge areas, and are generally far more effective than human searchers at finding samples. Given the physical demands of this occupation, the best canine candidates are large, agile working breeds that have ample drive and energy. They must also be very object-focused, as their reward-toy serves as an ongoing incentive for seeking out scat. In addition to locating scats in the field, detection dogs have been trained to detect a variety of carnivore-related odors, including carcasses and the scent of burrowing animals such as black-footed ferrets (Reindl-Thompson et al., 2006).

The Future of Noninvasive Carnivore Research

The noninvasive methods described above enable wildlife researchers to closely examine the lives of secretive species that are typically unseen by people. Given the many threats that carnivores face in our crowded world, the ability to assess and monitor wild populations is crucial if we are to ensure a future for this remarkable group of animals. Although the responsible capturing and collaring of animals will continue to be necessary in some situations, a rapidly expanding toolbox of noninvasive alternatives is now available to field biologists. These alternatives present an exciting opportunity to enhance our knowledge about carnivores while minimally disturbing them.

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Paula MacKay and Robert A. Long

FISH

In contrast to mammals and birds, little consideration has traditionally been given to the welfare of fish. Increasing evidence indicate that fish are sentient beings, capable of suffering. Many ethicists consider sentience the key capacity for an animal to enter the moral circle, that is, to be given moral concern for their own sake. But also, according to other theories of ethics which do not focus on sentience, it may be argued that humans must care for and respect the individual fish.

Fish and Human Interaction

Human actions affect the lives of enormous numbers of individual fish through commercial fisheries as well as aquaculture. For leisure purposes, some people love the thrill of angling sport, or enjoy the beauty of ornamental fish kept in aquaria. In most of these cases, human interests may come at the expenses of the fish. In all of them, it seems relevant to discuss the moral status of fish.

The Moral Circle

Today most people in Western societies agree that animals such as mammals and birds deserve moral consideration, at least to a certain extent. That is, when humans plan to do something that will affect the welfare or interests of these animals, they must consider such effects. Fish are seldom included in these moral concerns. However, there are signs that the moral circle (see Figure 1) is now expanding to also include fish.

Throughout history, a philosophical discussion has been going as to whether or not animals ought to be moral objects, that is, worthy of moral consideration for their own sake. Early arguments against giving animals such consideration usually focused on differences between animals and humans, such as the fact that we belong to different species, that animals are not rational beings, don't have the ability to reason or not even a language, or that they can't take on moral responsibility. That is, you can't make a deal with a cat not to claw you if you promise the same. Arguments can also be religious (e.g., "this is the will of God"). The same kinds of arguments are still around today. In the late 18th century, the British utilitarian philosopher Jeremy Bentham successfully promoted the idea that only the capacity of suffering should decide a being's moral status. Thus, Bentham's argument made way for animals to enter the moral circle. One of the most well-known animal ethicists of today, Peter Singer, has further developed Bentham's utilitarian arguments that humans have the responsibility to evaluate the burdens and benefits of all sentient individuals, irrespective of species, affected by a course of action. The morally right action, then, is the one which in sum yields the best consequences for all sentient beings involved.

Today sentience has to a large extent come to mark the limit where moral concern begins. This includes several other ethical theories, for example those promoting the idea of animal rights. Tom Regan, the best-known animal rights ethicist, argue that not only humans but also

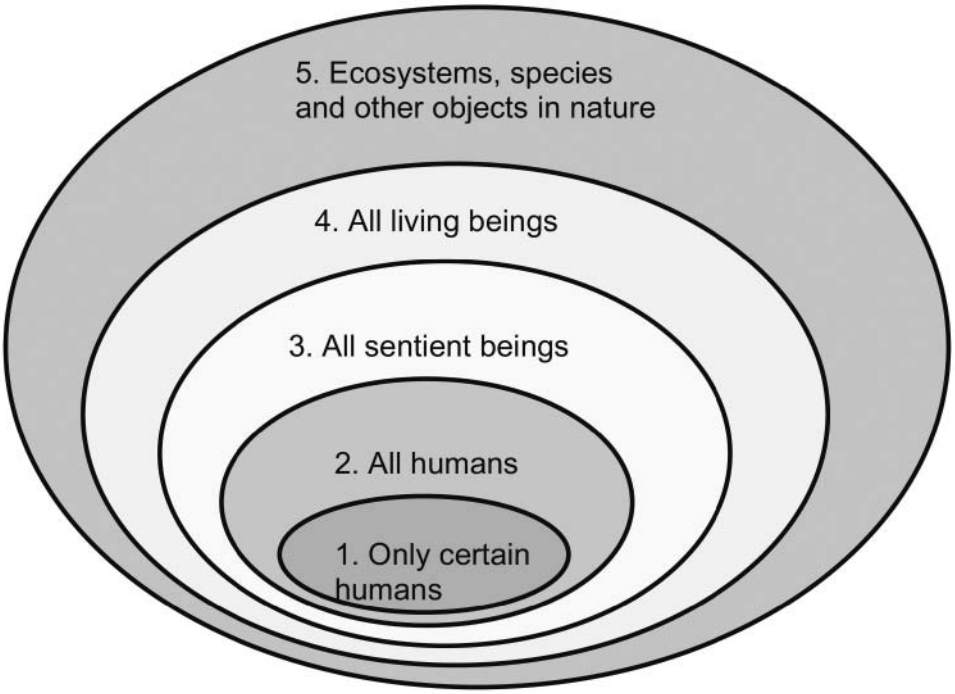

Figure 1. The moral circle. To be a member of the moral community or included in the moral circle is to be a being whose interests are given serious moral consideration for their own sake. The moral circle has expanded over time. During humankind's early history, only the family group or clan was included in the moral circle, while the expansion of the circle to eventually include all of humanity, for example, resulted in the UN Declaration of Human Rights. Peter Singer, among others, has argued for expanding the moral circle to include all sentient beings.

animals that are subjects of a life have inherent value and thus moral rights. The concept of subject of a life includes beings with a complex mental life, including perception, desire, belief, memory, intention, and a sense of the future—in other words, sentient beings. The basic right Regan wants to ascribe to these beings is derived from Immanuel Kant: the right never to be treated merely as a means to the ends of others. Another philosopher, Bernhard Rollin, includes sentient animals exclusively in the kind of rights-based ethics he advances. He argues that animals should be treated so that they may express or fulfill their evolutionarily imprinted natural behaviors or lives (i.e., their *telos*).

The Intangible Sentience

If fish are to enter the moral circle, sentience is the key, according to many ethicists. Sentience has also become the basis for legislative protection of animals in most countries. But what is sentience? Sentience is the ability to subjectively feel or perceive pain, for example. The International Association for the Study of Pain defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage."

Pain is thus distinguished from nociception, which is merely the activity in nerves from the nociceptors (pain receptors) to the central nervous system elicited by a noxious stimulus. Nociception does not include the subjective, conscious perception of this stimulation as pain. Consciousness is another troublesome term in this discussion. Obviously, to feel pain an animal must be conscious, in the sense of being aware of its surroundings, not anesthetized or sleeping. The discussion concerns whether awareness or a higher order consciousness, a perception of self, is needed in order to experience feelings. Interestingly, no specific anatomic location for consciousness has ever been identified in the brain, and self-consciousness is so far only scientifically demonstrated in humans above a certain age, in other primates, and possibly in dolphins, elephants, and magpies. Thus, if proven self-consciousness is made a premise for sentience, all other kinds of animals are nonsentient, something which, for example, most dog owners probably would firmly reject.

Subjective experiences such as emotions and feelings are not possible to scientifically prove directly, thus they must be assessed indirectly. Several criteria are used to document pain in animals. The first condition that must be in place is that the animal possess a nociceptive system capable of transmitting signals to a sufficiently developed central nervous system, where the stimulus can be interpreted and perceived as pain by the individual. Secondly, the animal should show physiological and behavioral signs indicative of aversion when exposed to a potentially painful stimulus. These signs should disappear or diminish when a painkiller is administered. Reactions to pain may include physiological stress responses (e.g. increased heart rate, respiration, and stress hormone levels in the blood) and behavioral signs (e.g. vocalization, limping, retraction, etc.). Thirdly, the animal should learn to avoid the noxious stimulus. Self-medication, that is, when an animal in chronic pain selects food with an analgesic effect if given the opportunity, is considered a strong indicator of pain.

Are Fish Sentient Beings?

Science still lacks fundamental knowledge about the sensory apparatus of fish species and how fish perceive sensory inputs from their environment. However, there is growing evidence indicating a capacity for pain perception in at least some fish species, leading many researchers to conclude that affective states of pain, fear, and stress are likely to be experienced in fish. The evidence includes neuroanatomical similarities between fish and other vertebrates in regards to nociceptors, nerve fiber types, and neurophysiology. Most neuropeptides, neurotransmittors, and opioid receptors involved in nociception and pain modulation in mammals are also found in fish. However, the fish brain is organized very differently from the mammalian brain. The most striking difference is the lack of a cerebral cortex, a difference fish share with birds. The physiologist James Rose points to this difference when he concludes that it is implausible that fish can experience pain or other feelings. In humans, the cerebral cortex is essential for cognitive functions and is believed to play a central role in human pain perception. However, the well-known brain researcher Paul McLean has shown that a wide range of human emotions can be evoked by stimulation of those parts of

the brain that are common to all vertebrates. Thus, the cortex modifies human feelings, but does not create them. Birds, in particular, but also some fish species, show advanced behaviors supporting the theory that other parts of avian and fish brains have cognitive functions which in mammals are dealt with by the cortex.

Fish display behaviors indicating pain in situations that would be painful to mammals, and this pain behavior is reduced when analgesics are administered. Fish also learn to avoid noxious stimuli, for example, to avoid particular baits after being hooked. There is a debate among scientists about whether such behavioral reactions to nociceptive stimuli are just reflexes, like when a hand is retracted from a hot item. Obviously, some are. Nevertheless, the conscious experience of a situation is important for the learning process. It will not only minimize future risk by teaching the animal to be more careful next time, but allows it to benefit from previous experiences by modifying its behavior in new circumstances. Studies have shown that fish learn to avoid aversive situations in ways that cannot readily be explained as simple reflexes.

Other Arguments for Extending Moral Consideration to Fish

The fact that fish are farmed and thus dependant on human care may automatically bring along a moral duty to provide for their needs. The influential philosopher Mary Midgley argues from an ethics of care that our moral responsibilities are derivative of our relationships with others. Our moral communities also include the animals in our care. This sense of community or connectedness comes from our shared evolutionary backgrounds and close human-animal relationships, and serves as the basis of our ethical obligations to animals. The domestication of fish and keeping them for farming purposes thus entails having a moral responsibility to care for their needs. Others have extended the idea to argue that the human-animal relationship in farming could be formulated according to the idea of a tentative contract. This can enjoin us to share the wealth created in aquaculture with all those sentient beings contributing to it and care for the welfare of the individual animal, protecting the fish from exploitation, just as human workers should not be exploited.

There are also other ethical arguments that do not focus on sentience but still insist that fish should be handled with care and respect. Some of these belong to biocentric ethics, which holds that we should extend moral consideration to all living beings. Albert Schweitzer's principle of reverence for life is one example of biocentric ethics, which regards every living entity as intrinsically valuable and something that should be respected. Also, within the deep ecology movement, a principle of species egalitarianism is forwarded, but here the common denominator is not life *per se* but the fact that all living beings are equally part of the Earth's biosphere. The symbiosis among humans and animals may be perceived on both a mystical and practical level, and it urges humans to handle animals with great respect.

Where to Go from Here?

One may conclude that there are many good ethical arguments why we should think twice before we expose fish to painful procedures or handle them disrespectfully, perhaps regardless of their contingent sentience. However, some

form of sentience seems likely in at least some fish species. The fact that there are some 30,000 teleost species, comprising an extremely diverse group of fish, makes it difficult to draw general conclusions about fish capacities. In this situation it could be wise to apply the precautionary principle, based on a simple risk analysis. The estimation of risk is usually based on the expected value of the conditional probability of the event occurring, multiplied by the consequence of the event, given that it has occurred. The event in this case is that fish are sentient. The consequence is the suffering of an enormous number of individual fish. The risk can be great, even though probability may be low. A reasonable risk management strategy in this case would be to implement animal welfare in fish farming, even though there still is scientific uncertainty regarding fish capacities.

The next challenge is how to provide these finned animals with a good life, since our knowledge regarding what fish require for their welfare is so far very limited. That must be the subject of further extensive research.

See also Fishing as Sport

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FISHING AS SPORT

Many humans interact with fish on a regular basis, although for most people this is not an intimate relationship. Fish are cold blooded, slimy, and inhabit an alien waterworld in which humans travel with difficulty. Despite that, fish are a mainstay of human diets. In the Western world, dieticians and health gurus tell us that if we want to lead long, happy lives, we need to eat more fish rich in heart-friendly Omega-3 and Omega-6 fatty acids. Fish also drive the symbolism and life rhythms of entire cultures, such as those for many of North America's Pacific Coast First Nations, whose year

revolves around the Pacific salmon. Despite this, most humans interact with fish only at the seafood counter at the local supermarket, where our piscine friends generally arrive filleted and skinned from industrial commercial fisheries, or aquaculture operations.

It wasn't always this way. For millennia the primary interaction people had with fish was to enter the fish's world and devise ways to catch them. The modern, technology-driven fishing fleets of today are a far cry from the one-on-one struggle that for most of human history dominated the capturing of fish. At some point in our evolution, people consciously or unconsciously came to the realization that the process of fishing was pleasant, even spiritual. Out of this was born the pastime of sport fishing, the quest of an individual angler armed with a fishing rod to capture a fish.

The earliest sport-fishing record we have, at least in the English language, is that of Dame Juliana Berners, *The Treatyse of Fysshynge with an Angle.* Dame Juliana was reportedly a nun and prioress of an abbey in Hertfordshire, England, but there is dispute over whether or not she actually existed. Some believe that the name is a pseudonym for the true author, who wished to remain anonymous. The book, however, definitely exists, is written in the English language style of the 15th century, and appeared in 1496. The *Treatyse's* primary purpose was to inspire people to go sport fishing, but it was also the start and inspiration for the voluminous English language angling literature which continues to pour forth to this day.

Consistent with her supposedly being a prioress, Dame Juliana starts her treatise by quoting the parables of Solomon, noting in particular that a healthy, happy, righteous life flowed from a beauty of spirit ("a good spyrite maketh a flouring age that is a fayre age and a longe."). She believed that to achieve that beauty a person needed to pursue activities that nurtured the spirit (". . . a mery occupacion which may rejoice his harte, and in which his spirites may haue a mery delyte."). Not for her the contemporary popular pastimes among the noble-born of hunting, hawking or fowling, which were "laborious and greuous (grievous)" occupations and did not get people out of bed early enough to be ". . . holy, helthy & happy." Angling was the ticket, and in her how-to book she takes prospective anglers with simplicity and great accuracy through the equipment and techniques needed, on a species-by-species basis, for catching fish with a fishing pole. She even includes a description of the first reported artificial flies, and the materials needed to tie them.

Sport anglers today are more or less divided into two major groups: those with hardware and those devoted to fly fishing. Hardware fishermen use a variety of artificial metal lures, and/or baits to try and entice a fish to get caught. The equipment is primarily designed to securely hook and retain a fish, with the intent to take it home and eat it.

The fly fisherman typically approaches the sport differently. Fly fishing is full of social hierarchies, elaborate rituals, and techniques that have to be perfected in order to become a respectable fly fisherman. For example, aficionados believe that they must master fly-tying, which requires artistic capacities, manual dexterity, and a house full of esoteric materials like jungle cock feathers and fur strands that can be woven into the dress of an effective artificial fly. They must equip themselves from head to toe; proper dress

includes waders, a fishing vest stuffed with tools, and a good hat. Finally, they need a good fly rod and reel, and through patience and hard work develop the motions that cast a nearly weightless fly accurately to the places in the water where the fish are waiting. All of this develops within the true partisan a particular identify as a fly angler, camaraderie with other like minded individuals, and at times a particular bent to the psyche. The sum of these characteristics was cogently captured by writer Fen Montaigne in his description of Atlantic salmon anglers: "In the angling world, there is no snob like an Atlantic salmon snob. And while being mindful not to tar all Atlantic-salmon fishermen with the same brush, the truth is this: many devotees of the 'sport of kings' are insufferable, elitist, tweedy, name-dropping bores" (p. 41).

Fly fishing goes on in unlikely places, under unlikely circumstances, with unlikely species. Atlantic salmon anglers were among the first wave of Westerners to enter Russia when the Soviet Union dissolved. They were seeking the undisturbed rivers of the Kola Peninsula, and in these turbulent times some of them found themselves being escorted back out of the country at gunpoint. Fly fishing sport camps for peacock bass have been established in the Amazon River basin, and at least one of them has been overrun by guerillas, with the anglers escaping into the jungle. Saltwater fly fishermen prize bonefish, and some are now even pioneering techniques for catching sharks!

Sport fishing is big business. In North America, people spend millions of days and billions of dollars each year on fishing trips. These expenditures create valuable employment in rural areas for guides and small businesses like hotels and restaurants, and play to the traditional nature-oriented skills of people in these regions such as boat handling and river navigation. Since people take care of the things that they value, the economic benefits of sport fishing provide a powerful incentive to conserve fish populations and maintain clean water. Despite this, there are many instances where too many sport anglers are chasing too few fish, which can have severe impacts on fish populations (Arlinghaus & Cooke, 2005).

Recent surveys of recreational anglers consistently show that the thing they value most is not catching a fish. Rather, it is the joy of being in the natural world and the gentle pace of life on the water. They are seeking to massage their spirits, which is exactly why Dame Juliana recommended the activity over 500 years ago.

Some anglers so prize the fishing experience and the conservation of fish populations that they can no longer bring themselves to kill a fish that they have caught. This has given rise to the practice of live release, also known as catch-and-release. Simply put, live release means that you treat a fish gently as you reel it up next to your boat or into a net, that you remove the hook as quickly as possible, preferably without taking the fish out of the water, to minimize stress, and you then let it swim back into the wild. Many studies have shown that many species of fish treated this way will survive, reproduce, and even be caught again by anglers a second time or more. However, while live release has proved to be a successful and valuable conservation tool, it has not been without controversy.

Humans have to eat, and most societies accept the capture of fish for consumption as an ethical and necessary human behavior. However, there has been a growing

movement that has questioned the ethics of angling in general, and live-release fishing in particular, irrespective of the conservation and water quality benefits that the presence of a sport fishery can bring. With live-release fishing, many believe it is cruel to capture fish by impaling it on a metal hook, forcibly coercing it up to wherever the angler happens to be positioned, and then releasing it back to the wild to try and do the same again. Caught-and-released fish are often injured.

A key component of the cruelty argument revolves around fish awareness and whether or not they feel pain. The available scientific evidence is conflicting and contradictory. Some hold that the brains and neural systems of fish are not sufficiently developed to experience pain and awareness (Rose, 2002). However, recent experiments have generated results that consistently showed fish detecting and non-reflexively attempting to avoid noxious stimuli and pain (Sneddon, 2003, Sneddon et al., 2003). Scientific work is ongoing in this important field (for a recent review, see Arlinghaus et al., 2007), and there is a great deal at stake.

See also Fish

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Fred Whoriskey

FOOD ANIMALS: ETHICS AND METHODS OF RAISING ANIMALS

A fundamental ethical choice concerns whether it is morally acceptable for humans to use nonhuman animals at all, for any purpose, including food. Once a choice has been made, by an individual or a society, to raise certain animals for food, ethical issues center around what considerations humans owe these animals, both as species and individuals, in life and in death. Answers may be influenced by the ethical frameworks within which issues are examined (e.g., utilitarian, contractualist, and so forth), the relative weights

given by decision-makers to human and animal interests, which may rest on personal value systems, and whether or not decision-makers perceive animals' interests to be consistent with or opposed to humans' interests.

Some Ethical Considerations Regarding Species

Which species are suitable or appropriate for domestication, that is, can be expected to have a reasonably good life if under human control?

Should humans modify animals raised for food genetically in ways that threaten their ability to survive as a species without human intervention. for example, broad-breasted turkeys which can only reproduce by artificial insemination, or double-muscled breeds of cattle that require repeated caesarians to deliver their calves?

At what point are genetic changes likely to become irreversible, and should humans stop selecting for changes before they reach that point, in case individuals or society deem at a future time that these changes have been taken too far?

Should animals be genetically selected or modified to survive in production environments that humans have been unwilling to improve in ways that would meet their species-specific needs? Should producers be required to improve production environments and management techniques that result in a high occurrence of poor welfare indicators, instead of or before further selecting animals to meet human interests? And should breeding efforts be directed toward increasing viability of modern food-producing animals rather than on further increases in production and growth?

Once an ethical choice has resulted in individuals or species becoming unable to survive on their own, should future research and selection be directed toward reversing the unsustainable condition, thereby eliminating the condition that creates pain and distress? Should humans try to genetically select for reduced calf sizes in double-muscled cattle or research the most effective pain killers to administer during and after deliveries? The first restores to future animals a natural ability necessary for the breed to sustain itself and relieves future individuals of the distress of difficult births. The second, if attempted independently of the first, reinforces the condition requiring human intervention, but attempts to mitigate the impact on each individual animal. A decision could be made to attempt both: aim for a long-term, sustainable solution for the breed, while providing relief from suffering for individuals undergoing procedures now. Alternatively, a more radical decision could be made to stop breeding double-muscled cattle altogether and allow the breeds to die out.

Some Ethical Considerations Regarding Individuals How far should humans go to ensure that animals raised for food are spared pain, fear, distress, boredom and suffering, that is, eliminate or reduce the occurrence of negative consequences of human management?

How far should humans go to ensure that animals raised for food have positive life experiences, that is, permit them to satisfy innate needs such as mothering or enable freedom of movement and choice of social companions or ensure that experiences provide functional feedback? That is, from the animal's point of view, its actions with respect to its environment have the intended outcome. For example, chickens' dust bathing behavior results in cleaner feathers, which would only

happen in a proper dust bath and not on a wire cage floor. Nest building behavior results in creating a secure and comfortable place for the sow to bear her young, which can only happen in a natural or artificially-enriched production environment and not in a farrowing crate..

Decisions about Methods and Systems of Raising Animals for Food Decisions might be taken from the perspective that *humans* are better off spiritually, economically, physically, morally, or ecologically if animals raised for food are provided with positive life experiences, genetic resources are managed so that animals are healthy and self-sustaining, and death comes to them swiftly and without fear or pain or arguments could be made that animals ought to be afforded these things because animals themselves have direct moral status. However, without the power to command humans to respect their rights or their moral status, the possession of rights may have as little practical advantage to animals as the possession of human rights appears to have to oppressed peoples. Legislatures in major farm states in the United States, at industry urging, have enacted legislation exempting animals raised for food from protections afforded other animals under state anticruelty statutes (Wolfson, 1996). Hence, at least in those states, without legal mechanisms in place to protect animal rights, arguments from this position may have insufficient practical value to make a difference in animals' lives.

A growing number of people, including many farmers, appears to accept that animals have a moral status in which their interests count directly in the assessment of actions that affect them, but do not count for as much as humans' interests (Wilson, 2006). They accept that animals are raised for food for humans, but also desire that animals have lives worth living and come to their deaths without fear or pain. In a lecture to veterinary students, Waldau (2005) notes that "what is at issue for many people today . . . is not necessarily the value of traditional practices, but, rather, the ethical dimensions of certain modern practices and methods chosen because they create economic efficiencies."

Since the publication of *Animal Machines: The New Factory Farming Industry* by Ruth Harrison in 1964, much attention has been devoted to the conditions to which animals raised for food are subjected. *Animal Machines* directly influenced the development of a new scientific discipline, animal welfare science, which in the intervening years has produced a vast literature on the biological and behavioral needs of animals raised for food. This body of research has gone a long way toward illuminating conditions that can afford such animals a life worth living. Harrison herself advocated an ethic of fair play as the only way humans can repay animals for the sacrifices humans ask of them.

Several sets of criteria have been put forth regarding the adequacy of farming systems for meeting welfare needs of animals raised for food. The most well-known of these is the Five Freedoms enumerated by the Farm Animal Welfare Council (FAWC) in the United Kingdom:

1. Freedom from hunger, thirst, and malnutrition
2. Freedom from physical and thermal discomfort
3. Freedom from pain, injury, and disease (including parasitical infections)

An injured goat bleeds after a horn is ripped off during transit. (Farm Sanctuary)

4. Freedom to express normal behavior
5. Freedom from fear and distress, including predators

In an essay on health and wellbeing of companion animals, Dr. Michael W. Fox has enumerated Five Principles for Animal Health and well-being:

1. Right understanding and relationship
2. Right breeding/genetics
3. Right nutrition
4. Right environment
5. Right holistic veterinary care

The principles apply equally well to animals raised for food.

Fraser et al. (1997) note three overlapping ethical concerns expressed by the public for the welfare of animals raised for food. These are:

1. Animals should lead natural lives through the development and use of their natural adaptations and capabilities
2. Animals should feel well by being free from prolonged and intense fear, pain, and other negative states and by experiencing normal pleasures, and
3. Animals should function well in the sense of satisfactory health, growth and normal functioning of physiological and behavioral systems

And Hurnik (1988) conceptualized animal wellbeing as

> a condition of physical and psychological harmony between the organism and its surroundings. [In this conceptualization,] harmony [is] based on an acceptance of [a] basic moral principle that every sentient, living organism subjected to full, direct human control, should have an opportunity to experience an environment for which its own genotype is predisposed, in order to develop into a physically and psychologically healthy organism.

Ethical Performance of Different Systems of Raising Animals for Food

Some may argue that human interest in cheap food outweighs animals' interests in having lives worth living. A growing comprehension of the environmental consequences, human health risks, and net economic costs of industrialized animal production lead others to question whether human and animal interests are as far apart as has been believed, and whether society is really better off when food is cheap. These are human interests. This chapter considers only the ethical performance of systems in meeting animal needs and interests.

Using the above criteria, one can examine systems of raising animals as to their ability to deliver to animals a life worth living. Modern animal production systems range widely along a spectrum from most exploitive to most supportive of animal interests, for example:

> System 1: Conventional, industrially-oriented systems characterized by high capital investments, high volumes of production, and a high degree of control over or restrictions on animal biology and behaviors
>
> System 2: Modest changes to conventional systems such as banning battery cages and gestation crates, but leaving the basic animal genetics and industrial approach in place
>
> System 3: Confinement systems taken a step further with behaviorally-appropriate space allowances for freedom of movement and positive social interactions, high levels of environmental enrichment with natural materials such as deep straw bedding for occupation, fiber fill, and comfort, limited access to the outdoors, opportunities for mothers of most species to care for their young
>
> System 4: Free-range systems where normal behaviors are not restricted, breeding programs emphasize the ability of individuals to sustain themselves and their breed, and appropriate shelter for weather extremes and protection from predators and supplemental environmental enrichment are provided

In practice, management and husbandry range widely from extreme abuse, as demonstrated by undercover videos taken inside industrial facilities and slaughter plants, to high levels of care and consideration of animal needs. Here systems are compared assuming that husbandry reflects the highest level of competence for operators in all systems, so that only the systems themselves are being examined. Possible results are shown in Table 1.

Table 1. Comparison of systems using 4 ethical models

Ethical criteria	System 1. Industrial	System 2. Industrial Cage-, crate-free	System 3. Enriched confinement	System 4. Free-range
Five Freedoms (FAWC)				
1. Freedom from hunger, thirst, malnutrition	−	−	+	+
2. Freedom from thermal and physical discomfort	−	−	+	+
3. Freedom from pain, injury and disease	−	−	+/−	+/−
4. Freedom to express normal behavior	−	−	+/−	+
5. Freedom from fear and distress	−	−	+	+
Five Principles (Fox)				
1. Right understanding and relationship	−	−	+	+
2. Right breeding/genetics	−	−	+/−	+
3. Right nutrition	−	−	+	+
4. Right environment	−	−	+/−	+
5. Right holistic veterinary care	−	−	+	+
Fraser, et al.				
1. Use of natural adaptations & capabilities	−	−	+/−	+
2. Free from negative emotional states. Feeling normal pleasures.	−	−	+/−	+
3. Satisfactory health, growth, normal functioning of physiological and behavioral systems	−	−	+/−	+
Hurnik	−	−	+	+

The basic biological and behavioral characteristics of an animal comprise his or her initial endowment of tools and resources for coping with the environment. When these basic characteristics are compromised, for example by selective breeding for single traits such as fast growth or milk yield, the animal's ability to adapt to his or her environment may be compromised. Industrial systems clearly fail to meet animals' basic needs and interests. However, despite the slight increase in freedom afforded to cage- and crate-free animals, if all else in the production system remains unchanged, these animals may still experience a poor level of welfare. Only System 4, the free-range system, where birds and animals are exposed directly to variations in climate and terrain, requires more robust genetics for the birds or animals to thrive in their environments. Similarly, System 3, while allowing greater freedom of expression and opportunities for occupation and comfort than Systems 1 and 2, still prevents the animal from exercising certain normal patterns of behavior, such as grazing, an important feeding behavior for herbivores and for pigs as well.

See also: Factory Farms.

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THE GENDER GAP AND POLICIES TOWARD ANIMALS

Differences in the attitudes and behavior of women and men towards animals have long been observed. Women comprise the majority of activists, members, and donors in the animal protection movement. In study after study, women generally express more favorable attitudes than men towards animals and animal protection policies.

According to Kellert and Berry (1987), gender is "among the most important demographic factors in determining attitudes about animals in our society." Women are more likely than men to support animal welfare positions and to express concerns about the moral treatment of animals (Jerolmack, 2003; Hills, 1995; Herzog and Galvin, 1997; Peek et al., 1996). Women are less likely to support animal use. While women and men share similar levels of concern about conservation, women are more supportive of strengthening the Endangered Species Act (Czech et al., 2001). Women also are more likely to oppose lethal wildlife management (Korval et al., 2004; Teel et al., 2002). In his comprehensive review of thirty-one human-animal interaction studies, Herzog (2007) found women consistently more sympathetic than men to animals, although the effect sizes varied.

In the political arena, the term gender gap is used to describe the differences between male and female attitudes and voting patterns. Since women register to vote in higher numbers and have a higher rate of turnout, the gender gap can be the margin of difference in close political races (Smeal, 1984).

While the gender gap is most often associated with divergent party preferences, candidate choices, and positions on war, social welfare, and women's rights, the magnitude of gender-based attitudinal differences on animal-related issues is comparable to and in some cases exceeds these more traditional gender gaps. The gender gap, often in double digits, has been a constant factor in animal protection victories in state-level ballot measure campaigns in which the public votes directly on policy measures.

Animal protection organizations have increasingly turned to ballot measures when legislative and administrative channels have been blocked (Pacelle, 2001). In response, opponents of animal protection have placed measures on the ballot to reverse pro-animal gains. Since 1990, animal protection organizations have prevailed in 28 out of 41 ballot measure contests (Humane Society of the United States, 2008). Animal protection ballot measure victories in California and Oregon have included bans on sport hunting of mountain lions and the use of baiting, hounds, and body gripping traps for bear

and other furbearing species in Colorado, Arizona, Massachusetts, Washington, and Oregon. Animal advocates also have won measures prohibiting sow gestation crates in Arizona, Florida, and California, veal crates in Arizona and California, and battery cages for chickens in California. Arizona and Missouri have recently banned cockfighting. Slaughter of horses and sale of horsemeat for human consumption is banned in California, and greyhound racing has been banned in Massachusetts.

Pre- and post-campaign public opinion polls and ballot measures provide insights into the size of the gender gap on animal policy issues and its political consequences. Polls conducted in 10 ballot measure campaigns between 1995 and 2008 suggest that women voters favored the animal protection position by gender gaps ranging from 7 to 25 points (see Table 2).

In some contests, women voters have been decisive in animal protection victories. In these cases, supermajorities of women voters provided the margin of victory for animal protection measures in the face of opposition from the majority of male voters. For example, in Michigan, voters rejected the attempts of the legislature to repeal a ban on dove hunting by 69 percent to 31 percent. Preelection polls in Michigan showed less than half of male voters supporting the ban, in contrast to almost three-fourths of female voters.

Animal policy and traditional gender gap issues share a common basis in women's greater levels of compassion and opposition to the use of force. Women are more likely to support social welfare programs for the needy and disadvantaged and oppose discrimination on the basis of sex, race, and sexual orientation (Center for American Women and Politics, 2008; Smeal, 2004). Similarly, women are more likely to attribute mental capacity to animals and to regard animals as sentient beings, which influences their attitudes towards animals (Herzog and Galvin, 1997; Hills, 1995).

Women's strong opposition to hunting and trapping converges with women's negative attitudes towards weapons and the use of force. Women demonstrate far greater support for gun control and opposition to military intervention (Howell and Day, 2000). The gender gap on force issues has been found to be even greater than gender differences on compassion issues (Shapiro and Mahajan, 1986).

Causes of the Gender Gap

Social scientists posit cultural, structural, and ideological explanations for the gender gap. Often grounded in the work of Carol Gilligan (1982), cultural explanations of the gender gap maintain that differential socialization of boys and girls produces value differences which, in turn, contribute to distinctive political attitudes and behaviors (Howell and Day, 2000). Females are socialized to be more oriented toward caring, nurturance, cooperation, interpersonal relationships and responsibility. Males are socialized to be more oriented towards rules and rights and to be more competitive.

Feminist animal care theory is in part based on the assumption that women's greater concern for relationships is reflected in feelings of connection to nature and other living beings. Lauber et al. (2001) found that women contextualized their positions on deer management issues, considering more criteria than men. Women expressed concerns about whether management techniques would result in the suffering or death of deer, have unintended effects on pets or

Table 2 Gender Gaps in Pre-Election Polls of Likely Voters in Animal Protection Ballot Measure Contests

State/Year	Ballot Measure Question	Pollster/Sample Size	Gender Gap	Animal Protection Election Outcome
CA 2008	Prevention of farm animal cruelty	Survey USA 661 sample	14 pts.	Victory 63%-47%
MI 2006	Dove hunting	Lake Snell Perry Mermin 500 sample	25 pts.	Victory 69-31%
AZ 2006	Sow gestation and veal crates	Lake Snell Perry Mermin 200 sample	15 pts.	Victory 62-38%
ME 2004	Bear baiting, hounding, and trapping	Decision Research 400 sample	11 pts.	Defeat 48-52%
OK 2002	Cockfighting	Decision Research 500 sample	19 pts.	Victory 56-44%
WA 2000	Steel traps and poisons	Decision Research 600 sample	8 pts.	Victory 55-45%
OR 2000	Steel traps and poisons	Decision Research 600 sample	12 pts.	Defeat 41-59%
OH 1998	Morning dove hunting	Decision Research 800 sample	21 pts.	Defeat 41-59%
MA 1996	Body-gripping taps, hound hunting of bears and bobcats, and wildlife board	Decision Research 500 sample	14 pts.	Victory 64-36%
WA 1996	Bear baiting and hound hunting of bears, cougars, bobcats, and lynx	Decision Research 600 sample	7 pts.	Victory 63-37%

Polling data made available courtesy of Humane Society of the United States, with the exception of the 2008 SurveyUSA poll of likely California voters. The polls have sampling error rates from +/− 3.5–4.5%.

nontarget wildlife, or involve weapons. Studies of attitudes toward the environment also attribute women's greater support for the environment to awareness of the consequences of human actions and concern for nonhuman beings (Zelezny, 2000).

A related cultural explanation for the gender gap has been women's experience of motherhood. This approach argues that women's responsibility for children translates into an ethic of caring and nonviolence. However, a number of studies have questioned maternal thinking as the basis for the gender gap, since gendered differences in attitudes predate motherhood and are found to be especially strong among those who have never had children. The absence of children in households has been associated

with greater concern for animals (Kendall et al., 2003).

Others tie the gender gap to feminism and women's structural position in a patriarchal society (Peek et al., 1997). Feminist identity correlates with a sense of egalitarianism, liberal ideology, a modern view of sex roles, and expression of sympathy for the disadvantaged. Donovan and Adams (2007) have articulated the connection between sexism and speciesism. Peek et al. (1996) argue that women's experiences with oppression make women more disposed to support animal rights, although egalitarian attitudes tend to account for differences among women on animal rights rather than between women and men. Additional structural explanations for the gender gap include women's increasing personal and economic autonomy and women's closer relationship to the state as beneficiaries and public employees.

Obstacles to Measuring the Gender Gap

Despite the consistency and prominence of the gender gap, examination of gender differences in attitudes towards animal policy has been hindered by several methodological and data collection challenges. First, with several notable exceptions, few studies of animal attitudes have been conducted with national, random sample surveys. Most attitudinal surveys have relied on convenience samples. Second, while wildlife researchers have used random sample surveys to a greater extent than other animal-related attitudinal studies, wildlife surveys most often use sampling frames such as telephone lists that significantly under-represent women. As a result, findings from these studies are based on samples that are disproportionately male, in some cases as high as 80 percent (Czech et al. 2001). Third, to date, media-sponsored exit polls have not included animal-related ballot measures or issues in their Election Day surveys.

The intersection of gender and animal protection interests can be seen in the substantial gender gap in attitudes towards animals and animal policy issues. The gender gap in voting behavior has profound implications for the success of animal protection measures in the political arena.

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GENETIC ENGINEERING

Although humans have always genetically engineered domesticated animals to suit their uses of these animals, the only tool available to accomplish this in the past was to breed animals selected specifically for this purpose. This in turn required many generations of gradual change in order to produce significant changes in the animals, and also limited manipulation of genes to those that could be introduced by normal reproduction. Since the late 1970s, however, the technology for inserting all manner of genes into an animal's genome, including radically foreign genes (for example, genes from human beings), has progressively developed in sophistication. This opens up a vast range of possibilities for manipulating animals' genetic makeup and thus their phenotypic traits. In 1989, the U.S. Patent Office announced that it had issued the first animal patent for a mouse that was genetically engineered to be highly susceptible to developing tumors, a trait rendering the animal extremely valuable for cancer research.

Genetic engineering and the potential for patenting the resulting animals have evoked strong negative criticism, largely from theologians and animal advocates. Theologians express concern that genetic engineering does not show proper respect for the gift of life and implies that humans are playing God. Although such religiously based criticisms are perhaps meaningful within the context of a religious tradition, it is difficult to extract from them any ethical content that can be used to illuminate the issue of genetic engineering of animals in the context of social ethics. Animal advocates, on the other hand, express the concern that genetic engineering and animal patenting will result in increased animal suffering.

It is certainly not necessarily the case that genetic engineering of animals must inevitably result in increased suffering for animals. Genetic engineering can,

in principle, significantly reduce animal suffering by, for example, increasing animals' resistance to disease. This has already been accomplished in chickens which have been genetically engineered to resist some cancers. Furthermore, genetic engineering could be employed to correct suffering created by traditional breeding, as in the case of the more than 400 genetic diseases in purebred dogs that have been introduced into these animals by breeding them to fit aesthetic standards. Third, genetic engineering could be used to make animals more suited to the harsh environments in which we raise them, for example, hens kept in battery cages, though both common sense and common decency suggest that it makes more sense to change the environment to fit the animals than vice versa.

But animal advocates are correct in their concern that if current tendencies in animal use continue unchanged, they will favor genetic engineering being used in ways whose result, albeit unintended, will increase animal suffering. Consider animal agriculture. Traditional pre-mid-20th-century agriculture was based on animal husbandry, that is, caring for animals, respecting their biological natures, and placing them into environments for which they would be optimally suited; the producer did well if and only if the animals did well. Animal suffering worked as much against the farmer's interests as against the animal's interests, and thus animal welfare was closely connected with animal productivity. However, the advent of high-technology agriculture allowed farmers to put animals into environments that did not suit them biologically (e.g., battery cages), yet in which they could still be productive.

One major and legitimate concern is that genetic engineering not be used as yet another tool to augment productivity at the expense of animal welfare. Thus, for example, in the early 1980s, pigs were genetically engineered to produce leaner meat, faster growth, and greater feed efficiency. While this was accomplished, the negative effects of this genetic engineering were unexpected and striking, with the animals suffering from kidney and liver problems, diabetes, lameness, gastric ulcers, joint disease, synovitis, heart disease, pneumonia, and other problems.

To prevent the use of genetic engineering as a tool enabling us to further erode animal welfare for the sake of efficiency, productivity, and profit, Bernard Rollin proposed the principle of conservation of welfare as a check on commercial use of genetic engineering of animals,: Genetically engineered animals should be no worse off than the parent stock would be if they were not so engineered. Such a principle should serve to forestall new suffering based in genetic engineering for profit.

The second major source of suffering growing out of genetic engineering of animals comes from our increasing ability to create transgenic animal models for human genetic disease. Genetic engineering gives researchers the capability to genetically create animals who suffer from human genetic diseases. This means that vast numbers of defective animals will be created to research these human diseases. In many if not most cases of genetic disease, there is no way to control the painful symptoms, and reducing the animals' suffering through early euthanasia is excluded, since researchers wish to study the long-term development of the disease. Thus this sort of genetic engineering creates a major problem of animal suffering. Thus far, neither the research community nor society in general

has addressed this issue, despite society's 1985 expression in federal law of its ethical commitment to limit animal suffering in biomedical research.

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Bernard E. Rollin

GENETIC ENGINEERING AND FARMED ANIMAL CLONING

The farming of animals for human medical and commercial purposes is being intensified through two new biotechnologies. One is genetic engineering, which involves either the splicing of alien genes into target animal embryos to create transgenic animals, or the deletion of certain genes to create genetically modified knockout animals. The other is cloning, which entails taking cells from the desired type of animal, which may be transgenic or a knockout, or from a conventionally-bred genotype possessing such qualities as rapid growth or high milk or wool yield, and inserting the nuclei of these cells into the emptied ova from donor animals of the same species. Once activated by electrical fusion of the nucleus to the egg wall, these embryo-developing ova are inserted into surrogate mothers to be gestated.

Cloning conventionally-bred and genetically engineered animals is now well underway in several countries. Transgenic farm animals are being cloned to create flocks and herds for gene pharming; many carrying human genes that make them produce various novel proteins in their milk, such as antithrombin 111 and alpha-trypsin, that the drug industry seeks to profit by. The animals are called mammary bioreactors. Commercial aims are directed toward developing animals that have leaner and more meat and healthful fats for human consumption; have greater disease resistance, fertility, and fecundity; produce more wool or milk with higher protein, even hypoallergenic and infant milk high in human lactoferrin; and that produce environmentally less harmful wastes containing lower levels of phosphorus. Pigs with transgenes from spinach, jelly fish, and a species marine worm have been cloned. The spinach gene lowers saturated fats and increase linoleic acid levels in body fat. The jellyfish gene make the pigs fluorescent, thus serving as a genetic marker, and the nematode worm gene converts omega 6 fatty acids into more consumer-beneficial omega 3 fatty acids Genetically altered pigs are also being created to serve as organ donors for humans, to produce human blood substitutes, and to produce monoclonal and polyclonal antibodies. Models of human diseases have also been created in transgenic animals, like Denmark's cloned pigs, which have genes for Alzheimer's disease.

Advocates for the creation of genetically engineered and cloned animals claim that this new biotechnology is simply an extension of the process of

Seven-month-old Dolly, a genetically cloned sheep, at the Roslin Institute in 1997. (AP Photo/ Paul Clements)

human-directed natural selection for desired genetic traits that began thousands of years ago when animals were first domesticated. Some of these production traits, coupled with how these animals are husbanded in crowded factory farms, are now recognized as causing a host of animal health, welfare, public health, and economic problems. Critics contend that the creation of transgenic and knockout animals, as well as cloning, are biologically aberrant if not abhorrent technologies that the life science industry and others cannot, from any sound scientific or bioethical basis, claim to be simply an extension of natural selective breeding. Clones are not identical to the original foundation-prototype, because of epigenetic environmental influences and different maternal mitochondrial DNA.

In 2008, the FDA announced that the meat and milk from cloned cattle and pigs is as safe to eat as food from more conventionally bred animals. But greater genetic uniformity can mean significant economic losses from diseases that become contagious when there is a fatal combination of genetic susceptibility and uniformity. The loss of genetic diversity in a livestock population increasingly displaced and replaced by homozygous clones is a bioethical and potential financial issue that governments and regulatory agencies have not fully addressed.

Health and Welfare Concerns

The incorporation of other species' genes into farm animals, such as the human growth hormone gene into pigs, can have so-called multiple deleterious pleiotropic effects. These unforeseen consequences on transgenic animals' development and physiology include abnormal

and excessive bone growth (acromegaly), arthritis, skin and eye problems, peptic ulcers, pneumonia, pericarditis and diarrhea (implying an impaired immune system), as well as decreased male libido and disruption of estrus cycles. Inserted/spliced genes may be overexpressed, meaning overactive, and produce excessive amounts of certain proteins such as growth hormone, or create an insertional mutation problem, disrupting the functions of other genes and organ systems. These Russian roulette-like adverse consequences of genetic engineering can result in serious health problems later in life, if they do not cause fetal deformities and pre- or early postnatal death. Many transgenic creations are either stillborn or are reabsorbed by the mother, or soon after birth they die from internal organ failure or circulatory, or immune system collapse. This is especially so with cloned animals, with the success rate being extremely low in terms of survivability. For example, a U.S. Department of Agriculture research experiment to create cows resistant to mastitis had a success rate of 1.5 percent, with only eight calves being born from 330 transgenic cloned ova and gestated to term as live calves. Three of these died before maturity.

Cloning can result in abnormally large fetuses, which can mean suffering and death for the mothers. Abnormal placentas, deformed stillborn fetuses, and live offspring with defective lungs, hearts, brains, kidneys, immune systems, and suffering from circulatory problems, deformed faces, feet and tendons, intestinal blockages, and diabetes have been documented. Cloning seems more likely to cause problems when the cloned animals have been previously subjected to genetic engineering. Yet it is only through cloning that productive flocks and herds can be quickly built from one or two founder transgenic/knockout stock. The treatment and ultimate fate of surrogate mother and egg-donor cattle, and other farmed animals used as mere instruments of commercial biotechnology, call for the most rigorous humane standards and their effective enforcement by the United States and other governments.

Conclusions

Is the incorporation of genetically engineered and cloned farmed animals into conventional, industrial agriculture ethically, economically and environmentally acceptable? Health and environmental experts, conservationists, and economists are calling for a reduction in livestock numbers globally, and for more sustainable, organic, and ecological farming practices, including more humane and free range animal production methods. They see no place for cloned livestock and agricultural bioengineering if there is to be a viable future for sustainable agriculture. We should all ask what farm animal cloning and genetic engineering have to do with feeding the poor and hungry and developing a sustainable and socially just agriculture locally and globally. The use of farm animals as medical models of human diseases, and as sources of new pharmaceutical and other medical products from livers to hearts for xenotransplantation into humans raises a host of scientific and ethical questions. It may not be a sustainable or effective path for medicine to take, profitability not withstanding. From a bioethical perspective, it places the human in the role of genetic parasite, which, from a cultural and evolutionary perspective, may not make for a better or desirable future.

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Michael W. Fox

GENETIC ENGINEERING: GENETHICS

Genethics is the application of moral or social values to genetics. The field of genetics was born with the experiments of Gregor Mendel on generations of pea plants in the 1850s. The young field of genetics was promptly put on ice until the early years of the 20th century. Later geneticists expanded their experimental organisms to include plants and animals, both human and nonhuman.

Within the last decade, the techniques of genetics have advanced greatly, allowing us to identify genes for cancer, mental illness, obesity, and a host of other traits and diseases. Although we can map and identify the gene(s) for such characteristics, our ability to treat them lags far behind.

Genethics is typically applied to humans, particularly with relevance to and rejection of eugenics approaches which advocate selective breeding of humans. However, there is no reason we should not apply similar principles to other animals. Nonhuman animals are currently the experimental organisms of choice for research geneticists interested in human diseases and other traits. The reason is simple: the experimental work necessary to understand the genetic basis of a characteristic is often invasive and typically involves the rapid breeding of large numbers of offspring, procedures which cannot readily be applied to humans. For example, in research that focuses on the genetics of a behavior in mice which may be similar to alcoholism in humans, it is necessary to inject mice with a standard dose of alcohol so that researchers can assess its effect on them. Animals also have to be euthanized to allow for analyses of tissue or biochemistry that are lethal.

There are three types of genetic research that involve animals. The first is the use of animal models for human genetic diseases. These include diseases caused by abnormalities in single genes, such as cystic fibrosis, sickle cell anemia, and Huntington's disease, as well

as polygenic (many gene) diseases such as cancer, heart disease, and alcoholism. Next come the genome projects, which have as their goal the identification of all the genes of a given organism. Currently genome projects have been completed on thousands of species including bacteria, viruses, plants, invertebrates, and many vertebrates such as cow, dog, opossum, mouse, and rat, in addition to the human genome. Finally there is transgenic research, also known as recombinant DNA technology, which moves genes from one organism into another. This area of research initially allowed the insertion of human genes into bacteria, primarily for the purpose of producing the protein specified by the human gene, for example, insulin. Now, many human genes are being moved into a variety of mammalian species both for production and to study the function of the human gene.

As genetic technology and statistical interpretations improve, more scientists are beginning to study humans in order to elucidate the genetic bases of human genetic conditions. As the potential to work directly on humans becomes more feasible, it is possible that we'll see a reduction in the use of animal subjects.

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Beth Bennett

GLOBAL WARMING AND ANIMALS

Over the last 100 years, the average global surface temperature has increased approximately 0.8°C. This warming has been quite fast, and the rate of increase is continuing to escalate, significantly faster than when the globe warmed about 6°C from the last ice age (18,000 years ago) to our current warm interglacial period (12,000 years ago). The average rate of warming over this 6,000 year time period was about 0.01°C per decade. The rate of warming within the last 150 years is already significantly higher than the entirety of this prehistoric change.

With this rise of 0.8°C, wild animals are already exhibiting discernible changes. This is because all living things are affected by temperature in one way or another. Several types of changes have already been seen in the wild, including shifts in ranges boundaries (e.g., moving north in the Northern Hemisphere) and/or shifts in the density of individuals from one portion of their range to another (e.g., the center of the abundance pattern moving up in elevation), shifts in the timing (i.e., phenology) of various events primarily occurring in spring and/or autumn, changes in genetics, behavior, morphometrics (e.g., body size or egg size), or other biological parameters, and extirpation or extinction, the latter of which is the final irreversible change. Given what is known about the physiological requirements of species, these changes are consistent with those expected with increasing ambient temperatures.

Numerous studies have found that wild animals and plants on all continents are already exhibiting discernible changes in response to regional climate changes. A

primary concern about wild species and their ecosystems is that they are not only having to adapt to rapidly warming temperatures, but they are also having to cope with other human-caused stresses: pollution, land-use change, invasive species, and others problems. The synergistic effects of these stresses combined with rapid warming are greatly influencing the resilience, that is, the ability to return to the same condition after a stress, of many species, communities, and ecosystems. Another major concern for the survival of species is explained in the *Summary for Policy Makers of Working Group I of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (IPCC). Here we learn that if we do not change our reliance on fossil fuels, the global temperature could rise as much as 6.4°C and even beyond if we stay on the energy path we are currently traveling.

Changes in Ranges

As the globe warms, we find that species in North America are extending their ranges north and up in elevation, because habitats in these areas have now warmed sufficiently to allow temperature-restricted species to colonize. This dispersal of species forced by rapidly rising temperatures, however, is frequently slowed and often blocked by numerous other human-made stresses, such as land-use changes, invasive species, and pollution. Dispersing individuals must not only find suitable habitat through which to travel, but appropriate habitat in which to colonize. This is relatively easy for highly mobile species like butterflies, birds, and bats, but certainly scorpions, salamanders, shrews and the like will have trouble navigating across highways and through farm fields or cities. Consequently, individuals that are moving have to navigate around, over, or across freeways, agricultural areas, industrial parks, and cities.

Species near the poleward side of continents, such as South Africa's fynbos, will have no habitats into which they can disperse as their habitat warms. The same is true for species living near the tops of mountains. Additionally, species living in these areas will be further stressed by species dispersing into their habitats from farther inland or farther down the mountain. Because of heat stress and the new species with which they must interact, many species currently on the poleward side of continents and near the tops of mountains are highly likely to go extinct unless humans manage to relocate them. Those species facing extinction unless aided by humans are called functionally extinct.

Throughout prehistoric and more recent times, species have been found to move independently from other species in their community or ecosystem; species move at different rates and in different directions, depending on their unique metabolic, physiological, and other requirements. Such independent movement results in a disruption of biotic interactions such as predator-prey relationships. For example, if the range of a predator shifts and the range of its prey does not, a population balance becomes disrupted —a perceived benefit if the prey is an endangered species. If, however, the prey is a food-crop pest, then humans could certainly see the increase in its population as detrimental.

Progressive acidification of oceans due to increasing atmospheric carbon dioxide is just now beginning to be

understood, and the findings are surprisingly grim. The pH of the oceans has dropped around 0.3 over the last 100 years, with the steepest drop beginning around the mid-1970s. Carbonic acid, which is causing the lowering of pH, is not only hindering species from laying down needed calcareous structures, but this lower pH is eroding calcareous structures that have already been generated, such as the shells of clams and snails. Indeed, by the year 2100 ocean pH is very likely to be lower than during the last 20 million years.

Changes in Timing Species on every continent are already shifting in the timing (i.e., phenology) of various events primarily occurring in spring, but also to some extent in the autumn. Frogs are breeding earlier, cherry blossoms bloom earlier, and leaves turn color later. Over the last 30 years, around 115 species (plants and animals together) from locations around the globe were found to be altering the timing of a spring event earlier by around five days per decade. Only 6 of the 115 species (~five percent) showed a later change in timing of their spring events.

Rapid phenological changes of species are of concern, because for over tens of thousands of years or more, animals have been adjusting to the timing of other species around them. For example, as the planet warms, farmers may have to change the timing of their planting and might even change the type of crop grown. Either of these changes could provide an insect with a food resource that was previously limited, thereby allowing the population size to grow. If the insect feeds on the nectar from the flowers of the crop, then the farmer could experience a benefit owing to the plants being pollinated. If, however, the insect feeds on the tissue of the crop plant, then the increasing size of the insect population could be seen as a detriment that must be countered in some manner, for example, with pesticides. In wild communities, changes in timing could mean that a food source of a species is not available at the time it is needed. This in turn could cause the species stress, either in time and energy looking for food, or in competitive interactions with others over the little food available. Such stress may lead to lower fecundity rates which, if not rectified, could lead to extinction.

Changes in Genetics, Behavior, and Other Traits The third type of change is of traits that are reported relatively infrequently: genetics, behavior, and other species' traits. An example of a behavioral change is the foraging habits of polar bears. Now, instead of hunting seals, they are by necessity increasingly foraging in garbage dumps. Some species that rely on seal kills, the Ross and Ivory gulls, may not be getting the food they need to sustain their population numbers.

Extirpation and Extinction The escalating rise in average global temperatures over the past century has put numerous species in danger of extinction. Functionally extinct species, or species we can anticipate as likely to go extinct unless humans come to their aid, include those that cannot move to a different location by themselves as the temperature increases, due to either lack of available habitat or the inability to access it. For example, in Australia the Mallee emu-wren is quite sedentary (rarely moving farther than 5 or 6 km), with a small fragmented range that is frequently threatened by fires. This

small bird cannot move until its habitat moves, which will likely be much slower than the speed the emu-wren will need, given the rate of temperature increase. Unless humans intervene and translocate individuals to suitable habitat farther south, this bird will most likely go extinct within the next 25–50 years. Unfortunately, only about 2,000 km^2 of suitable native habitat are available today, two- to three-year-old spinifex grass is needed to create suitable habitat farther south. After the birds are moved to a new habitat, preventing a fire cycle with a frequency of less than 10 to 15 years is necessary to ensure that both the habitat and the emu-wren survive.

Many factors are needed for a successful managed relocation: money, knowledge of how to move a species successfully, the ability to introduce individuals in a manner that allows establishment of a group but at the same time ensures that it does not become an invasive species and cause the extinction of other species, land, personnel, or negate political will. Also absent is the long-term commitment needed to monitor even a small percentage of the functionally extinct species we know of today. Consequently, many biologists believe we are standing at the brink of a mass extinction that would be caused by one species—us.

Roughly 20–30 percent of known species could likely be at increasingly high risk of extinction if global mean temperatures increase 2–3 C above pre-industrial temperatures (1.3–2.3°C above current temperatures). Given that there are around 1.7 million identified species on the globe, somewhere between 340,000 and 570,000 species could be committed to extinction primarily due to our carelessness. Extinctions are virtually certain to reduce our societal options, such as adaptation responses, medicine, and others.

If we do not change our present trajectory of using carbon-intensive energy, then the global average temperature could go above 4°C, which could commit 40 to 50 percent of known species to extinction. In addition to endangering a large number of our ecosystem services (e.g., pollinating our crops), loss of any species is irreversible, and as such it is an unethically high price to pay. Indeed, many people pay higher insurance premiums for lesser catastrophes with much lower probabilities of happening.

In recent years, it has been pointed out that, especially in the United States, what each of us does adds up. Suggestions have included driving highly fuel-efficient cars; not using incandescent light bulbs anywhere; using more efficient roofing materials; using highly energy efficient windows, heaters, air conditioners and appliances; using materials that do not need to be shipped long distances; and making sure all materials are harvested sustainably.

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Terry L. Root

THE GREAT APE PROJECT

The Great Ape Project aims to grant basic moral and legal rights to nonhuman great apes—chimpanzees, bonobos, gorillas and orangutans. Since its establishment, many other organizations strive for the

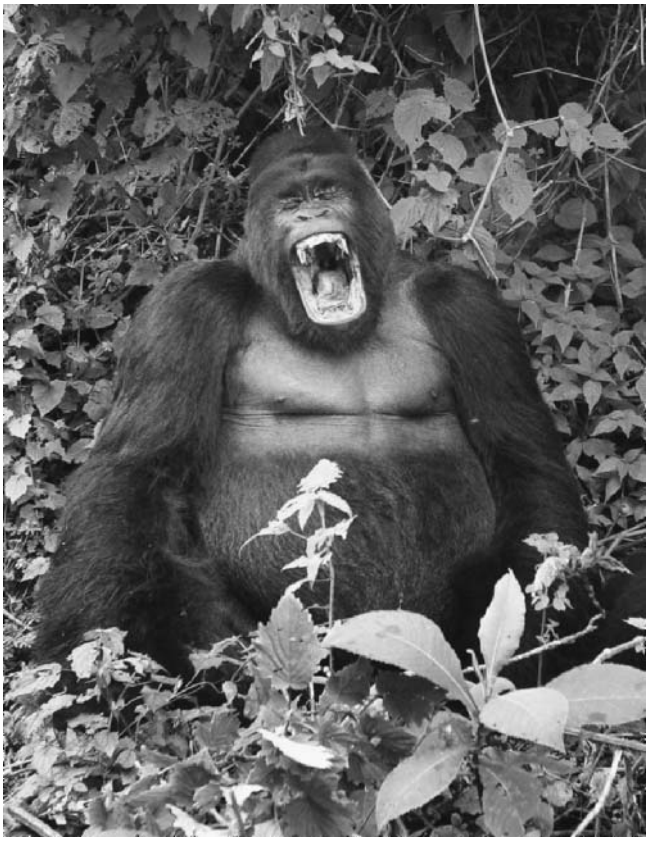
recognition of great ape rights as well. This has resulted in some remarkable changes. Several countries have imposed a ban on invasive biomedical research with great apes, and the United States, where most research with great apes occurs, has stopped killing so-called surplus great apes and instead now relocates them in sanctuaries.

The Great Ape Project was launched in London on June 14, 1993 by Peter Singer, philosopher at Princeton University, and Paola Cavalieri, philosopher and editor of the Italian journal *Etica & Animali.* On that day the book *The Great Ape Project: Equality beyond Humanity* was released, which contains contributions from more than thirty subscribers to "A Declaration on Great Apes." This declaration demands the extension of the moral community of equals to include all human and nonhuman great apes. Like us, nonhuman great apes are intelligent beings with a rich and varied social and emotional life. Therefore, it is argued, we should consider them our moral equals; we ought to respect their basic interests in the same way we respect similar human interests. The protection of these interests needs to be assured through the endorsement of three basic rights, namely the right to life, the protection of individual liberty, and the prohibition of torture. Among the early supporters of the Great Ape Project are zoologists/primatologists Marc Bekoff, Richard Dawkins, Roger and Deborah Fouts, Jane Goodall, Adriaan Kortlandt, Lyn Miles, Toshisada Nishida and Francine Patterson and philosophers Dale Jamieson, James Rachels, Tom Regan, Bernard Rollin, and Steve Sapontzis.

Why this focus on great apes? There appear to be three major reasons, namely our close relationship with nonhuman great apes, their rich mental lives, and the expectation that the cost to stop their exploitation is relatively limited and thus quite feasible. Though the Great Ape Project directs its attention to great apes, many of its contributors see this as a first step in the process of extending the community of equals. Indeed, many are prominent advocates for other animals as well.

The use of great apes for biomedical research is meeting increasing moral and legal resistance. Over the last decade, several countries have forbidden the use of nonhuman great apes for invasive biomedical research, namely Austria, Australia, Japan, the Netherlands, New Zealand, Spain, Sweden, and The United Kingdom. Among these countries, only Austria and the Netherlands used great apes for biomedical research, and these have since been moved to sanctuaries and zoos. At the time of writing, the European Union is considering imposing a ban on great ape experiments in all of its member states (Harrison, 2008).

The United States is virtually the only country which still uses great apes for biomedical research and testing. The majority of the approximately 1,200 chimpanzees still used for research are housed in six research facilities. In 2000, President Bill Clinton signed the CHIMP Act into law, which states that chimpanzees no longer needed for research should not be killed, but moved into sanctuaries, and that the government needs to assume the largest part of funding needed for their lifetime care. A 2007 amendment to the CHIMP Act prohibits using these chimpanzees for research ever again. In 2008, the Great Ape Protection Act was introduced to end biomedical research using the remaining chimpanzees in U.S. laboratories. Several animal advocates



A silverback mountain gorilla seen in the Virunga National Park, near the Ugandan border in eastern Congo. (AP Photo / Jerome Delay)

and organizations are working to end such research; among these in particular the efforts by the New England Anti-Vivisection Society through its Project R&R: Release and Restitution for Chimpanzees in US laboratories campaign is notable (www.releasechimps.org).

The special attention to great apes over the last fifteen years seems to have had an impact on the zoo community as well. Whereas many zoos favor the killing of surplus animals, an exception is to be made for great apes. In 2001, the book *Great Apes & Humans: The Ethics of Coexistence*, was published to respond to the Great Ape Project. In this book, Michael Hutchins and colleagues of the American Zoo and Aquarium Association comment:

> As great ape zoo populations mature, the question arises of what to do with older, postreproductive individuals. Animal rights proponents argue that zoos have a responsibility to care for captive-bred animals from "the cradle to the grave." In the case of great apes, we agree. Despite arguments to the contrary (. . .) and the fact that it is legal, euthanasia of healthy great apes is not generally accepted in the professional zoo community as an option for controlling populations. (Hutchins et al., 2001, p. 352)

One is left wondering what the general zoo policy would have been without the

growing influence of the movement for great ape rights.

A tremendous challenge for those who defend the interests of great apes is to deal with the enormous threats faced by the remaining great apes in the wild. There may be no viable populations remaining within the next two decades. Major threats are the logging of forests, hunting for meat—the bushmeat crisis—and diseases such as Ebola. The United Nations has launched the Great Apes Survival Project (GRASP) "to lift the threat of imminent extinction" faced by gorillas, chimpanzees, bonobos, and orangutans (see www.unep.org/grasp). Conservation organizations refer in particular to the importance of conserving species in their ecological role, and in their aesthetic, scientific, and economic value. Organizations such as the Great Ape Project add a special dimension by stating that each great ape is a valuable individual who needs to be protected because of his welfare interests as an individual. The Great Ape Project hopes for the passing of a declaration of great ape rights by the United Nations, similar to declarations for children, women, and the disabled.

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Koen Margodt

GREAT APES AND LANGUAGE RESEARCH

Language research with nonhuman great apes (chimpanzees, bonobos, gorillas, and orangutans) allows for unique interaction between nonhuman animals and humans. In principle, it offers a distinctive window to the understanding of these animals' mental lives and welfare preferences; however, to some in the academic world, ape language research is considered to be highly controversial.

From the late 19th century until around the 1950s, several attempts were undertaken to teach nonhuman great apes

to talk. These yielded very little success, and their failure has been attributed to anatomical differences in the vocal tracts of nonhuman great apes and humans. All of this changed in 1966, when Allen and Beatrice Gardner pioneered the teaching of American Sign Language (ASL) to the chimpanzee Washoe. When Washoe was four years old, the Gardners reported that she had reliably acquired at least 132 ASL signs. As they wanted to exclude the risk of inadvertent cueing, the Gardners tested Washoe and other ASL chimpanzees individually, requiring them to name objects shown on slides. Two uninformed observers recorded their signs. The chimpanzees usually provided more than 80 percent correct responses, and inter-observer agreement was around 90 percent (Gardner & Gardner, 1969; Gardner & Gardner, 1989). In the 1970s, Project Washoe was taken over by Roger and Debbie Fouts. Similar ASL projects were started with other great apes, such as the gorilla Koko by Francine Patterson, the chimpanzee Nim by Herbert Terrace, and the orangutan Chantek by Lyn Miles. Different communication methods were used as well. David and Ann Premack taught the chimpanzee Sarah to communicate by means of plastic symbols, and Sue Savage-Rumbaugh uses a computer console with arbitrarily designed geometric forms or lexigrams for her research with the bonobo Kanzi and other great apes.

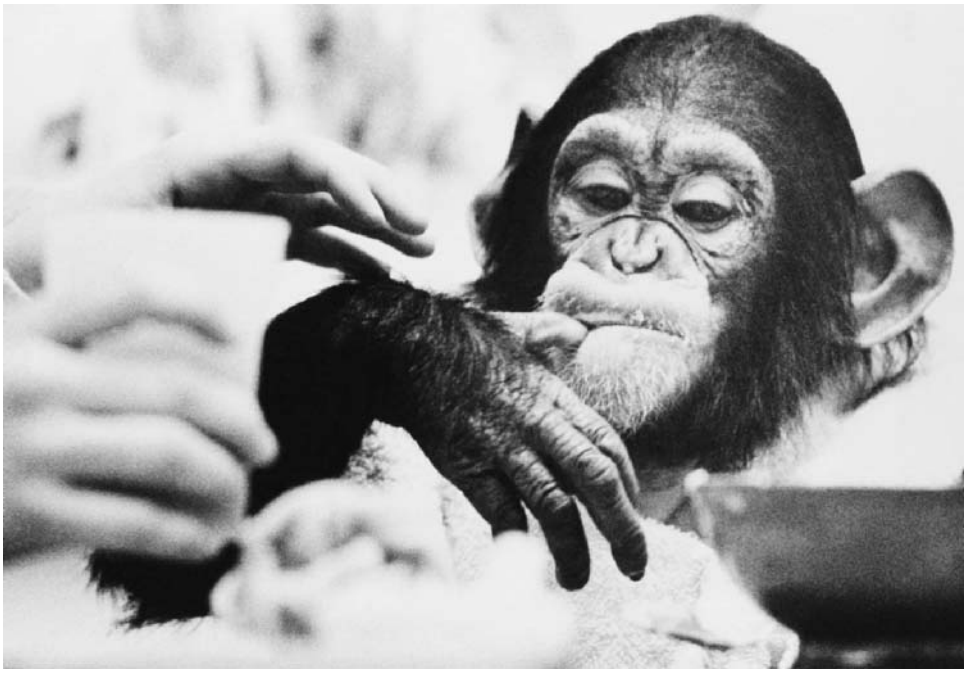
In particular, toward the end of the 1970s, ape language research came under heavy fire. The single most significant blow was provided by psychologist Herbert Terrace of Columbia University. Terrace came to question his former research with the chimpanzee Nim after analyzing videotapes of Nim and his teachers. In an article published in 1979 in *Science,* Terrace and his colleagues wrote that the majority of Nim's utterances (87 percent) immediately followed a human's utterance or so-called adjacent utterances. Also, nearly 40 percent of these utterances were classified as partial imitations of what the human teacher had signed (Terrace et al., 1979). However, what remained an unfortunate blind spot in the article was the fact that the majority of Nim's utterances were either spontaneously initiated by Nim (13 percent) or composed of novel signs (40.6 percent), signs that differed from those used by the human teacher.

It is also important to take into account the highly controlled training conditions and Nim's increasingly problematic psychological state. Nim was taught sign language for five to six hours a day in a concrete classroom of barely six square meters. Terrace later "wondered how I and the other teachers could have spent so much time in these oppressive rooms." (Terrace 1979, 1987, p. 209). Though chimpanzees develop strong social bonds that may last a lifetime, Nim had some sixty teachers within only four years. Even his eight principal caregivers were present for only parts of these four years, and Terrace was too busy with many other occupations to be present enough for Nim's developmental well-being. Al four of Nim's main caregivers at the Delafield house left around August and September 1976. In particular, when Laura Petito left, Nim became depressed and inconsolable (Terrace 1979, 1987, p. 108). Terrace recognized that "undoubtedly the loss of Nim's immediate family at Delafield at a critical stage of his growth had a permanent adverse effect on his social, linguistic, and emotional development" (Terrace 1979, 1987, p. 139). Nevertheless, at least four

of the ten videotapes used for the *Science* article were recorded between September 1976 and September 1977. As a consequence, their scientific reliability is highly questionable.

Research with other great apes has resulted in different findings than those of Terrace and his colleagues. The total of spontaneous and novel utterances for the bonobo Kanzi, the gorilla Koko, and the orangutan Chantek, range between 50 percent and more than 90 percent. Several of the language-research apes were reported to engage regularly in spontaneous self-signing, for example, during play; this behavior has been confirmed by independent observers. Jane Goodall describes a visit to the Temerlins, where she "watched as [the chimpanzee] Lucy, looking through her magazine, repeatedly signed to herself as she turned the pages . . . She was utterly absorbed, paying absolutely no attention to either Jane [Temerlin] or me." (Goodall in Peterson & Goodall, 1993, p. 204). Roger and Debbie Fouts state that the chimpanzee Washoe spontaneously taught the use of ASL to her adopted chimpanzee son, Loulis. Not only did she demonstrate to him the correct signs, but on several occasions she also molded his hands into the proper signing configuration. For six years, the researchers made only seven signs in Loulis's environment (such as "who" and "where"). Loulis, nevertheless, mastered 55 signs by the end of the study period.

The well-known linguist Steven Pinker at the Massachusetts Institute of Technology has suggested that "the apes had not learned *any* true ASL signs." (Pinker, 1994, p. 337). His position is



Nim, a chimpanzee who was taught sign language, signals that he wants a drink during lunch in his Columbia University classroom. (AP Photo/Jerry Mosey)

based mainly upon the remarks of a deaf man who testified anonymously in Arden Neisser's *The Other Side of Silence* (1983). This man had worked with chimpanzees that were staying with the Gardners only a few years after Washoe had left with Roger Fouts. The witness accepted fewer of the signs made by the chimpanzees as true ASL signs. What he does not mention in his testimony is that some of the signs accepted by the Gardners are variations of the ASL signs used by deaf humans. The Gardners have always been explicit about this. For example, in a 1969 article for *Science,* they clearly describe exactly how some of Washoe's signs differ from default ASL signs. One of those signs—the sign for "more"—was rejected by the deaf man for not being an ASL sign.

It should be mentioned as well that deaf people had to fight a fierce emancipation battle before ASL became recognized as a full language. Several of these people clearly felt deeply humiliated by the ASL research with nonhuman apes. Neisser comments:

> The entire issue of chimpanzee sign language is a painful one for the deaf. There is simply nothing in it for them—nothing from which they might be able to take comfort or find dignity, but only the opposite. The image of an ape signing echoes the ancient and familiar charge that their language is only suited for the beasts. (Neisser, 1983, p. 16)

Unfortunately, critics like Pinker fail to mention this dimension.

In sharp opposition to the anonymous testimonial referred to by Pinker, it is remarkable that the pioneering ASL authority William Stokoe recognized the ability of nonhuman great apes to master ASL signs. This linguist, who taught at Gallaudet College, the first college for deaf people in the world and was the first author of *A Dictionary of American Sign Language* (1965), saw how, during a walk, Washoe formed ASL signs such as "cow" (the animals were far away in the fields, barely visible to Stokoe) and "flower" (before she ate it). Stokoe concluded his considerations on the ape language experiments by stating: "I find that the critics who attack the experiments have failed to provide any solid basis for denying what the animals have demonstrated" (Stokoe, 1983, p. 157).

Joel Wallman has written that a distinction needs to be made between making trained gestures to obtain a reward, and symbolic communication. The best criterion in favor of the latter, according to Wallman, is the ability to use displaced reference, that is, to communicate about things removed in time or space (Wallman, 1992). Multiple instances support the suggestion that nonhuman great apes can meet this criterion. The most convincing example is, perhaps, a systematic research project undertaken by Charles Menzel at the Language Research Center in Georgia. On various occasions, Menzel hid objects under sticks, beyond the reach of the adolescent chimpanzee Panzee. The next day, Panzee spontaneously tried to draw the attention of uninformed caregivers. She persistently made vocalizations, moved repeatedly in the direction of her outdoor enclosure, formed the sign "hide" (by covering her eyes with her hand), pointed in the direction of the hidden objects, and tried to communicate by selecting the appropriate lexigrams on her keyboard, such as the symbols for "stick", "hide," and "blueberries". She thus successfully initiated symbolic communication with uninformed humans

about objects removed in time (she had to recall the object that had been hidden the day before) and space (these were beyond her sight and reach) (Menzel, 1999).

Some of the reports by ape language researchers suggest that nonhuman great apes may be remarkably creative in producing new signing combinations. A famous example is the combination "water bird," which was formed by Washoe upon seeing a swan. Critics have remarked that these were simply independent signs for separate objects, not a novel signing combination to describe the swan; however, in support of Washoe, it has been asserted that she consistently signed "water bird" for swans, whether they were in or out of the water (Lieberman, 1984). Also, such criticism may be less easily applied to combinations such as "white tiger" by the gorilla Koko, to indicate a zebra, "rock berry" by Washoe, for a Brazil nut, "cry hurt food" by the chimpanzee Lucy, for radishes, and "eye drink" by the orangutan Chantek, for contact lens solution.

What about the presence of syntax or grammar? Most language-trained apes seem to produce combinations of around three signs, though these may also consist of up to six or seven symbols. To meet the requirement of syntax, there must be indications of linguistic rules; in other words, the combinations of signs or lexigrams must reveal some order. Some indications indeed point in the direction of a rudimentary syntax. In Washoe's signing, for example, the subject precedes the action in almost 90 percent of her combinations. Washoe thus typically signs "you me go" or "you me out," but "out you me Dennis" is the exception. Roger Fouts writes that Washoe understands differences of meaning according to the position of the subject and object (Fouts & Mills, 1997). He illustrates this with the examples "me tickle you" and "you tickle me." The chimpanzee Ai has learned to indicate on a computer console, through keys, the quantity, color, and kind of objects shown by Tetsuro Matsuzawa. Ai is familiar with lexigrams, Arabic numbers, and Japanese *kanji* characters. Although she was free to choose the order of the keys, she nearly always selected color/object/number and object/color/number among six possible alternatives (Matsuzawa, 1989).

Sue Savage-Rumbaugh emphasizes that we should look not only at the combinations one can produce, but also at the comprehension of such combinations. In a test with 660 different sentences, the bonobo Kanzi reacted properly to 72 percent of the requests (a two-and-a-half-year-old human child responded correctly to 66 percent of these sentences). He understood quite complex sentences, such as "You can have some cereal if you give Austin your monster mask to play with." When asked "Can you throw a potato to the turtle?" he did not make the mistake of throwing both items or throwing the turtle toward the potato. Some of his reactions were quite surprising, though; for example, when asked to put water on the carrots, he threw them outdoors in the rain (Savage-Rumbaugh & Lewin, 1994).

Whether we can say that nonhuman great apes can learn language depends, ultimately, upon how language is defined. Nonhuman great apes appear to be capable of using several hundred symbols in a meaningful way. There are also indications of rudimentary syntax. This suggests that what makes humans unique in connection with language may simply be a difference in degree of complexity. Marc Hauser, Noam Chomsky, and Tecumseh Fitch hypothesize that recursion

is the only uniquely human component of the faculty of language. This capacity allows us to produce an, in principle, infinite number of combinations with a limited set of elements. For example, any possible longest sentence can still be made longer by adding "Mary thinks that . . ." (Hauser et al., 2002). Some commentators have suggested that the linguistic capacities of nonhuman great apes have resulted in redefining language in terms of what distinguishes humans from nonhuman apes, thus keeping language by definition beyond the reach of nonhuman apes. We may only wonder how important recursion will become in language definitions during the coming years.

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Koen Margodt

H

HORSE SLAUGHTER

Since 2001 there has been a concerted push to ban the slaughter of American horses for human consumption in Europe and Asia. The biggest equine welfare issue since passage of the Wild Free-Roaming Horses and Burros Act of 1971 (Public Law 92-195), the anti-horse slaughter effort has become a pivotal one in the animal protection world, with the result that horses are no longer being slaughtered on American soil. Yet in the absence of a comprehensive federal ban, tens of thousands of American horses are exported annually to Canada and Mexico for slaughter (National Agricultural Statistics Service, USDA). It is a trade that the horse slaughter industry and traditional agribusiness interests have fought to keep alive.

In fact, the entire debate has become extremely controversial, with two very distinct and entrenched sides telling two very different stories. Those advocating for a ban contend that horse slaughter is de facto animal cruelty, a predatory business that operates solely to turn a profit, while those wishing to maintain horse slaughter paint the practice as a humane disposal system, a necessary evil without which unwanted horses would suffer from neglect.

Multiple polls show that the majority of Americans consider horse slaughter to be inhumane and support an end to the foreign-driven trade (Public Opinion Strategies, 2006; McLaughlin & Associates, 2004; Voter/Consumer Research, 2003; Mason-Dixon Polling & Research, Inc., 2003). This comes as little surprise; Americans don't eat horses nor do they raise them for their meat. In reaction to public opinion, federal and state lawmakers have offered, and in some cases passed, legislation prohibiting horse slaughter. The courts have also been brought into the fray. Meanwhile, the slaughter continues.

Legal/Legislative Background

In 2007, the most recent year for which official numbers are available, 121,459 American horses were sent to slaughter, including more than 90,000 that were exported to Mexican, Canadian and Japanese abattoirs. While these numbers are far less than the nearly 350,000 horses slaughtered in America in 1989, there has been an upward surge in the number of horses enduring this fate annually since 42,312 were slaughtered on U.S. soil in 2002 (National Agricultural Statistics Service, USDA). The trend appears to correlate with the campaign to ban horse slaughter at the federal level, and would seem to be an effort by the foreign-owned horse slaughter industry to reap as much profit from the U.S. market as it can before a federal law is passed prohibiting the practice.

In this photo released by a protest group calling itself "Respect for Horses," demonstrators hold a banner above the severed head of a horse in Melbourne, Australia. The activists were protesting the use of horses in horse racing to coincide with Australia's biggest race, the Melbourne Cup. Thousands of horses who do not make the grade as race horses face slaughter. (AP Photo/Respect for Horses)

It can only be a matter of time before such a statute comes into existence. Under state law, the country's three remaining horse slaughter plants (all European-owned) were closed in 2007. In Texas, the BelTex and Dallas Crown plants were shut down when a 1949 law (Texas Agricultural Code, Chapter 149) prohibiting the sale of horsemeat was upheld as valid after a protracted legal battle (Empacadora de Carnes de Fresnillo sa de CV et al. v. T. Curry, District Attorney, Tarrant County, TX et al.). In Illinois, the Cavel International plant was shuttered after the state passed a law banning horse slaughter (Illinois Public Act 95-0002). While Cavel challenged the statute's legality, it was upheld by the courts (Cavel International, Inc. et al. v. Madigan). California voters also approved a ballot initiative in 1998 banning horse slaughter (California Prop. 6), though it was perhaps merely symbolic, given that there were no horse slaughterhouses operating in the state at the time. Still, the state witnessed a 34 percent drop in horse theft in the year following the law's enactment (California Livestock and Identification Bureau), presumably because fewer horses were stolen and shipped out of state for slaughter.

While American horses have long been exported for slaughter, even when U.S. plants were operational tens of thousands were exported annually, the plants' closures in conjunction with the lack of a

comprehensive federal law have resulted in a sharp increase in the number of horses being exported to foreign slaughterhouses. Absent a federal statute, the potential also exists for horse slaughterhouses to open in states with less restrictive laws than those of Texas, Illinois, and California. In 2008, South Dakota's state senate considered but ultimately rejected legislation to facilitate the construction of a horse slaughterhouse (Senate Bill 170, South Dakota State Legislature, 2008 Legislative Session).

Multiple federal bills seeking to ban the slaughter of horses for human consumption and their export for the same purpose have been taken up by Congress since 2002. The first incarnation of the American Horse Slaughter Prevention Act (H.R. 3782) was referred to the House Agriculture Committee, where it eventually died without consideration (Thomas, Library of Congress). Revised and reintroduced in subsequent years (Animal Welfare Institute), the bill has gone to more receptive committees and even passed the full U.S. House of Representatives in 2006 by a landslide vote of 263 to 146 (U.S. House Roll Call No. 433, 109th Congress, Second Session), but has thus far failed to pass into law.

Taking a slightly different route in 2005, Congress passed and President George W. Bush signed into law as part of a larger agriculture spending bill (Public Law 109-97) a funding restriction that was designed to temporarily halt horse slaughter. The move was circumvented by the U.S. Department of Agriculture and, in the face of a legal challenge by humane groups (The Humane Society of the US et al. v. Cavel International et al.), the slaughter continued until the plants were closed under state law.

In the second half of the 110th Congress, the Prevention of Equine Cruelty Act (H.R. 6598) was introduced by John Conyers, Jr., chairman of the House Judiciary Committee. A streamlined version of its predecessors, the bill seeks to criminalize horse slaughter and related activities by amending Title 18 of the U.S. Code. The Committee approved the bill by a voice vote in September 2008, but once again, Congress failed to act on it before the session ended.

Horses at Risk

Because horses can live more than 30 years and are expensive to maintain, they are often sold multiple times in their lives, each time placing them at risk of ending up at the slaughter plant. While a handful of horses are purposely sold to slaughter by their owners and many others are stolen, most arrive at the slaughterhouse via livestock auction, where unsuspecting sellers enter their animals into the auction ring only to have the animal bought by a killer buyer, one of the middlemen who supply slaughterhouses. All types and breeds of horses are at risk of slaughter including racehorses, workhorses, wild horses, and family horses. Despite the fact that U.S. plants are no longer in operation, killer buyers continue to purchase and haul horses from livestock auctions around the country to the slaughterhouses that have now relocated to Mexico and Canada.

Humane Euthanasia and Carcass Disposal

The number of American horses going to slaughter represents just over one percent of the total U.S. equine population of 9.2 million (American Horse Council).

It is also dwarfed by the annual equine mortality rate in the United States, which is figured at approximately 5–10 percent or 460,000–920,000 horses (Veterinarians for Equine Welfare). Thus, the vast majority of horses that die every year are not slaughtered, but either do so of natural causes or are euthanized by a licensed veterinarian at their owner's request and expense. The procedure, which is painless, can be performed on location so that the horse may meet a peaceful death in familiar surroundings. The average cost for chemical euthanasia and carcass disposal is $225 (Veterinarians for Equine Welfare). Disposal options include rendering, composting, burial, or incineration. In rendering, the carcass of a humanely euthanized animal is processed into useful byproducts without any of the suffering endured in transport to and during slaughter.

These facts and figures are often cited by animal advocates who contend that ending horse slaughter would not result in a glut of unwanted horses, as horse slaughter proponents argue. Indeed, a Colorado State University study commissioned by the US Department of Agriculture revealed that more than 92 percent of horses going to slaughter are healthy horses, and thus, presumably, marketable (Grandin et al., 1999).

The Slaughter Process

Multiple studies and reports have shown horse slaughter to be quite brutal (Animal Welfare Institute, Veterinarians for Animal Welfare, The Humane Society of the United States, Humane Farming Association), with suffering beginning long before the horse reaches the kill box. Some veterinarians contest that rough handling, loud noises, a foreign environment, overcrowding, and the smell of blood can cause the horses, who are unaccustomed to being handled as pure livestock, to endure great fear (Veterinarians for Equine Welfare). Government inspection reports obtained through the Freedom of Information Act show that rough and improper handling certainly does occur, and results in tremendous suffering (Animal Welfare Institute).

In the now-defunct U.S. plants, the standard operating procedure called for the use of the captive bolt gun. When it is administered correctly, application of the gun to the head so that the retracting captive bolt strikes directly into the brain, the horse is unconscious prior to being strung up and bled out. Yet undercover footage reveals that the technique is not always implemented correctly. Great pain and distress have ensued as a result, as described by Dr. Nicholas Dodman in reference to footage he reviewed from a Canadian horse slaughter plant:

> Because of the unsuitability of the slaughter setup, captive bolt operators were often trying to hit a moving target and in some cases were unable to locate the kill spot on the horses' forehead because the horse had turned around, slumped down, or moved backward in the kill box. I observed several horses being improperly "stunned." Mouthing, tonguing, and paddling of the feet were not uncommonly seen as horses were dragged away to be hung up and bled out. Some of these horses were likely still conscious as they were being bled. This experience is not significantly different than often occurred at horse slaughter plants operating in the U.S. (Dr. Nicholas Dodman, BVMS,

MRCVS in testimony before the U.S House of Representatives Judiciary Subcommittee on Crime, Terrorism and Homeland Security, July 31, 2008)

Concerns are even greater in Mexico. A 2007 investigation by *The San Antonio News-Express* revealed that the use of the *puntilla* knife on horses prior to slaughter is common practice in Mexican slaughter plants, such as a facility currently owned by BelTex, formerly operating in Texas. Footage shows horses being stabbed repeatedly in the neck with these knives prior to slaughter. Such a barbaric practice simply paralyzes the animal. The horse is still fully conscious at the start of the slaughter process, during which it is hung by a hind leg, the throat slit, and the body butchered.

Transport Issues

Concerns have been voiced by both sides about the harsh transport conditions endured by slaughter-bound horses. In fact, the 1996 Farm Bill (Public Law 104-127) instructed the Secretary of Agriculture to develop regulations governing the transportation of horses to slaughter. The resulting regulations (CFR Parts 70 and 88), however, were regarded as inadequate by the humane community, covering only the final leg of the journey to slaughter, and allowing horses to be hauled on journeys lasting more than 24 hours without food, water, or rest on double-decked cattle trailers. Not only are these double-deckers inhumane for transporting horses because of their low ceiling height, but they are also dangerous and have been involved in a number of tragic accidents. The regulations also allow the transport of horses that are partially blind, have broken legs, or are heavily pregnant. As a result, the regulations have been reopened and are currently under review (Docket APHIS-2006-0168), but it is unclear when a new rule will be issued. Regardless, it will not pertain to horses once they are shipped over our national borders.

The Future

One thing most observers of the protracted battle to end horse slaughter agree on is that Congress will pass a comprehensive law in the relatively near future that will effectively end the slaughter of American horses for human consumption. Where they tend to disagree is on what the long-term effects will be. Opponents of the legislation say horses will be abandoned *en masse.* Animal protection advocates contend that there are sufficient resources to deal with any unwanted horses through placement or veterinarian-administered euthanasia. What can be said with certainty is that the debate has engendered a very real discussion in the wider equestrian world about the need for responsible horse ownership and breeding, a discussion that can only be good for America's horses.

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Chris Heyde and Liz Ross

HUMAN EFFECTS ON ANIMAL BEHAVIOR

Humans are a unique species, and a very curious and inquisitive group of mammals. We're here, there, and everywhere, and our intrusions, intentional or not, have significant impacts on animals, plants, water, the atmosphere, and inanimate landscapes. Thus, we need to consider how we influence the lives of animals, how we must protect them, and what important questions to ask. We are the most dominant species the Earth has even known. When humans influence the behavior of animals, the effects are referred to as anthropogenic. There are many ethical issues surrounding our effects on the lives of animals outside of laboratories and apart from research projects. Here we consider some of the issues that center on animal protection. Many of the topics discussed are also considered in other essays in this encyclopedia.

The relationship between humans and animate and inanimate nature is a complex, ambiguous, challenging, and frustrating affair. While we do many positive things for animals, we also make the lives of animals more difficult than they would be in our absence, and we make environmental messes that are difficult to fix. On the positive side, in October 2006 the German parliament unanimously voted to ban seal products from the country because of the way in which seals are clubbed to death during mass slaughters. Whiteface Mountain, located in the Adirondacks in upstate New York, changed the configuration and design of ski trails to eliminate the negative impact on an elusive bird called Bicknell's thrush that nests there. Bicknell's thrushes are not an endangered or even a threatened species, but rather a species of special concern.

Scientists are also increasingly concerned about how we affect deep-sea communities that frequently do not receive this sort of attention. Ecotourism also has many sides to it, and is getting more detailed attention, so that we come to better understand the positive and negative aspects of our intrusions into animals' lives and the ecosystems in which they live.

We also influence the behavior of the urban animals with whom we share our homes, and their presence also enriches our lives. We must remember that our land is their land. too.

When wild animals become accustomed to the presence of humans it is called habituation, and numerous animals have changed their daily routines because of our intrusions into their homes. Often predators and their prey become bolder, and this causes problems for everyone, humans and animals alike. Mountain lions, for example, have become very habituated to humans in many communities in the western United States,

and this has caused people to launch campaigns to rid themselves of these magnificent animals. Yet attacks, while slightly on the rise, are still very rare. I once almost stepped on a male mountain lion while backing my car up and telling my neighbor that there was a lion in the area. On another occasion, thinking that a tan animal running towards my car was my neighbor's dog, I opened the car door only to see that it was a lion, not a dog, coming my way. Once, sitting in my living room reading, I saw a big black animal move slowly across my deck, seemingly without a care in the world. Then I heard some noise at my sliding glass door. I got up and went to the door, only to see a male black bear trying to open it. When he saw me, he stepped back, looked at me, and walked off my deck, went to my neighbor's house, and fell sleep under her hammock.

Because of the widely varying settings in which we interact with animals, we sometimes just do not know what to do when human interests compete with those of other beings, which happens almost every second of every day worldwide. Many people claim to love nature and to love other animals, and then, with little forethought, concern, or regret, go on to abuse them in egregious ways too numerous to count. Many of the animals we want to study, protect, and conserve experience deep emotions, and when we step into their worlds we can harm them mentally as well as physically. They are sentient beings with rich emotional lives. Just because psychological harm is not always apparent, this does not mean we do no harm when we interfere in animals' lives. It is important to keep in mind that, when we intrude on animals, we are influencing not only what they do but also how they feel.

Coexistence Is Difficult

Often we become at odds with the very animals with whom we choose to live when they become nuisances, dangerous to us or to our pets, or destroy our gardens and other landscapes. Thus, we have to make difficult decisions about whose interests and lives to favor, theirs or ours. A more aware public no longer believes that human interests always trump the interests of other animals; we have to factor in all of the variables to make the best choices on a case-by-case basis. For example, in some areas of Boulder, Colorado where I live, people choose to coexist with prairie dogs, whereas in other locales some people want to kill these family-oriented rodents because they are a nuisance to those building shopping malls, parking lots, soccer fields, and more homes. Killing prairie dogs, however, does not really solve the problem, and many believe we need to figure out the most humane solutions, so that people can pursue their interests and prairie dogs do not have to suffer because of our inability to limit growth.

Humans are generally motivated to care about other animals, because we assume that individuals are able to experience pain and suffering. Fortunately, very few people want to be responsible for adding pain and suffering to the world, especially intentionally. However, in our interactions with other animals, we often cause unintentional pain, suffering and death, usually for human ends. In addition, because humans interact with animals in an increasing number of settings as we expand our own horizons, it is becoming more common to debate whether or not to cull or kill members of a species because they may be involved in the transmission of disease to other animals

or humans. For example, badgers in the United Kingdom play a role in the transmission of bovine tuberculosis that infects cattle. A move to cull badgers to control the spread of this disease was met with substantial public resistance; 96 percent of about 47,000 people polled throughout England said no to the planned cull, many favoring better farming practices. Years ago this sort of response was not very usual; people either ignored the problem or favored the wellbeing of humans or domestic livestock. This example, along with the treatment of prairie dogs, shows that as time passes more and more people are showing concern for how we interact with other animals.

Consider also the reintroduction of grey wolves to Yellowstone National Park, an area in which humans exterminated wolves about eight decades ago because of their predatory habits. The project is considered by many people to be successful, in that numerous wolves now roam the Yellowstone ecosystem. However, in the process some of the wolves who were moved from Canada and Alaska have died, and the newcomers have killed numerous coyotes in various parts of the park. Did we do harm when we removed wolves from one area to bring them to another locale? Are we robbing Peter to pay Paul? Should we favor ecosystems and species over individuals? These are some of the difficult questions with which conservation biologists are faced. Some people argue that individual wellbeing should come before the fate of a given species or the integrity of an ecosystem, whereas others believe that it is acceptable for a few individuals to die for the good of the species as a whole.

There also are other questions that need to be considered, because not everyone favors bringing wolves back to Yellowstone. Ranchers and farmers believe that wolves are responsible for significant losses of livestock due to predation, although available data do not support this claim.

Consider also the reintroduction of Mexican wolves in New Mexico, and how federal gunners are free to wipe out the Nantac pack, despite the fact that these wolves haven't stabilized or reached suitable numbers to increase the likelihood that they will survival. The federal predator control program has been responsible for reducing the population of wild Mexican wolves from 55 at the end of 2003 to 44 at the end of 2004, and 35 at the end of 2005. During May 2006, federal gunners killed 11 wolves, including six pups from one pack.

To sum up, the big questions with which we must be concerned include whether it is permissible to move individual wolves from areas where they a have thrived, and place them in areas where they might not have the same quality of life, for the perceived good of their species, and whether it is permissible to interfere in large ecosystems that have existed in the absence of the species to be reintroduced, and remove animals from an ecosystem in which they play an integral role.

Many animal behavioral scientists believe that the major guiding principle is that the lives of the animals whom humans are privileged to study should be respected, and when we are unsure about how our activities will influence them, we should err on the side of the animals, and not engage in these practices until we know the consequences of our acts. This precautionary principle will serve the animals and us well. Indeed, this approach could well mean that exotic animals so attractive to zoos and wildlife parks need to be studied for a long time before they

are brought into captivity. For those who want to collect data on novel species to be compared to other perhaps more common animals, the reliability of the information may be called into question unless enough data are available that describe the normal behavior and species-typical variation in these activities.

We must continue to develop and improve general guidelines for research on free-living and captive animals. These guidelines must take into account all available information. Professional societies can play a substantial role in the generation and enforcement of guidelines, and many journals now require that contributors provide a statement acknowledging that the research conducted was performed in agreement with approved regulations. Guidelines should be forward-looking as well as regulatory. Much progress has already been made in the development of guidelines, and the challenge is to make them more binding, effective, and specific. Fortunately, many people worldwide are working to improve our relationships with other animals.

That many animals have subjective and inter-subjective communal lives, that is, they live in social groups and other animals are in their thoughts and feelings, and a personal point of view on the world that they share with other individuals, seems beyond question. In his development of an anthro-harmonic perspective on human-nonhuman relationships, Stephen Scharper, who studies the relationship between religion and environmental ethics, notes that "intersubjectivity is a fundamental reality of all human existence." Harmonic means of a integrated nature, which "acknowledges the importance of the human and makes the human fundamental but not exclusively focal." Working towards an anthro-harmonic understanding of human-nonhuman relationships in the future is a good road to travel.

What Should We Do?

Inquiries about how we interact with other animals raise a host of big ethical questions, such as why care about other animals? Who are we or who do we think we are in the grand scheme of things? How should we go about wielding our almost limitless power when we interact with other individuals, populations, species, and ecosystems? Are there any shoulds? Yes, there are; however, just because we can do something does not mean we should. Should be we concerned with the wellbeing of individuals, populations, species, or ecosystems? Can we reconcile a concern for individuals with a concern for higher and more complex levels of organization?

First and foremost in any deliberations about other animals must be deep concern and respect for their lives and the worlds within which they live, respect for who they are in their worlds, and not respect motivated by who we want them to be in our anthropocentric scheme of things. Can we really believe that we are the only species with feelings, beliefs, desires, goals, expectations, the ability to think about things, the ability to feel pain, or the capacity to suffer? Other animals have their own points of view, and it is important to appreciate, honor, and respect them when we interact with them. Ethics and scientific research are not incompatible.

The Best and Worst of Times for Animals

In many ways these are the best of times and the worst of times for many

species of animals, the best, in that more and more people around the world are truly concerned about how we effect the lives of the animals with whom we share space, and the worst in that the global population of humans is increasing steadily at unprecedented rates, and there is less and less space for us to live without intruding into the lives of other animals.

Humans are a powerful force in nature, and obviously we can change a wide variety of behavioral patterns in many diverse species. Coexistence with other animals is essential. By stepping lightly into the lives of other animals, humans can enjoy the company of other animals without making them pay for our interest and curiosity. There is much to gain and little to lose if we move forward with grace, humility, respect, compassion, and love. Our curiosity about other animals need not harm them. The power we potentially wield to do anything we want to do to animals and nature as a whole is inextricably tied to responsibilities to be ethical humans beings. We can be no less.

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Marc Bekoff

HUMANE EDUCATION

Humane education is about kindness and respect. Most clearly identified with George Angell, the founder of the Massachusetts Society for the Prevention of Cruelty to Animals, it is based on the assumption that if children learn to care for and respect animals they will develop an empathetic or feeling personality that will guide them in their relations with people as well.

The general theme of being kind to animals was present in the very earliest

publications printed for children. In the late 1700s and early 1800s, a number of stories and books for children talked about the mistreatment of animals. In *The Life, Adventures, and Vicissitudes of a Tabby Cat*, published in 1798, there is a description of a cat having its tail cut off with a pair of scissors by a terrible young man. Other stories told of stealing birds' eggs from nests, and the abuse of horses. The stories often had a strong moral theme that emphasized empathizing with the animals, and the evildoers came to a bad end because of their treatment of animals. This type of story would culminate with the publication of *Black Beauty* by Anna Sewell in 1877.

Early animal protection work did include elements of humane education. In the 1850s, M. DeSally published "Method of Teaching Kindness to Animals" in the *Bulletin Annuel de la Societe Protective des Animaux.* It was difficult for education to receive a high level of attention when an enormous amount of rescue and law enforcement work was required. George Angell, who had a background as a teacher, placed a major emphasis in the early work of the MSPCA on promoting humane education. He understood that to teach children kindness would be the best way to prevent cruelty to animals, and people.

When Angell began to formalize our understanding of humane education in the 1870s, he found fertile ground in the American educational system at the time. *McGuffey's Newly Revised Eclectic Reader,* published in 1843, included many stories about animals and nature. In that same era, the common school philosophy of Horace Mann maintained the important role that public education could play in providing students from many different backgrounds with a common sense of culture and morals. Most valuable at the time was the concept that schools could play a significant role in helping to solve major social problems.

In 1882 Angell began to organize Bands of Mercy in schools across the country. These clubs encouraged children to learn about animals and to do things to help animals. By 1883, when Angell addressed a meeting of the National Education Association, there were already 600 Bands of Mercy with 70,000 members in schools throughout the country. Angell founded the American Humane Education Society (AHES) in 1889, ". . . to carry Humane Education in all possible ways, into American schools and homes." One method was sponsoring the publication of literature with a humane message. It was Angell who brought the classic *Black Beauty* to American children. AHES also promoted Bands of Mercy across the country. By 1923 there were over 140,000 Bands of Mercy with a membership of over four million children! Twenty states, recognizing the importance of humane education for society in general, passed laws requiring its practice in the schools by 1922. Edwin Kirby Whitehead published the first humane education textbook in 1909, *Dumb Animals and How to Treat Them*, and Flora Helm followed with a *Manual of Moral and Humane Education.*

At the same time, the humane movement suffered the pains of evolution in a changing society. Many of the earliest humane societies, including the ASPCA and MSPCA, had been inspired by the need to protect the many horses used for transportation and work in America's cities and towns. As carriage and cart horses disappeared from streets and roads, the humane movement came to grips with new roles and challenges.

Stamp from 1964 encourages the humane treatment of animals. (Dreamstime.com)

In the 1960s, America shook off the effects of the Great Depression and Two World Wars. People once again began to question their relationships with one another and the environment. New educational philosophies emerged. Earth Day and the developing environmental movement gave rise to environmental education, and humane educators were poised to move forward with new opportunities.

New efforts have included curriculum development, teacher training, and teaching materials for classroom use. Most humane societies offer humane education programs, recognizing that the only certain way to prevent cruelty to animals is help children learn the meaning of kindness.

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HUMANE EDUCATION, ANIMAL WELFARE, AND CONSERVATION

Conservation education is beginning to be recognized as one of the critical components of preserving life on earth (Orr, 2004). The emerging field of conservation psychology is the study of human

behavior and the achievement of positive and enduring humane conservation goals. Recent work by Susan Clayton and Gene Myers (2009), in their textbook *Conservation Psychology: Understanding and Promoting Human Care for Nature,* is evidence of a growing interest and need for new methods of understanding psychology and behavior in terms of conservation.

In China, disturbing levels of animal abuse and neglect (Song, 2004) as well as the staggering loss of native wildlife there (Elvin, 2004) prompted the need for an intervention program to address these issues. Out of a five-year collaboration between an American conservation educator (S. Bexell) and her Chinese colleagues, a program was developed to help young people form emotional bonds with animals. Through learning about the behavior, minds, and emotions of animals, this group hoped children would develop humane attitudes and behavior toward animals, potentially leading to the development of a wildlife conservation ethic and more compassionate personal attitudes toward conservation. Because they wanted the program to have broad applicability, it was developed so conservation and humane education practitioners could apply it in multiple cultures. Animal abuse and neglect, as well as wildlife losses, are human problems and certainly not just Chinese phenomena. They are global tragedies needing urgent attention.

The program consisted of a camp experience developed for children ages 8-12 to encourage the acquisition of correct knowledge about animals, care about animals, a propensity for environmental stewardship, and compassionate behavior toward animals. The program was designed to take children along a "continuum of care." To facilitate this process, students first met small animals (rabbits, guinea pigs, hamsters, parakeets, and tortoises) as *individuals* (and not merely members of a species) and were allowed to recognize them as individuals with personalities and feelings similar to humans. They also met exotic captive animals (including giant pandas, red pandas, zebras, golden monkeys, giraffes, and lemurs) as individuals. The desired outcome was that students would begin to care about these animals as individuals. Stemming from this the conservation educators hoped that students would then begin to care about the environment that their new animal friends depend on. Finally, the educators hoped students would care enough about animals and their living space (for example home environments, captive situations, and natural habitats) to change their own behavior to care for and to protect animals (whether captive or wild) and their environs based on the knowledge and skills learned during camp. It was also hoped that students would develop a new and heightened empathy and compassion for animals to make it more likely that they would take better care of and protect individual animals.

For the program to be successful the conservation educators determined several essential curricular components for the camp experience: (1) extended personal interactions with animals; (2) "multiple points of contact" that provided the opportunity for children to interact and/or study the same individual animals over time to facilitate the human-animal bond through mutual trust and respect; (3) hands-on animal care by participants; (4) observation and interpretation of animal behavior; (5) encouragement of empathy with animals through teaching about animal minds (emotions and pain) and behavior by respected adults;

(6) conversations with conservation and animal care experts; (7) specific skills and knowledge about appropriate pets and animal care; and (8) provision of knowledge and skills to enable effective communication to others about animals, their welfare, and conservation.

Why a camp? The educators believed the format of the program was critical for their goals to be achieved. They designed it as a camp experience to provide extended contact time between the students and the animals, and extended time with positive role models, as well as peers. The duration of the camp, five days and four nights, also provided more time for students to acquire a depth of knowledge and skills. Lastly, they believed that time in nature (camping in tents and exploring nature were curricular components) was also important for developing a humane conservation ethic (e.g. Louv, 2005).

To test the hypothesis that exposure to animals would enhance development of humane attitudes and a positive conservation ethic (Myers, 2007; Myers and Saunders, 2003), this program was evaluated to determine its effectiveness (Bexell, 2006). Through evaluation, Bexell and colleagues found statistically significant self-reported increases of knowledge, level of care, and propensity for animal and environmental stewardship. They also found the students showed (1) significant increases in actual knowledge and, in agreement with qualitative data collected, an increase in the breadth and depth of accurate knowledge of animals; (2) care for animals; and (3) ways in which they could and wanted to take action for the welfare and conservation of animals. These findings support the efficacy of a camp program where personal experiences with animals spark interest in learning and promoting human-animal bonds that support caring behavior and the willingness to take conservation action. The findings also support the hypothesis that empathy with animals can be a precursor to wildlife and environmental stewardship (Myers, Saunders and Bexell, 2009).

The foundation of the camp curriculum is based in large part on human universals of compassion, morality, and solid scientific knowledge about animals and natural systems. Many scientists believe that humane and conservation education programs need to be designed to help children overcome socially and culturally imposed distancing from animals, and it's hoped that the research and curriculum foundations of the program designed in China will help to shape the future of conservation and humane education not only in China but also globally. The camp described provides another cultural lens into the field of conservation psychology and shows an element of hope for future generations.

See also China: Animal Rights and Animal Welfare; China: Moon Bears and the Bear Bile Industry

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HUMANE EDUCATION MOVEMENT

Humane education explores all the challenges facing our planet, from human oppression and animal exploitation, to materialism and ecological degradation. It explores how we might live with compassion and respect for everyone, not just our friends and neighbors, but all people; not just our dogs and cats, but all animals; not just our own homes, but the Earth itself, our ultimate home. Humane education inspires people to act with kindness and integrity, and provides an antidote to the despair many feel in the face of entrenched and pervasive global problems, and persistent cruelty and abuse towards both people and animals. Humane educators cultivate an appreciation for the ways in which even the smallest decisions we make in our daily lives can have far-reaching consequences. By giving students the insight they need to make truly informed, compassionate, and responsible choices, humane education paves the way for them to live according to abiding values that can lend meaning to their own lives while improving the world at the same time. Additionally, and perhaps most important, humane education encourages students to become engaged citizens and problem-solvers for a better world.

The term humane education originated in the late 19th century, as founders of SPCAs and child protection organizations (often the same people) realized the importance of teaching children the principles of kindness and respect for others, both human and nonhuman. For many decades in the late 20th century, humane education became synonymous with elementary-level school programs that primarily taught children about kindness toward and care of companion animals. As the crisis of dog and cat overpopulation grew, humane education began to focus on the importance of spaying and neutering. With the emergence of dog fighting as a popular sport among some communities, humane education programs often discussed the cruelty inherent in dog fighting as well as offering bite prevention presentations.

In the 1990s, several humane education programs emerged that expanded the then-limited perception of humane education, returning to its roots. These programs focused on the definition of the word humane (meaning having what are considered the best qualities of human beings), and applied this definition to our

relationships with everyone: animals, people, and the earth.

Humane education now encompasses animal protection education, environmental and sustainability education, media literacy, character education, and social justice education. It is the only educational movement that currently does so. Drawing connections between all forms of oppression and exploitation, humane education empowers and inspires students to be changemakers who not only have the skills to connect the dots between various problems and forms of abuse, but also to find solutions that work for everyone.

Quality humane education accomplishes its goals through the use of four elements. They are:

1. Providing accurate information so that students understand the consequences of their decisions as consumers and citizens
2. Fostering the 3 Cs: curiosity, creativity, and critical thinking, so that students can evaluate information and solve problems on their own
3. Instilling the 3 Rs: reverence, respect, and responsibility, so that students will act with kindness and integrity.
4. Offering positive choices that benefit oneself, other people, the earth, and animals, and the tools for problem-solving, so that students are able to help bring about a better world

Humane education achieves these goals through interactive and engaging teaching techniques that model compassion, respect, and openness.

Providing Accurate Information

In order to make the kindest and wisest choices, we need knowledge. For example, unless we know about the problem of dog and cat overpopulation, the abuse of farmed animals in factory farms, the plight of women and children working in sweatshops, the dangers of certain products and chemicals to the environment, or the escalating travesty of worldwide slavery, to name a few, we cannot make informed, conscious, and humane choices that help solve these growing problems. With knowledge, however, individuals, businesses, and governments are able to make choices that do not cause suffering and destruction, but instead create a more peaceful, humane world. Humane educators help their students by offering them accurate information so that they can make wise and compassionate decisions both personally and as emerging members of a democracy.

Fostering the 3 Cs: Curiosity, Creativity, and Critical Thinking

Humane educators do more than expose students to hidden truths. They teach the critical thinking skills necessary to evaluate information, as well as foster curiosity and creativity so that students pursue lifelong learning and imaginative, yet practical, solutions to difficult problems. When one visits a school where humane education is in progress, one may find students analyzing popular advertising or reading pamphlets from opposing groups, trying to separate fact from opinion. Students may be working together to develop creative answers to challenges often portrayed in either/or terms, crafting persuasive essays on various issues,

tracing the effects on animals, people, and the environment of certain products and behaviors, or coming up with ideas for everything from proposed legislation to meaningful disclosure on product labels. Humane educators inspire their students to think about, consider, and creatively and positively respond to norms and attitudes that are often accepted without question, from what is served in the cafeteria, to how and where the school's sports uniforms are produced, to the use and disposal of paper in the school, to dissection in biology classes, and much more.

Instilling the 3 Rs: Reverence, Respect, and Responsibility

Without the 3 Rs of reverence, respect, and responsibility, the acquisition of knowledge and improved critical and creative thinking by themselves will generally fail to inspire a person to take the necessary steps toward solving problems and making kinder and more positive choices in their lives and communities.

Reverence is an emotion akin to awe. What people revere, they tend to honor and protect. If young people have reverence for life, for other humans, for animals, and for the beautiful planet Earth, they are more likely to find the will to make choices that diminish harm to others and create more peace. Respect is an attitude people bring to the world; it is reverence manifested in interactions. Responsibility is respect turned into action. When young people are filled with reverence, and when they feel respect for others, taking responsibility for their actions and choices is an inevitable next step.

How do humane educators cultivate the 3 Rs? Through age-appropriate activities, reflections, field trips, opportunities to meet people and animals who've been exploited or abused, stories, pictures, and films, humane educators awaken the hearts and souls of their students and ignite their love for this earth, its people, and its animals. They spark students' innate empathy, so that respect follows easily and the motivation to take responsibility, in age-appropriate ways, is the likely result.

Providing Positive Choices

Humane educators do not tell students what to think or what to do, which would be the opposite of teaching critical and creative thinking, but they do make sure that students know that they have choices that can improve or diminish the world, end suffering or contribute to it, solve problems or perpetuate them.

This fourth element of humane education is the one that makes the rest meaningful. If students are exposed to the problems in the world and the suffering and destruction that abound, but are given no tools or choices to make a difference, they may become cynical and apathetic, exactly the opposite outcome from what humane education tries to achieve. When, instead, humane educators introduce students to innovative ideas and inspiring successes, and provide examples of ways in which individuals, communities, corporations, and governments can make a lasting positive contribution, they pave the way for young people to become visionary entrepreneurs, leaders, change agents, and engaged citizens in both small and large ways.

When these four elements come into play, young people not only become aware of the challenges facing animals,

people, and our planet, but also learn to trust that they can make a difference, and they become more enthusiastic and committed citizens. Their education becomes deeply meaningful, and their lives may take on a purpose greater than simply good grades or a future lucrative career. For those students who see the future as bleak, humane educators offer hope, meaning, and solidarity, empowering such students to create a better future for themselves as well as for others, drawing links between the oppression of other species and oppressive systems in our society that affect those who are disenfranchised.

Humane education has the capacity to change the world by educating a new generation to be caring, compassionate, and responsible. As humane education is integrated into curricula, and as humane educators are hired by schools in the same numbers as math or language arts teachers, students will gain the knowledge, opportunity, and will to live with more respect for others, be they other humans, other animals, or the ecosystems that support us all.

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Zoe Weil

HUMANE EDUCATION MOVEMENT IN SCHOOLS

Humane education is a pedagogical concept that centers on inculcating the ethic of kindness to animals through formal or informal instruction of children, although it is sometimes used to describe efforts to reach people of all ages. Its modern origins trace back to John Locke's environmentalist theory of mind, as outlined in his *Essay Concerning Human Understanding* (1690) and *Some Thoughts Concerning Education* (1693). The concept that virtuous character could be formed through the ideas, impressions, and experiences of youth soon prompted the emergence of an

entire publishing industry for children's literature. The kindness-to-animals ethic was one of the most common themes in such works, and had special resonance in the 19th century as a means for inculcating standards of bourgeois gentility such as empathy and moral sensitivity. By the time animal protection societies formed in England, Europe, and North America, humane education was already an established instrument of youth socialization.

During the post-Civil War period, the formation of character came to be seen by American moral reformers, including humane advocates, as a driving dynamic for social change. The promotion of humane education as a solution to numerous social ills drew animal protection into closer alignment with other reform movements of the era, especially child protection and temperance. These movements in particular all shared a deep concern about the implications of cruelty and violence for individuals, the family, and the social order.

The early decades of the 20th century saw the passage of compulsory humane education requirements in a number of states, the production of humane anthologies and textbooks, and the emergence of the professional humane educator, usually an employee of a local society for the prevention of cruelty to animals. However, as local societies became bogged down with the overwhelming challenges of municipal animal control during the middle decades of the 20th century, humane education became less of a priority. Given its limited resources and declining influence, the movement's efforts to institutionalize humane education within teacher-training institutions and school systems largely failed.

Nevertheless, the kindness-to-animals ethic continued to resonate as a theme in children's literature and other cultural forms, and how ever restricted its influence, humane education helped to reinforce the notion that wanton acts of individual cruelty against animals were the sign of a maladapted and sick personality, while a kind disposition toward animals became more recognized as an attribute of the well-adjusted individual.

In recent decades, the locus of human education continues to be the animal care and control community. Many organizations and agencies offer education programs at the municipal or county level, sometimes involving partnerships with schools or other youth-oriented institutions. For many reasons, however, elementary and secondary schools and colleges have yet to integrate humane education into their curricula. Companion animal issues predominate over other concerns in the content of humane education programs for reasons having to do with agency mission, institutional sensitivities, the perception of humane education as a special interest, and the view that certain issues are not age-appropriate for young people.

Although many animal advocates are quick to cast humane education as crucial to the advancement of their movement's objectives, it remains an underemphasized and underfunded component within animal protection. It is not a major programmatic focus of any of the larger national organizations, and at the local level must compete for priority with other needs, including the most basic ones associated with operating a shelter, finding homes for animals, and keeping humane agents in the field.

Contemporary humane education suffers from a further disadvantage in the lack of definitive empirical proof to demonstrate its effectiveness. There

A student in the humane education summer camp feeding appropriate food, in this case lettuce, to San Maio ("Three Whiskers"), a domesticated rabbit. (Sarah M. Bexell)

A young girl in the humane education summer camp offering security, respect, and love for Tiao Tiao ("Jumpy"), a domesticated guinea pig. (Sarah M. Bexell)

is relatively little evidence to show that humane education programs actually increase children's knowledge about or improve their attitudes and behavior toward animals, and none to show that such gains carry into adulthood. Intuition, anecdotal evidence, and a few formal studies suggest its promise, but there is an urgent, ongoing need for formal evaluation and assessment of humane education with respect to both content and methodology.

As at other times in the past, the current emphasis on character education, in the form of core or consensus values that transcend political, cultural, and religious differences, promises to increase opportunities for the expansion of humane education teaching. The advent of service learning mandates and the growth of social networking sites may also provide new opportunities for youth engagement. Still, in the absence of a stronger programmatic and financial commitment from the animal protection movement, and better efforts to establish humane education within institutions of higher learning, such progress cannot be assumed.

Bernard Unti

HUMANE EDUCATION: THE HUMANE UNIVERSITY

Woodrow Wilson, the only U.S. President who had a Ph.D. and taught at the college level, noted that "it is easier to move a cemetery than it is to change a curriculum at a university." Of course, the curriculum does change, slowly and cautiously. The changes not only reflect new knowledge, but new definitions of what is important to know. One area remarkably ignored is our relationship to animals. Animals have shared the homes of people in all cultures ever since those people lived in villages more than 15,000 years ago, and today more than 60 percent of American households have a nonhuman animal sharing their dwelling.

An increasing proportion of people believe that companion, laboratory, and farm animals should receive the best possible health care, including the latest advances in science and technology. One approach is to develop a focused course of study for students involved in a variety of fields of inquiry, addressing not only animal welfare, but also issues related to the conservation of endangered animals and their environments. Such a curriculum has been developed at Purdue University. Like any curriculum, it reflects the strengths of the faculty and the concerns of the present student body.

In 1982, Purdue University developed the Center for Applied Ethology and Human-Animal Interaction at its School of Veterinary Medicine, to promote interdisciplinary activities in the university and serve as a focal point for the exchange of ideas, and the development of new information related to human-animal interactions, and disseminate information in an unbiased manner to students, scientists, consumers, and agricultural groups. In 1997, the center's name was changed to the Center for the Human-Animal Bond, to better reflect our relationship with companion animals, and perhaps all animals.

The primary objectives of the program are to educate undergraduate students about the social, ethical, biological, behavioral, and economic aspects of animal care and use, provide students with a scientific and philosophic care and use, and train students to resolve conflicts concerning the humane use of animals, and to become leaders in policy development and implementation.

Today, more than half of all the veterinary schools in North American have centers dedicated to research and education about the human-animal bond. Perhaps it is time for this area of study to be part of higher education in general.

There is ever-growing concern and interest for our environment, the well-being of animals, and the quality of our interactions with animals; this course of study provides the knowledge and skills to communicate and act on these issues. It also stimulates research to improve human and animal well-being:

www.vet.purdue.edu/chab/; www.thepress.purdue.edu/Newdirectionsinthehuman.html

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Alan M. Beck

HUMANE SOCIETY OF THE UNITED STATES

See Humane Education Movement

HUNTING, HISTORY OF IDEAS

Although prehistoric people needed to hunt to survive, hunting has had little economic significance throughout most of the history of Western civilization. Its importance in Western thought derives chiefly from its symbolic meaning. That meaning has much to do with how we define hunting and distinguish it from butchery. Hunting is not simply a matter of killing animals. To count as quarry, the hunter's victim must be a wild animal. For the hunter, this means that it must be hostile: unfriendly to human beings, intolerant of their presence, and not submissive to their authority. The hunt is thus by definition an armed confrontation between the human domain and the wilderness, between culture and nature. The meanings that hunting has taken on in the history of Western thought reflect the varying values ascribed to culture and nature in this artificial confrontation.

Throughout Western history, the hunter has been seen as an ambiguous figure, sometimes a fighter against the wilderness and sometimes a half-animal participant in it. The meaning of hunting accordingly varies with the meanings ascribed to the wilderness. For the Greeks and Romans, forests were generally threatening and frightening places. In early Christian thought, the wilderness was a sort of natural symbol of hell, and the wild animals living there in rebellion against man's dominion were seen as typifying demons and sinners in rebellion against God. But this image was undermined by the counterimage of the hermit saint in the wilderness, attended by friendly wild animals that the saint's

holiness had restored to the docility of Eden.

Other medieval changes in the symbolic meaning of wild places and creatures reflect changes in the social status of hunting. From the 10th century on, Europe's forests dwindled as improved techniques of agriculture fostered a surge in human population growth. Hunting gradually became the exclusive privilege of the aristocracy, who put the remaining forest patches off limits as hunting preserves and ruthlessly punished any peasants caught taking game. Deer, the symbolic inhabitants of the wilderness, became the main objects of the aristocratic hunt, and took on an air of nobility in both folk ballads and high culture.

It was not until the early 1500s that the chase began to be viewed as cruel and to be invoked as a symbol of injustice and tyranny. Erasmus condemned the hunt in 1511 as a bestial amusement. In 1516, Thomas More denounced it in *Utopia* as "the lowest and vilest form of butchery . . . [which] seeks nothing but pleasure from a poor little beast's slaughter and dismemberment." Similar revulsion toward hunting is evident in the essays of Montaigne and in the plays of Shakespeare. Anti-hunting sentiment also crops up in 16th-century hunting manuals, which from 1561 on contain rhymed complaints by the game animals denouncing the senseless cruelty of Man the Hunter.

The rise of anti-hunting sentiments in the 1500s reflected rising doubts about the importance of the boundary between people and animals. In 1580, Montaigne denied the existence of that boundary and concluded that "it is [only] by foolish pride and stubbornness that we set ourselves before the other animals and sequester ourselves from their condition and society." The erosion of the animal-human boundary in Western thought was accelerated by the scientific revolution of the 1600s and the associated mechanization of the Western world. Animal suffering came to be more widely regarded as a serious evil, and hunting was increasingly attacked as immoral.

The romantic movement of the late 1700s brought about a radical transformation in Western images of wilderness. In romantic thought, nature ceased to be a system of laws and norms and became a place, a holy solitude in which one could escape man's polluting presence and commune with the Infinite. Romantic art and literature picture the hunter sometimes as a poet with a gun participating in the harmony of nature, for example, James Fenimore Cooper's Natty Bumppo, but more often as a despoiler of nature and animal innocence, for example, Samuel Taylor Coleridge's Ancient Mariner.

Western hunting has always been a characteristically male activity, often regarded as valuable training for the military elite and praised as a prototype of the just war. In the context of 19th-century European imperialism, this tradition gave birth to a third stereotype of the huntsman, the colonial White Hunter who dons a pith helmet and leads an army of servile natives on safari to assert his dominion over the conquered territory's land, animals, and people. At the height of Europe's empires in the late 1800s and early 1900s, a love of hunting commonly went hand in hand with imperialist politics, and anti-imperialism was often associated with anti-hunting sentiment. This link between hunting and the political right has persisted into our own time.

During the 20th century, the romantic idea of the sanctity of nature and the

Nietzschean and Freudian picture of man as a sick animal have interacted to yield a vision of the wilderness as a place of timeless order and sanity, in opposition to the polluted and unstable domain of civilization and technology. However, hunters tend to regard the hunt as a healing participation in the natural order, what the hunting philosopher José Ortega y Gassett described as "a vacation from the human condition," whereas opponents of hunting see it as an armed assault on the harmony of nature.

Both attitudes are grounded in the romantic image of nature as a place with no people in it. If we reject that concept of nature and adopt instead a more scientific and pre-romantic conception of human beings and their works as part of nature, the distinction between wild and domestic animals evaporates. Hunting thereby loses its rationale and appears to us, as it did to More, as nothing but a species of butchery practiced for amusement. However, doing away with the opposition between the human and natural domains poses problems as well for the philosophy of animal rights. The rights view generally assumes that the moral order and nature are separate realms and that what wild animals do to each other is a matter of moral indifference. But if the boundaries between people and animals and between culture and nature are imaginary, it is not clear why we should have a duty to prevent a wolf from eating a baby but not from eating a rabbit.

See also Wildlife Abuse

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Matt Cartmill

I

INDIA: ANIMAL EXPERIMENTATION

The history of animal experimentation in India in the 20th century parallels that of the United Kingdom in the same period. However, after independence from Britain in 1945, there was a sudden rise in the number of animals used, with a much sharper decline in the conditions under which the animals were housed and experimented upon. India's first Prime Minister, Jawaharlal Nehru, gave a very high degree of importance to building scientific institutions, which led to several animal-using laboratories being expanded.

Since the late 1950s, there was some amount of protest against the use of animals under conditions that many considered shameful. The initial cry was from Rukmini Devi Arundel, who, as an independent Member of the Upper House of Parliament, submitted a bill called the Prevention of Cruelty to Animals Bill. The government, realizing the importance of the measure, requested she withdraw her bill and introduced an identical bill which, in 1960, became the Prevention of Cruelty to Animals (PCA) Act.

From 1959 onward, the group which was registered in 1964 as the Blue Cross of India pursued the issue very seriously. In March 1965, the Blue Cross held an international conference on the subject. The National Anti-Vivisection Society of the U.K. and the British Union for the Abolition of Vivisection sent a delegate, and the Scottish Society for the Prevention of Vivisection provided a large amount of literature and films for the conference. Rukmini Devi, who had been nominated by the Government of India as the first chairperson of the Animal Welfare Board of India, a statutory body set up in 1962 under the PCA Act of 1960, presided over the conference. Under this pressure, the Government of India set up the first Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), whose members visited various institutions that used animals and met with various stakeholders on this issue. The author and three other members of the Blue Cross were the first to depose before the CPCSEA, and their claims were met with disbelief, if not ridicule. It is pertinent to note that the chairman of the CPCSEA was Kamal Nayan Bajaj, a Member of Parliament, and most of the other members of the CPCSEA were the heads of government laboratories that used animals.

Yet, after visiting all the major labs over a period of a year, the CPCSEA issued a paper on the issue, which began by saying:

> Vivisection, or animal experimentation, is one of the most inhuman cruelties against animals, which

are being perpetrated in the world to-day. The object of these experiments is said to be in order to advance scientific knowledge, and to undertake research to save or prolong human or animal life and alleviate suffering. In the name of science, however, animals are made to endure the most barbaric tortures ever invented by the human brain, often lasting over long periods and without any sort of anesthetic.

Animals are frozen, boiled, have electric currents passed through their brains, or are driven insane, all in an insatiable "quest for knowledge," which can do nothing whatever to benefit the human race. Many experiments which are successful with animals are a complete failure when applied to human beings. Vested interests, however, make it necessary for the experiments to continue, although what they are showing may be completely useless or already known.

Not to be out done by the rest of the world in cruelties, we perform them here in India on a smaller scale, but no less horrible, as can be seen in the photograph on the facing page. In this Calcutta experiment, several monkeys were given experimental dropsy, leading to their death in one to four months. In the various research laboratories and institutions of India, experiments are performed on certain animals like buffaloes, horses, sheep, goats, dogs, cats, monkeys, rabbits, guinea-pigs, mice, frogs, and fowl. Apart from experimenting upon them here, the export of monkeys from India for experimentation in other countries provides a handsome source of income, especially in dollars, as a monkey which fetches about Rs.10 in India costs more like 7 pounds or 8 pounds in the U.K.

Rhesus monkeys in large numbers in the Northern Indian State of Uttar Pradesh are trapped, stuffed into cages, and carried on shoulder-poles to Lucknow. A train journey of 260 miles takes them to New Delhi, whence a transport plane carries them the 4,000 miles to London Airport. From London they may be flown another 3,000 miles across the Atlantic to New York, from where they travel on for a further 700 miles in trucks to Okatia Farms in South Carolina. Here the Rhesus monkeys of India are caged with other hordes of "Java" monkeys from the Philippines. After twenty-one days of rigorous health checks, they are dispatched to laboratories in Toronto, Pittsburgh, Detroit, and Berkeley, California. It is disturbing to note that although the Okatia Farms may receive 5,000 monkeys a month, the supply never catches up with the demand, but is rather on the increase all the time. The above gives some small idea upon this vast subject which to deal with adequately is far beyond the scope of this small hand-out. ("Animal Experimentation," 1965)

With typical bureaucratic efficiency, the CPCSEA then abdicated its responsibility by saying:

> Much might be done towards alleviating the suffering of animals held for experimental purposes, through personal contacts with

> Medical Students and the Staff of Medical Colleges. It should be made more generally known that a very large proportion of painful experiments serve no useful purpose, and instances are known in which treatment successfully made on animals, when applied to humans proved disastrous. Seminars organized to discuss the subject with doctors and students might well prove profitable. Failing all else, there is nothing to prevent airing our views wherever possible and denouncing the cowardice of gaining human benefits at the expense of animals which are entirely at our mercy and unable to protect themselves. The Government of India have now set up a committee for the purpose of regulating animal experimentations. ("Animal Experimentation")

In the meantime, the Blue Cross continued with its campaign. In 1966, the World Coalition Against Vivisection, headquartered in Geneva, started its India office with Captain V. Sundaram as its president and S. Chinny Krishna as honorary secretary.

The attitude of the scientists who constituted the bulk of the members, with an occasional civil servant thrown in, can be judged by the fact that, over the next three decades, the CPCSEA was reconstituted three times and met only twice. Even the reconstitution was only done after numerous letters by the Blue Cross and the Animal Welfare Board. In 1990, the Indian National Science Academy (INSA) brought out its *Guidelines for Animal Experimentation*. These guidelines remained totally ignored by the scientists.

In 1996, Maneka Gandhi became the Minister for Environment and Forests. Her first move was to reconstitute the CPCSEA with herself as chairperson. Author S. Chinny Krishna was nominated as a member. Many of the other members were from animal-using laboratories. With a great deal of difficulty, rules were formulated based on the guidelines issued in 1990 by the Indian National Science Academy. Realizing that these rules would finally be effectively implemented, the scientists literally took to the streets in protest. Dozens of identical letters of protest were sent to the Prime Minister, alleging that implementation of these rules would set back India's scientific progress. A small committee of five was set up by the Prime Minister, with the condition that Mrs. Gandhi could not be on this Committee. Three scientists who used animals in their labs, the Director of the Animal Welfare Division of the Ministry of Environment and Forests, and Dr. Krishna were given the task of addressing the objections raised by the scientists and drafting suitable rules. A fresh set of rules was then drawn up, considered by the CPCSEA, and passed after following all required procedures.

For the next two years, over 500 laboratories and research institutions were inspected. Conditions were found to be deplorable in most of the places. Photographs were posted on the CPCSEA web site. Realizing that the government meant business, government and private institutions began to implement the rules regarding registration, housing, and treatment of animals.

By 2002, serum and vaccine manufacturers, and breeders and animal users were not averse to following the rules, since they began to realize that they got better and more dependable results. The

vast majority of the larger institutions were registered. Things were looking much better for the millions of animals bred and used in experiments each year (CPCSEA.org).

In mid-2002, some disgruntled scientists were able to have Maneka Gandhi removed, first as Minister and then as chair of the CPCSEA. The CPCSEA was purged of Dr. Sultan Ismail, Dr. P.Y. Guru, and Dr. S. Chinny Krishna, all of whom were strongly in favor of good science and proper regulations. The Ministry of Health took control of the CPCSEA, but the reforms had been set in motion and much of the progress was irreversible. Implementation is not as effective as it could have been, but the law is there now to protect the animals.

In 2006, thanks to the efforts of Norma Alvarez, the Government of India introduced the Fourth R—rehabilitation—to the existing 3 Rs concept. In addition to legally requiring reduction, refinement, and replacement in all experimentation, the rehabilitation of all animals has been added, meaning that those animals that do not need to be killed during the experimentation must be rehabilitated. Funds for this must be provided by the institution or person carrying out the study. The cost must be budgeted for while applying for grants for the experiments. Unfortunately, however, with the CPCSEA firmly under the control of the Ministry of Health, no worthwhile efforts are being made to implement the many safeguards in the laws in force.

Further Reading

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S. Chinny Krishna

INSTITUTIONAL ANIMAL CARE AND USE COMMITTEES (IACUCs)

Beginning in 1985, with extensive revision of the Federal Animal Welfare Act and the adoption of new policies by the National Institute of Health, most institutions that conduct animal research rely on an Institutional Animal Care and Use Committee standard or IACUC to determine whether research meets generally accepted ethical standards for the use of animals. Before 1985, such committees were generally called Animal Care Committees, and while they had some oversight of the care and housing of laboratory animals, they did not review the actual research procedures. Now, however, any organization which receives federal funds must follow Public Health Service (PHS) policies on animal research. Institutions engaged in interstate commerce in covered species of animals (mammals, with the exception of mice, rats, and animals used in agricultural practice) fall under U. S. Department of Agriculture (USDA) regulations, particularly the Animal Welfare Act, first passed in 1966, substantially revised in 1985, and amended several times since then. Both sets of regulations require an IACUC to ensure that the institution follows all applicable regulations, and that any proposal to use animals in research has been reviewed.

Although the USDA regulations and PHS policy differ in important ways (e.g.,

PHS policy applies to all vertebrates, while the USDA exempts many species), an IACUC must include a veterinarian, someone who does not use animals for research, typically referred to as the non-scientist, and someone who does not work for the institution. The two main duties of an IACUC are to review all proposals or protocols for use of covered species of animals, and to ensure compliance with all government regulations. Policies are written in a way that allows great latitude in how these duties are discharged, for example, how many of the protocols are reviewed and discussed by the full committee, as opposed to going through an expedited review process, and how facilities are inspected by the IACUC. As a result, practices vary widely depending on the size of the institution, the amount and range of animal research, and the policies set up by the individual IACUC.

From an ethical perspective, it must first be recognized that the whole system of IACUCs is based on the starting point that animal research is justified as long as it is carried out as well as possible, given the research goals. The questions they consider are almost never of the form should we be doing research on animals but rather, given that Dr. Smith is investigating X, has she shown that the study requires the use of this many animals of this species, and that she has designed the procedure to use appropriate care of the animals, including anesthetics and analgesics. The two questions are not entirely separable, because Dr. Smith will have to give some explanation for why animals must be used; however, the general presumption is in favor of animal research. Given that starting point, there are still at least two other ethical issues raised by the practice of using IACUCs to regulate research: the scope of an IACUCs authority, and the assumption that self-regulation is the best way to bring institutions into compliance with appropriate standards for ethical research.

With regard to scope, it was noted above that many animals are not covered by the relevant regulations. Most notably, rats and mice are not currently covered by USDA regulations, and farm animals used for production-oriented research also fall into an ambiguous category. No cold-blooded species is covered by USDA regulations, and no invertebrate is covered by PHS policy. Moreover, many IACUCs have adopted the policy that issues of scientific merit fall outside the scope of their decision-making process. This has the effect of restricting, sometimes in significant ways, the nature of the deliberation process when trying to decide whether a particular proposal should be approved. Few attempts have been made to evaluate or ground these scope restrictions with a well-formulated ethical theory.

The second ethical issue focuses on the fact that IACUCs are a way in which research institutions regulate themselves. Some countries, for example, Sweden, have adopted systems of outside regulation. Arguments that have been advanced in favor of outside regulation include a higher probability of impartial and consistent standards that might also better reflect the standards of the general public. Arguments in favor of institution-based systems such as IACUCs include increased flexibility, and the fact that outside review, while feasible in localized areas with a small amount of research, would not be practical in the United States. A broader perspective on the inside/outside issue might ask whether the review

process should be carried out primarily by those inside the research community, or primarily by ordinary citizens who do not themselves carry out research. In most review systems today, including the U.S. system, the majority of decision-makers (on a typical IACUC, the proportion may be six or eight to one) are people who themselves are or have been engaged in animal research.

Lilly-Marlene Russow

INSTITUTIONAL ANIMAL CARE AND USE COMMITTEES: NONAFFILIATED MEMBERS

Laws stipulate that Institutional Animal Care and Use Committees (IACUCs) should include a person or persons who are not affiliated with the research facility, to represent the concerns of the community about animal care and use. These members are referred to as non-affiliated members (NAM).

NAMs review research proposals submitted to the IACUC and participate in meetings of the committee. Questions about the proposals can be raised, and the researcher has the opportunity to answer these questions. While some committees require unanimous approval for passage of a proposal, most committees require a simple majority vote. Thus, in most research facilities, a NAM cannot block a proposal.

Only anecdotal information is available concerning the views of individuals being selected as NAMs. Nonetheless, Barbara Orlans states that individuals who are selected are typically not known within their communities as animal advocates. In fact, people with possible biases, for example, practicing scientists or staff of pro-vivisectionist organizations, have reportedly sat on these committees.

Levin and Stephens have proposed that NAMs should be community members known for their advocacy of animal protection. They propose that these people should be neither mouthpieces for the facility nor spies for local activists. Rather, they should be advocates for the research animals operating within an imperfect oversight mechanism.

Understandably, some feel uncomfortable if the NAM is or was a practicing scientist, for they believe that such a person cannot be an advocate for the animals. However, this issue should be resolvable if NAMs are chosen after careful deliberation. In fact, as we learn more about the effectiveness of NAMs in the past, for example, background and records, we will be able to make recommendations for the future. People of all views should be represented in these deliberations.

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Marjorie Bekoff

INSTITUTIONAL ANIMAL CARE AND USE COMMITTEES (IACUCs): REGULATORY REQUIREMENTS

Since 1985, U. S. regulatory agencies have required most institutions and facilities involved in animal research to establish Institutional Animal Care and Use Committees (IACUCs). These committees are responsible for reviewing animal research proposals, inspecting animal housing and laboratory areas, and monitoring programs related to scientific uses of animals.

The two major U.S. regulatory systems governing laboratory animal use, the Animal Welfare Act, and the Public Health Service Policy on Humane Care and Use of Laboratory Animals, require IACUCs. Both systems have similar requirements for IACUC membership, duties, and authority.

Committees must have at least three members. At least one doctor of veterinary medicine must serve on the committee. In addition, at least one person on the committee must have no other affiliation with the research institution. According to the Animal Welfare Act, this person should "provide representation for general community interests in the proper care and treatment of animals." Before a research project involving animals can go forward, it must be reviewed by the IACUC. The Animal Welfare Act and the Public Health Service Policy direct committees to ensure that laboratory animal pain, discomfort, and distress are reduced through the use of anesthetics, analgesics, tranquilizers, and humane killing methods. Committees must also determine that no scientifically acceptable alternatives to painful or distressing procedures on animals are available. Committees must consider whether a scientist has chosen an appropriate species and number of animals for the project as well. Finally, committees are to apply the following principle: "procedures involving animals should be designed and performed with due consideration of their relevance to human or animal health, the advancement of knowledge, or the good of society."

There are advantages and disadvantages of IACUCs. The federal government has often adopted a system of institutional committee oversight to address ethical issues in research. Institutional committees were first adopted in the 1970s as a means of monitoring research involving human subjects. Institutional committees are also used to address problems involving scientific misconduct and financial conflicts of interest affecting researchers.

Committee oversight systems reduce government expenses by assigning most of the monitoring responsibilities to research institutions, rather than to government officials. Researchers are also more likely to respect and cooperate with a committee of their colleagues than with a group of government outsiders.

Although committees must comply with certain general rules, they have a great deal of flexibility and freedom to tailor the rules to their specific institution's situation. The committee's mixed membership is intended to allow diverse values to shape ethical decision making. The hope is that this approach will produce reasonable positions on a variety of controversial bioethical issues.

Yet the committee system has its critics as well. Institutions bear financial and other burdens of administering the

oversight system; faculty and staff must put aside their other duties to serve on the committees. Because the federal rules are somewhat general, different individual committees can reach different decisions on proposed research. For example, an experiment found unacceptable by one institutional committee could be labeled acceptable by a committee in a different institution.

Animal advocates also question whether the inclusion of one public member can prevent the scientific viewpoint from dominating in IACUC deliberations. They argue that committees would be more effective if one member were assigned to represent the interests of animals against pro-research interests. Thus far, however, these advocates have not persuaded Congress to revise the rules governing IACUCs.

Committees also face challenges in developing an effective approach to working with the scientists whose projects they evaluate, and in establishing meaningful programs for training on humane approaches to animal care and experimentation. They must also develop a defensible approach to recruiting and selecting new committee members, particularly the persons chosen from outside the institution.

Many of the issues facing IACUCs reflect general uncertainty over the appropriate use of animals in science. Persons favoring the elimination of or drastic reduction in laboratory animal use are unlikely to see IACUCs as providing meaningful oversight of animal research. On the other hand, persons who believe that scientists should have complete control over their experiments are likely to label IACUC activities an unjustified invasion of scientific freedom.

The IACUC system was designed to implement a third ethical perspective. This view is that animal research is ethical if conducted to advance important social goals, and if harm to laboratory animals is reduced to the minimum necessary to achieve those goals. IACUCs will continue to operate within this ethical framework unless advocates of another view successfully persuade Congress to alter the current regulatory approach.

Further Reading

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Rebecca Dresser

ISRAEL: ANIMAL PROTECTION

While enormous progress has been made in the Western world in raising awareness about the human-animal bond and its importance to human and nonhuman species alike, in other countries this work has just begun. When Concern for Helping Animals in Israel (CHAI), www.chai-online.org, was founded in 1984, animal advocacy in Israel barely existed. There was no Animal Protection Law, no veterinary school, and only two very small animal shelters able to do little to promote spaying and neutering. Animal overpopulation control consisted exclusively of mass poisoning of cats and dogs using slow-acting, painful poisons such as strychnine and alpha chlorolose. Abused

work animals were a common sight, and humane education was unknown.

For more than two decades, CHAI's desire to raise consciousness in teachers, veterinarians, and government officials, as well as in the general public, about the need to help animals has motivated their efforts and projects. CHAI's mission is to prevent and relieve animal suffering in Israel and to elevate consciousness about animals through education. Its projects foster empathy, respect, and responsibility toward all living beings, and inspire and empower Jews, Arabs, and Christians alike to recognize the interconnectedness of all living beings and to make compassionate choices for the good of all.

For the first two decades, CHAI participated in the process of drafting Israel's first Animal Protection Law. It provided funds, veterinary supplies, and equipment, including the first animal ambulance, to help start shelters in areas where there were none and to assist existing shelters; promoted spaying and neutering, and sent the first mobile spay/neuter clinic in the Middle East to Israel; successfully pressed veterinary services to switch to the use of humane oral rabies vaccine to replace mass strychnine poisonings; co-sponsored educational projects, including a Jewish/Arab program, and national and international educational conferences with Israel's Ministry of Education, on topics such as the connection between violence toward people and animals and integrating humane education in the classroom; co-sponsored, with Israel's Ministries of Agriculture, Health, and the Environment, training in animal shelter management and humane overpopulation control for municipal and shelter vets; and successfully campaigned to end various cruelties, including the Army's use of dogs as live bombs.

Today, CHAI works through its sister charity in Israel, Hakol Chai (Everything Lives), founded in 2001. To prevent and reduce the overpopulation that results in so much suffering, CHAI/Hakol Chai's state-of-the-art mobile spay/neuter clinic provides low-cost operations and education on responsible animal care throughout the country. During the evacuation of settlements in Gaza and the West Bank, the clinic's professional veterinary staff and volunteers played a major role in rescuing and finding new homes for companion and farm animals abandoned in the territories.

The organization has also rescued and rehabilitated abused horses, actively promotes legislation to prevent their abuse, and is raising funds to construct a horse/donkey sanctuary. CHAI campaigns against specific cruelties, including filing an appeal with Israel's Supreme Court to prevent gambling on horse racing from gaining a foothold there. CHAI's Alternatives Fund offers grants to promote alternatives to the use of animals in laboratories.

All CHAI/Hakol Chai's projects have an educational component, as these organizations believe planting seeds of respect, empathy, and responsibility in future generations is essential for positive change. CHAI/Hakol Chai created educational materials and videos for secular, as well as Jewish schools, and provides education on animal-related issues in schools and community centers. Only when the importance of the human-animal bond is understood worldwide will all living beings share a compassionate planet.

Further Reading

Concern for Helping Animals in Israel (CHAI): www.chai-online.org, www.hakolchai.org.il.

Nina Natelson

K

KENYA: CONSERVATION AND ETHICS

On a continent where the struggle for survival for most people is stark, there is a tendency to forget that the welfare of animals is intricately linked to the welfare of people. More often than not, development activities carried out by local people and governments, as well as international development partners, tend to overlook this basic fact.

Kenya, for example, has a variety of animals ranging from farm, to working, companion, and free-ranging wildlife. It is a wonderful diversity, yet the animals are more often than not poorly treated. A number of animals such as dogs, cats, donkeys, cows, sheep, and goats are not properly cared for by their owners. Wild animals, however, face the greatest danger, mainly from poaching, snaring, and encroachment on their natural habitat. The explanation for their welfare status could be well captured through the recognized five animal freedoms approach.

Almost two-thirds of Kenya is classified as Arid/Semi Arid Land (ASAL) area. These areas experience long spells of dry seasons, meaning no rains and therefore insufficient water and pasture. Ironically, most pastoral communities, that is, the Turkana, Pokot, Samburu, Masai, and several other communities in the northeastern province inhabit these ASAL-classified areas. As pastoralists, the inhabitants' economic mainstay is livestock farming. The animals rarely feed to their full stomachs, and rarely quench their thirst even after moving long distances in search of these two precious commodities.

In 2006, hundreds of head of livestock succumbed to famine as dry spells ravaged the ASAL regions. The camel is understood to be the most enduring animal in the desert but, just to underline the hardship the animals face, several of them died. In other parts of the country, livestock did not suffer much, but dogs bear the brunt of hunger. In the recent past, stray dogs and cats have increased, especially in urban centers. Their owners no longer take care of them; therefore, they have to scavenge for and fight over the remnants of bones around slaughterhouses and dumping sites. They lack access to clean water, so they drink stagnant water during rainfall, and from sewers during dry seasons, or simply burn with thirst. Africa Network for Animal Welfare, together with its partners the Department of Veterinary Services, Worldwide Veterinary Service, University of Nairobi, and Kenya Veterinary Association, held a dog population and rabies control program for six days in September 2008, vaccinating a total of 1,384 animals, and spaying and neutering 152 cats and dogs in Nairobi's informal

settlement areas. During that time, the team observed many stray dogs.

On the other hand, there is ample widespread and concrete evidence that many countries on the continent are losing numerous wild animals to people who snare them for the commercial bushmeat trade. And though wildlife in countries like Kenya and elsewhere in Africa face many threats, killing wildlife for bushmeat is probably one of the most potent. If unchecked, this might reverse all the gains made by conservationists over the years.

There are many ways by which hapless wild animals meet their deaths. However, poaching and snaring are the two most potent ways. and this has been going on not just away from protected areas, but also in parks and sanctuaries that are protected by armed rangers. The scale at which animals are been snared for meat is quite worrisome. For instance, during a desnaring project that took place between July 23 and August 6, 2008, a desnaring team was able to remove and destroy 156 snares in addition to arresting two poachers, one with a giraffe carcass and the other with poaching tools. They ended up getting jail sentences of five and two years respectively.

In many cases, animals are trapped using wire snares. Powerful torches and the blowing of horns are used to blind, confuse, then kill the animals on dark nights. There are different types of snares. Wire snares of different strengths, ranging from simple telephone wires, to tow ropes and unbreakable winch and break cables which are tied to trees, and others that are timed to trigger in the event that an animal steps on them. This results in the animal hanging up in the air, which makes it easy for the poacher to land a deathblow. Then there are the wire snares that are tied to tree stumps and placed on plastic sheet that is itself placed expertly on top of a dung hole. Once the animal unknowingly steps on the plastic sheet, its foot pierces a hole in it, essentially making it difficulty for the snare to slip out. As the animal pulls in an attempt to free itself, the noose tightens, making it impossible for the animal to escape.

Death might be the ultimate price animals end up paying under the hands of poachers, but in many cases, the targeted animal might end up escaping with the snare either hanging from its neck, or piercing different parts of its body. This often results in extensive suffering for the animal which, more often than not, might develop a gangrenous, pus-oozing wound around its neck and finally die after days of intense pain. Snares are also indiscriminate, and oftentimes catch non-target animals such as elephants, who although they may break away, die later due to deep wounds resulting from wire cuts.

In Kenya, poaching is an illegal activity punishable by jail sentences and/or fines. However, poaching is not the only threat affecting the survival of animals, and particularly wild animals. Owing to the rise in human population, which translates into an increase in demand for land, water, shelter, and other environmental services, animals in Kenya and elsewhere in Africa have lost, and continue to lose, much of the habitat that has sustained them since time immemorial. The critical issue here is the fact that tens of millions of people have continued to rely directly on such environmental goods as forests for timber and charcoal, salt licks, and water in animal habitats, and even pastures that wild herbivores depend on. In essence, this has continued to deplete the lands that the animals use for procreation,

feeding, and general survival, as well as the water catchment areas so crucial for the country's river systems.

With increasing population, there is pressure for more land for human settlement and other economic activities such as farming. The glaring effect is currently being felt around Lake Naivasha in Kenya, where horticultural farming has taken root. Due to high water demands, the flower farmers have fenced off the lake, barring wild animals from accessing the fresh water body. More perturbing is that the lake is highly polluted, and several studies in the area have documented many deaths of both wild and domestic animals that drink the water. Marine species such as hippos, for example, have declined by more than 25 percent, according to Food & Water Watch report (Food & Water Watch, 2008, p. 2).There were 1,500 hippos in 2004 and 1,100 in 2006.

Kenya's pastoral communities mostly survive on animal blood, meat and milk. The cows are pricked by sharp spears on the neck to draw blood, causing untold pain. They are severely injured and left weak, since this is done on weekly basis. Some communities such as the Masai use clubs with which they knock the animal on the head until it dies, while the Turkana spear the animal's heart through the ribs. These are very inhumane ways of killing animals for food. In slaughterhouses, animals witness the slaughter of others while they wait in a line for the same. These animals are also inhumanely slaughtered.

The Africa Network for Animal Welfare and its partners produced an

Rangers stack elephant ivory at the Kenya Wildlife Headquarters. (AP Photo/Khalil Senosi)

emergency response to displaced animals in 2008 in Rift Valley province, following post-election violence in Kenya, where the group vaccinated, dewormed and treated a total of 10,439 farm, working, and companion animals belonging to the Internally Displaced Persons, who had lost virtually everything they owned except the few animals the lucky ones had left. The team also came across dry cattle dips, which left the animals to the mercies of tick-borne diseases. Dogs have notably suffered the most. The government has been employing very inhumane and brutal means of controlling the stray dog population. They are baited and poisoned using strychnine poison, thus dying an agonizing death. Donkeys and camels are the mode of transport especially in ASAL areas. Despite ravaging famine at times, they are overloaded with household goods and building materials as the pastoralists move around in such of pasture and water.

The transportation of livestock and poultry destined for slaughter is seriously wanting. Kenya has only one meat processing plant in Athi River while most of the animals slaughtered are from pastoralist communities averaging 400km (approximately 250 miles) from the meat processing plant. The animals are cruelly stuffed into lorries during transportation. On the other hand, poultry farmers stuff their chicken in crates, as well as tying their legs and loading them onto the carriers of public service vehicles to drive them to urban centers for sale to consumers. By the time they get to the market, most of them are featherless or have broken limbs due to congestion and heavy winds atop the vehicle. In the villages, oxen and donkeys are whipped to force them pull heavy loads as well as perform strenuous jobs like plowing. They end up with wounds on their necks and severe injuries on their backs.

The soaring human population is negatively affecting animals, as space becomes more limited for both wild and domestic animals. Animals, especially young ones, naturally need to run around as well as play. Migration corridors for wildlife have been interfered with or encroached on, locking the wildlife in one area. Currently there is frequent human wildlife conflict as the animals, especially elephants, leopards, and lions stray past their natural habitat due to very limited space in the game reserves and national parks. Farming in forests has also interfered with the jungle lifestyle, as the forest grounds are cleared and natural feedstuff for primates such as baboons and monkeys are uprooted.

In a nutshell, there is a need for policies and legislation that safeguard the welfare of animals. These need to be enacted and implemented. There is also a need for humane education geared towards valuing and appreciating animals as the sentient beings they are. Indeed we appreciate what we love, we love what we understand, and we understand what we are taught.

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Josphat Ngonyo Kisui

KROGH PRINCIPLE

The Krogh principle is one of the guiding principles of animal investigations. In a lecture delivered in 1929, Danish

physiologist August Krogh (1874–1949) said: "For a large number of problems there will be some animal of choice, or a few such animals, on which it can be most conveniently studied" (quoted in Krebs, 1975, p. 221). While there is no nonhuman animal upon which all problems can be conveniently studied, for most problems there exists a convenient animal model.

Animal researchers have generally adopted the Krogh principle. They seek out species whose members have, for any problem of interest, anatomical structures of useful size or arrangement, or physiological and biochemical processes that make it easy to conduct their experiment. This principle is primarily applicable in the context of basic research. It is less clear how it is to be applied in the context of applied research, especially where the aim is to make predictions about humans. Even if an animal provides a convenient subject, we cannot automatically assume that the findings in such an animal will be applicable to humans. This problem is especially acute in the context of risk assessment, for example, predictive toxicology and teratology. Moreover, many nonhuman primates, our close phylogenic relatives, have not proven uniformly useful as predictors for human disease or genetic disorders. So there are substantial risks involved in using them as substitutes for humans. The Krogh principle, although perhaps useful as a methodological guide to basic animal research, is less useful in applied, predictive contexts.

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Hugh LaFollette and Niall Shanks

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LABORATORY ANIMAL USE—SACRIFICE

Different language is used to refer to the killing of different categories of animals. Companion animals are euthanized, farm animals are slaughtered, and research animals are sacrificed. Unlike the first two terms, however, use of the term sacrifice has been particularly controversial.

Spokespersons from the scientific community have called upon its members not to use the term sacrifice because it is unnecessary, too regularly used, and meaningless, and because it has religious and unscientific connotations. In recent years there has been a serious effort to delete the term from biological journals and grant proposals as part of a trend in this century to remove subjectivity and personalization from science. Some individuals critical of animal experimentation have also challenged its use because it makes it easier for researchers to kill animals and glorifies a practice that, in their opinion, should be seriously questioned if not stopped.

Despite official efforts to ban the term, it can still be overheard in the laboratory conversations of scientists and technicians as well as in the presentations of scientific papers at professional meetings. Direct observation of scientists and technicians has led sociologists to conclude that sacrifice is not used in the religious sense, but rather in a broader sacred sense within the scientific community. According to sociologists, sacrifice means more than simply killing laboratory specimens; it is part of a sequence of procedures that transforms animals into tools having a clear and valuable place in laboratories. Although sociologists agree that this transformation enables researchers to use animals in experiments, they disagree about the processes that create this transformation.

On the one hand, Michael Lynch argues that the transformation entails a single social process where the naturalistic animal found in nature is redefined as an analytic object signifying data and having only research value. The animal's death has meaning only to the extent that it assists research. On the other hand, Arnold Arluke maintains that the transformation involves two opposing social processes. Like Lynch, Arluke argues that laboratory animal sacrifice involves the stripping away of the everyday or nonscientific identity of animals so that they can be regarded as instruments or data. Arluke also contends that sacrifice involves a process of identification with lab animals. Some researchers, especially those who have routine contact with nonhuman primates or domestic animals, attribute human qualities to them. For these researchers, the animal's death has personal meaning. The concept of sacrifice embraces both of these tendencies by acknowledging the simultaneous

distancing from and identification with laboratory animals that occur in research settings.

Rather than getting rid of the term sacrifice, the metaphor can be institutionalized by creating and openly acknowledging group rituals commemorating the death of laboratory animals. Rituals link individuals and culture by pulling together, in a personally meaningful way, the paradoxes of existence into something sensible, and the fragmentation of reality into something whole.

See also Euthanasia

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Arnold Arluke

LABORATORY ANIMAL WELFARE

Millions of animals are used in laboratories around the world. Scientists may use animals to test toxic chemicals or to develop new surgery techniques. They may cause cancers and infections in animals to study them and develop cures. They may kill the animals to collect tissues and study their cells. Despite the death and pain that these acts can bring, there are ways to limit animal suffering in the laboratory.

The principle that underlies most regulation of laboratory animal use is that it can be justifiable to harm animals for science, but that pain and distress must be limited to that which is unavoidable to accomplish the scientific goal.

England led the way, with its 1868 Animals Act, in placing some government restrictions on how animals are used. Since then, other countries and jurisdictions have enacted laws. Along with these laws and regulations, scientists and veterinarians have developed standards for self-regulation of animal use over the years.

In the United States, the first national law was the Laboratory Animal Welfare Act of 1966. In 1966, Congress sought to regulate some peripheral aspects of laboratory animal welfare without actually interfering with how scientific experiments were performed. The law dictated how animals, especially dogs and cats, may be obtained for research, and how a dog vendor or a laboratory must document that they were not trafficking in stolen animals. The law specified how animals should be housed in a laboratory, and created a team of inspectors in the U.S. Department of Agriculture (USDA) to visit laboratories. The law also required that adequate veterinary care be provided for laboratory animals. But the law stopped its coverage as soon as the animal left the animal housing area and went down the hall into the laboratory.

The Laboratory Animal Welfare Act regulated animal care but not animal use, with some curious results. Although inspectors scrupulously enforced any departure from strict hygiene that might

result in animal infections, no welfare rules covered intentionally infecting animals as part of an experiment. Though the law required veterinary care of animals, scientists had no oversight in conducting experiments that might intentionally make an animal sick.

This exclusion of laboratory practices from laboratory animal welfare laws was not a stable arrangement and it did not stand. The U.S. Congress has amended the Laboratory Animal Welfare Act (now called simply the Animal Welfare Act) several times. They expanded the requirement for adequate veterinary care, adding the use of painkillers and anesthetics for many experiments, with a veterinarian, not the scientist, prescribing the pain medications. Similarly, they expanded the regulations about housing animals, to include providing exercise for caged dogs and psychological wellbeing programs for caged monkeys and apes.

The most important innovation in the regulation of laboratory animal welfare has been the requirement that most institutions that conduct experiments on animals have some sort of animal care and use committee that reviews every planned use of animals. These Institutional Animal Care and Use Committees (IACUC) have been required in most American laboratories since 1986, and many other countries require similar committees. A scientist who wishes to use animals must apply to the committee for approval. She or he must describe why animals are necessary, must consult with a veterinarian on pain management and anesthesia, must describe the qualifications of everyone who will work with the animals and, in general, must assure that everything is being done to minimize animal pain and distress to that which is unavoidable. She or he must document a search for alternatives to the painful use of animals. The IACUC must also have a system in place that allows concerned individuals and whistleblowers to anonymously report their concerns about animal care and use.

Animal pain and distress are the overriding focus of animal welfare policies. One framework for reducing pain and distress is to think in terms of the Three Rs of alternatives: replace, reduce, and refine. Replacement alternatives are conceptually the most straightforward: researchers must find ways to generate research data without using sentient animals at all. Candidates for consideration include studying cells in tissue culture (in vitro techniques), developing computer simulations, making better use of human epidemiological data and human volunteers, or using inanimate models in teaching. Reduction is just what it sounds like—efforts to lower the numbers of animals used. This often means rethinking statistical tests and using just the number necessary for statistically valid results. Refinement alternatives are the most varied, because they comprise all the myriad ways to rethink animal care and use to reduce the potential for pain or distress. Refinements can include more aggressive use of painkillers, using noninvasive techniques such as X-rays instead of invasive dissections or surgeries to see inside the animal's body, or housing animals in compatible groups instead of all alone in steel cages.

Scientists are not barred from causing pain and disease in animals. There are some studies where this is unavoidable. Many studies of cancer, for example, call for inducing cancer in the test animals. Developing a new painkiller for human use often involves causing pain to animals to see if the new medication is effective. The job of the scientists, the veterinarian,

and the committee is to limit the pain and illness. If the project is studying cancer prevention or biological processes that happen early in cancer, then there may be no reason to allow animals to progress to advanced disease. Thus, the scientist and the committee refine their experimental endpoints, either treating the cancer at its first appearance, or humanely euthanizing the animals. In studies of pain and the development of painkillers, the scientist may mostly use pain stimuli that are mild and that the animal can opt to end. For example, a scientist may time how long a rat who has received a particular painkiller will tolerate having her foot on a hot plate before she withdraws it on her own.

Critics of current animal welfare regulation raise several issues. For one, scientists are still allowed to hurt and kill animals, even though they should try to minimize any suffering. Second, in the American system, some animals are not covered by the regulations. The Animal Welfare Act only covers warm-blooded animals and, even at that, excludes mice and rats, overwhelmingly the most numerous mammals in laboratories. Another law (the Health Research Extension Act of 1985) covers all vertebrate animals if they are involved in projects or on campuses that receive federal research grants. This leaves the potential that animals at private companies and small schools that receive no federal grants may not have government oversight at all. Invertebrate animals, even sensitive species such as octopuses, are not covered by American laws at all.

Another criticism of the current system is that IACUCs are a form of self-regulation, and that this has the potential for abuse. Scientists on the committee assess the work of their peers, coworkers, and department-mates. To limit the potential for abuse, the laws require that a public or unaffiliated member or members be appointed to the committee. USDA inspectors review the work of the IACUC during their inspections, and institutions and their IACUC report annually to the USDA and to the National Institutes of Health's Office of Laboratory Animal Welfare, which enforces the Health Research Extension Act. Additionally, many institutions voluntarily seek to have their animal facilities and their IACUC program accredited by the Association for the Assessment and Accreditation of Laboratory Animal Care International, with its teams of scientists and veterinarians who conduct site visits. Still, self-regulation, with its strengths and weaknesses, remains the core of welfare oversight for the majority of laboratory animals.

Working in the animals' favor is the realization that to a great extent good science and good animal care are intertwined. Though animals may get ill or may suffer during the course of an experiment, the vast majority of experiments require that animals enter the study in uniformly good health and that pain and distress are minimized throughout. If animals are carrying various infections as they start an experiment, the scientist may never know whether she or he is seeing the results of the experiment or simply the results of the illness. If animals are stressed during an experiment, their biology is affected, and again, interpretation of data is muddied. Although it is best that scientists feel a moral responsibility to treat their animals well, there is also self-interest in keeping their animals free of disease and distress. To this end, the Institute of Laboratory Animal Resources published its *Guide for the Care and Use*

of Laboratory Animals, a combination of ethical standards and expert guidance on ways to minimize pain and distress.

Ultimately, no law and no committee can see everything everywhere at all times, and so the personal, ethical responsibility of the scientists, veterinarians, and students working with animals is the main determinant of animal welfare.

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Larry Carbone

LAW AND ANIMALS

Until the 19th century, at least as far as the Western tradition is concerned, nonhumans were excluded completely from the moral and legal community. Humans could use animals for whatever purpose we wanted and inflict pain and suffering on them pursuant to those uses without violating any obligations we owed to them. That is, nonhumans were regarded as things that were indistinguishable from inanimate objects, and toward which we thus could have no moral or legal obligations.

To the extent that the cruel treatment of animals was thought to raise a moral issue, it was only because of a concern that humans who abused animals were more likely to ill-treat other humans. The moral obligation concerned animals, but was really owed to other humans. Similarly, to the extent that the law provided any protection for animals, that protection was almost exclusively incidental to the animal being the property of another. Judicial condemnation of animal cruelty, with rare exception, reflected the moral concern that gratuitous cruelty to animals would translate into cruelty to other humans, or that acts of cruelty to animals might offend public decency and cause a breach of the peace.

This exclusion of animals from the moral community and denial of direct legal protection was justified on the ground that nonhumans were the spiritual inferiors of humans, were not made in God's image, and lacked a soul, or on the ground that animals were natural inferiors and lacked certain cognitive characteristics thought to be uniquely human, such as the ability to use symbolic communication or abstract concepts, or engage in reasoning or reciprocal moral relationships, or some combination of spiritual or natural inferiority. The paradigm ostensibly shifted in the 19th century as social progressives, many of whom also opposed human slavery and supported greater equality for women, maintained that any differences between humans and nonhumans did not serve to justify the treatment of animals as things. For example, moral philosopher and legal reformer Jeremy Bentham (1748–1832) maintained that animals had been degraded into the

class of things, and he observed that although animals shared the characteristics regarded as unique to humans to some degree and that, in any event, the absence of these characteristics did not grant humans a license to treat animals in any way that they wished. As Bentham put it, "The question is not, Can they reason? nor, Can they talk? but, Can they suffer?"

As a direct result of the influence and efforts of Bentham and other reformers, the legal systems of Great Britain, the United States, and other nations enacted animal welfare laws that purported to provide legal protection for animals. These laws were of two kinds: general and specific. General animal welfare laws, such as anticruelty laws, prohibit cruelty or the infliction of unnecessary or unjustified suffering, or require the humane treatment of animal, without regard to particular use. Specific animal welfare laws purport to require the protection of animal interests in particular contexts, such as the use of animals in experiments or the slaughter of animals for food.

The emergence of animal welfare laws recognized that humans owed legal obligations to animals. This is not to say that these laws did not also reflect the concern that the cruel treatment of animals would have the effect of making humans treat one another badly. But it is also clear that, for the first time, animals were seen not merely as things, but as members of the moral community who were inherently deserving of some legal protection. Anticruelty laws are often explicit in applying to all animals, whether owned or unowned.

Animal welfare laws are based on the principle that animals are morally inferior to humans and that it is acceptable for humans to use animals for human purposes as long as any pain or suffering the animal incurs are considered necessary and the treatment is regarded as humane. It is often suggested that the animal welfare approach requires that we balance the interests of animals against our interests as humans in order to determine whether animal suffering is necessary. To balance interests means to assess the relative strengths of conflicting interests. If the benefits that will accrue to humans from using animals outweigh the animal interest in not suffering, then our interests prevail, and the animal suffering is regarded as necessary. If no justifiable human interests are at stake, then the infliction of suffering on animals must be regarded as unnecessary.

Many animal welfare laws, such as anticruelty statutes, are criminal laws. For the most part, only those moral rules that are widely accepted, such as prohibitions against killing other humans, inflicting physical harm on them, or taking or destroying their property, are enshrined in criminal laws. That many animal welfare laws are criminal laws suggests that we take animal interests seriously enough to punish violations of the humane treatment principle with the social stigma of a criminal penalty.

Although the emergence of animal welfare laws ostensibly represented a dramatic departure from the view that animals are merely things, the laws that were enacted in Britain, the United States, and other nations have, for the most part, failed to provide any significant level of protection for animal interests. Animals are property; they are economic commodities that have no value except that which we accord them. Under the law, the owner of an animal is entitled to exclusive physical possession of the animal, the use of the animal for economic and other gain, and the right to make

contracts with respect to the animal, or to use the animal as collateral for a loan. The owner is under a duty to ensure that her animal property does not harm other humans or their property, but she can sell or bequeath the animal, give the animal away, or have the animal taken from her as part of the execution of a legal judgment against her. She can also kill the animal. Wild animals are generally regarded as owned by the state and held in trust for the benefit of the people, but they can be made the property of particular humans through hunting, or by taming and confining them.

The property status of animals renders meaningless any balancing that is supposedly required under the humane treatment principle or animal welfare laws, because what we really balance are the interests of property owners against the interests of their animal property. It is, of course, absurd to suggest that we can balance human interests, which are protected by claims of right in general and of a right to own property in particular, against the interests of property, which exists only as a means to the ends of human property owners. Although we claim to recognize that we may prefer animal interests over human interests only when there is a conflict of interests, there is always a conflict between the interests of property owners who want to use their property and the interests of their animal property. The human property interest will almost always prevail. The animal in question is always a pet or a laboratory animal, or a game animal, or a food animal, or a rodeo animal, or some other form of animal property that exists solely for our use and has no value except that which we give it. There is really no choice to be made between the human and the animal interest, because the choice has already been predetermined by the property status of the animal. The suffering of property owners who cannot use their property as they wish counts more than animal suffering.

There are several specific ways in which the property status of animals renders animal welfare laws ineffective. First, it costs money to protect animal interests. We generally spend money to protect animal interests only when it is justified as an economic matter; that is, only when we derive an economic benefit from doing so. In most cases, animal welfare laws are limited to practices that are economically inefficient. For example, in the United States, federal law requires large animals to be stunned before being shackled, hoisted, and butchered. But this requirement merely recognizes that if animals are not stunned, carcasses will be damaged and workers will be injured. As a general matter, animal welfare laws do little more than ensure that animal exploitation is economically efficient.

Second, many of these laws explicitly exempt most forms of institutionalized property use, which account for the largest number of animals that we use. The most frequent exemptions from state anticruelty statutes involve animal agriculture, the use of animals in scientific experiments, and hunting. In some cases, specific animal welfare statutes exempt certain species of animals widely used in the practice that is supposedly regulated.

Third, even if anticruelty statutes do not contain explicit exemptions, courts have effectively exempted our common uses of animals from scrutiny by interpreting these statutes as not prohibiting the infliction of even extreme suffering if it is incidental to an accepted use of animals and a customary practice on the part of animal owners. For example,

courts have consistently held that animals used for food may be mutilated in ways that unquestionably cause severe pain and suffering, and that would normally be regarded as cruel or even as torture. These practices are permitted, however, because animal agriculture is an accepted institutionalized animal use, and those in the meat industry regard these practices as normal and necessary to facilitate that use. Courts often presume that animal owners will act in their best economic interests and will not intentionally inflict more suffering than is necessary on an animal, because to do so would diminish the monetary value of the animal.

Fourth, anticruelty laws are generally criminal laws, and the state must prove beyond a reasonable doubt that a defendant engaged in an unlawful act with a culpable state of mind. The problem is that if a defendant is inflicting pain or suffering on an animal as part of an accepted institutionalized use of animals, it is difficult to prove that she acted with the requisite mental state to justify criminal liability.

Fifth, many animal welfare laws have inadequate penalty provisions, and we are reluctant, in any event, to impose the stigma of criminal liability on animal owners for what they do with their own property. Moreover, those without an ownership interest generally do not have the requisite interest, otherwise known as standing, to bring legal challenges to the use or treatment of animals by their owners.

In certain respects, the regulation of animal exploitation is similar to the regulation of human slavery in North America. Although many laws supposedly required the humane treatment of slaves and prohibited the infliction of unnecessary punishment, these laws offered almost no protection for slaves. In conflicts between slave owners and slaves, the latter almost always lost. Slave welfare laws, like animal welfare laws, generally required that slave owners merely act as rational property owners, but did not recognize the inherent value of the slaves. Slave owners were, of course, free to treat their slaves, or particular slaves, better. But as far as the law was concerned, slaves were merely economic commodities with only extrinsic or conditional value, and slave owners were essentially free to value the interests of their slaves as they chose, just as we are free to value the interests of our dogs and cats, and treat them as members of our families, or to abandon them at a shelter or have them killed because we no longer want them.

In recent years, animal lawyers have developed a practice that focuses on veterinary malpractice cases, pet trust cases, pet custody cases, and similar cases. These sorts of cases do not move animals away from the property paradigm; they enmesh them further into it.

See also Utilitarianism

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See also Animal Rights: The Abolitionist Approach, www.AbolitionistApproach.com

Gary L. Francione

LAW AND ANIMALS: AUSTRALIA

Over the last few decades, society's understanding of animals has changed enormously. While there is still a range of views about how animals should be treated, people everywhere are increasingly willing to accept that animals can have highly developed cognitive abilities and that they can experience a multitude of emotions. This increased awareness of the complexity of animals has led to a proliferation of animal welfare laws, which seek to regulate interactions between humans and animals. These laws exist in many Western nations, including Australia.

Australia is a large and diverse island continent situated in the Asia Pacific. It is a land of wide-ranging climates and terrains, which is home to some of the world's most unique and complex animals. While it is perhaps best known for its native animals such as the kangaroo, koala, platypus, and emu, Australia is also home to countless other native and introduced species. These include wild animals such as crocodiles, camels, buffalo, goats, rabbits, and domesticated animals such as pigs, chickens, cows, and sheep. Companion animals, such as dogs and cats, also play an important role in Australian society, with billions of dollars being spent annually to ensure the health and wellbeing of family pets.

As in most countries throughout the world, animals in Australia have no fundamental legal rights. They are considered to be the property of their owner and therefore cannot rely on the law to protect many of their basic needs and interests. In reality, because the law does not protect animals in a meaningful way, animal-based industries are free to use staggering numbers of animals for commercial gain. For example, each year in Australia:

- close to half a billion pigs, cows, sheep, and chickens are used for food and food production
- millions of animals, including rats, mice, birds, and guinea pigs are used for scientific research
- millions of kangaroos are killed for their meat, fur, and skin, because they are viewed by some members of the community as pests that compete with farming interests, and
- countless other introduced wild species such as foxes, rabbits, and wild dogs are shot and poisoned in the name of conservation

The use of animals in entertainment is also widespread, in sport and gaming events such as horse and greyhound racing, and in zoos, circuses, and rodeos.

Overview of Animal Law in Australia

Although animals in Australia do not have fundamental legal rights, a large number of laws have been enacted which claim to protect their health and wellbeing. These laws are based on the assumption that most animals are resources, and that some harm to them is justified in order to satisfy human wants and needs.

Australia has a federal political system with three tiers of government, federal, state, and local. Although there is no national animal welfare law, the federal government (Commonwealth) plays an important role in relation to the international wildlife trade and the live export of animals such as sheep, cattle, and goats, particularly as Australia is one of the

largest exporters of live animals in the world.

State and territory governments have enacted animal welfare laws which regulate most other aspects of animal use. Broadly speaking, these laws, which are also referred to as anticruelty or animal protection laws, apply to all animals. They protect companion animals against cruelty, and regulate the use of animals in educational and research institutions, in zoos and circuses, in food production, in the wild, and in urban and rural communities. Some issues that do not relate directly to animal welfare, such as responsible pet ownership and unwanted animals, are addressed in separate laws made by local government.

While the federal government is in the process of coordinating a national animal welfare strategy with a key aim of establishing nationally consistent animal welfare laws, at the present time there are still numerous inconsistencies in state and territory laws, both in relation to the treatment of animals and to law enforcement. Some examples of these inconsistencies are set out below.

- The definition of animal is not the same in all states and territories, as some laws exclude crustaceans, cephalopods, and fish. This means that although animals have the same capacity to experience pain and suffering irrespective of their geographical location, they are not protected by the same legal standards
- People who commit crimes against animals face different penalties, depending on the state or territory in which the act of cruelty takes place. This means that although society might agree that it is morally wrong to harm an animal, there can be substantial variation in the punishment given to animal cruelty offenders
- As a general rule, state and territory police, designated government agencies, and animal welfare organizations such as the Royal Society for the Prevention of Cruelty to Animals (RSPCA) are the main bodies that respond to complaints about animal abuse. Despite this, the resources that government allocates to enforcement varies, with some state and territory inspectorates expected to monitor the treatment of large numbers of animals, or animals situated over vast distances on comparatively smaller budgets
- Some states and territories give third parties, such as private individuals or animal rights groups, the power to start proceedings under animal welfare laws, while others have passed laws designed to limit third party involvement. This means that it is easier to take action against someone who has harmed an animal in some parts of Australia than in others
- Some activities involving animals are banned in some states and territories but permitted in others. The Australian Capital Territory, for example, has prohibited rodeos and the use of certain wild animals in circuses, whereas these events continue to take place in other states and territories

Despite the variations in state and territory animal welfare laws, it is possible to identify a number of common themes. These themes are also found in the laws

of many other industrialized countries. Some examples are set out below.

Animals as Property

First, as stated above, Australia's animal welfare laws have adopted the common law classification of animals as property. This is reflected in the wording of many acts and regulations, which define farm animals kept for economic gain as stock or livestock to be bought, traded, sold, and disposed of. Some laws and policies refer to animals kept for research or entertainment as specimens. This mirrors lawmakers' attitudes that animals are mere objects or resources, as opposed to living beings with complex needs and abilities. Until this way of viewing animals as property is changed, it seems likely that animals will never receive adequate legal protection.

Laws against Cruelty

Second, all of Australia's animal welfare laws prohibit acts of gratuitous or reckless cruelty, regardless of the commercial value of the animal. While much of today's society would consider this a basic ethical principle, these laws only came into effect in Australia in about the mid-19th century. Since that time, the definition of animal cruelty has been refined, and it varies between states and territories. Generally speaking, cruelty includes violent activities such as beating, mutilating, or torturing an animal. Some states and territories have introduced tougher punishments for people charged with aggravated cruelty, which are more serious acts resulting in the death, disabling, or serious deformity of an animal. The failure to provide food, water, shelter, and basic veterinary care is also generally seen as an act of cruelty.

Differential Treatment of Species and Implications for Farm Animals

Third, while Australia's animal welfare laws claim to apply to all animals, in practice many animals fall beyond the protective reach of the law. This happens because some animals, such as farm animals, are expressly excluded from legislative protection. In other words, certain acts which would constitute cruelty if performed on a dog or a cat are deemed acceptable if the victim is a farm animal. For example, both castrating a young piglet and dehorning a young calf without pain relief are considered defensible in the State of New South Wales.

Justifiable or Necessary Cruelty and the National Codes

As in other countries that have enacted animal welfare laws, animal suffering in Australia is considered lawful when it is judged to be necessary, reasonable, or justifiable. These words have no statutory definition, and are intended to be flexible in order to reflect changing community values. Since animals are classified as property, these words appear to have, by implication, sanctioned a range of practices that take an enormous physical and psychological toll on animals. This is particularly so when they are read in conjunction with the National Model Codes of Practice which underpin many state and territory laws.

The codes, which are primarily a joint initiative of Commonwealth, state and territory governments, set minimum standards for the treatment of animals from birth to slaughter in a range of

industries. While they are characterized as representing industry best practice, in reality they help justify many practices that would otherwise constitute acts of cruelty to animals, since compliance with a code generally provides protection against prosecution for cruelty. Examples include:

- The permanent confinement or factory farming of millions of pigs used to satisfy Australia's appetite for ham, bacon, and pork. These sensitive and intelligent animals are kept indoors for the duration of their life, confined in sheds with thousands of others of their kind, and denied the opportunity to exercise many of their natural behaviors. Their mothers, female pigs or sows used for breeding, are generally treated as piglet producing machines. Under Australia's current animal welfare laws and policies, they may be confined in pens known as sow stalls, in which they can barely take a step forward or backward, for the majority of their reproductive cycle. Once they stop producing, they are considered of little utility and, with no meaningful legal rights to assert, they are sent straight to the slaughterhouse
- The factory farming of millions of chickens or battery hens, bred specifically to lay eggs. Under the current regulatory framework, battery hens may spend their entire lives standing on sloping wire bars in cages with between four to 20 cage mates. At 216 in (550cm) their allocated area is less than a letter-sized piece of paper. Australia's current animal welfare laws do not give them the opportunity to perform many of their natural behaviors such as dust bathing, nesting, and foraging for food. They also do nothing to protect millions of male layer chicks who, since they cannot lay eggs, are generally considered waste products to be disposed of shortly after birth
- The carrying out of various procedures or mutilations on young animals, generally without pain relief. These procedures include the teeth clipping, castrating, and tail docking of piglets and the beak trimming (debeaking) or removal of one third of the beak of layer hens. These practices, which are carried out routinely in Australia's intensive or factory farming industries, would be considered acts of cruelty if they were carried out on companion animals, and would likely outrage a considerable proportion of the community.

Reform Efforts

In recent years, Australia's legal regime for the treatment of animals has come under increasing scrutiny from legal advocates for animals. This appears to be part of a broader international movement in animal protection law. The primary indicators of Australia's budding animal law movement include the increased availability of animal law as a course of study in universities, and the emergence of a community of legal academics and lawyers interested in debating and discussing present laws, and identifying potential areas for law reform.

Although law reform is not an overnight process, it seems likely that in the coming years legal advocates will challenge the many inconsistencies and inequities in Australia's regulatory framework

for animals. Such action is essential if the widespread injustices perpetrated against animals are to be addressed.

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Katrina Sharman

LAW AND ANIMALS: EUROPEAN UNION

Animals enjoy a sometimes high degree of esteem within European law. Historically speaking, legal animal protection began in Great Britain in 1822 with the passage of Martin's Act. Since then, laws on animal protection have spread their reach across Europe's breadth and width. A brief, and admittedly incomplete, survey confirms this and provides a springboard to consider legislation in certain European countries using a comparative approach.

Within the entire field of animal protection, animal welfare legislation plays an increasingly important role. In contrast to animal ethics, animal welfare law defines, with binding effect, how legal stakeholders should deal with animals with the help of the state. Animal protection law is characterized as legal means that protect animals from adverse effects upon their lives or wellbeing. This legislation can be divided into three categories. Animal welfare under private law regulates the proper classification of animals within

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legal relationships between private people. Criminal law covers the punishment of animal torturers, and people who have committed other acts contravening animal welfare provisions. Administrative law regulates the appropriate interaction between people and animals with the help of enforcement measures.

Legal animal welfare is a fundamental part of protecting animals, and provides a decisive weapon in ensuring that this protection is ensured every day. Animal welfare law in Europe is a mixture of primarily administrative law with some criminal law provisions.

Actual Animal Welfare Law

Animal welfare laws directly regulate interaction with animals, and usually apply to domestic animals (such as agricultural food-producing animals, pets, and sport animals), those used in experiments, and wild animals. To a greater or lesser degree, they prescribe, among other things, how animals should be kept, cared for, fed, stimulated, transported or slaughtered, and specify when a public license is required, for example, for animal experiments or to keep particularly difficult animals.

Animal protection in Slovenia and some German-speaking countries is regulated by the national constitution. The majority of European nations have their own animal protection acts that apply to the country as a whole, or in the very least have animal protection laws on a regional level, or through relevant provisions on a national level. States like Germany, Switzerland, Austria, Sweden, Norway, and the Netherlands have a comparatively advanced level of animal welfare.

Here is a glimpse into some regulated areas:

Germany

Just as in Switzerland, Germany has also had an animal welfare act applicable throughout the country for several decades. This underwent a thorough revision in 1998, and was amended in 2001 to include the keeping of dangerous dogs. German animal welfare received a decisive boost when the principle of animal welfare was incorporated into the country's constitution in 2002. The new article, Article 20a, stipulates that:

Mindful also of its responsibility toward future generations, the state shall protect the natural foundations of life and animals by legislation and, in accordance with law and justice, by executive and judicial action, all within the framework of the constitutional order.

Thus, animal protection, just as in Switzerland since 1973, is something that the state is supposed to legislate on, and is considered to be an extremely important community asset. This is a significant decision on the value of animal protection as far as constitutional law is concerned, which the lawmaker while legislating, as well as the administrative authorities and courts during the interpretation and application of the law, has to take into account. This new clause within a state's objectives does not, however, lead to protecting animals without limits, but it does mean that henceforth this consideration must be weighed with other constitutional provisions and cannot be avoided when it comes to the unfettered exercise of art, religion, science, or teaching. Rather, animal protection represents, in principle, a legal equivalent to basic human rights and, therefore, must be respected in cases involving artists or researchers, for example, who invoke their own en-

titlement to basic rights when it comes to using animals.

The act protects the animal as a fellow being (*Mitgeschöpf*) as far as its wellbeing and life is concerned. The killing of a mammal without reasonable grounds is punishable; the law applies to non-mammals, too. Under various sections of the law, certain animal groups or species enjoy varying degrees of protection.

The act consists of 13 subclauses and 22 paragraphs, some very comprehensive. These regulate the keeping and killing of animals, interference, animal experiments, and husbandry. Also included are implementation rules, punishments, and fines, as well as transition periods. Compared with other international laws, certain provisions of this act are very advanced.

Austria

Austria's current revised animal protection act and related regulations were put in force at the beginning of 2005, replacing nine federal edicts. This act's purpose is to ensure that the life of an animal is protected, and prohibits killing both mammals and non-mammals without reasonable grounds. Pain-inducing breeding is expressly forbidden, as well as the import, export, and transfer of animals with marks of such breeding, and the display of dogs and cats in pet shops. Effective from 2009, keeping hens in battery cages, as well as housing cattle, horses, and goats permanently in tie stalls, is prohibited. At least 90 days in the open air is required.

France

France has no unified national legislation in this area; animals and their legal status are protected through various local decrees. Animals are divided into two groups: domestic and wild. However, the definition of domestic animals is broad and includes those that live, eat, and reproduce under human supervision and care.

Animal torture is punishable under the penal code (Articles 521–1, 521–2). These provisions, which were revised at the beginning of 2002, set out, among other penalties, a prison sentence of up to two years or a fine of a maximum of €30,000, permit a prohibition order on keeping animals and is against the abandonment of animals. Also punishable is the unjustified, deliberate or negligent killing or injuring of a pet (Articles R653–1, R654–1, R655–1).

Switzerland

Swiss legislation has been totally revised in the past few years, culminating in the new federal animal welfare act and ordinance on September 1, 2008. The main reasons for the overhaul were the significant gaps in the old law, in particular in implementation, as well as the need to align animal protection law with new scientific findings in the area of human-animal relations. The goal of the revision was also to improve practical implementation and to create the necessary related instruments.

In addition to the protection of an animal's dignity (see below), the responsibility held by animal-keepers stands at the heart of the new legislation. Whoever interacts with animals has to be aware of the latter's needs and know how to look after them properly. Awareness of a responsible and respectful interaction with animals is to be achieved through better training and information.

The act is 160 pages long and contains 46 articles on interaction with animals: keeping, breeding, and genetically modifying, trade, transporting, interference, animal experiments, slaughter, research, administrative measures, and complaints from authorities, as well as criminal and transitional provisions.

Animal Welfare Law in the European Union

The 27 member states of the European Union, to which Switzerland does not belong, have their own body of law. The EU is primarily an economic community. Animal protection is not of significance per se and is not listed in the catalogue of community activities. Despite this, the EU is concerned with technical matters relevant to animal welfare, as these are often closely linked to economic and trade-policy issues. A series of animal protection measures that are applicable to all EU members is to be found within the framework of the EU's Common Agricultural Policy (CAP). Specific guidelines, directives and regulations cover the protection of agricultural food-producing animals, layer hens, calves, and pigs, and the transport of slaughter animals. Others cover animal welfare during experiments and the keeping of zoo animals.

The various guidelines are extended by further legal instruments in some cases, particularly in regard to animal transport and experiments. The guidelines set out minimal requirements within animal protection, leaving it to member states to legislate more stringently on a national level. This, however, rarely happens. Sometimes member states are prevented from adopting more strict measures on a national level because of EU law.

General provisions on animal torture, using animals at sporting or cultural events, and keeping domestic or wild animals, fall under the competence of the national legislator.

Animal Welfare Law and the Council of Europe

The Council of Europe, not to be confused with the EU's European Council, has five important European conventions on the protection of agricultural food-producing animals, transporting animals, slaughter animals, those destined for experiments, and pets. They generally lay down minimal standards for animal protection that are less strict than animal protection legislation in many countries, particularly in Western and Northern Europe. However, seen within the context of Europe as a whole, the conventions are purveyors of considerable advancement due to their systematic declarations of intent.

Further International Treaties and Norms

Alongside European legal provisions there also exist other international regulations that are relevant to protecting animals and species. These include the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the International Whaling Convention (IWC), and the global economic organization's OECD principles of Good Laboratory Practice (GLP), which aims for worldwide harmonization of testing methods in the field of chemical toxicology. The detailed Live Animals Regulations of the International Air Transport Association (IATA) apply to transporting animals by air. Also, the

World Organization for Animal Health (OIE) will in the future go beyond its current activities in battling animal diseases and into international animal welfare. Furthermore, discussions are taking place on whether import restrictions due to animal welfare considerations are permissible within the World Trade Organization's (WTO) framework. The areas affected include the international fur trade, a particularly controversial field from an ethical point of view, and the trade and transport of animals and animal products, the keeping of food-producing animals, ritual slaughter, and animal experiments.

Animal protection under private law Legal norms governing the classification of animals in legal relations between private persons, and the taking into account of animal interests using civil law, fall under private law.

Recent national regulations, such as German, Austrian, Swiss and French legislation, take into account the special legal standing of animals as being somewhere between objects and human beings as a norm for compensation. For example, in Switzerland, Germany, and Austria, adequate compensation and reasonable costs for veterinary care are to be paid in case of the injury or death of an animal. In France, a tenant may keep an animal on a rented property under certain conditions. In Swiss divorce cases since 2003, judges have been legally entitled to reassign pet ownership from one spouse to the other if the other person is a better pet keeper, even if he/she is not the owner. As far as lost and found pets are concerned in the UK, Austria, Italy, Spain, the Netherlands, Denmark, and Switzerland, there is a special delay until the finder of an animal becomes its owner. In Switzerland, a central office facilitates contact between the owner and the finder. In the UK, Germany, Austria, Switzerland, and Denmark, animals are protected from seizure if the owner is in debt. Although animals in Switzerland do not have legal rights, there are legal grounds for reinterpreting a last will in favor of an animal.

The new provisions are restricted mostly to the domestic arena and not to animals kept for business reasons, thus applying only to pets. This results in a change in their status as objects and is a step in the other direction.

Trends and the Future

Better Protecting the Needs of Animals The Swiss legislature attracted media attention in 2008 when it stated that animals belonging to social species should enjoy social contact with their own kind. This recognizes that an animal has a right to live its life well and in dignity, thus taking ethological studies into account.

Dignity of the Creature Traditionally speaking, animal welfare laws in Europe are aimed at protecting animals from unjustified pain, suffering, damage, and fear, and at preserving their lives. The basis for this concept is the capacity for suffering in animals. A fundamental development based on this took place in Switzerland in 1992, resulting in a worldwide first that resulted in animals' dignity being protected by the Swiss constitution. Swiss legislation on animal protection now states that the dignity of the creature must be respected when interacting with an animal. The animal's dignity is negatively affected if the animal is subjected in particular to pain, suffering, or injury, is made to feel fear or is subjugated, if its

appearance or its abilities are strongly interfered with, or if it is disproportionately instrumentalized. Sexual relations with animals, or zoophilia, are also classified as disrespecting dignity. This is now punishable on the grounds of animal protection and not just because of morality.

The Animal Attorney Animal protection law now contains certain structures to ensure better animal protection in administrative and criminal law. The many concerns that crop up during the implementation of animal protection law have often been criticized. New implementation measures and the involvement of representatives from the world of animal protection should provide assistance. In Austria, for example, animals have had legal standing in administrative procedures through the animal protection ombudsmen since 2005, as provided in the animal welfare act. The animal welfare ombudsman can also challenge in court decisions taken by federal-state authorities once s/he has examined the case files.

The Swiss canton of Zurich created the post of animal attorney in criminal cases in 1992; the third holder of this post is the author of this essay. The position is anchored in the Animal Welfare Act of Zurich, which states:

In criminal procedures referring to violation of provisions in the national animal-welfare legislation, the administration of the Canton and a lawyer appointed by the cantonal government at the suggestion of the animal-welfare organizations safeguard the interests of the injured party.

This lawyer has unfettered access to all case files, investigations, and court proceedings. He must be informed in full of all decisions and can appeal against them. The animal attorney stands by animals as an independent representative in criminal procedures against animal torture, and provides dynamic support to the criminal investigatory authorities in their efforts to better protect animals.

Thanks to the creation of legal institutions and terms such as the dignity of the creature, as well as the presence of an animal attorney in criminal matters, the debate on animal rights and alternatives has new wind in its sails now.

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LAW AND ANIMALS: UNITED STATES

During the 1960s, vivid press coverage both of the kidnapping of family pets that were then sold for research, and also of the conditions under which dog dealers who sold animals to research facilities kept these animals, aroused the public's fear of having their pets kidnapped and sold for research. Congress reacted to these concerns by passing the Laboratory Animal Welfare Act of 1966, which mainly licensed and regulated animal suppliers but did little to assure the wellbeing of animals used in research. By the 1970s, however, more substantive concerns about animal research had surfaced in society. Growing public suspicions and misgivings about animal research were solidified in the early 1980s, when a number of serious examples of animal abuse in research facilities were revealed, including instances at the University of Pennsylvania Head Injury Laboratory and the laboratory of Edward Taub, both situations which involved abuse, improper care, and neglect of nonhuman primates. By the mid-1980s, public confidence in the research community's ability to regulate itself in the area of animal care and use was sufficiently eroded to demand federal legislation.

In 1976, a group of Colorado citizens consisting of two laboratory animal veterinarians, a humane advocate and attorney, and a philosopher began proposing legislation that would enforce self-regulation by local animal care and use committees. These committees would review research projects before they began, in order to make sure that everything possible was being done to assure that animal pain, distress, and suffering were minimized. The committees would also assure that facilities were adequate, and that systems of care assured proper animal husbandry.

In 1985, despite vigorous opposition from certain portions of the research community, the key concepts proposed by the Colorado group were passed by Congress as components of two pieces of legislation. The first piece of legislation was passed as an amendment to the Laboratory Animal Welfare Act and was entitled the Improved Standards for Laboratory Animals Act. The second piece of legislation, complementing the first, was the Health Research Extension Act. The major provisos of the Laboratory Animal Welfare Act amendment were as follows:

1. Establishment of an institutional animal care and use committee (IACUC) whose members must include a veterinarian and a person not affiliated with the research facility
2. A directive to the U.S. Department of Agriculture (USDA), which enforces the law, to establish standards for exercise for dogs
3. Establishment of standards for a physical environment for primates that enhances their psychological wellbeing
4. Establishment of standards of adequate veterinary care, including use of anesthetics, analgesics, and tranquilizers

5. Prohibition of the use of paralytic drugs without anesthetics for surgical procedures
6. Proof that the investigator has considered alternatives to painful procedures
7. Prohibition of multiple surgeries except for scientific necessity
8. The IACUC must inspect facilities at least semiannually, review protocols, and file an inspection report detailing violations and deficiencies
9. The USDA was mandated to establish an animal welfare information service at the National Agricultural Library to provide information aimed at eliminating duplicative animal research, reducing or replacing animal use, minimizing animal pain and suffering, and training animal users
10. Each research institution must train animal users in the items enumerated in (9), and in any other ways of minimizing animal suffering
11. The USDA should effect a working relationship with the National Institutes of Health (NIH)

The Health Research Extension Act turned NIH guidelines for proper care and use of animals into law. NIH had long promoted reasonable guidelines for animal care but had had no mechanism for enforcing them. Violations could result in seizure of all federal money granted to an institution. Between the two laws, virtually all vertebrate animals used in research in the United States, with the exception of farm animals used in agricultural research, and rats and mice used in private industry research, are now legally covered. Many IACUCs apply the same standards to agricultural researchers vis-à-vis pain and suffering as they do to animals used in biomedical research. Researchers are becoming increasingly sophisticated about animal pain, suffering, and distress, and how to control them in the face of federal law that assumes the existence of animal pain, thought, and feeling. Many researchers now admit that minimization of pain and distress results in better data. Researchers are also gradually becoming aware of the ethical issues in animal research. Consequently, researchers are increasingly looking into housing systems that better take into account animals' psychological and biological needs. The NIH *Guide to the Care and Use of Laboratory Animals,* currently being revised, is the bible for judging laboratory animal programs. The 1996 version urged environmental enrichment for all species used in research.

While the USDA initially looked only at pain control, once the research community had adapted to the use of analgesics, the USDA announced that it would begin auditing control of distress as well. Distress is a catchall phrase for a variety of noxious experiences that may be undergone by research animals in addition to pain—fear, anxiety, social isolation, boredom, etc. These concerns may be alleviated pharmacologically or by environmental modification.

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M

MARGINAL CASES

The argument from marginal cases (AMC) has been one of the most powerful weapons in the contemporary debate about nonhuman animal rights. There are two basic versions of the AMC. The categorical version claims that so-called marginal humans, such as people with severe mental disabilities, have moral rights and concludes that nonhumans who are relevantly similar to these humans also have moral rights. The biconditional version maintains that the moral status of relevantly similar marginal humans and nonhumans is equivalent; the nonhumans have moral rights if and only if the humans have such rights. Several objections have been made to both versions of the AMC.

Some people are concerned that the argument is unfair to marginal humans. Many mentally disadvantaged humans are capable of speaking, going to school, learning trades, etc. These abilities are not possessed by any nonhuman animals, so far as we know. Defenders of the AMC can fully agree that many mentally disadvantaged humans are more capable than nonhuman animals. Nevertheless, quite a few severely damaged, sentient humans are far less capable than many nonhuman animals. Empirical evidence supports the contention that some humans and some nonhumans are roughly comparable in terms of their intellects, emotional capacities, and other capabilities. While some humans outstrip some nonhumans on this score, the reverse also appears to hold.

Another rather more serious charge of unfairness has been made against the AMC. Humans who become mentally incapacitated are unfortunate because they have been deprived of their personhood. Humans who are born with severe mental limitations are also unfortunate, one might argue, because they do not possess the potential to become normal members of their species. In contrast, the nonhumans used in laboratories and farms are likely to be normal members of their species. Thus there is a morally relevant difference between marginal humans and mentally and emotionally comparable nonhumans. Fairness dictates that we not add yet another huge burden to the unfortunate humans' lives. The normal nonhuman, then, rather than the marginal human, should be sacrificed to benefit persons. AMC supporters could respond as follows. The objection assumes that marginal humans are already morally significant. Only a morally significant being can be treated fairly or unfairly. But what makes them morally significant, in the context of the objection? It cannot be the misfortune itself, since this would make the objection circular. If it is the fact that they are capable of preferring pleasure to pain, this also holds for many nonhumans. Thus the latter would be morally significant

also. In the case of two obviously morally significant beings, for example, two human persons who are alike apart from the fact that one of them is missing a leg and the other has two, we would not consider it justified to steal from the human with two legs rather than the human with one leg, because the latter is already more burdened than the former. A choice that would be fair to both individuals is the refusal to sacrifice either.

Another approach to criticizing the AMC is to deny moral status to both marginal humans and sentient nonhumans, but deny that unacceptable consequences would follow in practice. A. V. Townsend, for example, has argued that many humans, incapable of personhood in the strict sense, do not have rights, as is the case for similarly limited sentient nonhumans. Thus he rejects the categorical version of the argument, while accepting its biconditional form. But he does claim that persons must treat these humans as if they have rights. Otherwise, when distinctions among humans are blurred, genuine rights holders are threatened; this allegedly does not hold for the case of nonhumans. Peter Carruthers has made essentially the same argument. Animal rights supporters can counter that this is a textbook example of the slippery slope fallacy; without further evidence, it is assumed that treating marginal humans as we now treat nonhuman animals would lead to denial of persons' rights. Indeed, history and anthropology offer several examples of societies whose members had no difficulty in distinguishing between marginal and typical humans. After all, humans excel in their discriminatory powers, even when the characteristics chosen as the basis of that discrimination are morally irrelevant (e.g., race or gender). According to the final, very serious objection made by Alan Holland, the AMC is at best a useless addition to the case constructed for nonhuman animal rights, and at worst an unexploded bomb that could take out many humans as well as nonhumans. The biconditional version of the AMC claims the moral equivalence of marginal humans and sentient nonhumans. There is nothing in the argument to stop a person from rejecting the moral significance of both groups.

Although this last objection is strong, it cannot be concluded that the argument from marginal cases is rhetorically or psychologically superfluous. Both opponents and supporters of nonhuman animal rights should confront the following questions: If it were wrong to harvest the organs of a severely retarded human to save the life of a normal human adult, would it also be wrong to sacrifice a baboon or pig for the same purpose, assuming that transspecies transplants become medically feasible? In general, is it wrong to treat sentient nonpersons as resources for persons? Both versions of the AMC challenge all parties to the debate to do some very fundamental moral thinking.

See also Animal Rights; Sentience; Xenograft.

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Evelyn Pluhar

MEDICAL RESEARCH WITH ANIMALS

The topic of using animals in science in general and in medical research specifically is very controversial. Most people involved in the controversy focus on the ethics of using animals. Animal advocates, on the other hand, state that humans do not have the right to use sentient nonhumans for selfish purposes. Animal users claim that without using animals in medical research we would no longer see cures and treatments for diseases.

Differences

Animals are used for scientific purposes in essentially nine different ways (Table 1):

1. Animals as models for human disease
2. Animals as models for testing drugs destined for humans
3. Animals as spare parts
4. Animals as factories or bioreactors
5. Animal tissue to study basic physiological principles
6. Animals for dissection in education
7. Animals as a modality for ideas (heuristic)
8. To benefit other animals, such as in veterinary research
9. Knowledge for knowledge's sake

However, when people think about the use of animals in medical research, they usually think of number 1, using animals to model human diseases, and number 2, using animals in drug testing and development in order to predict human response. In these two areas, the differences between species and even between individuals become important.

Many drugs may be good for patients, provided they are given in the proper dose at the proper time. In the 16th century, this concept led Paracelsus to say: "The dose determines the poison." The same is true today. But today we should add a corollary: The genetic makeup also determines the poison.

For example, of ten medications withdrawn from the U.S. market between 1998 and 2001, eight were withdrawn secondary to side effects that occurred primarily in women (GAO, 2001). Among cigarette smokers, African Americans and Native Hawaiians are more susceptible to lung cancer than whites, Japanese Americans, and Latinos (Haiman et al., 2006). Identical, or monozygotic, twins do not always succumb to the same disease despite

identical genetic makeup (Flintoft, 2005; Albert et al., 2005). Troglitazone, also known as Rezulin, was very effective for controlling diabetes in many patients, but in others it caused liver failure. Penicillin likewise has saved millions of lives, but causes life-threatening allergic reactions in some patients. Articles in *Nature* and *Science* have revealed that no two cancers are exactly alike (Associated Press, 2008; Kaiser, 2008).

Obviously humans are more similar to other humans than they are to mice, and yet one group of humans does not always respond the same as another, as these examples show. The genetic differences that result in different responses to drugs are multiplied when one considers different species.

Comparative genome research has revealed remarkable genetic similarities between humans and other animals like chimpanzees, dogs, and mice. But these and other studies have also revealed why the small differences are so important.

Single nucleotide polymorphisms (SNPs) are DNA sequence variations and are named such because they occur when a single nucleotide—A, T, C, or G—is changed. These changes can affect the activity of a gene by enhancing it, reducing it, or even inactivating it. When the protein the gene codes for is an enzyme involved in drug or toxin metabolism, the result can be a very large variation with respect to what that drug or toxin does to the body.

Copy number variations (CNVs) are an increase or decrease in the copies of a particular gene. CNVs can influence rates of drug or toxin metabolism so that a dose which is effective in one person may be ineffective in another (see Shanks and Pyles, 2007). In addition, CNVs also influence disease states and phenotypic variation. Variations with respect to SNPs and CNVs are very important even when studying humans.

Genes essentially come in two flavors: structural and regulatory. Regulatory genes tell the structural genes when to turn on and off and for how long. Humans and mice are virtually identical with respect to the genes regulating development, for example, the so-called *Hox* genes. Further, the mouse and human genomes do not appear to be qualitatively very different. They both contain about 30,000 genes, with mice having 300 genes that humans don't have and vice-versa. Humans and mice both have the genes that, in mice, result in a tail. In humans, the gene is turned off, while in mice it is turned on. Same gene, just regulated differently.

Consider pianos. All pianos have the same keys. But not all pianos play the same tune. The keys can be the same, but the music can be highly variable. The tune depends on the order and timing of the pressing of the keys, that is, how the keys are regulated by the person sitting at the keyboard. You might sit at the piano and play Ray Charles tunes, while someone else might play Chopin. Identical keyboards can give rise to very different musical phenotypes. Humans and mice develop from similar genetic keyboards, but the genetic analogs of the pianist's fingers are the regulatory genes.

The differences between the two species lies, in part, in the regulations of the same genes. Gene regulation also determines drug reaction and disease response. Because of differences in gene regulation, even identical twins may respond differently to diseases and medications.

SNPs, CNVs, and regulatory genes are not the only ways species and individuals differ.

Animals differ from humans, and humans differ from other humans, and hence manifest different responses to the same stimuli, due to the following:

- differences with respect to genes present
- differences with respect to mutations in the same gene
- differences with respect to proteins and protein activity
- differences with respect to gene regulation
- differences in gene expression
- differences in protein-protein interactions
- differences in genetic networks
- differences with respect to organismal organization (humans and rats may be intact systems, but may be differently intact)
- differences in environmental exposures
- differences with respect to evolutionary histories

These are some of the important reasons why members of the same species often respond differently to drugs and toxins, and experience different diseases. To many, these reasons also invalidate the use of animals as predictive models for human disease and drug testing.

Some courts are now recognizing that animal tests are not relevant to humans (see court cases listed in Further Resources).

Similarities

Despite the above differences, there is no doubt that animals can be useful in science. Numbers 3–9 in Table 1 are examples of how animals can be used in a scientifically viable way.

Number 3 involves the use of animals for spare parts. For example, many people have had a damaged aortic valve replaced by the aortic valve from a pig. There is no doubt that pig valves function adequately in humans, and hence this is a scientifically viable use of animals.

Number 4 includes animals used as factories. For example, for decades insulin was harvested from cows and pigs at slaughter. Hepatitis B and C viruses and other viruses were grown in nonhuman primates and other animals so scientists could have a convenient reservoir of the virus for study. This was before the viruses could be grown in culture. More recently, mice have been used to produce monoclonal antibodies.

Number 5 relates to the fact that researchers frequently use tissues obtained from animals to study basic physiological processes. This is sometimes referred to as basic science research, as are numbers 7 and 9.

Number 6 is the use of animals for dissection, which most people have experienced in school. If a teacher wants a student to learn that nerves, arteries, and veins are found close to one another, dissecting animals will reveal this.

Number 7 is the issue of using animals as a heuristic, or exploratory, device or as a source from which to get new ideas. Of course, if a veterinarian or scientist wants to learn about diseases of cats, she can study cats as in number 8, where other nonhuman animals benefit from animal model use. And the final area, number 9, is knowledge for the sake of knowledge alone.

Numbers 3–9 are scientifically viable ways to use animals in science. The animal protection community objects to the

use of animals in such a fashion, and may speak of alternatives for numbers 3–9. For example, aortic valve replacement can be performed with artificial or synthetic valves instead of obtaining them from pigs, and physicians rarely prescribe insulin from pigs and cows, since human insulin can be synthesized. Instead of using animal tissue to study basic physiological processes, human tissue is plentiful and better, if what the scientists actually want is more knowledge about humans. These are all alternatives to using animals. They are scientifically valid, and acceptable to the animal protection community.

The way veterinary students and researchers study animals can also be made less harmful to animals. The same criteria used in research involving humans can be applied to research designed to find cures for diseases in dogs and cats. Instead of creating models of cancer, researchers can study cancers that occur naturally in dogs. They can even break this down further and study the same cancer in different breeds, as there will be genetic differences between breeds just as there are differences between groups of humans.

A final consideration is the use of animals that lack either a central nervous system or a highly organized peripheral nervous system. These animals do not appear to be sentient, which is the basis of the animal rights and welfare arguments. Therefore their use should be acceptable to all. Some of the great breakthroughs in biological science are now coming from the study of invertebrates and organisms like yeast.

The level of examination has changed since the 18th and 19th centuries. As our examination of living systems has become increasingly fine-grained, we have found that, when it comes to explanations of biologic activity, subtle differences between organisms tend to outweigh gross similarities. Science could use animals to shed light on shared functions when we were struggling to understand living systems at the level of the organ; for example, the functions of the liver and heart are similar between species. But today we are studying drug response and disease at a level that defines not only a species, but in many cases the individual. Today, science studies human disease and drug response in light of complexity theory, evolutionary biology, gene expression, and gene regulation.

Arguments about ethics have been around for centuries. Ethics are somewhat subjective, but science should be less so. Scientific questions are eventually answered with more or less unanimous agreement. Such is the nature of studying the material world. In the final analysis, society will have to decide what role animals will play in scientific pursuits, indeed in all pursuits. But hopefully all sides will be able to agree on the scientific principles outlined above and use that knowledge to make intelligent decisions.

See also Alternatives to Animal Experiments: Reduction, Refinement, and Replacement

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MICE

Contributing to stem cell research, the fast-moving world of mouse genetics has catapulted these small creatures into the forefront of science. The 2007 Nobel Prize in Physiology or Medicine was awarded for isolating and modifying embryonic stem cells and introducing specific genes into the mouse germline. Inserting viruses plus genes into the skin cells of an adult mouse transformed them into new stem cells, permitting the growth of new mouse skin and organ tissue. With the new knockout technology used in mice, termed targeted genomics, specific genes can be added or deleted to assess their effects on behavior and physiology. Mice are well-defined genetically, and procedures are available for manipulation of specific genes and control of reproductive outcomes. New mouse strains with specified genetic constructs are created to study disease processes. Cryopreservation (freezing) makes it possible to store embryos and blastocysts of mouse strains for later recovery, rather than needing to house colonies of valuable mouse strains. The new vocabulary for mice includes terms such as mouse engineering, chimera, targeted genomics for knockout and knock-in mice, molecular constructs, genetic analysis, and phenotyping. Expanding techniques for imaging can acquire significant information on the processes of disease from a small number of mice.

The most typical laboratory mammal, mice account for a large majority of all mammals used in research in the United States and Europe. Their genetic similarities to humans combine with a tiny body size and high reproductive rate to make them an economical, efficient option as models for studying the human body, the effects of diseases, and the feasibility of treatments for diseases. Specific genes can be added or deleted to examine the gene's effects. A further use of mice sometimes required by regulations is to evaluate the safety of new chemicals or products, drugs, and vaccines, as well as to measure the effects of limited or long-term exposure to a substance. Very few mice are used in education and teaching.

While it is difficult to know the exact numbers of mice used in scientific procedures, detailed records from the United Kingdom's Home Office show that mice account for 69 percent of the vertebrates

Millions of mice are used throughout the world in a wide variety of laboratory experiments that cause pain, suffering, and death. Although they display empathy for other mice in pain, mice are not protected from invasive experiments. Here, a Chinese scientist has grafted human cells on a white mouse to create an ear-shaped graft. (Associated Press)

used, and most of the remaining animals used are rats. These figures also show that the use of genetically modified animals, mainly mice, more than quadrupled between 1996 to 2007.

History of Breeding Strains of Mice

Long before their use in science, mice were specially bred for coat color and physical or behavioral traits for thousands of years. Before 1000 BCE, mice of special colors were bred in China. Mice have always been favored by some as pets, a form of petkeeping termed the mouse fancy. Historically, the mouse assumed religious importance in Egypt, Greece, China, and Japan, among others, despite also being a serious pest. In research, William Harvey, Joseph Priestly, and Antoine Lavoisier in the 17th and 18th centuries, were among the scientists who employed mice to make discoveries concerning anatomy and physiology.

In the 20th century, an expanding array of inbred strains of mice was bred starting with mice from the mouse farm of Abbie E. C. Lathrop in Granby, Maryland, which provided the ancestors of most of today's strains of mice.

Among the mouse pioneers, William E. Castle laid the groundwork for mammalian genetics. Clarence C. Little studied color inheritance in mice and became the first director of the Jackson Laboratory. Leonell Strong pursued cancer research using the mouse as his model. Ultimately, C57BL/6, BALB/c and C3H mice became the most common strains. Together with FVB and 129 mice for genomics research, they became termed the "big five" by Stephen Barthold.

Examples of Strains of Mice

Inbred mice are genetically identical due to inbreeding, and predisposed to getting a certain disease or genetic defect. *Transgenic* mice have been genetically engineered by injection of one or more genes, such as human breast cancer. *Immunodeficient* mice used in cancer and AIDS research have minimal immune function, and include nude mice and mice with severe combined immune deficiency (SCID). *Knockout* mice are engineered to lack a specific gene. *Pathogen-free* mice are free from all detectable viruses, bacteria and parasites.

Uses of Mice in Testing

Mice are used to evaluate the safety of new chemicals or products such as household cleaners and pesticides that may be potentially toxic to humans. Mice are also used to assess the safety of drugs and vaccines made for medical use. Toxicity tests are performed to measure the effects of limited or repeated long-term exposure of an animal to a particular substance. Other tests measure the extent to which the substance damages cells and causes cancer, mutations in DNA, and birth defects. Although mice are used to test the cancer-causing ability of substances, the number of whole animals used in carcinogenicity testing has diminished. Faster, short-term tests are now used to screen substances.

Uses of Mice in Research

Historically, the study of cancer and the production of vaccines and monoclonal antibodies are among the most widespread uses of mice.

Cancer research Mice have been used in cancer research since 1894. Initially, mice were used for same-species tumor transplantations and drug treatment studies. In 1921, inbred strains that were predisposed to getting tumors were bred and disseminated among cancer researchers. More strains of mice originated from 1929 onward with the founding of the Jackson Laboratory in Bar Harbor, Maine, now the largest supplier of mice.

The inbreeding of mice predisposed to developing cancer led to specialized strains. In 1921, Leonell Strong established many inbred strains that frequently and spontaneously developed cancer. These inbred mice made it possible to study the growth and general characteristics of tumors.

The discovery in 1962 of the immunodeficient nude mouse led to human tumor transplantations without rejection, a valuable breakthrough for cancer research. Grafting human tumors onto these mice allows for the study of specific human cancers and the testing of new treatments in a whole animal system. A further breakthrough in the late 1980s led to transgenic mice, whose genes have been altered to produce a desired characteristic. Genes that cause cancer could then be studied in greater detail. In 1983, mice

with severe combined immune deficiency (SCID) were discovered. SCID mice are even more immunodeficient than nude mice. Tumors from other species are easily transplanted into SCID mice and will grow without being rejected. SCID mice are used for the growth of *hybridomas in vivo* to produce a continuous supply of antibody. Sometimes referred to as reagents, antibodies are necessary for a wide range of diagnostic, clinical, and experimental procedures.

In the late 1980s, transgenic mice were engineered from genetically altered embryos, in which a gene or combination of genes is microinjected into developing oocytes. The genetic alteration can subsequently be transmitted to progeny. Through selective breeding, it is then possible to maintain a strain of mice consisting of individuals with particular traits of interest. A specific trait, such as a predisposition to develop a particular type of tumor, can be introduced into a mouse strain by injecting into the embryo a gene that causes cancer. Transgenic mice permit the study of cancer in specific tissues, including initial tumor development.

Vaccines Developing a new vaccine for a particular disease requires investigation of the efficacy and safety of the vaccine, both in the short-term acute phase, and also over the long term, to assure that birth defects or other delayed effects do not arise. Even after the vaccine is known to prevent infection with the disease and has been approved, batches of vaccine still need to be tested for safety.

Methods to develop new vaccines differ for each type of virus or bacteria. Animal experiments are usually required to select the initial materials in the formula, establish the stability and formulation of the vaccine, and determine the mode and frequency of administration. Experimental vaccines are tested for safety and efficacy on animals, chiefly mice, before clinical tests on humans begin. In the Netherlands in 1986, roughly two-thirds of the experimental animals used to make biological products were mice. In the actual vaccine production process, animal blood may be required for culturing media. Viruses are propagated in cells of animal or human origin. In the past, viruses were cultured *in vivo,* as in the production of smallpox virus on the brains of mice. Since 1949, primary cell cultures have largely been produced using *in vitro* methods.

Quality control is the most essential aspect of vaccine production. Since all vaccine batches are not the same, their content and effects must be tested regularly at selected stages of production to monitor safety, as required by federal regulations. Human lives have been lost when quality control has not been sufficient. The experimental animal is still a main indicator in the detection of the desirable and undesirable activities of newly-produced vaccine batches.

Safety testing assures that the vaccine product is inactivated and free from extraneous microorganisms or residual live virus. Other tests assess whether the vaccine causes development of tumors or is otherwise harmful. Also important are assays assuring that the vaccine is potent enough to induce protective immunity.

Monoclonal Antibodies In 1975, Kohler and Milstein first fused lymphocytes to produce a cell line which was both immortal and a producer of specific antibodies. The Nobel Prize for Medicine was granted in 1984 for the development of this *hybridoma,* used from about 1987 to produce monoclonal antibodies (MAbs) in rodents for diagnos-

tics. These antibodies have exceptional purity and specificity, are components of the immune system, and can recognize and bind to a specific antigen. They are used diagnostically to measure protein and drug levels in serum, assess blood type, identify infectious agents, diagnose leukemias or tumor antigens, and assess hormones.

In vivo expansion of hybridomas in animals has become less acceptable due to humane and economic concerns. Several European countries have enacted legislation limiting antibody production in mice. MAbs are extensively produced *in vitro* in Switzerland and Germany, using cell culture systems. Although *in vivo* production is relatively inexpensive, ascites fluid extracted from mice may yield commercially unsuitable antibody. One popular alternative is bulk tissue culture in hollow-fiber bioreactor systems.

Preservation of Mouse Strains

Many thousands of distinct strains of mice now exist, some of which serve as models for specific human diseases. The mouse is the only mammal available in so many different genetic strains. Studying mice with specific genetic mutations can greatly advance studies of immune function, tumor growth, and various human genetic diseases. The Mutant Mouse Regional Resource Centers function as a repository system in the United States for the preservation and distribution of mice and embryonic stem cell lines, to make valuable genetically engineered mice available.

Imaging

Non-invasive imaging techniques are increasingly available for use with small animals. These permit monitoring the health or disease of an animal. Modalities include PET, SPECT, CT, MRI, ultrasound, autoradiography, and optical (fluorescence and bioluminescence).

Legislation

The United States Animal Welfare Act, as revised in 1985, includes most mammals, but excludes laboratory rats and mice. Research institutions can voluntarily seek accreditation by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC). Accreditation ensures that an institution is in conformance with the *Guide for the Care and Use of Laboratory Animals,* which applies to all laboratory animals, including rats and mice. This conformance with the Guide is a requirement for funding by many federal agencies, such as NIH. Hence, most academic institutions seek accreditation, and provide the same level of oversight for the care of mice as for other mammals.

For industries or testing facilities that do not seek funding and house only rats and mice, legislation and accreditation requirements do not apply. These institutions would only retain an institutional animal care and use committee as a proactive measure to assure optimal animal welfare, not as a regulatory requirement. One drawback of mice not being regulated is that no accurate figures are available concerning the numbers of mice used in the United States.

Patented Strains of Mice

Mice have been patented in the United States, Japan, Canada, and many European countries. The Harvard mouse, which carries a gene for breast cancer,

was patented in 1988. The second patent was granted to Ohio University in 1992 for a mouse carrying a human gene that makes the animal resistant to viral infection, due to its continuous production of interferon, which attacks invading viruses.

Providing Welfare

The tiny body size, fast movements, and behavioral and sensory capacities of mice contrast with the traits of humans, and make it difficult for us to understand their behavioral needs. Mice are social animals and are most comfortable when surrounded by their own familiar odors. Research with mice requires infection control with special cages that are individually ventilated, which is not necessarily what the mice would prefer. Technicians are less likely to feel attached to mice in their care than to other species. They wear protective clothing, limiting tactile contact with the mice when cleaning cages, in order to protect the mice and also to reduce their own exposure to allergens from the mice.

Induced genetic defects and research procedures sometimes cause pain and suffering to laboratory mice, which may be somewhat alleviated by appropriate analgesia and anesthesia. Enhancing the quality of life for mice may partially offset some of their discomfort. For example, living in social groups would be a more normal situation for mice than solitary housing. Caregivers can make it more rewarding to work with mice and enrich their physical environments by enhancing their housing. Mice provided with hardwood shavings burrow and build nests. Placing hay or straw on racks above cages allows mice to pull material into the cage and arrange nests. Plastic tubes offer an artificial burrow space, perhaps shielding mice from illumination that may be too bright. Simple enrichments such as these can provide mice with some control over their environment.

One complication is that immunodeficient mice require sterile environments. All cage materials used for them, including bedding, food and water, must be autoclaved for sterilization before use. Thus, offering an improved quality of life requires more effort and cost when dealing with these mice that are especially valuable for their potential contribution to the scientific knowledge to improve human and animal health.

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Lynette A. Hart

MISOTHERY

The term misothery is derived from the Greek *misein,* to hate, and *therion,* beast or animal, and literally means hatred and contempt for animals. Since animals are so representative of nature in general, misothery can mean hatred and contempt for nature, especially its animal-like aspects. Tennyson, for example, has described nature as "red in tooth and claw," that is, bloodthirsty like a predatory animal. In another version of the same idea, we say, "It's a dog-eat-dog world." These are misotherous ideas, for they see animals and nature as vicious, cruel, and base.

The term misothery was constructed because of its similarity to the word misogyny, a fairly common word for an attitude of hatred and contempt toward women. The similarity of the two words reflects the similarity of the two bodies of attitudes and ideas. In both cases, the ideas reduce the power, status, and dignity of others. Misogyny reduces female power, status, and dignity, and thus aids and abets the supremacy of males under patriarchy. Misothery reduces the power, status, and dignity of animals and nature, and thus aids and abets the supremacy of human beings under dominionism. Just as agrarian society invented beliefs to reduce women, it also invented beliefs or ideologies about animals that reduced them in the scheme of life. Among these are the idea that animals are too base and insensitive to feel physical pain or emotional suffering.

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Jim Mason

MORAL STANDING OF ANIMALS

Intelligence and adaptation in animals is often incomprehensible to us unless we attribute to them some form of understanding, intention, thought, imaginativeness, or form of communication. Many of their actions suggest adaptive and creative forms of judgment. To attribute these capacities to animals is to credit them with capacities analogous to human capacities, which suggests that animals merit at least some of the moral protections humans enjoy.

Historical Background in Darwin

Prior to Darwin, many biologists and philosophers argued that despite the anatomical similarities between humans and apes, humans are distinguished by the

possession of reason, speech, and moral sensibility. Darwin thought, however, that animals often exhibit powers of deliberation and decision making, excellent memories, a strong suggestion of imagination in their movements and sounds while dreaming, and the like. He wrote about the intelligence, sympathy, pride, and love of animals. Darwin also criticized the hypothesis that only humans have significant cognitive powers.

The import of his theory is that complex biological structures and functions as well as cognitive abilities are shared in the evolutionary struggle. Darwin argued that despite differences in the degree of mental power between humans and apes, no fundamental difference exists in kind between humans and many forms of animal life. He thought that a greater gap existed between apes and marine life than between apes and humans. He judged that there are numberless gradations in mental power in the animal world, with apes and humans on the high end.

Moral Status

Questions of whether animals have higher-level cognitive capacities are closely connected to questions of moral and legal standing. Terms such as status and standing have been transposed into ethics from law, where standing is defined as "One's place in the community in the estimation of others; one's relative position in social, commercial, or moral relations; one's repute, grade, or rank" (*Black's Law Dictionary*). In a weak sense, standing refers to a status, grade, or rank of moral importance. In a strong sense, standing means to have rights, or the functional equivalent of rights.

To have moral status, then, is to deserve the protections afforded by the basic norms of morality. One popular view attributes a more significant standing to an animal by granting that it is relevantly similar to an intact adult human being. Its standing is still further enhanced by attributing personhood or autonomy. Defining it as an person or autonomous agent elevates the animal to a position approximating that occupied by those who have rights. A widely shared view today is that if animals have the capacity for understanding, intending, and suffering, these morally significant properties themselves confer some form of moral standing.

The Model of Cognitive Properties

Several philosophers have produced arguments along the following lines: One is a person if and only if one possesses certain cognitive properties. The possession of these properties gives an entity moral standing. As a corollary, anything lacking these properties lacks moral standing, and therefore does not possess rights.

Cognition here refers to processes of awareness and knowledge, such as perception, memory, thinking, and linguistic ability. The thesis is that individuals have moral status because they are able to reflect on their lives through their cognitive capacities and are self-determined by their beliefs in ways that nonhuman animals seem not to be. Properties found in various theories of this type include: self-consciousness (consciousness of oneself as existing over time, with a past and future); freedom to act and the capacity to engage in purposive sequences of actions; having reasons for action and the ability to appreciate those reasons for acting; capacity to communicate with other persons using a language, and rationality

and higher-order volition. Many believe that more than one of these five conditions is required to be a person.

As long as high-level cognitive criteria are required, animals cannot qualify for significant moral standing. But if less demanding cognitive capacities are employed, animals might acquire a significant range of moral protections. For example, if a high-level qualifying condition such as speaking a human language is eliminated, and conditions such as intention and understanding are substituted, then it becomes plausible to find the cognitive capacities needed for moral standing in at least some animals.

Critics of theories based on human cognitive properties often argue that some creatures deserve moral status even if they do not possess a single cognitive capacity. They argue that a non-cognitive property may be sufficient to confer some measure of moral standing. The most frequently invoked properties are those of sensation, especially pain and suffering, but properties of emotion, especially those associated with fear and suffering, are also mentioned.

Animal Minds

At the root of many of these issues is a rich body of problems about animal minds. Little agreement exists about the levels and types of mental activity in many animal species or about the ethical significance of their mental activity. Humans understand relatively little about the inner lives of animals, or about how to connect many forms of observable behavior with other forms of behavior. Even the best scientists and the closest observers have difficulty understanding intention and emotion in animals. Neither evolutionary descent nor the physical and functional organization of an animal system, that is, the conditions responsible for its having a mental life, give us the depth of insight we would like to have to understand their mental states. The more we are in doubt about an animal's mental life, the more we may have doubts about its moral status and the issue of rights.

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Tom L. Beauchamp

MUSEUMS AND REPRESENTATION OF ANIMALS

All museums are human-centered, or anthropocentric. They are by their very

nature monuments to human creations, concerns, collections, curiosities, explorations, memories, and attitudes. Even the most enlightened museum starts with the assumption of the primacy of the human animal. For our purposes here, the term museum includes art museums and galleries, natural history museums, history museums, historic houses, living history sites, children's museums, science centers, zoos, nature centers, and aquaria.

In art museums around the world, museum educators create tours called some variation of "Animals in Art" for school groups. Their docents troop these youngsters through their collections in a glorified scavenger hunt, as little ones gleefully point out the animals they spot. While sometimes these tours take the time to compare the elongated arms of the monkeys in a Chinese screen to the elongated necks of sculpted folk art birds for weathervanes or decoys, mostly they do not connect the dots beyond "Miss, I see one!" With the youngest groups, they avoid a bronze depicting animal savagery or Francis Bacon's terrifying dog, leaning far more heavily on richly painted depictions of Aesop's fables and versions of Edward Hicks' *Peaceable Kingdom,* more acceptable, non-nightmare-inducing material.

To some, this find and name process appears to be no more than youthful hunting, or a form of animal watching without any context. What attitude to the art, to the animals does it seek to engender in children? The differences between George Stubbs' horses, Alexander Calder's lions, and Northwestern Native raven masks are rarely discussed. While formalist concerns come to the fore with older students and adults, attitudes toward animals as evidenced within the works of art remain largely ignored.

Even the most overtly political contemporary artists, such as Sue Coe or Walton Ford, are approached aesthetically, biographically, and contextually, within the framework of contemporary art. Meanwhile in parts of museum collections, like those of indigenous peoples, where adults could, if "Animals in Art" were revisited, look closely at the symbolic, totemic, and narrative, recurring imagery is usually thought too simplistic. Turtles, frogs, lions, dogs, and snakes go uncommented on, other than for their incorporation as design elements.

For many adults, museum memories relate to natural history museum visits. Of those, the memory may be of the American Museum of Natural History in New York, and specifically the center floor diorama of elephants that seem to dash from one end of the room to the other, majestic, terrifying, and, in the true sense of the word, awesome. Some may remember a sleepover under the whale. And though dinosaurs are ever popular, the art of the diorama, more than just the bones, is effective theater, and those charging elephants, not behind glass, but inhabiting the room, are startling enough to stick in the memory.

But museums in their texts and subtexts present more attitudes about animals than simply what a child, still determining alive from dead, real from fake, can perceive. For adults, museums present a broad spectrum of views about animals. While art museum depictions indicate attitudes that range from symbol and story to dominion and possession, there is also evidence of kinship, wonder, and catalog, as well as extensions of symbol to include totem, logo, and pure pattern and design.

A child gazes at a stuffed Tasmanian Tiger on display at the Australian Museum in Sydney. (AP Photo/Rick Rycroft)

While certain painters may be classified as Fauves or wild beasts, their newly and vividly colored foxes, wolves, and horses are a source of delight. Their dissonance, the struggle between what we know and what we see, makes them fascinating, all the more so because everything other than their color makes them completely understandable, and not particularly wild.

Perhaps because museums in America were born from the cabinet of curiosity and derive from a Victorian collector and cataloguer mentality, the sense in which many natural history museums seem like a Noah's Ark or exhaustive compendium is sometimes overwhelming. Many natural history museums, though, have sought to better acquaint their visitors with the animals of their region. On a museum tour in North Carolina, for example, visitors might see more snakes, living and dead, than at your average roadside snake farm. Near the end of this herpetological grand tour, a curator might note that the exhibit's purpose is not to show cobras and pythons for the sheer creepy excitement of it, but to show the snakes of North Carolina, all creatures their visitors might well encounter in the wild. Getting to know them, recognize them, and understand their dangers and benefits, is a survival tool, for both museum visitor and snake alike.

As natural history museums compete with zoos, botanical gardens, safari farms, and circuses, their serious mission, to educate about animals and their habitats, and the interrelatedness of all creatures and their habitats, has moved them into advocacy positions around endangered species, climate change, and global interdependence.

History museums and historic houses seem to catalogue or freeze old attitudes, sometimes reinterpreting them, often ignoring their implications, especially those whose impact is felt by animals. The historic homes of the early 20th century's very rich, many of them robber barons, for whom exploitation of people, animals, and all natural resources was a way of life, a source of their wealth. and motor of the nation's growth, sport animal head trophies from tours of the great American West and African safaris. Now many of these collect dust and act to mark their owners as belonging to a certain era, people who might well have caged or stuffed specimen humans had it not seemed somehow barbaric. Still, their dusty attitudes toward people and animals pervade the air.

Safari trophy heads at the George Eastman House in Rochester, New York, raise the interesting question of the difference between the shoot and the photo shoot, something the contemporary photographer James Balog takes aim at squarely in his work. While revisionism and political correctness have altered or appended the point of view of some history museums and historic homes, it is the rare historic house collection that comments with contemporary eyes on the morality of the day depicted. Such asides, in addition to being considered bad form, destroy whatever theatrical leap of the imagination the fully appointed house-as-time-warp might create. It is left to visitors to bring their own contemporary attitudes as they visit the past and to try to square the two.

Reconstructions, historic villages, farmsteads, and workplaces often stress domesticated animals and their care and feeding, as well as their uses in home, hearth, and community. For contemporary visitors, often totally unaware of the processes that go into the making of things they use all the time, exposure to those processes can only increase awareness, and sometimes even change attitudes. To watch shearing, carding, spinning, dying, weaving, and sewing is to understand clothing and, it is hoped, something about sheep, in a totally different light.

Since science centers and children's museums, though hands-on in their learning presentation, are not petting zoos, the experiences and attitudes they present about animals are constructed around dramatic play, sensory input, and some didactic presentations, these last an especially difficult and underutilized mode within an interactive context. They diverge largely because of their audiences. For science museums, biology, evolution, the structures of categorization, animal behavior, defense of animal testing for human uses, extinction, and mutual dependence and cycles, are all valid and often approached areas. With children's museums, in an attempt to garner empathy for animals, the focus is often on animal babies, experiencing the world through the animal's, mostly visual, senses, instructive help for young people and their pets, and initial steps at categorization.

Zoos, aquaria, and nature centers have the most insistent, if sometimes contradictory, stances toward the animal kingdom. While zoos and aquaria collect animals, many of them are actively involved in attempts to save species, breed them in captivity, and return them to their habitat. Zoos and aquaria often look to reproduce habitats so that humans can better understand the context from which

a given animal or group of animals has been taken, as well as to aid in the animal's adjustment to captivity. The artificiality of the setting, captivity, and close contact with many other species and, of course, with human beings, thwart these admirable goals and often present visitors with animals in a psychologically damaged state, what critics characterize as slaves embracing their slavery.

Nature centers, giving visitors a chance to see animals in their own environs, expend immense efforts to make sure that their visitors, in their encounters, do not damage the habitat or the plant and animal life within it. In a real sense, encounters between people and animals in sites of this sort are the most primal, though groups of ten or more people with cameras, binoculars, and guidebooks are not harmless in or to a habitat.

The complexity of museums' attitudes towards animals, bound up as they are in each institution's mission and vision, sometimes also evidence attitudes often unspoken and unacknowledged. Sometimes these attitudes are the unwitting result of insensitivity—many museums are, in fact, no better in their treatment of indigenous peoples—and render them impossible to generalize. They are made all the more complex by new generations of political artists with advocacy positions and new understandings of the roles of zoos and aquaria in a world in which habitats and their creatures are rapidly disappearing.

While the elephants of the American Museum of Natural History, and contemporary Chinese-born artist Cai Guo-Qiang's *Inopportune: Stage Two*, a life-size, walk-through Chinese landscape with nine tigers pierced by hundreds of arrows, would seem worlds apart in impact, if not in intent, they are similar. They destroy the boundary between viewer and viewed, remove the glass from the diorama, and in that simple act totally reorder our perceptions. People gasp when they walk into Cai's installation, until they realize that the tigers are fabricated. The gasp, the shock, is real. *Inopportune: Stage Two* has been shown at New York's Guggenheim Museum, the Massachusetts Museum of Contemporary Art, and other museums.

Photographer Jerry Uelsmann, in an untitled photograph from 1973, focuses on the diorama experience. The photograph presents a majestic landscape in black and white, with a backlit, theatrical jewel case of a diorama in a dark foreground, almost a television screen, but with more depth; this is 1973, no HDTV. Across the diorama walk deer, placid, unskittish, stopped dead in their tracks, a vignette within a larger story, a microcosm in a larger context and, really, a controlled way of seeing and experiencing, what is too big, too fast, too quiet, too other for many human beings to grasp otherwise.

See also Art, Animals, and Ethics

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N

NATIVE AMERICANS AND EARLY USES OF ANIMALS IN MEDICINE AND RESEARCH

Constitute reductionism is the idea that all living things in the organic world are essentially made of the same elements. Phylogenetic continuity is the concept, originally proposed by Charles Darwin, that differences between nonhuman animals and human animals are quantitative differences in degree, rather than qualitative differences in kind. This can be translated into the concept that physiological processes, including behavior and even cognition, share common properties across species. The bases of constitute reductionism and phylogenetic continuity, which are contained in the theory of evolution, provide the theoretical support for the use of animals in research to understand humans.

While these ideas may be rejected by some religions, Native American religions view the creation of humans as based on the transformation of an animal into a human form. Many Native American religions also stress the point that all items on the earth are related, and animals are not that different from humans. In Ojibwa culture, the creation of humans begins in the eastern great salt sea (the Atlantic ocean), where the back of the *megis*, a large ocean clam, is warmed by the sun and the Anishnabe (Ojibwa people) are brought to life. This legend shares some common ideals—life starting in the ocean, the relationship between human and animals—with the theory of evolution.

Many if not all pre-Columbian Native American nations used animals in medical treatments and education. The common view of Native medicine has been that it is shamanistic. Although ritual did, and still does, play an important role in Native American medicine, there was extensive use of practical therapy. The more practical therapies included the use of plants and animal parts to treat specific medical conditions.

Most Native American nations, with the notable exception of the Aztec, did not engage in internal surgical practices. Furthermore, in many Native American nations, postmortem examinations were not conducted on the dead for religious reasons. Most of the information Native Americans had about internal anatomy came from their dissection of animals during the butchering process. It has been documented that, from the analogy with animals, Native Americans knew the function of internal organs, and knew that the brain was the organ of thought.

In addition to anatomy lessons, animals were utilized in observational research. By noting particular animal behaviors, especially the interaction

Chief Arvol Looking Horse talks about buffalo in the Lakota language as Rosalie Little Thunder translates into English before a Spirit Releasing ceremony for the animal in Yellowstone National Park. Native Americans held a sacred ceremony in the park for those animals who were killed or removed as part of a livestock protection program. (AP Photo/Douglas C. Pizac)

between animals and plants, Native Americans gained information about the nutritional and medicinal properties of many plant substances. For example, the bear is a medicinal animal in Ojibwa culture, believed to be given the secrets of the *Mide* (medicine) by Kitshi Manido (Great Spirit). Because of this belief, the Ojibwa would carefully observe the bear in its environment. These examples demonstrate that, in addition to using animals for food and clothing, early Native Americans also used animals to gain information about themselves and their environment.

Although a number of Native American herbal remedies have been adapted by mainstream medical organizations, the use of animal products in medical treatment has not received the same attention. Animal products were used in a number of medical remedies in many Native American nations. Moose and bear fat were used by the Ojibwa to treat skin wounds, and to ensure healthy skin in extreme temperatures. Deer tendons were used as suture material by numerous tribes. The Yukon treated scurvy by ingestion of animal adrenal glands. Fish oil, because of its high iodine content, was used to treat goiters in Eskimo/Aleut nations. Some South American Nations treated epilepsy through shock treatment with electric eels. A type of injection device was used by some Native American nations well before the invention of the syringe in 1904. These were constructed from the bladder of a deer or

duck connected to the reed or quill of the porcupine. These syringes were used to clean wounds or to inject herbal medicine into the wound.

The examples listed demonstrate that Native Americans' unique relationship with animals included their use in research and medicine. By documenting both the physiological and behavioral properties of animals, we as humans can learn more about animals, including ourselves.

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NATIVE AMERICANS' RELATIONSHIPS WITH ANIMALS: ALL OUR RELATIONS

The relationships between animals and Native Americans are as varied as the more than four hundred different tribal nations that existed in pre-Columbian North America. Native people were and in many cases still remain deeply tied to the particular ecosystems in their regions of the continent. Some based their lives on agriculture, some on the ocean and salmon fishing, others on the hunting of hoofed animals, some in all three. However, certain generalizations about the relationships between Native Americans and animals can be made. One of the most important generalizations is that animals are not seen by the American Indian as dumb beasts whose lives are ruled only by instinct, but as individuals—thinking, feeling beings with families, beings worthy of respect. They are the animal people.

In the truest sense of the word, animals are seen as relatives of human beings. Many Native traditions, such as those of the Cherokee or the Lakota, tell that certain animals were direct ancestors. The idea of clan often comes from a tradition of direct descendants from one animal or another—a frog, an eagle, a bear. If a person belongs to the Bear Clan, it may be that the clan's origin is in the form of a bear who married a human woman and produced offspring. The border between the worlds of the animal people and human beings is easily crossed. A human being may go and live among the animals and become a bear or a deer as easily as an animal may take on human shape and live among human beings. Sometimes these animal people have great power and are to be feared. Through the Midwest and West, tales are still common of the Deer Woman who comes to gatherings to lure off young men and harm them. Beneath her long dress she has hooves, not feet. Such beliefs are extremely widespread and are reinforced by stories and ceremonies.

Animals often appear as teachers in traditional stories. Humans can learn many things from the animal people.

Traditional stories tell us how flute songs came from the birds, how medicine plants were shown to the humans by the bears, and how humans were taught how to work together and to care for their children by watching the behavior of wolves as they hunted and cared for their cubs.

Native American people have found it necessary to hunt animals to ensure their own survival. However, even hunting is seen as cooperation with the animals. Although the animal's body is killed, its spirit survives, and it may punish a disrespectful or greedy hunter. It is only through animals' consent that they allow themselves to be hunted. Further, the hunting of animals that are pregnant, or caring for young ones whose survival depends upon the mother, is usually forbidden. Many current game laws, closed seasons, and limited harvesting of game animals have their roots in Native American traditions that have existed for thousands of years.

Animals are frequently kept as pets or companions. In the Northeast, among the Iroquois, orphaned beavers were often suckled by Native women and adopted into the family. Across the continent, dogs were kept as pets and used for hunting. According to the traditional stories of the Abenaki, the dog was not domesticated, but chose to live with the human beings because it liked them. To this day, the dog in a Native American household is often viewed not as a possession but as a family member. The fact that in some Native American cultures dogs were sometimes eaten or sacrificed, as in the Seneca White Dog Sacrifice, so that the dog's spirit could take a message to the Great Spirit, did not diminish the respect for the dog or its place in the household.

In the traditions of the many different Native peoples of North America, animals are almost universally seen as equal to humans in the circle of life. The word circle is especially appropriate, for all living things, animals and humans alike, are viewed as part of a great circle. No part of that circle is more important than another, but all parts of that circle are affected when one part is broken. In the eyes of the Native American, animals are all our relations.

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Joseph Bruchac

O

OBJECTIFICATION OF ANIMALS

In 1995, the Summit for Animals, a loose confederation of national and grassroots animal protection organizations, passed a resolution stating, in part, "We resolve to use language that enhances the social and moral status of animals from objects or things to individuals with needs and interests of their own." Collectively called the linguistic turn, a current view in several academic fields holds that language plays an important formative role in the way we see, think about and, ultimately, treat entities in both the cultural and natural world.

Numerous areas that need change have been identified. The most important and perhaps the most difficult to bring about is the use of the term animal, which has come to mean "as distinguished from human." In this use, the conflicting terms human and animal deny that human beings are part of the animal kingdom. More critically, this usage reinforces the invidious comparison of animal as inferior to human. Although a number of suggestions have been made to correct this, for example, retaining the term animal to refer to all animals including humans, and anymal to refer to animals other than humans, none has gained common usage.

Other linguistic habits support the lower status of animals. In many settings, such as the farm and the research laboratory, individual animals are not named. Further, they are referred to as it rather than he or she and which or that rather than who. These uses decrease the value of animals by depriving an animal of individuality, including their identities as members of a particular gender. This practice is also seen in language used by hunters and wildlife managers when they refer to deer as a species rather than a group of individuals.

In farm and laboratory settings, language operates to deprive animals other than humans of even this identity as members of a particular species. Rather than the rat or the monkey, investigators typically refer to animals in the lab as the animal. A final decrease in value occurs when they are referred to as less than even this already-weakened notion of animal. On the farm, the individual animal is referred to as beef or meat on the hoof, while in the laboratory the individual rat is an organism, a generic living being, or a preparation, a living physiological or behavioral process.

In the scientific laboratory setting, additional practices support the devaluing of animals. Many scientists use the term anthropomorphism as a criticism of both scientific and popular accounts that use psychological terms to describe animals

other than humans. For example, terms like intended, anticipated, felt, and attributions like play, grief, and deceit to animals other than humans are avoided, because their use commits the error of anthropomorphism. This prohibition against terms implying consciousness in animals other than humans is a legacy of the philosopher Descartes, in whose view animals were mechanical beings, without psychology, without minds. Consistent with this view, the pain, suffering, and death attendant to either the conditions of an experiment or the conditions under which animals in the laboratory are kept is typically not described as such. For example, an animal is said to be food deprived rather than hungry, or subjected to aversive stimulation rather than experiencing pain. The death of an animal is obscured by various terms such as collected, harvested, or sacrificed, or anaesthetized and then exsanguinated.

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P

PAIN, INVERTEBRATES

While most people assume that vertebrates (animals with backbones) perceive pain, this is not as clear for most invertebrates (animals without backbones). However, the common octopus, with its large central nervous system and complex behaviors, has been given the benefit of the doubt in Great Britain and is now protected under the Animals (Scientific Procedures) Act of 1986.

Some argue that insects do not perceive pain and others that it is difficult to be certain. One may be uncertain about insect pain but still believe they should be given the benefit of the doubt. The conclusion that insects do not perceive pain is based on several lines of reasoning.

First, although insects have complex nervous systems, they lack the well-developed central processing mechanisms found in mammals and other vertebrates as well as the octopus, which appear to be necessary to feel pain. Second, it is not apparent that insects have a nerve fiber system equivalent to the nociceptive fibers found in mammals. However, this does not mean that they do not have some nerve fibers that carry aversive signals. Third, the behavior of insects when faced with noxious or harmful stimuli can usually be explained as a startle or protective reflex. In some cases, for example, locusts being eaten by fellow locusts, insects display no signs that the tissue damage that is occurring is aversive.

The conclusion that insects do not perceive pain appears to contradict the claim that pain confers important survival advantages. However, simple neural reflex loops producing an aversive startle reflex that involves no pain perception could confer sufficient evolutionary advantage in short-lived animals like insects that rely on a survival strategy involving the production of very large numbers of individuals.

If insects and most other invertebrates do not perceive pain, this would be relevant for ethical systems that rely on sentience as an important criterion of moral consideration. However, it would not necessarily indicate that insects should be accorded no moral consideration. Moral arguments that rely on reverence for life considerations—for example, the Jain or Schweitzerian systems—or ecosystem values would still regard insects as deserving some moral consideration.

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PAIN, SUFFERING, AND BEHAVIOR

Suffering can be defined as: A negative emotional state, which may derive from various adverse physical or physiological or psychological circumstances, and which is determined by the cognitive capacity of the species and the individual being, as well as its life's experience.

This proposed definition addresses the mental distress that may be caused in some animals through their perception of the external environment, particularly through senses such as smell, sight, and sound, as well as their internalized individual predicament through feelings such as pain, or an instinct to carry out certain behaviors, for example migration in a wild bird when it has been caged. This mental distress will also be affected by an animal's experiences in life and the ability to recall them and recognize contextual similarities.

What Animals?

Only animals that have the neurological development and capability to experience adverse states are the subjects of concern here. More primitive forms such as amoebae, simple multi-cellular organisms that lack a complex organized nervous system are unlikely to feel, although they may well react and even possess simple programming mechanisms. However, they are unable to interpret novel circumstances. When animals possess a level of consciousness that allows them to assimilate new information and to apply general learned principles to novel circumstances, they are more likely to anticipate the future and therefore possibly suffer more than an animal that does not have these faculties. As far as we are know, this level of awareness is generally found in vertebrates, but not in invertebrates. However, new evidence and a reinterpretation of existing data for invertebrates suggest that this is not entirely true. For example, the octopus seems to have an ability to recall adverse experiences and use avoidance behaviors. Moreover, the ability to feel pain and other adverse states varies between different phyla and, if two key questions regarding sentience are phrased differently, a different view emerges. Specifically, does the animal possess similar or homologous neural pathways, neuropeptides, and hormones that might indicate sentience? And does it behave as it if is sentient in response to what would be a noxious stimulus to vertebrates?

Not surprisingly, sentience progressively develops throughout gestation or incubation. In humans this seems to be somewhere between 18 and 26 weeks, probably later rather than earlier. Furthermore, the development of the nervous system in some mammalian species has been shown not to stop at birth. For example, the descending inhibitory pathways that control the passage of nociceptive impulses up to the brain, which is known as gating, because it serves as an obstacle to the continuing passage of impulses up to the brain, continue to develop for several weeks after birth. This has led to the speculation that neonatal and young animals feel more pain than they will later in life when their nervous systems have fully matured and the gating mechanism is fully developed. Finally, the development of self-awareness and therefore the ability to reflect on one's own circumstances, could add another dimension to any experience of suffering, and appears to develop at around two years of age in humans, but there is little data in animals other than that it may be present or absent in adults. This entry discusses those beings that are sentient, that is, capable of feelings such as pain, fear, frustration, boredom, and possibly other feelings such as happiness, pleasure, grief, and guilt.

"A Negative Emotional State . . ."

Animals that are sentient can feel positive and negative emotions, and suffering may occur when these feelings are overwhelmingly negative. In some situations there may be a mixture of positive and negative states. Obtaining food at the price of an electric shock may still be an overall positive experience, and an animal may return to such a situation to maintain its homeostasis, that is, to satisfy its inner feeling of hunger. It is obvious that animals can experience a range of emotions, from those indicating pleasure and happiness in some way (dogs wagging tails, cows eager to get out to grass even though they have ample food before them, cats

purring) to the other end of the spectrum, where animals may deliberately avoid situations that they have found unpleasant (a puppy returning to the veterinary clinic, sheep avoiding a shed where they have undergone electro-immobilization in the past, a surgical procedure such as foot trimming in dairy cows). Such negative experiences can be recalled by an animal from an earlier event, and animals may take avoiding action when given a chance. However, not all negative experiences require prior exposure, for example, thirst, or the desire to migrate, mate, or play.

". . . Which May Derive from Various Adverse Physical or Physiological or Psychological Circumstances . . ."

Examples of adverse physical states include environments that induce abnormal behaviors, or where abnormal lengths of time are spent carrying out normal behaviors. These are closely linked with the mental or psychological health of animals. Barren environments like cages or pens where animals have little opportunity to carry out instinctive behaviors such as dust-bathing in chickens, digging in rabbits and gerbils, nest-building for mice and sows seem to set up an internal conflict for the animal akin to a feeling of frustration when they are unable to satisfy their instincts, and lead them to subconsciously carry out stereotypic behaviors. Wild animals also often show repeated escape behaviors when caged, and which seem to be exacerbated when an animal has known freedom as opposed to being born and bred in captivity. Examples might include polar bears and wolves pacing in their concrete pens in zoos, horses weaving at the door of their stable, rabbits pawing at the back of their cages, wild birds looking for an escape route from their cages. These poor environments lead to psychological responses that are internally driven, but the physiological changes are less obvious. We can start to examine aspects of the environment that may be better for animals by observing what environments they choose to be in and how hard they will work to get there. For example, rodents work hard in choice tests to reach a particular type of environment. They prefer solid floors to grid floors, and certain types of bedding substrates are preferred to others. A word of caution, however. Animals may not always choose what is good for them in the long term, nor does it really tell you what they want, as humans may not offer that particular choice. Animals that carry out stereotypic behaviors due to an impoverished environment, to the point of causing tissue damage to themselves, will obviously suffer additionally.

Adverse physiological circumstances would include poor health, for example, due to an infection that, in humans, leads to feelings such as discomfort or malaise. Similar signs are also seen in animals when their behavior changes to inactivity, poor appetite, and possibly a change in disposition from docility to aggression. Animals in pain, for example horses with colic, animals with fractured bones, slipped discs, or arthritis, cats with an aortic thrombus, any animal with unrelieved post-surgical pain, all lead to various changes in behavior and physiology. Animals can also suffer with nonpainful diseases such as cancer, diabetes, or epilepsy.

". . . and Which Is Determined by the Cognitive Capacity of the Species and the Individual Being"

The development of the central nervous system is manifestly different between species; consider the development of key areas such as the cerebral cortex. The evolutionary older part of the brain dealing with emotions, the limbic system, is present in all sentient species. Perhaps it is the interaction between the cerebral cortex and other areas of the brain, for example, the hippocampus, which determines the level of cognitive ability and hence the ability of an animal species to suffer. However, it is also apparent that individuals within a species will have had different life experiences, and this too will have an effect. At one end of the spectrum, a human being in a permanent vegetative state will be unable to suffer, as their cerebral cortex has been irreversibly damaged; for others, such as anencephalics, it may not have developed, or development has been restricted or retarded, for example, mentally impaired through hypoxia at birth. At the other end might be a highly sensitive and imaginative person who will suffer more mental anxiety than most. Animal species represent a range of development of the central nervous system, but those that are self-aware, that is, having the ability to become the object of their own attention, and self-conscious, that is, having the ability to be aware of one's own existence especially in relation to others and over time, may suffer more through an anticipation of the future based on a mix of past experience, natural instincts, and intuition. Thus a captive animal that has known what it is like to live in the wild may have internalized that experience and so suffer more when kept confined, compared with an animal that has not had that experience. The basic instincts to carry out certain behaviors are still there, but now there is the extra dimension of physiological integrity, prior experience, and memory.

Animal Well-being

So how does this affect human assessment of animal suffering, that is, on concern for animal welfare or an individual animal's well-being? The following description can be used to help decide what might be good and poor welfare: "Welfare is dependent on and determined by an animal's physiological and psychological wellbeing in relation to its cognitive capacity and life's experience."

At one level, an animal's well-being is reflected in its subconscious attempts to cope with an aversive environment, that is, the homeostatic reflex, through activation of the autonomic nervous system, the hypothalamic-pituitary axis, and the adrenal glands. But this is not the stuff of suffering that is being described here; suffering is more an animal's conscious attempts to deal with its specific predicament. When an animal feels threatened in some way, it usually tries to take avoidance action. This self-preservation is universal in all vertebrates as far as we can tell, and has been conserved through evolution. Many laws and research guidance notes state something to the effect of "It should be assumed that persistent pain or distress in animals leads to suffering of animals in the absence of evidence to the contrary" (OECD, 2001). Many believe that the same should be considered for all areas where humans use or exploit animals for their own ends.

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David B. Morton

PAINISM

Painism is a term coined by Richard Ryder in 1990 to describe the theory that moral value is based upon the individual's experience of pain (defined broadly to cover all types of suffering whether cognitive, emotional, or sensory), that pain is the only evil, and that the main moral objective is to reduce the pain of others, particularly that of the most affected victim, the maximum sufferer. Painism opposes the prejudice of speciesism.

The unit that experiences pain is the individual organism, the whale, the human, or the mouse. It is not the gene nor the herd nor the species itself that feels pain. This is an important point for animal protection and is crucial for ethics generally. Yet it is routinely overlooked.

Pain is the main subject of animal protection and, ultimately, of all ethics. Whatever is deemed to be bad—injustice, loss of liberty or infringement of other's rights—is bad because it causes pain to individual organisms. Pain and suffering are the great impediment to happiness, and they underlie all rational concepts of evil.

The two main systems of modern secular ethics, utilitarianism and rights theory, have both helped to improve the treatment and status of nonhuman animals over many years, but both systems have major faults: rights theory principally because of its difficulty in resolving inevitable conflicts of rights, and utilitarianism because it allows the infliction of agony on one or a few individuals if that action causes mild pleasure to such a large number of others that the total of their pleasures outweighs the pain of the victim(s). Thus a gang rape may be considered a good thing by utilitarians if all the pleasures of the rapists add up to more than the severe suffering of the victim. The same sort of argument can be used to excuse severely painful vivisection or torture.

Painism aims to avoid such pitfalls. It does so by denying the validity of adding up the pain or pleasure of separate individuals. Ryder says that pain or pleasure has to be experienced to truly be pain or pleasure, but that no one individual actually experiences these added-up totals. They are theoretical and not real. One does not add up the feelings of surprise of separate people and say the total of surprises is meaningful, so why claim that the totaled feelings of pain or pleasure felt by several separate individuals has meaning? Painism measures the badness of a situation neither by the total of pain, nor by the number of sufferers, but by the quantity of suffering experienced by the most painfully affected sufferer.

It is important to emphasize that painism still permits the tradeoff of pain and pleasure between individuals, so it may be

permissible to force mild discomfort, let's say taxation, on A, if this action releases B from agony, for example, through free medical treatment. But it is not permissible, according to painism, to trade off the pain of A against the added up pleasures of A plus B plus C, etc. By rating rights according to their efficacy as pain-reducers, painism can also help to deal with conflicts of rights, giving preference to whichever right reduces the most pain or produces the most pleasure.

Ryder, as the inventor of the concept of speciesism (1970), is concerned with pain regardless of whether it is felt by animals, humans, or others. So X amount of pain in a pig matters as much as X amount of pain in Socrates! Ryder has described the effects of painism in animal protection, politics, and generally, claiming that it may resolve the main problems of other ethical theories and even of democracy itself. He sees democracy as being based upon a cobbled-together mixture of utilitarianism (the dictatorship by the majority) and rights theory, both imperfect theories, and he proposes painism as a more consistent approach. Painism is counterintuitive in challenging the usual everyday assumption that large numbers of sufferers matter more, morally speaking, than lesser numbers of sufferers. We are accustomed to thinking that the maiming and murder of ten people is morally worse than the maiming and murder of one. Painism questions this. For painism, the agony of one counts for more than the mere discomfort of many. The question is not how many were harmed by an action, but how much was suffered by the maximum sufferer. So painism focuses on the intensity of suffering of each individual and not on the number of sufferers.

See also Speciesism

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Richard D. Ryder

PEOPLE FOR THE ETHICAL TREATMENT OF ANIMALS (PETA)

People for the Ethical Treatment of Animals (PETA) is an international nonprofit charitable organization based in Norfolk, Virginia, with affiliates in the United Kingdom, Germany, the Netherlands, India, and the Asia-Pacific region. Dedicated to establishing and defending the rights of all animals, PETA operates under the principle that "animals are not ours to eat, wear, experiment on, or use for entertainment" ("PETA Guide to Animals and the Dissection Industry," 2008).

Origins

PETA President Ingrid E. Newkirk previously served as a deputy sheriff

in Montgomery County, Maryland; as a Maryland state law enforcement officer with a high success rate in convicting animal abusers; director of cruelty investigations for the second oldest humane society in the United States; and as Chief of Animal Disease Control for the Commission on Public Health in the District of Columbia.

While Newkirk was working at a Washington, D.C. animal shelter, she read the book *Animal Liberation,* written by Australian philosopher Peter Singer. Inspired by the concepts set forth in Dr. Singer's book, Newkirk founded PETA in 1980 with a small group of friends. PETA has grown into the largest and, many consider, the most influential animal rights organization in the world, with more than two million members and supporters (PETA, www.peta.org/about/).

Investigations

In 1981, PETA embarked on its first undercover operation, when an investigator took a job in a laboratory in Silver Spring, Maryland, where a group of monkeys was kept, all but one of them having been captured as infants from their native habitat in the Philippines. The nerves in the monkeys' spines had been cut, affecting their ability to control their arms. The animals' limbs were also injured and fingers torn off from getting caught in the rusted and broken cage wires. The researcher had converted a small refrigerator into a shock box inside which the monkeys were punished if they failed to pick up objects with their damaged limbs.

The investigation found grossly unsanitary conditions, with cages cleaned so rarely that fecal matter rose to a height of some inches in places and fungus was growing on it. The monkeys had not been given food bowls, so food thrown into the cage fell through the wire, requiring the monkeys to pick the food out of the waste collection trays in order to eat. The evidence provided by PETA's investigation resulted in the first search and seizure warrant served on a laboratory for cruelty to animals, the first arrest and criminal conviction of an animal experimenter in the United States on charges of cruelty to animals, the first confiscation of animals from a laboratory, the first cancellation of a government animal research grant, and the first U.S. Supreme Court victory for animals in laboratories (PETA, stopanimaltests.com/investigations/asp).

Subsequent PETA investigations have led to further protections for animals, including these examples:

- An undercover investigation ended scabies experiments on dogs and rabbits at Ohio's Wright State University and led to charges by the USDA of 18 violations of the Animal Welfare Act
- PETA released photographs and videotapes showing ducks being force-fed on a foie gras farm in New York, resulting in the first-ever police raid on a U.S. factory farm, as well as ending the sale of foie gras at many restaurants
- Investigations at pig-breeding factory farms in North Carolina and Oklahoma revealed substandard conditions and regular abuse of pigs, including one pig who was skinned alive, leading to the first-ever felony indictments of farm workers
- A California furrier was charged with cruelty to animals after a PETA

investigator filmed him electrocuting chinchillas by clipping wires to the animals' genitals

- PETA's undercover investigation of a Florida exotic-animal training school revealed that big cats were being beaten with ax handles, which resulted in the USDA's developing new regulations governing animal training methods
- PETA campaigned successfully to have car companies replace all use of animals in crash tests with mannequins

Campaigns

PETA's investigation of a contract testing laboratory in Philadelphia to many leading companies, such as Avon, Revlon, and Estée Lauder, permanently banning animal tests (PETA, www.stopanimaltests.com). PETA now lists hundreds of personal and household-care companies that do not test products on animals.

PETA's work to promote vegan diets and reduce the living and dying conditions of animals on industrialized farms is the largest of the group's campaigns. According to its Web site, PETA distributes hundreds of thousands of free vegetarian starter kits each year (PETA, http://www.peta.org/about/). As a result of PETA's campaign efforts, industry-leading companies, including Burger King, Safeway, and McDonald's have reduced the suffering of animals used and killed by their suppliers (PETA, http://www.goveg.com/corpcampaigns.asp).

Through its "Fur Is Dead" campaign, PETA has brought attention to the ways in which animals are trapped, raised, and killed in the fur industry and convinced retailers, including J. Crew, Wet Seal, Forever 21, and Ann Taylor to stop selling fur in their stores. Top designers such as Ralph Lauren, Marc Bouwer, and Stella McCartney have banned the use of fur in their designs. PETA also convinced dozens of companies, including Adidas-Salamon, Gap Inc., Eddie Bauer, Nike, and Reebok, to refuse to use Indian and Chinese leather in their products, after their investigation of the overseas leather industry revealed severe abuses during the transport of cattle to slaughter (PETA, http://www.peta.org/mc/factsheet_display.asp?ID=107).

A PETA campaign against the circus industry led some corporations, including General Mills, Liz Claiborne, MasterCard, Ford Motor Company, and Sears, Roebuck and Co., to stop sponsoring the Ringling Bros. and Universoul circuses (PETA, http://blog.peta.org/archives/2008/01/dennys_victory.php).

CDW, Puma, Honda, and Subaru are among the companies that have withdrawn ad campaigns using great apes as a result of PETA's "No More Monkey Business" campaign (PETA, http://www.nomoremonkeybusiness.com/campaignUpdates.asp). Other efforts on behalf of animals in entertainment include campaigns against zoos, and the use of animals for rodeos and blood sports such as bullfighting, dog fighting, and cockfighting.

Although PETA frequently works directly with companies and governmental bodies, the organization's campaigns primarily focus on making individuals aware of issues affecting animals and encouraging them to take action. PETA's International Grassroots Campaigns department works with local activists to organize demonstrations and to send letters urging companies and individuals to make changes for animals.

Companion Animals

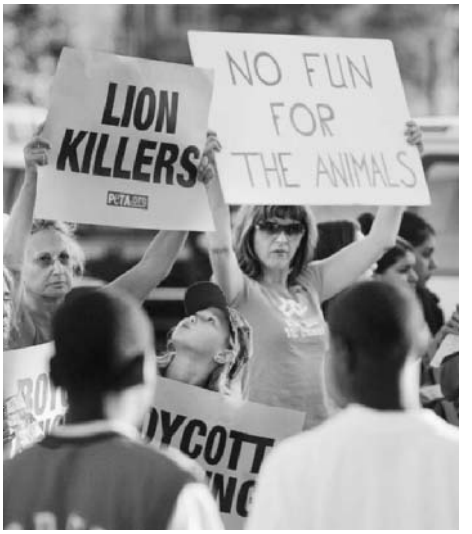
PETA works to address issues affecting dogs, cats, horses, birds, and other companion animals. PETA's cruelty caseworkers investigate cruelty to animals, and alert district attorneys to the link between cruelty to animals and violent acts against humans, urging them to prosecute abuse cases.

Since its inception in 2001, PETA's mobile clinic, SNIP (Spay and Neuter Immediately, Please), has sterilized tens of thousands of dogs and cats at a reduced cost, preventing the births of unwanted animals. PETA also builds and delivers free doghouses and gives away bales of straw in order to provide better shelter to dogs forced to live, often chained, outdoors.

Tactics

PETA has been a pioneer in using provocative tactics to attract attention to its messages. Their "I'd rather go naked than wear fur" ads, featuring eye-catching images of largely unclothed models, were an early success for the organization. PETA ads and demonstrations also often feature colorful costumes or the involvement of sympathetic celebrities. PETA maintains that attention-getting stunts are necessary to attract the notice of the media in order to reach the public, even if they alienate some people.

PETA's media-friendly tactics have also led to a growing involvement by younger animal advocates. A 2006 youth marketing survey by Label Networks found that PETA was "the #1 overall non-profit organization that 13-24-year-olds in North America would volunteer for" by a nearly two-to-one margin over the second-place finisher, and that, "The younger the demographic, the higher the percentages who would volunteer for PETA, peaking among 13–14-year-olds at 29.1 percent of this age group" (Generation Vegan, 2006).



Members of the animal rights activist group, People for the Ethical Treatment of Animals (PETA), hold up signs in front of pedestrians in protest against the Ringling Bros. and Barnum & Bailey Circus at the Los Angeles Sports Arena in Los Angeles on Wednesday, July 21, 2004. PETA is part of the growing animal rights movement that is concerned with the safety of animals around the world. (AP/Wide World Photos)

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Ingrid Newkirk

PET RENTING

In 2007, pet renting companies received considerable publicity. Arguing that they met a societal need by providing dogs for people who could not commit to owning one in the long term, they advertised pools of dogs online. Some offered a membership scheme that allowed members to book dogs in advance and have them for any period.

Often claiming that their dogs are checked regularly by a veterinarian for physical health and mental well-being, although it is not stated how the latter can be determined by a veterinarian conducting a routine examination, some rental companies assert that they screen members to ensure that the dogs will be properly looked after. Furthermore, they argue that because their members must undergo a brief training session and meet the dogs in the presence of a certified dog trainer, the dog's welfare while under hire is somehow assured.

It is unclear whether these businesses are commercially viable, but their emergence raises some important questions about the nature of guardianship of animals. The hiring of animals is not a new concept. For example, for centuries, horses have been hired for riding, with attendant concerns about the quality of equitation and the unwelcome cumulative effects of relentless and poorly timed pressure from the legs and hands of incompetent riders. More recently, horses have been hired for draft work, for example, for weddings and horse-drawn caravan holidays, with and without hired equestrian expertise, respectively. In the UK, retired racehorses make guest appearances at supermarket openings. Exotic, and sometimes potentially dangerous, animals can be hired for staged appearances to glamorize an event, though these animals are not generally left unattended with those hiring. In contrast, the pet renting business leaves the dog with its hiring humans for as long as they are willing to pay for it. Responsible animal shelters screen potential owners and may subsequently inspect the premises in which potential adoptees are to be housed. The same level of scrutiny is not afforded to hired dogs, and there may be financial disincentives for dog rental companies to find anything amiss. Unless inspections of the dogs' temporary destinations are undertaken and the credentials of the renters are fully established, the owners of rented dogs appear to be failing in their duty of care.

What is particularly novel about this venture is that the providers argue that they are leasing dogs not as accoutrements but as companions. This implies that humans and dogs can develop a transient bond in a very brief period, and that the dissolution of the bond at the end of the period of hire has no deleterious effects on the dogs. The formation of transient bonds seems possible because dogs are opportunists and, given the right set of enticements and rewards, some will accompany unfamiliar humans and readily forsake their familiar territory and guardians. The notion of bonds being broken without any costs, on the other hand, seems less plausible. Admittedly, the next human in a hired dog's life could come

loaded with even better enticements and therefore win the dog over. However, the chances are that the dog will establish a valued routine and profound bonds with its relatively permanent caretakers between leasings. It would be interesting to see whether dogs that are serially hired become sensitized or habituated to this social flux. Physiological evidence from shelter dogs indicates that habituation to novel environments takes at least four days. So, unless this period is taken as the minimum, dogs are unlikely to adjust fully to each context.

The motivation of people who rent dogs is worth consideration. This maybe reflected in the breeds in demand for this purpose. Among several engaging breeds, some pet-renting sites offer Afghan hounds for hire. This breed is often described as relatively high maintenance and difficult to train; the Afghan hound breed standard describes them as having an aloof temperament. In other words, they are not the most personable of breeds. Afghan hounds are generally released from shelters to new homes only after exhaustive questioning of the adopting family's knowledge of and expertise in dog care. These observations suggest that, when acquired on a temporary basis, Afghans have an appeal chiefly as status symbols rather than as companions. A dog's role as a status symbol can be more demanding than that of a companion, since it may require parading in ethologically challenging contexts. While a companion dog may accompany its erstwhile caregiver on a recreational trip to a dog park, a status dog may be taken shopping.

Dogs have a behavioral need for stable social groupings. Reflecting this undeniable reality, leasing operators often claim that their dogs live with them when not on visits. Although this approach seems humane, it is not necessarily as worthy as it appears, because the dogs are repeatedly withdrawn from the security of their owner's home. One could argue that the dogs somehow know that they will return to their base. This knowledge can only come with repeated experience of separation and reunion. In the absence of any data to show that dogs can reliably predict the future return of their preferred companions, we should err on the side of caution and assume that repeated disruptions in a dog's social network are likely to compromise its welfare.

Dog hiring companies claim that they source their dogs from pounds, and so assert that they have saved numerous canine lives. Yet many veterinary behaviorists believe that dogs that have spent time in a shelter need a stable rather than a transitory base. Noting that a history of having been acquired from a shelter is a risk factor for separation-related distress, they propose detailed protocols to reduce the recently adopted dog's chances of becoming distressed when left alone. Repeated fragmentation of established bonds with humans may compromise a dog's ability to cope during periods of separation from its primary attachment figure. This means that rescued dogs are likely to be among the least suitable candidates for the social flux typified by pet renting.

Unsurprisingly, dog hiring companies also offer their dogs for sale. This seems to acknowledge that there is a ready supply of replacement dogs, that little training is required to prepare them for their home-hopping existence, and that some humans will reliably feel pity for dogs with no permanent home. People contemplating this offer should consider bypassing the operators and visiting a shelter directly.

There it will become clear that many other dogs can be walked on a voluntary basis, as a form of environmental enrichment, and that foster homes are always needed. Thus dogs' needs can be met without the need to pay for the privilege.

Paul McGreevy

PETS

See Companion Animals

PIGS

Domestic pigs are canny and sensitive animals, with strong urges to forage, explore, and interact socially. These characteristics were inherited from their ancestor, the Euro-Asian wild boar (*Sus scrofa* L.). Historically, pigs were either herded in woods, housed in pens, or roamed scavenging around human dwellings. In Euro-American civilization, they were often regarded with some scorn, which was sometimes connected with rough treatment. Their of way life has been altered during the last 60 years by intensive husbandry and selective breeding. Through selection for large litter size, fast growth, and high-yielding carcass characteristics, pigs became heavier and more muscular, whereas the relative weight of bones and heart decreased. Pigs are prone to overheating and even heart failure in stressful situations, as well as to leg problems, especially if they have little exercise and/or when they are housed on slippery or rough slatted floors. Breeding for fast growth also boosts pigs' appetites. While growing pigs and lactating sows can be fed to satiation, gestating sows cannot, since they will get fat. Hence, they must be kept in a permanent, even if only "subjective," state of hunger.

Nevertheless, domestication also brought about changes such that pigs do not miss the challenges of the wild life. Although no behavioral pattern is known to have disappeared from the pig repertoire, quantitative changes have occurred during domestication that make domestic pigs inherently less active, less excitable, and less aggressive than their wild ancestors. Therefore, if the keeper provides quality food with adequate doses of fiber, an environment structured and spacious enough to meet exploratory, foraging, resting, and thermoregulatory needs, and arranges for stable social company, then pigs can live a contented, and perhaps even happy life in human care. Most current systems are far from this ideal, because mass consumption of and therefore massive demand for cheap pork, combined with tough low-price marketing competition among big retailers, pushes farmers into very slim economical margins with little space for any improvements that will make their meat production even slightly more expensive. Nevertheless, partial legislation-based changes in the EU and market-based shifts in North America have improved the welfare of pigs slightly in these two world regions in the last ten years. Much depends on whether these regions will be able to maintain the pace or even get other regions, like Latin America, on board, under the pressure of imports from countries with little or no welfare legislation or self-regulation.

Most pigs today are housed in barren environments which conflict with their behavioral make-up. The most pressing problems are:

Absence of bedding and inadequate flooring: Straw, which in older housing systems provided dry floor comfort, an outlet for exploratory and foraging

activities, and a source of dietary fiber, has disappeared from most piggeries. Lack of bulky or high-fiber food for restrictedly fed sows is not only associated with frustration, but also increases the incidence of painful stomach ulcers. However, starting in 2013, sows and gilts in EU will have access to manipulable material, and intensive research is going on to establish which properties of the material are most important for pigs. Slatted or partly slatted floors that are in common use for all categories of pigs bring increased levels of claw, leg, and limb injuries as well as shoulder lesions in lactating sows, and carpal skin lesions in suckling piglets. Full-time housing on deep straw litter, on the other hand, leads to overgrown claws and the risk of lameness, unless the claws are properly trimmed. Thus, optimal flooring combines soft dry bed for resting and hard solid surface in activity areas for abrasiveness.

Restriction of movement: The majority of pregnant sows in North America and many in Europe are confined in small crates. This, combined with hunger and the absence of bedding, leads to continual chewing on bars or other repetitive stereotypic behaviors, and causes constant stress, as revealed by elevated levels of corticosteroid levels. Oral stereotypies could be reduced by a high-fiber diet. There has been positive development both in EU, where gestation stalls will be phased out by 2013, and in the United States, where some states have banned crates, and big pork suppliers, under the demand of large fast food chains, are shifting towards group housing of pregnant sows. In small piglets, spatial limitation and lack of contact with other litters suppresses social play, which may hamper normal development of their social skills.

Thermoregulation: For adult pigs, temperatures above 25ºC (77º) pose a

A pig standing in his pen on an Iowa farm. (AP Photo/Charlie Neibergall)

challenge, as pigs cannot sweat. In nature, they cool themselves by rolling in mud or wallowing. For pigs kept indoors, maintaining the temperature below 25°C is important, while pigs kept outdoors should be provided with shadow and wallowing opportunities.

Body cleanliness: If space allows, pigs defecate and urinate in one location and never lie in a fouled place. They are forced to do so, however, when kept in groups of high spatial density, or confined in crates, or if they are exposed to high temperatures and cannot use other wallowing material.

Social behavior: When unfamiliar pigs meet, they perceive each other as intruders, and intense fighting invariably begins. Numerous, although superficial, injuries are inflicted by biting. As confined spaces prevent the losing individuals from fleeing, attacks may last for several hours or even days, with the losers becoming extremely distressed. The composition of the pigs in a group should be changed as little as possible. Pigs have a strong need to eat synchronously, and if access to food is disturbed, low-ranking pigs can suffer from bullying by pen mates.

Farrowing and nursing: Hormonal changes preceding parturition prompt the sow to seek a half-hidden place and build a nest. Most parturient and lactating sows are housed in unbedded farrowing crates. This prevents locomotion and nest-building and results in agitation, futile nest-building movements, and elevated levels of the stress hormone cortisol. Individual bedded pens give more freedom, but may result in a higher number of piglets crushed by the mothers (see below). Some farmers use straw-bedded indoor group housing systems where lactating sows can freely enter small individual farrowing pens, but this system demands highly skilled management. Outdoor huts, which are a good option under some climatic and soil conditions, provide better welfare for farrowing and suckling sows, given that protection from extreme weather and disease is guaranteed.

Piglet mortality. About 15 percent of live-born piglets die within the first three days of life, even on well managed farms, due to low birth weight, insufficient milk intake, and crushing by the sow. This is a direct consequence of very large litter size (median around 12, maximum up to 16 piglets). Selection for further increase in litter size is therefore clearly undesirable from the pig welfare point of view.

Surgery on small piglets: The majority of piglets are subjected to tooth-trimming and tail-trimming, and the males are castrated. No anesthesia is given. Tooth-trimming is performed to prevent damage to sows' teats and to littermates, and tail-trimming is performed to prevent mutual tail-biting. As these are husbandry-related risks, the objective should be to treat the causes and thus avoid the need for these practices.

Weaning: While the natural age of weaning is four months, piglets on factory farms are most often weaned at 3–5 weeks. The method of weaning at 8–16 days, based on strict hygiene and mandatory antibiotics in food, is becoming more common. However, weaning before three weeks of age causes intense distress reactions and disturbed behavior among the piglets, such as suckling-related belly-nosing and nibbling of age mates.

Human-swine interactions: Rough treatment, such as hitting, kicking, and using pain-inflicting devices, makes pigs fearful of humans. They are then difficult to handle, get easily excited, and produce less well in terms of growth and reproduction. Working with such animals is an

unsatisfying job, produces negative attitude towards them among the personnel, and a vicious circle occurs. Improvement both in welfare and in performance can be reliably achieved by educating the personnel about the principles of pig behavior and positive ways to handle them.

Transport: Transportation is stressful to pigs. The strain may be severe or even fatal if pigs also experience exposure to extreme temperatures, long durations without water, food, and rest, mixing with alien pigs, overcrowding, and slippery floors. Regulation concerning animal transport are being gradually imposed, but unacceptable practices are still common, often in defiance of existing regulations.

Slaughter: Most industrialized countries require instantaneous stunning of pigs before slaughtering. It is the preslaughter handling and housing of pigs rather than the slaughter itself that causes considerable suffering because of its large scale, total anonymity, and the tendency among the personnel to depreciate the suffering. Education and setting firm standards for procedures and equipment can eliminate unnecessary suffering at slaughterhouses.

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PLEASURE AND ANIMAL WELFARE

The desire to feel good dictates much of what we do in our lives. The foods we eat, our choice of companions, our career choices, and our hobbies all can bring feelings ranging from satisfaction to joy. While it may be more important to avoid pain and suffering where we can, it is the pursuit of pleasures that fills more of our waking time.

Despite its central place in our lives and, as I shall argue, in the lives of other animals, the study of pleasure has suffered neglect. Today, the titles of at least nineteen scholarly English-language journals contain the word pain, yet there are no journals dedicated to the study of pleasure.

The neglect of pleasure has been even more profound in the study of animals. One reason for this is that pleasures are so-called private experiences, and therefore difficult to demonstrate clearly, especially in another being who doesn't use our sort of language. Also, for much of the last century it was considered bad science to even suggest that nonhuman animals were conscious or had feelings. Fortunately, in recent decades, the momentum has shifted, and time is now ripe for the pursuit of pleasure to be understood as an important element of animals' day-to-day lives, as it is for ours.

The Basis for Animal Pleasure

Pleasure is a product of evolution. There are good reasons that sentience, the awareness of pain and pleasure, evolved. Because animals, unlike plants, are able

to move freely, the capacity to feel allows them to be pleasure-seekers and pain-avoiders. The individual is rewarded for performing behaviors that promote survival and procreation. Pain's unpleasantness teaches the animal to avoid bad behaviors that risk the disaster of death. Similarly, pleasure encourages animals to behave in good ways, such as choosing high quality foods, seeking good mates, and finding a comfortable shelter.

In appreciating the pleasure that other animals feel, we also have the advantage of relating their experience to our own. Because we know the enhanced taste of food when we're hungry, the scent of a flower, the thrilling touch of an intimate partner, or the experience of slipping into a warm bed on a chilly night, perhaps with a cat or dog snuggled against us, it is easier to recognize that other animals can have comparable sensations. Human languages contain rich vocabularies for good feelings, which attest to the diversity of both the physical and emotional pleasures we can feel. It follows that some animals, having evolved to dwell in diverse environments, from flying to burrowing to living submerged in the oceans, might also be able to experience realms of pleasure unfamiliar to humans. For example, the echolocation abilities of bats and whales, electric communication in fish, birds' tuning into the earth's geomagnetic field to help navigate, may not explicitly involve pleasure, but they illustrate the potential for sensory pleasures unknown to us. Several leading scientists have recently suggested that other animals may experience some feelings more intensely than we do.

Examples of Animal Pleasure

Animal pleasure can be studied through both observation and carefully designed experiments. To illustrate, let's look at some examples relating to the realms of play, food, sex, and touch.

Play Play behavior is widespread in mammals, and has also been so far described in about half of all families of birds. Behavior suggestive of play has also been observed in reptiles, fish, and at least one invertebrate, the octopus. Because play tends to occur spontaneously and unpredictably, it is difficult to measure, and most published studies of animal play are anecdotal. But more systematic studies are possible. For example, a three-year study of aerial drop-catching behavior by herring gulls in Virginia concluded that it was play. These birds will drop clams onto hard surfaces to smash them and access the soft parts; but they will also swoop to catch clams and other objects they have dropped before they hit the ground. The latter behavior appears to be playful, because drop-catches were performed more by younger birds, drop-catches were not necessarily made over a hard substrate, sometimes non-food objects were dropped/caught, and it occurred more often during warm, windy weather.

There are good adaptive reasons for the existence of play. Playing games of chase is no doubt beneficial for young animals who need to be prepared to flee from a lurking predator, as it is for young predators who will need to catch their food. Yet, animals including humans do not consciously play for ultimate reasons; they play because it is fun to do so. Enhanced survival can be seen as a positive reward in the evolutionary sense, but not in the sense of experiencing a pleasurable sensation. Several species are known to calibrate the boisterousness of their play, apparently to sustain the activity, which also suggests that they are enjoying it.

Food There are innumerable clues that animals favor the flavor in their food. Individual food preferences are well documented in both domesticated and wild animals, as are the anticipation of food and individual tastes that change over time. Language-trained apes and parrots can actually tell us their enthusiastic reactions to food. It has also been shown that animals produce pleasurable compounds known as opioids during both the search for food (the pleasure of anticipation) and its consumption.

Facial responses to tastes are similar in rodents, and humans and other primates, suggesting shared evolutionary origins. Enjoyably sweet flavors elicit characteristic licking responses, while bitter tastes cause gaping and head shaking. These responses are accompanied by activity in shared hedonic hotspots of the brain. This linking of brain activity with positive patterns of behavior points to the conscious experience of pleasure.

A study of juvenile green iguanas showed that these animals would trade-off the palatability of a bait (lettuce) with the disadvantage of having to venture into a very cold area to retrieve it. As the temperature near the bait was lowered, the lizards visited the bait less often and for shorter periods, choosing instead to stay under the heat-lamp where nutritionally complete reptile chow was freely available. Moreover, time interval between sessions with the lettuce bait, ranging from one to eight days, had no effect on the duration of stay on the bait, suggesting that the lettuce was more of a luxury rather than an indispensable nutritional food source. Rats respond conversely, shunning convenient but dull laboratory chow and running into a cold environment to consume highly palatable foods.

Sex It is hard to overestimate the importance of reproduction to an organism. Without it, species would cease to exist. Because reproduction is so important, natural selection should strongly favor behaviors that promote mate-seeking, mating and, where necessary, the raising of young. Unfortunately, sexual activity in animals is usually portrayed as all business and no pleasure. From journal articles to textbooks to television documentaries, the idea that animals may be enjoying themselves is not explicitly rejected; it is just generally avoided.

One piece of evidence for the sensual aspect of animal sex is that a good deal of animal sexual behavior is not procreative. Many animals routinely copulate or engage in other sexual activities outside of the breeding season, including during pregnancy, menstruation, and egg incubation. Such non-procreative activity constitutes a large proportion of the sexual behavior expressed by such animals as common murres, proboscis monkeys, addax antelopes, rhesus macaques, wildebeest, golden lion tamarins, and mountain goats, to name a few. Another variation on the theme of wasteful sex is group sexual activity wherein few if any participants are passing along genes. Spinner dolphins, gray and bowhead whales, swallows, and herons are known for their orgies. Other common examples in normal wild animals include various forms of non-copulatory mounting; stimulation with hands, paws, flippers or mouth; same-sex mating, interspecies sexual couplings, and self-stimulation.

Touch Touch sensitivity, while indispensable neither to survival nor to reproductive success, is very useful.

It allows animals to react adaptively to their environments. Being able to detect water movements helps fish orient themselves in murky streams or on migration routes, and to detect the movements of other nearby animals, including potential predators. But for group-living species especially, the pleasure of touch acts as a social lubricant, strengthening friendships and defusing tensions. For chimpanzees, macaques, and other primates, grooming occupies up to a fifth of their waking time. The release of pain-relieving endorphins has been shown in grooming primates.

Few investigators have addressed the pleasure of touch. In some cases, animals' liking of tactile contact may reveal itself by accident. For example, in a study in which dolphins could request rewards by pressing plastic symbols on a keyboard with the tips of their beaks, some animals favored getting a rub to getting a fish. When human researchers experimentally groomed Camargue horses, the animals' heart rates slowed significantly more, an indication of pleasurable relaxation, when the touch was directed at areas of the neck that horses prefer when grooming each other.

Young rats show a mirthful response to the touch of a trusted human. Trained to expect a friendly tickle when the human hand is introduced to their space, these rats pursue the hand. No food reward is provided; touch is the reward. Tickled rats run to the hand about four times as quickly as do control rats trained to expect a gentle stroke on the neck. Tickled rats also make about seven times more high-pitched chirps during play and other presumably fun activities. Brain imaging reveals that a tickled rat shows similar brain activity patterns to those of a human who is enjoying a good laugh.

The Well-being of a Pleasure-Seeker

Animal pleasure has weighty moral implications. Being a pleasure-seeker adds considerably more to one's interests than if one were merely a pain-avoider. Being able to feel good means being able to enjoy life. There is more at stake, more to be gained, and lost.

Philosophers for centuries have recognized the significance of pleasure to ethics. Utilitarianism, originating in the 18th century, favors actions that optimize pleasurable outcomes while minimizing negative ones. Its founder, Jeremy Bentham, regarded animals as serious objects of moral concern, based on their capacity for both pain and pleasure. Peter Singer argues that sentient animals have interests, and that those interests involve not just avoiding physical pain and/or psychological suffering but also the experience of pleasure. Tom Regan emphasizes the intrinsic value of sentient organisms. An individual who can experience good feelings has a life that is of value to that individual, independent of any value it could have to another, such as a source of entertainment or revenue. American veterinarian Franklin McMillan adds that such an individual has a quality of life.

Regarding the human-animal relationship, it is the denial of pleasure, not its bestowal, that has moral weight. One has no obligation to provide pleasures to another, be they another animal or a fellow human. Bringing flowers to a friend is an act of kindness, but it is not an injustice if I decide to keep them for myself. If, however, my friend has flowers and I take them away, then I am violating my friend's interests, albeit rather trivial ones in this example. The pleasures we deny animals are more serious. When we keep animals in factory farms, laboratory

cages, fur farms, and other settings, we not only inflict pain and suffering, we deny them the opportunity to express natural behaviors. Animals confined for generations in laboratories and in factory farms retain high levels of motivation to engage in activities natural to their species; thwarting them leads to frustration, physical stunting, and psychological illness.

A more profound way in which we may deny animals pleasure is in killing them. An untimely death denies the victim the opportunity to experience the rewards that life would otherwise offer them. It may be claimed that a dead animal misses nothing. But the main reason that our criminal system treats murder so seriously is not that the victim may suffer, though that certainly compounds the crime. Murder is wrong because life, specifically that portion of life yet to be experienced, has value. Thus, killing is the greatest harm that can be done to conscious, autonomous beings, and pleasure is firmly rooted in the harm committed.

By and large, the harms humans cause animals are not necessary. Most animals killed by humans are killed to be eaten, and with rare exceptions humans can choose plant-based diets, including highly palatable faux meats. Similarly, we use animals in laboratory experiments and tests because we can, not because we must. The same goes for other consumptive uses of animals by man: hunting and fishing, blood sports, fur and leather fashions, classroom dissection, etc. As a society we can change our laws and policies toward animals, and such changes are beginning to happen. As individuals, we can effect immediate change by making lifestyle choices that don't aid and abet the industries that harm animals and deprive them of pleasure. If animals felt only pain, that would be a worthwhile aim. That they also feel pleasure makes it more so.

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Jonathan Balcombe

POETRY AND REPRESENTATION OF ANIMALS

In poetry, the distanced relationship between modern and contemporary poets and the animal kingdom is a clear example of the slow movement of civilization that separates people from the natural world. In the poetry of indigenous peoples around the world, in the crystalline evocations of a moment, the presentness of the *haiku* poets (Issa, Basho, Shiki), and in the incantatory works of visionary poets (William Blake), one discovers a charged closeness to animals.

In the poetry of childhood, nursery rhymes and instructive books of childhood verse, one encounters poems which wean children away from a world view in sympathy with animals to the controlled and distanced relationship the adult world maintains.

In his preface to *Technicians of the Sacred,* Jerome Rothenberg notes that, of the primitive poetries from around the world which he has collected, ". . . above all there's a sense-of-unity that surrounds the poem, a reality concept that acts as a cement, a unification of perspective" (Rothenberg, 1968, p. xxii).

In their poetry, Native Americans spoke in the voice of the deer spirit, as well as their own, the hunter's. John Bierhorst's *In the Trail of the Wind* includes a whole section of poems "The Deer" from the Papago, Pima, and Chippewa. The poems construct a sort of conversation between animal and man grounded in respect, belief, and connection (Bierhorst, 1971, pp. 51–57). It is in their understanding of the connectedness of all living things, even the hunter and the prey, that their relationship to the animal kingdom is expressed.

Japanese *haiku* poets Basho, Issa, and Shiki, from the 17th, 18th, and 19th centuries respectively, address animals (frogs, crickets, cicadas, and others). In some poems they speak in the voices of animals, and throughout their work they show a consistent, tangible awareness of animal presence. In his introduction to *The Penguin Book of Japanese Verse,* Geoffrey Bownas notes that among Basho's construct of rules for *haiku*, the poet "should so express the nature of the particular as to define, through it, the nature of the world." (Bownas, 1964, p. lxvi). While Issa's poems directly address a cricket, a lanky frog, and insects, with a question or a warning, Basho's in many instances use a creature's sound or presence on which to hang a mood, a comment, an instant. In Shiki's poems, the slightness, to American sensibilities, of the *haiku* form seems to turn toward the poetic equivalent of a snapshot. In all of these poets, the presence of and connectedness to the animal kingdom is unmistakable.

Incantatory and magnificent, William Blake's "Tiger, tiger burning bright" ("The Tyger") is poetry's most startling creature, feverishly real, devastatingly powerful, and alive, addressed, in fact questioned, throughout the poem as to what "could frame thy fearful symmetry?" (Blake, 1958, pp. 49–50). American poet Robinson Jeffers shows the same reverence and respect for the animal kingdom, for hawks, skunks, deer, stallions, and "the bird with the dark plumes in my blood" (Jeffers, 1959, p. 196). The question of the extent to which visionary poets employ animals as symbols or metaphoric constructs lies outside this consideration. For our purposes, the creatures are as vibrant and staggeringly real as they are meant to be.

The poetry of childhood is instructional, memorable and, at its best, able to capture the world from a child's perspective. Start with Mother Goose and her animal tortures. Four and twenty black birds are baked in a pie. Everywhere that Mary goes, so does the lamb. The mouse runs up and down the clock, and finally three blind ones have their tails cut off with a carving knife by the farmer's wife. Luckily, thankfully, the poet James Stephens asks in his poem "Little Things" that the "Little creatures everywhere" forgive us all our trespasses (Bogan & Smith, 1965, p. 19).

Edward Lear's *Nonsense Books* are filled with animals, some of them little

more than personifications or anthropomorphisms, and quite Victorian at that. His Owl and Pussycat are a prime example. Similarly, Lewis Carroll's creatures, the Snark and the Jabberwocky among them, are imaginary, vivid, magical, and requiring no empathy. And Robert Louis Stevenson's *A Child's Garden of Verses is* devoid of animal life.

It takes Christopher Smart and William Butler Yeats, writing each about their house pet cats, to refocus children's caring and connection. Smart's gloriously celebratory "My Cat Jeoffry" in its penultimate line reminds us " For he is an instrument for the children to learn benevolence/ upon." (Grigson, 1959, pp. 120–121). Yeats' Minnaloushe in "The Cat and The Moon," is "Alone, important and wise" (Bogan & Smith, 1965, pp. 245–246). But perhaps Thomas Hardy, hardly a poet of childhood, best sets the example when in "Snow in the Suburbs" he writes of a black cat, stray in the snow which "comes, wide-eyed and thin; And we take him in" (Bogan & Smith,, 1965, p. 254).

Is it too easy to posit that life in the modern world—largely urban, separated in most cases from food gathering processes, enclosed in concrete, steel, and glass—is the culprit in modern and contemporary poetry's seeming lack of connection to animals? There is no poetic equivalent to the visual tirade against the mistreatment of animals in the meat industry by the artist Sue Coe. And though there are poets who show some awareness of the animal kingdom, appreciation for animal beauty, a fistful of poems about birds and butterflies, and some Zen-inflected poets like Robert Bly, Gary Snyder, and W.S. Merwin, who show quick recognition of animal being, for the most part, with a few notable exceptions, the work, especially in English, of the last hundred years, speaks more than anything to the break in the connection we once had with animals.

In her rich and instructive anthology *We Animals: Poems of Our World,* Nadya Aisenberg collected poems from around the world, and developed a classification system for the relationships they display, which are reverence, dominion, fraternity, communion, and fantasy (Aisenberg, 1989, p. 3). Each of these relationships is reflective and reflexive, indicative of a loss from the connectedness described earlier. When D. H. Lawrence in "Snake" throws a "clumsy log" at a snake he is watching, aware of his ambivalence, fear, and fascination, in the last stanza he bemoans his loss, having "missed his chance with one of the lords/Of life" and indicates his need to make amends for his small-mindedness (Lawrence, 1965, pp. 95–98;Aisenberg, 1989, pp. 22–24). How much more clearly can the lost connection be expressed or mourned?

Contemporary Native American poets, caught between a traditional world and modern life, often write of mending that broken connection. For many of them, poems move slowly back to an older knowledge. Maurice Kenny's "Late Summer in the Adirondacks" from his *In The Time of the Present,* celebrates, with echoes of traditional poets in its repetitions of the phrase "they have come," the arrival of blue jays to the land. Peter Blue Cloud's *Winter with Crows* lets the crows of his home take their rightful places in his poems, considered, described, and honored.

But what of American poets, modern and contemporary, in a world disconnected? Can they capture presentness or connection with the animal kingdom, a belief, made apparent in their words,

in the rights and welfare of animals? Wallace Stevens' "Thirteen Ways of Looking at a Blackbird" works with an almost mathematical sharpness, seemingly a construction, an exercise, but one which deepens and opens up. Stevens' meditation not only consciously asks questions about the relationship between us and the blackbirds, but acts as a measure, not of us against the blackbirds, but of their presence in the world, albeit and however reluctantly, our world. The blackbirds live beyond symbol, memory, myth, and number in the poem.

Denise Levertov gracefully and gratefully acknowledges all animals and their role in the world in "Come into Animal Presence." She speaks with hope, the hope that as a consciousness of animal rights and welfare grows, so it will grow in our poems, returning to something we have lost, or as Levertov puts it, "An old joy returns in holy presence" (Aisenberg, 1989, p. 43).

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James S. LaVilla-Havelin

THE POLITICAL SUBJECTIVITY OF ANIMALS

Although nonhuman animals are the objects of legislation governing their welfare, they seem *prima facie* to lack political subjectivity, which is to say that they do not seem to be agents who can represent themselves politically. Thus, it would seem that humans must speak on behalf of nonhuman animals, representing them in the exclusively human political domain.

This exclusion of nonhuman animals from the political sphere was of course classically signaled by the ancient Greek philosopher Aristotle when he defined man as the *zoon politikon,* the political animal, therefore implying that other animals are not political, which is to say, they cannot play a part in the life of the *polis,* the city, the basic unit of Greek civil life. Now, it was not only nonhuman animals who were in principle excluded by

Aristotle from political life, but also the mass of humans who were non-Greeks, and even the vast majority of Greek humans who were female, slaves, and/or children. It may thus be argued that the exclusion of nonhuman animals from political participation might be ended, just as women and the common people have ended their exclusion by acquiring political suffrage in modern democratic societies.

Certainly something like this claim seems to be true for animal rights. At first, we had the rights of man, then human rights, extended not only to men but also to women, children, and what were once regarded as inferior races, and now animal rights, which have actually been enshrined in law. The rights of animals indeed give them a form of political subjectivity under the law.

Types of Political Rights for Animals

Although he is not interested in animal rights so much as animal liberation, Peter Singer is one among the many who have argued that there is an historical progression at work here. The key concept of this view of the political status of animals is Richard D. Ryder's concept of speciesism, adopted most famously by Singer. This concept condemns the exclusion of animals from political consideration because of their species, just as racism has excluded some humans through the subcategorization of some humans.

The anti-speciesist animal liberationists do not, however, argue for the extension of full political rights to nonhuman animals. It seems that there is still a level that nonhuman animals cannot attain, namely, participation in political decisions. Certainly they do not have the rights of suffrage, the right to vote or participate otherwise in political processes, even though these processes claim the right to create legislate about animals. In this they are in a similar position to human children. Both groups are held to lack sufficient rationality to determine their own futures, as was once held to be the case also for slaves and women, hence they are barred from playing a formal role in the political process.

However, this lack of a de jure role in political processes does not mean that nonhuman animals and infant humans are not de facto political agents. It is clear that human children in fact have a nontrivial political influence, both through influencing their parents and other enfranchised humans and by influencing things more directly, carrying out small acts of resistance, organizing politically within schools, and so on.

Some of the more explicitly political actions of human children, such as joining political youth groups or participating in school governance, are of course not undertaken by nonhuman animals. However, animals are able to undertake actions that have political import.

Peter Singer's views have tended to contradict the prevalent view of nonhuman animals as passive political objects, by claiming that animals have desires or rather preferences which they manifest and which can readily be discerned. Thus, Singer argues that when an animal tries to escape captivity, it is expressing its preference not to be captive in a readily discernible way. In this, Singer accords more importance to the agency of animals than does Ryder, whose painism emphasizes the capacity for suffering of animals as the source of our ethical obligations to them.

Although animals resist our control enough to show that they do not want to be controlled, their lack of political subjectivity in the full sense possessed by human animals seems to be confirmed by their inability to resist effectively on the human level. Animals' resistance is such that they are readily contained by now-perfected measures. By changing the animals themselves through selective breeding, and building environments, fences, cattle prods, cages, and so on, we now control domesticated animals to the extent that their resistance, although still commonplace and obvious, is apparently neutralized. Unlike humans, nonhuman animals in such situations seem incapable of, for example, secretly organizing to stage an uprising against their captivity, though such a scenario is the premise of several works of fiction, most prominently George Orwell's *Animal Farm.*

This inability is in fact a major cause of a certain contemptuousness on the part of the traditional political left against the placement of animal liberation on the same plane as the liberation of humanity, because they see political struggle as being an exclusively human affair. They are therefore out of sympathy with talk about how animals are exploited in much the same way as human workers, despite the fact that animals are often exploited in the same facilities as humans and by the same people, because animals are not seen as possible allies in the organized human struggle.

However, the fact that animals are incapable of political organization in a narrow sense does not necessarily mean that their resistance has been entirely negated. Just as African elephants are actually farming grass on the African savannah by their habit of uprooting trees, animals have political agency via the actual political effects of their actions. Specifically, through their expressions of anguish during human maltreatment, animals can influence humans to act to protect them. Such animal actions may certainly be seen as an essential cause of the discourse of animal rights and animal liberation itself.

Certainly, animals manipulate humans the way children manipulate adults, which is to say that it is naïve and lacking in cynicism. Indeed, part of the reason why humans are moved to help animals can be their very innocence.

Everyday Power Relations

While we can say that, although on a macro-political level it does seem that animals lack political subjectivity because they cannot participate in government, on a micro-political level, as most prominently put forward by French philosopher Michel Foucault, this is by no means obvious. In a household, for example, animals seem quite capable of exercising power, defined by Foucault as the ability to act on the actions of others. For example, a cat is quite capable of behaving in such a way as to purposefully motivate its owners to give it food, in much the same way a human can with another human. Pets and other animals are able to enter into power relations with humans in which they entice, seduce, or threaten humans or are in turn cajoled or seduced by humans. It would even be possible to link this micro-political subjectivity to a macro-political influence; pets owe their very survival to an ability to bond with and command the loyalty of owners, which can in turn lead to owners taking relevant political action for the needs of pets.

Such recent poststructuralist thinking about political agency tends to turn the

tables on traditional thinking about political subjectivity. Thinkers such as Singer merely see an existing progressive trend broadening in the future to include respect for animals in addition to the rights of man, without challenging our notions of subjectivity themselves. Poststructuralist approaches to subjectivity, on the other hand, are suspicious of such a progressive view of history, and instead attempt to undermine our way of thinking by exploring our notions of subjectivity themselves and showing how in fact we can, in this case, understand animals as politically engaged subjects.

Of course, it still appears to be the case that animals' political capacities are inherently and permanently limited to a level lower than that of most adult humans. As Singer has frequently pointed out, however, there are adult human adults who are handicapped and therefore have similarly limited political capacities.

See also Ethics and Animal Protection—Political Action Committees (PACs) for Animal Issues

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Mark G. E. Kelly

POLYISM

Polyism is the phenomenon whereby a given standard of care is lower because of the numbers of animals involved, and also partly because of the size of the animal. It is particularly noticeably in intensive farming systems for pigs and poultry, where literally tens or hundreds of thousands of animals are kept in a single shed or similar confinement, compared with, say, dairy cattle where the herd size is measured in hundreds or less. It is partly due to the impossibility of observing each animal individually, the financial value of each animal as a unit of production, and the numbers of animals showing adverse effects, such as lameness in chickens towards the end of the growing period. Farm personnel would likely pay more attention to a lame dairy cow than to a lame chicken or pig.

David B. Morton

PRACTICAL ETHICS AND HUMAN-ANIMAL RELATIONSHIPS

Our relationship with other animals is complex, and our treatment of them is as controversial as our treatment of other human beings. Questions about the ethics of human-animal relations are thus an ongoing concern, and have implications for humanity's interaction with wild, companion, farm, and research animals. The topic of animal ethics is therefore at the core of the emerging field of animal studies, the discourse of environmental studies, and in many subfields such as animal geography. One manner of addressing such issues is through practical ethics, a mode of moral understanding that is well

suited to grappling with our responsibilities in a more-than-human world.

Ethics

Definitions of ethics can differ vastly. Most of these differences are rooted in attempts to explain ethics in terms of something else. For example, various academics have tried to associate ethical concerns with personal preferences, emotional responses, religious beliefs, social expectations, and genetic determinism. Personality, empathy, spirituality, social custom, and science may all enrich ethics at various points and times. Yet we should be careful not to let this obscure the meaning and importance of ethics itself.

To discover the meaning of ethics, we can look to Socrates, a Greek philosopher whose definition of ethics has been at the core of ethical thought for several thousand years. Socrates saw himself as a gadfly and midwife. As a gadfly he pushed people to think harder. As a midwife he helped them develop their thoughts to a higher level of rigor. For him and his followers, ethics was about how we ought to live (Plato *Republic*, Book 2, p. 312d). What this brief statement means is this: ethics is about the moral values that inform or should inform our lives. When we engage in ethics, we are not only exploring our ideas about what is good, right, just, and valuable, we are also articulating principles of conduct based on these ideas.

Note that ethics is not only for human beings. People may be the only creatures on Earth who have abstract systems of thought labeled ethics. In this sense, ethics is an artifact of human culture. This does not mean our ethical considerations must exclude other creatures. The moral community is a mixed one, populated by humans and other animals, all of whom share an intrinsic value and moral standing alongside the rest of nature. In addition, individuals and groups, ecosystems and societies, represent different foci and scales of ethical reason. People, animals, and nature all have characteristics that ethics helps us appreciate and protect.

Theoretically Rich and Empirically Situated

The world's moral complexity and the kind of ethical reasoning necessary to grapple with it was no secret to Socrates. He practiced a form of moral reasoning that was fully engaged with the empirical world, and differs markedly from the standard ways in which ethics is often practiced today.

In the standard model of ethics, moral truth is determined through abstract argument prior to one's engagement with concrete moral problems. This is sometimes called theoretical ethics. These claims are then applied to concrete cases in a top-down, linear, and deductive manner. This is what is meant by applied ethics.

Practical ethics proceeds differently. Rejecting an easy division between theoretical and applied ethics, it does not determine moral truth ahead of time. Rather, it seeks out a situated truth by integrating what we learn from a concrete case, in conjunction with the conceptual insights that help us best understand and resolve that case. Practical ethics looks to diverse moral principles, rooted in the empirical reality of cases, to triangulate on the reasons for and resolutions to our moral concerns. Put another way, practical ethics is a situated moral understanding, an ethics that is simultaneously conceptually rich and situated in real life.

Several features about practical ethics should be emphasized here.

Pluralism. For the practical ethicist, moral concepts are plural and complementary. The more concepts we have, the deeper our reservoir of potential insights. Thus the practical ethicist is not precommitted to a single concept that she uses over and over in all situations. She is free to choose from a constellation of concepts. Ideally, her choice reflects those concepts that are most useful in resolving a moral problem. Moral concepts that are commonly used in practical ethics are recognized by such terms as good, right, fair, just, and valuable.

Triangulation. Ethical concepts cannot be applied by rote, like some grid of latitude and longitude from which we can read the correct moral position. Rather, moral understanding is akin to triangulating on the best ethical position. When triangulating over land or sea, one needs several reference points to properly plot one's position. These reference points may be stars or landmarks. The same applies to practical ethics, where the reference points are well developed moral concepts.

Principles and Maxims. Moral concepts can be used as either principles or maxims. A principle is a moral concept used to clarify our thinking. It provides guidance to our reasoning about how we ought to live. A maxim is a moral concept used to clarify our actions. Maxims provide more focused guidance than principles. The intrinsic value of people and animals is an example of a principle. The golden rule, treat others as you want to be treated, is an example of a maxim. Overall, principles justify the use of certain maxims that guide our conduct, while maxims align our actions with principles.

Rule of Thumb. Moral concepts are not rigid or absolute laws. They are a rule of thumb that helps us distinguish better from worse ways of thinking and acting. Both principles and maxims actively and dynamically reveal the ethical issues at stake, and provide guidance on what we ought to do about them. They do not, however, make moral decisions for us. Rather, they are the tools through which we exercise moral judgment.

Praxis. The term praxis refers to putting theory into action. Praxis is not a one-way relation where one deductively reasons from theory to action. It is a two-way relation where theory and action are reciprocally informing. In practical ethics, the principles and maxims we use to reveal ethical issues and guide our subsequent actions are selected in light of the case at hand. It is a form of practical reasoning where theory and reality are not disengaged from each other.

Context. Concrete moral problems are situated in space, time, nature, and culture. All ethical issues therefore have a geographical, historical, environmental, and cultural context. The stock of moral concepts in use and the actions that a moral agent can take are enabled and constrained by the context in which one operates. These are the sites and situations in which moral problems, the controversies that swirl around them, and their possible resolutions exist.

Judgment. The proper matching of principles, maxims and cases takes experience and skill, a feature that practical ethicists refer to as judgment. Having good judgment means one can correctly match the most appropriate moral concepts to the case at hand. This is best done when we integrate the facts on the ground with our best ethical understanding. From this point we can make moral decisions and chart a course of action from there.

Truth. From the standpoint of practical ethics, there is rarely a single, indisputable judgment that is right or wrong. Reasonable people will differ on the best principles and/or maxims for understanding a particular case. They may also differ on what a reasonable course of action might entail. Recognizing that absolute truth (veracity) is rarely possible, practical ethics seeks the best account of truth that is possible (verisimilitude).

Situating. The recognition that absolute moral truth is very difficult to come by is not a reason to endorse ethical relativism. With its emphasis on praxis and context, practical ethics is not only situated in the world, but takes the creative middle ground and situates itself between absolutist and relativist interpretations of ethics. It does so in the belief that we can distinguish better from worse moral reasoning or courses of action. We do so in light of the evidence at hand, and the rigor of our thinking.

Examples of Principles and Maxims

Below are a few examples of how a practical ethics regarding nonhuman animals would work.

Principles (Guidelines for Thought)
Geocentrism—We should acknowledge the moral value and standing of people, animals, and nature. This means that we value animals and their habitats, while encouraging recognition of humanity's membership in a wider moral community. Geocentrism incorporates the insights of anthropocentrism (the moral value of people and their communities), biocentrism (the moral value of individual people and animals), and ecocentrism (the moral value of biodiversity and ecosystems).

Equal Consideration—We should give equal consideration to the well-being of people, animals, and nature. This principle helps us actualize geocentrism by identifying and balancing our responsibilities to people, animals, and their mutual habitats. Note that equal consideration does not imply equal treatment. When creatures differ in their capacities and modes of life (for example, people, foxes, voles), then equal consideration requires appropriate differences of treatment.

Hard Cases—Our universal need for geographic space—habitat, resources, etc.—makes win/lose conflicts a fact of life. When faced with a situation pitting humans against animals, we must first solve the underlying problem, then look for alternatives and, as a last resort, choose a geographic compromise that protects the entire community's well-being. This principle helps us think through the complications raised when we give equal consideration to the well-being of humans and nonhumans.

Moral Carrying Capacity—People should live within an overall carrying capacity that protects the well-being of nonhumans, biodiversity, and landscapes. This principle is crucial, as it helps us avoid the hard cases mentioned above. While technology and social organization may mitigate the upper limit on the earth's carrying capacity for humans, there is a definite and negative impact of societal growth and consumption on the nonhuman world. Humans must take responsibility for limiting their use of the earth's carrying capacity.

Precaution—The idea behind precaution is similar to the medical principle: First, do no harm. This is a principle for dealing with the uncertainty that pervades questions of both ethics and

science. Precaution states that a lack of certainty is not an excuse for actions that are irreversible or may create harm. In the face of uncertainty, precautions should be taken to minimize the risks to people, animals, and the rest of nature. One has no inviolable right to engage in activities with risk of harm (for example, polluting a water source) simply because the range and extent of that harm is not yet well documented.

Maxims (Guidelines for Action)
Integrity—We should endeavor to respect the psychological, physical, and social integrity of wild and domestic animals by minimizing stress, using noninvasive and nonlethal techniques in cases of conflict, and avoiding the disruption of their social organization and ecological relationships.

Graduated Response—In cases of human-animal conflict, there is a continuum of responses, from the nondestructive and nonlethal through the destructive and lethal. We should seek to resolve a problem with nondestructive and nonlethal responses first. Where one starts on this continuum depends on the severity of the problem.

Harm-Benefit Ratios—During the design phase of research, policy, or management strategies regarding nonhuman animals, we should calculate harm-benefit ratios for each action. Such ratios help us explore whether the probable benefits to science, society, or nature can outweigh the foreseeable harms to animals as individuals, groups, populations, or species.

Mutual Benefits—Whenever possible, we should adopt those actions that provide mutual benefits for people, animals, and nature. Vague assertions about human benefits or risks to public health are rarely sufficient reasons to sacrifice the well-being of animals. This is a more positive and proactive principle than the harm-benefit ratios mentioned above.

Reduction, Refinement, Replacement (the 3Rs)—When using invasive or harmful procedures in the laboratory or the field, we should practice the 3Rs—a reduction in the number of procedures, refinements in their technique, and replacement with noninvasive and nonharmful procedures.

End-Points—Invasive or harmful actions should specify humane endpoints, so that if an action proves harmful, we know when to stop. When an action based on a policy or management strategy is proving harmful, it should have a predefined endpoint. After the action is brought to a halt, the situation should be reassessed to produce a better course of action.

In modern times, variations on the practical approach to ethics have been advocated by philosophers such as Hans-Georg Gadamer, Karin Lauria, Arne Naess, Stephen Toulmin, and Anthony Weston.

It was Mary Midgley, however, who set the tone early on in animal ethics as well as animal studies, a discipline which might also be dated to her publications. In her book *Animals and Why They Matter* (1984), Midgley carefully explores the dominant theories of animal ethics. She does so as part of an appreciative critique, seeking out conceptual insights, while at the same time noting shortcomings when a theory or concept is misapplied. She does not ask her readers to choose one theory per se, but to appreciate and carefully use the full range of concepts that are made available through a diversity of

theories. In other words, she asks that we generate a situated moral understanding, one that takes both moral concepts and the facts on the ground as equally important and mutually informing. Midgley's practical approach to ethics models the use of principles and maxims to triangulate on better versus worse accounts of how we ought to live. This is the task of practical ethics.

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William S. Lynn

PREDATOR CONTROL AND ETHICS

In the United States, more than 120,000 native carnivores are killed each year by the federal government as part of the U.S. Department of Agriculture's Wildlife Services predator control program. Taxpayer dollars subsidize this carnage to the tune of tens of millions of dollars, even though the killings are intended primarily to benefit private livestock operators. Killing native carnivores has been a common practice since European colonists arrived in North America nearly four centuries ago. The colonists viewed native carnivores as a threat to livestock and as competition for game species. So prevalent was this view that a bounty on wolves was enacted shortly after the founding of the Plymouth Bay Colony in Massachusetts in 1630.

As settlers pushed west into the Great Plains in the 1800s, they slaughtered native carnivores to open the land to livestock and farming. Ranchers, bounty hunters, and professional trappers killed millions of coyotes, wolves, bears, and mountain lions. Large-scale cattle grazing resulted in the widespread depletion of vegetation and the wildlife that consumed it, thereby reducing the numbers of prey available for native carnivores. With less natural prey, the remaining coyotes, wolves, bears, and cougars turned to livestock, which only bolstered predator eradication campaigns. The federal government became officially involved in predator control in 1915 when Congress allocated $125,000 to create the Branch of Predator and Rodent Control within the Department of Agriculture's Bureau of Biological Survey. Their mission was to carry out official strychnine poisoning and trapping campaigns targeting wolves, mountain lions, coyotes, foxes, bears, and eagles on the public domain lands of the West. Later, during the Hoover Administration, livestock operators and hunters pressured Congress

to pass the Animal Damage Control Act in 1931. This Act, still in effect today and largely unchanged, authorized the "suppression, eradication, and control" of wild animals that caused injury to agriculture, horticulture, forestry, and animal husbandry.

The methods employed by USDA Wildlife Services, formerly the Animal Damage Control Program, include poisons, steel-jaw leghold traps, strangulation neck snares, denning (the killing of coyote pups in their dens), hounding, shooting, and aerial gunning. Critics of the program argue that it perpetuates an endless cycle of conflict and killing with an emphasis on nonselective methods, that it lacks accountability to the public, needlessly kills millions of animals for the benefit of a relatively small number of livestock producers, and fosters a dependence on taxpayer-funded assistance instead of promoting effective long-term solutions to conflicts (O'Toole, 1994; Treves and Karanth, 2003; Mitchell et al., 2004; Fox and Papouchis, 2005; Robinson, 2005; Feldman, 2007) (see Table 1).

Table 1 Coyotes killed by U.S. Department of Agriculture Wildlife Services in 2007, by state

Texas	19,123
Wyoming	10,915
Montana	9,251
California	7,759
Nevada	7,447
Oregon	6,492
Oklahoma	5,544
Utah	4,888
Idaho	4,783
New Mexico	4,568
Colorado	2,738
North Dakota	1,899
Nebraska	1,858
Arizona	1,218
Washington	608
West Virginia	400
Virginia	368
Wisconsin	74
Louisiana	69
Florida	66
Georgia	61
Michigan	56
Ohio	54
Minnesota	44
Kentucky	30
Illinois	17
Tennessee	17
Missouri	12
Massachusetts	12
Mississippi	10
North Carolina	6
Pennsylvania	5
Indiana	5
New York	4
South Carolina	3
New Jersey	3
Iowa	3
Alabama	3
Maine	2
Kansas	1

Wildlife Services reported that no coyotes were killed during FY 2007 in Alaska, Connecticut, Delaware, Washington, D.C., Maryland, New Hampshire, South Dakota, Vermont, Rhode Island, or Arkansas. Coyotes are not found on Hawaii. During FY 2007, a total of 90,416 coyotes were killed by Wildlife Services.

Project Coyote. www.ProjectCoyote.org. More information about Marin County's Strategic Plan for Protection of Livestock and Wildlife and predator control can be found on the Web site.

Impacts of Lethal Predator Control

Scientists are only just beginning to fully comprehend the ecological impacts and potential long-term consequences of broad-scale removal of large carnivores from the landscape. By studying the effects of their removal on ecosystems, biologists have found that large carnivores can function as keystone species, playing a pivotal role in maintaining ecological integrity and preserving species diversity. The disappearance of a keystone species can trigger the loss of other resident species, and the intricate connections among the remaining residents begin to unravel, dramatically changing the habitat. In a domino effect, species losses cascade through the ecosystem, as the disappearance of one species prompts the loss of still others. As argued by conservation biologists, "Our current knowledge about the natural processes that maintain biodiversity suggests a crucial and irreplaceable role of top predators. The absence of top predators appears to lead inexorably to ecosystem simplification accompanied by a rush of extinctions" Terborgh et al., 1999).

Remarkably, USDA WS has never attempted to calculate the overall environmental costs of its predator control programs or its impact on ecosystems and the biota therein. Indeed, we may never be able to accurately and fully assess the extent of its impact. Soulé et al. postulate that the failure of wildlife management agencies to incorporate a doctrine of "best conservation practices based on the best science," and to consider the ecological value of maintaining large carnivores on the landscape, is due to these agencies still functioning under anachronistic laws and policies that are based on old and simplistic scientific concepts, for example, that predators are bad and need to be eradicated (Soulé, Estes, Miller, and Honnold, 2005).

The ecological impact and ethical implications of broad-scale lethal predator control would be a serious cause for concern even if such programs were effective in their apparent aim of reducing livestock losses. However, when ecological systems are damaged by ineffective programs, this compounds the tragedy. More than a century of killing predators has done little to diminish overall livestock losses. This is largely because lethal control does not address the underlying cause of livestock predation, which is the presence of an attractive prey, for example, domestic sheep, in the habitat of opportunistic carnivores. The large size of livestock and the absence of defense against predators provide a sizable meal for relatively little effort, especially in terms of domestic sheep unaccompanied on open range far from human activity, as occurs on public lands throughout the West. Further, livestock consume and trample the vegetation needed to survive by most of the predators' natural prey (Crabtree, and Sheldon, 1999). When these species are depleted, predators may turn to livestock, leading to increased lethal control efforts and an endless and ultimately futile killing cycle.

Evidence of the futility comes from a recent study by biological economist Kim Murray Berger, who examined predator control in the United States in relation to sheep production. Berger suggests that the decline of the sheep industry is more closely associated with unfavorable market conditions than predation, and raises serious questions about the effectiveness of traditional lethal predator control programs (Berger, 2006). Berger also found that despite Wildlife Services's killing of

While coyotes have adapted to lived side by side with humans in urban landscapes, people are often less tolerant of America's native wild dog. (John Harrison)

five million predators at a cost of $1.6 billion from 1939 to 1998, the effort had little effect on sheep industry trends. Even though the agency has been killing predators for nearly a century, she points out, 85 percent of U.S. sheep producers have gone bankrupt.

Attempts to reduce coyote populations, the main emphasis of Wildlife Services's predator control program (more than 90,000 coyotes were killed by the agency in 2007; see Table 1), have failed because coyote populations exhibit strong compensatory responses to lethal control. While lethal control may result in short-term reductions in the number of coyotes in a specific area, the vacuum is soon filled by coyotes emigrating from surrounding areas and by increased litter size and pup survival in remaining populations. Lethal control disrupts the social hierarchy of coyote packs, causing pack members to disperse and allowing more females to breed. Females in exploited populations tend to have larger litters because competition for food is reduced and more unoccupied habitat is available. Lethal control also often selects for coyotes that are more successful, wary, nocturnal, and resilient, what some biologists call a super coyote (Fox, and Papouchis, 2005).

Hence, lethal control of coyotes may actually exacerbate livestock conflicts by stimulating improved reproductive success and pup survival in the remaining coyote population (Connolly, and Longhurst, 1975). Despite research conducted over 30 years ago showing that suppression of a coyote population over the long term requires removing more than 75 percent of the population annu-

ally because of the reproductive rate of the species (Connolly, and Longhurst, 1975), USDA WS continues to emphasize lethal coyote control in its national livestock protection program. While millions of coyotes have been systematically killed through subsidized predator control programs over the last century, their range has expanded three-fold since 1850 (Crabtree, and Sheldon, 1999). Even in the most extreme cases, when measures are taken to eliminate entire coyote populations, the loss in species diversity that results from killing predators to protect livestock can lead to increased problems for ranchers. Researchers at Texas Tech University reported in 1999 that removing nearly all of the coyotes in a 5,000-hectare area caused a severe decline in the diversity of rodent species and a significant increase in the numbers of jackrabbits, badgers, gray foxes, and bobcats (Henke, and Bryant, 1999). They concluded that removing coyotes to protect livestock could actually be counterproductive:

> Increased jackrabbit density caused by a lack of predation could cause increased competition for forage between jackrabbits and livestock . . . consequently, a reduced stocking rate [of livestock] may be required to offset competition, which may financially negate the number of livestock saved from predation. (Henke, and Bryant, 1999)

Tools of the Trade

Many of the lethal methods used to kill native carnivores are inhumane, indiscriminate, and a threat to public safety. The primary killing tools employed by Wildlife Services include leghold traps, strangulation neck snares, poisons, denning (the killing of coyote and fox pups in their dens), and aerial gunning. Increased public, scientific, and Congressional scrutiny has led to greater awareness and widespread condemnation of lethal predator control methods which are often used prophylactically prior to lambing season. In 1995, largely as a result of public outcry, Congress directed the General Accounting Office to investigate Wildlife Services' predator control activities in the field. The GAO found that: "ADC [Wildlife Services] personnel in western states use lethal methods to control livestock predators despite written USDA policies and procedures giving preference to the use of nonlethal control methods where practical and effective" (GAO, 1995). Then in 1999, the American Society of Mammalogists passed a resolution stating that the

> common methods of predator control are often indiscriminate, preemptive, lethal measures, particularly in relation to state- and federally funded livestock protection programs . . . and often result in the needless killing of animals that are not contributing to the problem, as well as many non-target species. (ASM, 1999)

They called on the federal government to "cease indiscriminate, preemptive, lethal control programs . . . and to focus on the implementation of non-lethal control strategies, compensatory measures, and sound animal husbandry techniques" (GAO, 1995). As the ASM and other scientists have pointed out, not all predators kill livestock (Treves, and Naughton-Treves, 2005). In fact, many of the animals killed through predator control

programs, up to 81.3 percent according to one study that looked at lethal carnivore management programs across the globe, are non-offending animals (Treves, and Naughton-Treves, 2005). However, the dominant practice in the United States is based on the theory that by killing a large number of predators the offending animal will be among the casualties (Wagner, 1988). Wagner suggests that the federal government's approach is "something of a sledge-hammer one: If enough coyotes are shot, trapped, and exposed to M-44s . . . their numbers can be reduced and the chances are that the offending animal(s) will be among those taken and the losses reduced" (Wagner, 1988).

In addition to the U.S. federal government, several states carry state-sponsored predator control programs that range from bounty and contest hunts to aerial hunting and carnivore snaring programs. For example, in Alaska, Governor Sarah Palin announced in 2007 that the state would pay wolf hunters $150 when they bring in the left forelegs of wolves taken from any of several designated control areas. When wildlife advocates challenged the program, the state insisted it wasn't a bounty; however, the judge presiding in the case ruled that the program was indeed a bounty and ordered it to stop. Then in June 2008, the state issued a press release announcing that it had successfully used a helicopter to kill 28 wolves on state lands near Izembeck National Wildlife Refuge to boost caribou numbers for hunters. Newspaper reports on July 19 revealed that 14 of the 28 wolves killed by the Alaska Department of Fish and Game were actually pups. Conservation groups are challenging the action and maintain that the pups were illegally killed because denning is an illegal practice.

More than 90,000 coyotes were killed by federal agents in 2007 as part of a government-subsidized lethal predator control program. (John Harrison)

Paradigm Shift Despite clear scientific evidence demonstrating the futility and counterproductiveness of indiscriminate lethal predator control, many state and federal wildlife managers continue to promote prophylactic killing as the best method to address conflicts. An increasing number of scientists, however, have begun to speak out publicly against lethal control. As discussed above, their studies show that coyotes and other large carnivores play a vital ecological role and that their removal can have a devastating impact on species diversity and on the health and integrity of native ecosystems.

But scientific evidence is not enough. Many scientists believe that a new paradigm is needed for the way humans treat native carnivores, indeed all wildlife, one that recognizes the ecological importance of these species as well as their intrinsic value as individuals. If the money and efforts used to kill predators were redirected toward cost-effective, nonlethal methods such as public education, better landscape development, improved fencing, and guard animals, conflicts could be significantly reduced without the need to kill indiscriminately (Fox, 2006). Ultimately, wildlife managers will be forced to make this ethical shift as communities across North America demand humane solutions to wildlife conflicts that consider the importance of individual animals as members of a larger integrative community that includes both humans and nonhumans alike.

An Alternative to Lethal Predator Control: The Marin County Model

In 1996, in the bucolic northern California county of Marin, community-wide controversy arose when wildlife advocates learned that Marin was to be one of three counties where the deadly poison Compound 1080 would be pilot tested to kill coyotes. The proposed plan led to a rancorous debate about management of native carnivores in a community known for its environmental consciousness and strong support of agriculture (Fox, 2001). On one side were animal advocates and conservation groups who questioned the ethics of using taxpayer dollars to employ a federal trapper to kill native wildlife with predator poisons, denning, and body-gripping traps. On the other side were sheep ranchers who argued that federal assistance with predator management was necessary and that loss of such assistance would put them over the edge in a market that was already being undermined with cheap imports from overseas.

After a series of roundtable discussions organized by the Marin County Agricultural Commissioner that included ranchers, animal advocates, conservationists, and local public officials, the Marin County Board of Supervisors attempted to reach a compromise with Wildlife Services. The Supervisors said they would renew the contract with the federal agency, but stipulated that neck snares and other lethal methods could only be used a last resort after nonlethal methods had been tried and proven unsuccessful (Fox, 2001). When Wildlife Services refused to operate under the county's guidelines, the Marin County Board of Supervisors decided it was in the county's best interest to cease contracting with the agency. The decision, however, did not prevent ranchers from removing predators on their own land to protect their livestock.

In place of the traditional WS program, the Supervisors approved a program put forth by a coalition of animal advocacy

and conservation organizations and later more fully developed by the Marin County Agricultural Commissioner's office with input from the ranching community. The plan, called the Strategic Plan for Protection of Livestock and Wildlife, redirected the county's $30,000 annual cost for WS, to assist qualified ranchers in implementing nonlethal techniques including livestock guard dogs, llamas, improved fencing, lambing sheds, and night corrals.

To date more than 80 percent of all Marin sheep ranchers participate in the program, and initial data indicates that livestock losses have declined since implementation of the program (Fox, 2008). More important, the program provides a model that has successfully addressed and embraced ethical concerns as well as differing values expressed by both the animal protection and ranching communities.

See also Wildlife Abuse; Wildlife Services; Trapping, Behavior, and Welfare

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Camilla H. Fox

PUPPY MILLS

Puppy mills are one of America's biggest secrets. Buyers don't know it, but often the adorable lumps of fur frolicking in the pet store window or posing on the Web are produced by the millions, like cash crops, in dark cages and sheds. Victims of inbreeding and poor care, puppy mill dogs often emerge frightened of ordinary noises, grass, even the touch of a human hand. They may suffer seizures, autoimmune disorders, and other illnesses. It's not uncommon for a puppy mill dog to die within weeks after a family has taken it home.

The mother dogs have it worse. Confined to cages for years at a stretch, they may be forced to bear litters of puppies every six months before they are rendered useless and put to death or, if they're lucky, turned over to rescue groups.

Puppy mills have proliferated over the last half century or so, from a handful of operators to an industry of more than 5,000 licensed commercial breeders, concentrated in the Midwest. The Humane Society of the United States estimates that when unlicensed kennels are included, the true number of puppy mills is closer to 10,000. Large-volume breeders insist that they produce dogs under optimum conditions; that to do otherwise would be bad business. Critics maintain that many puppy mill operators cut corners on humane treatment and churn out as many dogs as they can.

Puppy mill dogs typically live in cramped cages in dirty conditions, often exposed to the elements. The may be given inadequate food and water and almost no medical care. They're called purebreds, but often suffer a range of debilitating illnesses and conditions that are far below the standards most would associate with purebred dogs. Puppy millers often dispense with veterinary care and perform necessary procedures like cesarean sections themselves, sometimes without anesthesia. Reckless breeders have crudely amputated the legs of dogs trapped in wire cages. Dogs confined to wire cages for years at a stretch can and do go mad. One 13-year-old Sheltie kept in a kennel piled with feces for nine years limped in circles even after he was rescued. It was a habit he'd developed to stave off boredom.

The irony is that puppy mills thrive in a country where, according to the American Pet Products Manufacturers Association, 44 million households embrace dogs as members of the family. Dog owners have become so devoted to their pets that they buy plaid berets for their bulldogs, send their malamutes to doggy daycare, and spend hundreds of dollars on pet portraits. Beneath all this affection lies the shadowy world of puppy mills, but most dog lovers have no clue that they exist.

A bright yellow sign reading "puppies" still beckons the visitor to a now-shuttered puppy breeding facility Tuesday, March 24, 2009, in Seneca, Missouri. In February rescuers found more than 200 dogs living in their own excrement, crammed into weather-exposed single cages and hutches, many of them contaminated and hairless at the facility. Missouri is the "puppy mill" capital of America, home to more than 4,000 shoddy and inhumane dog-breeding businesses, by one estimate. But now the state is trying to shed its reputation, with the chief of the Agriculture Department pledging to do more to crack down on bad breeders. (AP Photo/Jeff Roberson)

The federal government has done little to address the issue. A 1966 *Life* magazine spread exposing puppy mills outraged readers and helped galvanize support for a law governing commercial dog-breeding. Yet 40 years later, the U.S. Department of Agriculture has turned a blind eye to puppy mill abuses and has actually encouraged large-volume dog breeding as a way for retired chicken and pig farmers to earn new income.

Most puppy breeders are paid $100 to $200 for each puppy. Brokers turn around and sell the dogs to pet stores for $200 to $300 each. Pet shops, and breeders selling directly via the Internet, are able to charge buyers up to $2,000 for a dog.

Even if the USDA wanted to crack down on the problem, it has just 96 inspectors overseeing 4,700 licensed facilities. The head of the department's Animal and Plant Health Inspection Service conceded several years ago that barely half of all licensed commercial dog breeders met even minimal standards set by the federal government. Thousands more puppy mills operate on the sly, absent a license, which enables them to escape any scrutiny. And the federal law has an enormous loophole: it doesn't apply to dogs sold directly to the public.

Consequently, thousands of dogs are now available through such Web sites. By one estimate, at least 10,000 of them a year are flown into the United States from countries as far away as Hungary, Poland, Russia, and Lithuania. New designer breeds like labradoodles, a

Labrador-poodle mix, and puggles, a cross between a beagle and a pug, also fuel the demand.

The result is a consumer's nightmare. Regardless of their origin, puppy mill pups are often weaned too early and shipped in large groups, exacerbating the likelihood they will contract a transmittable disease such as parvovirus, parasites, or distemper. Customers who have purchased puppy mill dogs report dismaying experiences in which the dogs arrive sick or injured, often fatally, with no way to get their money back. Buyers in some states have some recourse if they purchased a dog at a pet store, but they still may have paid vet bills and experienced heartache. By the time most owners realize their dog is sick, they've bonded with the animal. They don't want to trade it in for a new puppy: they want to do everything possible to help their new pet recover.

When he testified before the U.S. Congress in 2006, the Humane Society of the U.S.'s Chief Executive Officer Wayne Pacelle cited three typical examples of puppy mills:

- In Berry, Kentucky, officials found 108 dogs covered in feces, with frozen water bowls. One dog had frozen to death
- In Macomb, Missouri, an Internet dealer had 147 live dogs and four dead ones, all with severely matted fur, suffering eye ailments, hair loss, deafness, blindness, and tumors
- At the home of a breeder in Vero Beach, Florida, authorities discovered 151 dachshunds and springer spaniels so emaciated they were skin and bone

Those puppy mills pale in comparison to more recent discoveries: Nearly 700 malnourished dogs in Lyles, Tennessee (http://www.pet-abuse.com/cases/13942/TN/US/), 750 Chihuahuas and other small breeds at a puppy mill near Tucson, Arizona (http://www.azstarnet.com/metro/229469), and 1080 dogs at a puppy mill in Hillsville, Virginia (http://www.pet-abuse.com/cases/12626/VA/US/).

States are beginning to crack down on puppy mills. Louisiana and Virginia now limit the number of dogs that can be kept in kennels, and Pennsylvania has passed one of the toughest laws in the country; it mandates larger cages for dogs in large-volume kennels, requires breeders to provide exercise for the dogs, and requires that dogs in large-volume kennels undergo twice yearly veterinary exams. Breeders have protested in vain that the new rules would be costly and time-consuming and would drive responsible breeders out of business. Dogs were livestock, they argued, and with livestock it was only natural to expect the occasional deadstock.

In the meantime, there are ways to avoid buying puppy mill dogs. Customers should never buy a dog from a pet store or online. When dealing with breeders, they should insist on visiting the kennel and meeting the parents of the puppy they're looking to buy, and be prepared to walk away from any dealer who refuses to let them. Better yet, they should check out the prospects at their local animal shelter or on www.petfinder.com, which profiles thousands of abandoned dogs in need of a new home.

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The following Web sites also have information about puppy mills:

www.petshoppuppies.org
www.unitedagainstpuppymills.org
www.pet-abuse.com

Carol Bradley

Q

QUALITY OF LIFE FOR ANIMALS

Content, Richness, and Value

By content, philosophers and others refer to the subjective experiences of nonhuman animals, especially the higher animals. That the higher animals have experiential lives with unfolding sets of experiences is widely accepted today. The nature of these experiences and of the lives that contain them have come to be important for three reasons.

Moral Standing

Some accounts of moral standing or moral consideration turn upon cognitive abilities in human and nonhuman animals alike, and if decisions about how to treat creatures in part turn upon their moral standing, then the cognitive abilities of animals matter. It is sometimes claimed, for example, that in order to have moral standing a creatures must be (1) autonomous, or (2) able to make choices about how to live its life, or (3) able to plan out its life over time, or (4) able to act for reasons, or (5) capable of agency. Depending upon how these notions are unpacked, some creatures will be incapable of these intellectual feats. Thus, this way of conferring moral standing runs into the argument from marginal cases, that is, unfortunate humans, since some human beings are also incapable of these feats. Accordingly, if we nevertheless extend moral standing to these humans, then what reasons do we have for not extending it to at least the higher animals? If we do not extend moral standing to humans with radically impaired lives, then how ever many of them gain entry into the moral domain through the interests of other humans, they count for nothing, morally, in their own right, and so arguably can be treated in the way that other creatures who are not members of the moral community are treated at the present time.

Value of Life

Increasingly today, on all sides, it is recognized that quality of life, not life itself, is what matters essentially. The value of a life is determined by the quality of the life being lived. There is debate over how to determine quality of life, not least over whether the issue is primarily a subjective or an objective one. One of the central difficulties with objective accounts is that, while by objective criteria a life could be going well, by subjective criteria it might be going badly. A person might have all the calories needed to function well, yet still not think there lives are going well. The subjective element is about how the life looks from the point of view of the creature living it, and the subjective element seems to require some account of the subjective experiences of creatures

in order to be properly understood. What we want to know in essence is how rich a life is from this point of view, and by richness we refer to such things as the variety, depth, and extensiveness of kinds of experiences.

To hold that we have absolutely no access to the interior lives of animals seems false, at least if we take scientific work by ethologists, cognitive scientists, biologists, and others seriously. Again, to hold that we cannot know exactly what these interior lives are like does not mean that we cannot know a good deal about them, and so can make some very provisional or, indeed, even more permanent, judgments about them. Playing fetch with a dog enriches its life is a case in point.

Of course, in discussing the richness of animal lives, we must not apply criteria appropriate to human lives as if they applied straightforwardly, without further defense, to animals. This would be a second-order form of speciesism. Yet something here does set a kind of presumption of where both empirical science and argument must occur, for it does seem clear that richness of content in our lives is tied in large measure to our capacities for enrichment. Where these capacities are impaired or missing, as with the loss of a sense, a life appears less rich than an ordinary adult life which contains the kinds of experiences that that capacity makes possible. This does not mean that another capacity for richness cannot compensate for this loss, but it does mean that we must be convinced of this.

Thus, at the end of life, when we look back and say of a human that they lived

In this photo provided by the animal rights group Mercy for Animals, chickens in a cage at a California egg farm are shown during a news conference in 2008. The group released a video showing chickens at a major California egg farm being mistreated by workers and housed in cages so small they could not spread their wings. (AP Photo/Handout-Mercy for Animals)

a rich and full life, we refer to an array of kinds of experiences that characterize the lives of normal adult humans. At this level, we take ourselves to mean something far beyond what we would mean were we to say this of the life of a dog, for we take ourselves to have capacities for enrichment that far outstrip anything the dog has. Nothing is settled, of course, by this presumption of argument; it simply means that something must be said in the dog's case, by way of compensation, to make us think that the richness of its life approaches that of the normal adult human. Again, nothing is prejudged. Perhaps one can point to features of one of the dog's capacities that transform its life. That is, is there any single dimension of a dog's life analogous to our lives all our various capacities? If one thinks only of the role of culture, or marriage, or accomplishment of chosen ends in our lives, however, those who wish to contend that the dog's life is as rich as the lives of normal adult humans have a case to make.

Comparative Value of Human and Animal Lives Everything here is cast in terms of normal adult humans, for the obvious reason that it is false that all humans live lives of equal richness. Some human lives are so wanting in richness and scope of enrichment that we strive mightily to avoid them for ourselves and our families. We do not, despite most religions and devotees of the argument from marginal cases, appear to hold that all human lives are equally valuable. Rather, a quality of life view commits us to another view: if human lives are not approximately equally rich, they are not of equal quality, and if they are not of approximately equal quality, they are not of equal value. In fact, what such a view suggests is that some animals' lives can be of a richness and quality higher than some human lives, such as the brain-dead and anencephalic infants, and so can be of greater value. There is nothing speciesist about this conclusion.

Empirical work on the subjective lives of animals can be seen as necessary for these reasons. It must fit in with a philosophy of mind that makes intelligible to us ways of understanding and appreciating animal experience, with a moral philosophy that enables us to fit animal experience into our account of the value of a life.

R. G. Frey

R

RABBITS

Wild rabbits (*Oryctolagus cuniculus*) have been hunted for fur and for meat in Europe and Asia for thousands of years, but it wasn't until the Middle Ages that rabbits were domesticated. These rabbits were kept in large pens for food and fur, and for hundreds of years bred on their own; later, their keepers selectively bred them for size, temperament, color, and other characteristics. By the early 20th century, following the popularity of Gregor Mendel's work on the inheritance of traits, dozens of breeds of rabbits were created, primarily for the meat, fur, and newly developing show markets. While some people kept rabbits as pets, probably going back hundreds of years, true pet-keeping and the pet industry did not develop until the Victorian era. Today, rabbits are purpose-bred to fulfill the needs of four primary industries: pets, meat, fur, and vivisection.

Rabbits have been kept for meat longer than for any other purpose. In the United States, rabbit breeding remains a cottage industry, and typically takes place in backyard farms, unlike the massive factory farms that produce this nation's chickens or pigs for the table. Also unlike other meat producers, rabbit farmers are relatively unregulated; USDA inspectors only inspect rabbit production facilities when requested to do so by the operator. According to the USDA, these federally-inspected facilities sold two million rabbits for meat in 2001, out of a total of at least 8.5 million rabbits overall in the United States. Worldwide the total is about 800 million per year, primarily centered in France, Italy, and China, where rabbitries are much larger than in the United States (USDA, 2002).

Rabbits bred on meat farms live short, brutal lives. Weaned at four weeks so that their mothers can be bred again, sometimes as soon as 24 hours after they give birth, baby rabbits live together in very small cages until they are slaughtered at 12 weeks. Breeding adults live their entire lives (about two years, as opposed to a pet rabbit's life expectancy of ten or more years), on the other hand, in solitary cages, which is difficult, since they are a social species like primates or dogs, preferring to spend their time in the company of others. In addition to behavioral deprivation, living in small cages for one's entire life leads to disease, broken bones, damaged paws, and other problems. Once the rabbits are ready for slaughter, they are shipped to processing plants in small crates loaded onto trucks, and many die from stress or injury along the way.

Rabbits, like chickens, are not considered to be livestock under the USDA definition of the term. This means they are exempt from the USDA's Humane Methods of Slaughter Act, which is meant to ensure that meat animals are rendered insensitive to pain before they

are slaughtered. Rabbits, then, can be killed when fully conscious, by breaking their necks, by hitting them with a blunt object, by decapitation, or by any other means.

The rabbit fur industry in the United States is the smallest of the industries that uses rabbits for profit. Rabbit fur is not considered a luxury fur, and has never had the cachet of mink or sable. On the other hand, because it is cheap to produce, it is often considered a fun fur and is used on everything from cat toys to the trim on cheap clothing aimed at young people with limited disposable income. Today, most rabbit fur and, indeed, a large percentage of fur in general, used in American clothing and products is imported, primarily from China, although the number of rabbits killed for fur annually is not known. Wherever it is produced, rabbit fur is not a byproduct of the meat industry. Instead, fur is taken from rabbits that are slaughtered at six months, while rabbits killed for meat are killed much earlier, at three months.

The newest industry that uses rabbits is the vivisection industry. It wasn't until the mid-20th century that rabbits and other animals began to be purpose-bred specifically for laboratory use. Today, rabbits used in medical experimentation and product testing come from a handful of large laboratory animal suppliers which supply labs with millions of animals per year. Of the animals that must be reported to the USDA (rodents, birds, amphibians, and reptiles are excluded from reporting requirements), rabbits are the most popular laboratory animal in the United States, with 239,720 used in the United States in 2006 (USDA, 2006). The number of rabbits and other animals used in labs every year is dropping, as these animals are being replaced by non-animal substitutes as well as by genetically-modified rodents.

Rabbits are popular for scientific use because they are cheap, as little as $30 apiece, small and relatively docile, and they have short reproductive cycles. Rabbits are used for fertility studies, for product testing, especially toxicity tests on skin and in eyes, and for their antibody production.

While living in the lab, whether at a university, private testing facility, or government-run laboratory, rabbits typically lead lives of isolation. Because most are not surgically sterilized, they are kept in small, single cages to prevent fighting and unwanted reproduction, and typically have nothing to play with and nothing to do. Rabbits, like other laboratory animals, are often observed engaging in stereotypic behavior associated with emotional and psychological deprivation, such as bar licking or paw chewing, and sitting in a hunched position for hours at a time.

On the other hand, some laboratories provide environmental enrichment for their laboratory animals in order to try to meet the animals' psychological and physical needs as well as the requirements of the Animal Welfare Act, which only mandates enrichment for primates and dogs, but recommends it for other animals.

The USDA Animal Welfare Information Center provides resources for the voluntary enrichment of all animals. Suggestions for rabbits include social housing, the ability to forage and dig, and opportunities to run and play. Dozens of studies have been published in the past fifteen years on the benefits of enrichment for rabbits. It's impossible to know, however, how many laboratories have actually implemented any of these suggestions.

The pet rabbit industry is certainly the most seemingly benign of all of the industries that use rabbits for profit, in that it produces rabbits to be purchased as companions in families around the world. Unfortunately, as in the industries discussed above, rabbits suffer here as well.

Pet rabbits are either bred in small backyard rabbitries or in large commercial operations, some of which could be called rabbit mills. In either case, breeder rabbits are generally kept in solitary cages throughout their lives, being bred and giving birth throughout the year. Large-scale operations with annual profits over $500 must be licensed and thus inspected by the USDA, but these inspections are so infrequent that the facilities might as well be unregulated.

From the rabbitries, rabbits are transported via brokers or wholesalers to pet stores around the country, generally in large crowded trucks, when the babies are four to six weeks old. Many rabbits, perhaps as many as 20–30 percent, die during transport, and many die upon arrival at the pet store, thanks to the stress of the travel, the early age at which they were weaned, and the conditions at the store upon arrival. The Animal Welfare Act does not cover the care of animals at pet stores. Once sold, their fate rarely improves. Most pet stores provide minimal care and behavior information on the animals that they sell, and the pet store industry routinely fights legislation that would force them to give out more comprehensive information, so the new owners are often not equipped with the information and supplies that they need to care for their new pet. In the case of rabbits, the situation is complicated by the fact that the pet industry has long marketed rabbits as starter pets and good pets for children when, in fact, caring for a rabbit in anything other than a cage in the backyard is a complicated proposal, given the rabbit's behavioral and physical needs.

Because of the throwaway mentality in the United States and other countries, rabbits, like other animals, are often discarded when they prove too much a burden to care for. The House Rabbit Society, founded in 1988 as the first American rabbit rescue organization, is now the leading advocate for domestic rabbits around the world, rescuing and rehoming domestic rabbits and educating the public on rabbit care and behavior. Since its founding, hundreds of other rabbit rescue groups have formed, all with the aim of helping the tens or hundreds of thousands of rabbits discarded and brought to animal shelters every year. Unfortunately, because much of the public is still uneducated as to rabbits' unique needs, adoption rates at animal shelters remain terribly low.

Today, the plight of rabbits may be improving, thanks to the work of animal advocates around the world and, in particular, rabbit advocacy organizations like House Rabbit Society, and other groups and individuals working to ensure that domestic rabbits are given a fair shake.

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Margo DeMello

RATS

The term rat refers not to any one species, for there are more than fifty species of true rats in the world today. However, in Western societies, the rat most commonly referred to is the brown or Norway rat, *Rattus norvegicus.* Because this is the species that is so widely used in laboratory experimentation and testing, this short essay will focus mainly on the Norway rat. However, it should be said at the outset that any ethical considerations that may apply to this species also apply to other rats.

Rat Sentience and Awareness

With the exception of vision, rats have more acute sensory perceptions than humans. They use frequent urine marking to communicate by smell. From these marks, rats can discern each other's individual identity, age, reproductive status, and familiarity. Other rats may even detect the marker's social status and stress level from these cues. Rats also communicate with a variety of vocalizations. Compared to humans' hearing range of from about 16-20,000 Hz, a rat's hearing range is about 200-90,000 Hz. Recent analyses of high-speed video reveal that rats use complex whisker movement patterns to explore their environment, much as humans use their fingertips.

During play, rats produce ultrasonic chirps (around 50 kHz) believed to communicate positive feelings. Subordinates studies by neuroscientists Jaak Panksepp and Jeff Burgdorf show that rats will come running to be tickled by a trusted human handler, and that they will utter many more chirps during these interactions than will rats who are merely stroked on the neck. However, these rats lose their willingness to be tickled if there are cats nearby, or if their handlers have punished them, indicating that the rats' response appears to hinge on their feeling comfortable and safe.

Rats are aware, alert, and intelligent. As early as 1948, it was shown that rats form mental maps. When trained rats were placed in mazes and their optimal pathways to food were blocked, the rats created and remembered new paths. Rats can learn some things faster than human children or chimpanzees, such as the association between a shape or pattern and a food reward. Experiments from the University of Georgia published in 2007 indicate that rats demonstrate metacognition, that is, they know what they know. When presented with an easy discrimination task, rats quickly chose the correct answer for a reward. However, when presented with a difficult discrimination, they usually opted to decline the trial by poking their nose into a cone and proceeding directly to the next trial for a small reward, rather than risking failure and earning no reward. Other experiments show that rats grasp the relationship between seeing and doing, and understand cause and effect.

Highly social mammals, rats have evolved behaviors that can be described as considerate or empathetic. A 1959 study titled "Emotional Reactions of Rats to the Pain of Others" showed that rats would stop pressing a bar to obtain food if doing so delivered an electric shock to a rat next to them. In another study, rats pressed a lever to lower to the floor a squirming, vocalizing rat trapped in a suspended har-

ness, but did not respond to a suspended block of Styrofoam. Possibly the Good Samaritan rats merely wanted to stop a disturbing stimulus and were not concerned for the other rat, but in the very least a form of empathy termed emotional contagion was occurring. Rats become stressed when other rats are suffering or being killed in the same room. Scientists have concluded that rats can feel anticipation, surprise, and disappointment, that they experience joy during rough-and-tumble play, and that they may become optimistic or pessimistic depending on their living conditions.

Rats and Humans

Rats have flourished as human commensals. Wherever man goes, rats are likely to follow. It is estimated that there is about one rat for every human living on Earth today. Native to Japan and possibly eastern Asia, *Rattus norvegicus* arrived in Europe later than its cousin the black rat (*Rattus rattus*). Its first known appearance in Europe was around 1553, and in North America around 1775; both introductions are believed to have happened via ship. Much of humankind's ongoing antipathy toward rats originates in the latter's role as a host to fleas bearing the bubonic plague, which killed an estimated one-third of the human population of Europe during the 1340s. Particularly in Western culture, Norway rats have become popular as companion animals. However, it is as subjects of laboratory tests and experiments that most domesticated rats are used today.

Laboratory Use

Tractable, easily maintained, and readily bred in captivity, rats became popular as subjects in laboratory experiments early in the 20th century. Rats rank second only to mice in frequency of laboratory use. Official estimates are that between 3.4 and 3.7 million rats are killed yearly in American research laboratories, though estimates from other sources are as high as 23.6 million. A search on PubMed, the U.S. National Institutes of Health's online database of biomedical journals dating from 1950, yields over 1.26 million hits for the search term rats as of January 2009.

Much of this use is in product testing. One of the most notorious of tests for which rats are commonly used is the LD50 Test, in which animals are exposed to prescribed amounts of a test substance until 50 percent of the subjects die (hence lethal dose 50%, or LD50). Examples of test substances include drugs, industrial chemicals, household cleaners, and cosmetics. Variations on the LD50 test include the LC50 for assessing lethal concentrations of test substances to which rats may be exposed by air (inhalation LD50) or by applications to the skin (dermal LD50). Rats are also used in standard tests of potential cancer-causing substances (carcinogenicity tests), and standard tests for potential birth defects (teratogenicity tests). Cancer test methods may last up to two years, with chronic exposure to the potential carcinogen. Rats and mice are also routinely used in tests for genetic toxicity, immune toxicity, and skin irritancy.

Rats are used as subjects in a wide range of harmful experiments, including studies of sleep deprivation, noise-induced hearing loss, fracture pain, constriction injury, spinal cord injury, burns, and models of depression and pain, to name a few. Depression and despair models include the forced-swim test, tail-immersion test,

inescapable electric shock, and other behavioral, drug- or injury-induced models of depression. One of the criticisms of psychological studies using animals is that the subjects are unable to verbalize their symptoms and feelings in the way that human subjects can do.

For various reasons, and despite their overwhelming use, rodents are poor predictors of human outcomes. The LD50 test, for example, yields wildly varying results that have been attributed to a long list of causes, including strain, age, weight, sex, health, diet, temperature, and housing conditions. A study commissioned by the European Communities found that LD50 tests of the same substance conducted at different laboratories yielded LD50 values that differed by as much as a factor of 12. A follow-up trial with methods carefully standardized across labs still came up with eight-fold differences. These are comparisons of rats with other rats; extrapolating to humans is a far greater leap. In an evaluation of cell toxicity tests conducted at several test facilities, researchers evaluated 68 different methods to predict the toxicity of 50 different chemicals. Rat LD50 tests were only 59 percent accurate (lowest possible accuracy is 50%, or chance), but a combined *in vitro* human cell test was 83 percent accurate in predicting actual human toxicity.

Several investigations have shown that animal carcinogenicity tests are poor predictors of human carcinogenicity. The U.S. Food and Drug Administration determined that the overall failure rate for new drugs is 92 percent after they have passed animal testing and entered clinical (human) trials. This failure rate is at least 95 percent for cancer drugs. There are a variety of causes for the poor human predictivity of studies of rodents and other animals. These include differences across species, strain, and gender; differences in aspects of absorption and metabolism of substances; variable responses of organ systems; and the effects of stress experienced by animals in the laboratory setting. Studies show that rats and other animals have a pronounced stress reaction to routine laboratory events, including injections, blood collections, the forced feedings normally used to deliver test substances, and prolonged confinement in small, uninteresting cages. Changes in hormone levels, blood pressure, heart rate, and other factors accompanying stress can greatly influence how the body responds to drugs and other treatments.

Ethical Considerations

In addition to the question of the possible scientific utility of animal studies is the question of whether it is moral to deliberately harm sentient animals in the name of science. Like all mammals, rats are sensitive to pain and pleasure, and they express a range of emotions. It is often assumed that other animals are not capable of suffering as much as humans are, but this idea is tenuous and there is no rigorous science to support it. Pain is equally adaptive to a rat as to a human. A growing number of scientists are beginning to suggest that animals may be more vulnerable to states of suffering than we are. For instance, we can be told, or can rationalize, that a pain will not last for long, whereas an animal like a rat is presumably unable to do so.

Despite this, the Norway rat, along with house mice and birds, is not covered by the U.S. Animal Welfare Act (AWA). Animal welfare organizations have campaigned vigorously to have them covered by the AWA, but without success. The

development of non-animal alternatives has been progressing more rapidly in recent years. Practical advantages shown for many of these methods are that they are quicker, cheaper, and more reliable. Adoption of these alternative methods is currently perhaps the most promising avenue by which rats and other animals will be replaced in laboratory research.

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Jonathan Balcombe

RELIGION AND ANIMALS

Religion influences our understanding of human and animal relations in three principal ways. The first is the contribution that religion makes to our perception. People sometimes refer to religious vision, and by that they mean that there are ways of seeing that are deeply rooted in religious traditions that can enrich our perspective. The way we view the world is indebted to a range of influences, and religion is one of them. well

What are these religious perceptions? In terms of the animal-human bond, they are both negative and positive. Negatively, some religions tend to exalt human power over animals and exclude animals from the bonds of friendship with humans. Perhaps the most extreme version of this tendency can be found in the writings of Thomas Aquinas (1225–1274), who held that friendship with animals was impossible because they are not rational. Since, according to St. Thomas, friendship was only possible with rational creatures, animals were deemed incapable of "fellowship with man in the rational life" (*Summa Theologica,* Part 1, Question 65.3). This strong emphasis on rationality, which in Western religious traditions was denied to animals, has meant variously that they were largely perceived as being without a mind or an immortal soul, and incapable of having a relationship with God.

Although Judaism, Christianity, and Islam all recognize that animals are creatures of God, that their lives belong to God, even that God loves creatures, it remains true that all have given animals a low status in comparison with human beings. There is little in their religious literature that specifically champions relations with animals. Largely in hagiography, the biographies of saints, and early apocryphal Christian literature are relations with animals recognized and celebrated. St. Francis of Assisi is the obvious example, but there are countless other Christian saints of East and West, such as St. David of Garesja, St. Anthony of Padua, St. Catherine of Siena, St. Guthlac of Crowland, St. Werburgh of Chester, and St. Columba of Iona, who befriended animals and had friendly relations with them. St. Francis's idea that animals are our brothers and sisters has had great symbolic power within the Christian tradition, though it appears to have influenced behavior very little. Within Islam, animals and birds belong to communities (Qur'an 6.38) and give praise to God (Qu'ran 24.41), but animals clearly have an inferior status to that of human beings. Animals may be eaten for food and used for clothing. But the Prophet Muhammad required his followers to be merciful when killing. "Kindness to any living creature will be rewarded," the Prophet said.

Eastern religious traditions have envisaged a much stronger bond between animals and humans. Jainism, Hinduism, and Buddhism all offer cosmologies that explicitly link humans and animals. Chief among the animal-inclusive concepts is the notion of *samsara*, the cycle of death and rebirth, which expresses a radical continuity between all living beings. All life exists as in a chain, and all are linked together. From this perspective, animals and humans are not creatures but subjects; all life is in a state of progress or regress determined by *karma,* understood very simply as a moral law of cause and effect. Animals and humans, thus conceived, are obviously interrelated; each individual soul has not just a biography, but also an ancestry.

The second contribution that religion makes concerns values. In the West, the predominant view of animals is that they exist to serve human interests. The originator of this view, or at least its earliest philosophical exponent, was Aristotle (384–322 BC). He maintained that since "nature makes nothing without some end in view, nothing to no purpose, it must be that nature has made them [animals and plants] for the sake of man" (*The Politics*). Although not specifically religious, this became the predominant lens through which later religious thinkers, including Augustine, Aquinas, Luther, and Calvin, interpreted the place of animals.

What Aristotle held to be the end or *telos* of animals became in later Jewish and Christian thought the God-given purpose of animals as well. Even the Hebrew and Christian scriptures were subsequently interpreted in terms of this instrumentalist model. Thus, for example, dominion in Genesis 1:28 came to be seen as God's validation of human supremacy. The irony is that, in its original context, dominion or *radah* meant something quite different, namely God's commission to humans to care for the rest of creation. Proof that this is the correct reading is given in the subsequent verse (29–30) where humans, like animals, are given a vegetarian diet, a situation that is only reversed after the Fall and the Flood (Genesis 9.3f). God's original will in Genesis 1 was therefore for a peaceful, nonviolent creation. But the idea that animals are given for our use, through either the designs of nature or divine providence, has so caught hold that Western society still principally regards animals as tools, machines, commodities, and resources for human use.

In Eastern religion, the idea of *ahimsa*, meaning non-injury or nonviolence, has a long provenance. Arguably, Jainism taught the concept of nonviolence to the world; it has certainly influenced Hinduism and Buddhism, perhaps more widely. Many believe that it is the noblest of all Indian ethical injunctions, expressed in the incomparable words of the venerable Mahavir: "For there is nothing inaccessible for death. All beings are fond of life, hate pain, like pleasure, shun destruction. To all life is dear" (*Acharanga Sutra*).

These words are the result of a simple but profound spiritual discovery: all life is holy, or sacred, or God-given. Life, therefore, has intrinsic value, and all that lives has an interest in living. It does not follow, of course, that all life is accorded the same value. *Samsara* is not an egalitarian doctrine; on the contrary, those who commit misdeeds, or rather those with bad *karma*, are sent back to live as one of the lower forms of life. While life is an interconnecting chain, humans still represent the apex of the moral hierarchy.

The third contribution that religion makes is in terms of practice. How people perceive the world obviously affects what they do. Religious practices can therefore be seen as the embodiment, that is, the physical shape of religious perceptions of animal-human relations. The obvious example is animal sacrifice. It has been said that the most usual characterization of animals in the Hebrew scriptures is as objects for sacrifice. In fact, there are a wide variety of characterizations. For example, they are perceived as creatures, as covenant partners, as possessors of *nephesh* or God-given life, to take only three examples, but it is the case that animals and birds are most regularly used throughout the Hebrew scriptures as a means of sacrificial offering.

Interpreting what this practice means is less than straightforward. As one might expect of any practice lasting more than a thousand years, various interpretations are possible. Negatively, it can most usually be seen in terms of using animals as a means of reparation for human sin or appeasing the divine.

But it is worth pointing out that this is only one of many views. For example, another view is that sacrifice is to be understood as the returning of an animal to the Creator who made it, so that far from involving the gratuitous destruction of a creature, the practice paradoxically involves its liberation, its final union with God. Whatever interpretation is given, it is significant that within the Hebrew Bible there is a developing criticism of the practice as inefficacious or immoral. Psalm 50 describes the Lord opposing sacrifice on the grounds that creatures belong to him:

> I do not reprove you for your sacrifices;
> your burnt offerings are continually before me.
> I will accept no bull from your house,
> nor he-goat from your folds.
> For every beast of the forest is mine,
> the cattle on a thousand hills.
> I know all the birds of the air,
> and all that moves in the field is mine. (7–11, *RSV*)

The logic of this protest appears to be that humans should not appropriate what in fact belongs to God. Not only are all creatures his, but he also knows them individually and cares for them.

Eastern religious traditions have, however, firmly set themselves against animal sacrifice, though it is true that Islam retains animal sacrifice for major festivals. And, of course, both Judaism and Islam maintain the practice of religious slaughter, called *shehita* and *halal* respectively. Again, Jainism led the way in rejecting animal sacrifice and in commending the way of peaceable living with all nonhuman creatures. In Mahayana Buddhism, the Bodhisattva postpones his own enlightenment in order to save all living things from the cycle of misery and death:

> I have made a vow to save all living beings . . . The whole world of living beings I must rescue from the terrors of birth, old age, of sickness, of death and rebirth . . . I must ferry them across the stream of *samsara* . . . I will help all beings to freedom. (*The Bodhisattva's vow of universal redemption*)

This vision of humanity using its power to save other living creatures, and

doing so sacrificially, is characteristic of Jain and Buddhist thought, which seeks *moska,* or liberation, for all. But it is not completely unknown in other religious traditions. In Christianity, the redemptive effects of the death of Christ are understood as inclusive of all beings as, for example, in Colossians, where Christ is described as "the first born of all creation." Through Christ, God has determined "to reconcile to himself all things, whether on earth or in heaven, making peace by the blood of the cross" (1:15–19). In Judaism, there is the vision of a future heaven and earth in which the lion lies down with the lamb, where there is universal peace, and "they shall not hurt nor destroy in all my holy mountain" (Isaiah 11: 6–9).

Oddly, there are no religious rites in Eastern traditions that unite concern for animals and humans, or specifically celebrate the animal-human bond. It may be that because *ahimsa* is such a widely accepted practice that no need was felt for any specific rites. In Western traditions, there are likewise no specific rites, except that Catholicism has always accepted the appropriateness of blessings for animals, presumably mirroring God's own blessing of the creatures recorded in Genesis 1: 20–22. These appear in the *Romanum Rituale,* the priest's service manual, first written in 1614 and left virtually untouched until 1952. This provision has enabled animal blessing services, and latterly animal welfare services, arranged by all Christian denominations in the West. These are usually held on St. Francis Day, October 4th, which is now designated World Day for Animals, and the first Sunday of each October is designated Animal Welfare Sunday.

One of the new, unofficial rites especially concerns the celebration of human relationships with companion animals. The service involves the bringing of animals to the front of the church, where their human companion publicly promises to be faithful in care and love, mirroring God's own covenantal care as shown in Genesis. The priest then says: "May the God of the new covenant of Jesus Christ grant you grace to fulfill your promise and to show mercy to other creatures, as God has shown mercy to you" (*Animal Rites,* 1999). Services of celebration and blessing are held in many cathedrals in Britain and America.

There are resources within almost all the religious traditions of the world for a celebration of the animal-human bond. But it must be said that many of the more positive ideas have been obscured by instrumentalist elements which present animals as wholly separate from humans, or which suppose that they exist only to serve us. There is a need for religious traditions, many think, to respond creatively to the new voices of ethical sensitivity to animals that are now increasingly heard in Western society in particular. At the heart of this sensitivity needs to be a reevaluation of human relations with animals, from one of crude dominance to one of friendship and respect. Ironically, although religion is often seen as an anti-progressive force because of its social conservatism, it contains many subtraditions that offer precisely that vision of filial relations with animals.

Baptist preacher Charles Spurgeon once recounted the view of Rowland Hill that a person "was not a true Christian if his [or her] dog or cat were not the better off for it" and commented: "That witness is true" (*First Things First,* 1885). Many

believe that the same should also be said of all world religions.

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Andrew Linzey

RELIGION AND ANIMALS: ANIMAL THEOLOGY

Animal theology relates Christian thinking to contemporary debates about the status and rights of the nonhuman animals. It seeks to address and redress the failure of historical theology to take seriously alternative insights that lie largely silent within the Christian tradition. Systematic theology has largely proceeded on the basis of the virtual nonexistence of animals. Historically, they have been the outcasts of theology, defined as beings with no mind, reason, immortal soul, or moral status. Basic questions about their status and significance have simply not been addressed. The question raised by animal theology is whether Christian doctrine is necessarily speciesist, and whether it can incorporate animal-centered concerns into mainstream thinking. Modern theologians argue variously that even conservative theological understandings can be enhanced and deepened by the adoption and development of these insights.

In terms of traditional doctrine, there are three main areas. The first is creation. Much theological emphasis has been laid on the special creation of humans, to the detriment of nonhumans. But the special place of humanity in creation can be read another way: as support for the special role of humanity in looking after the world, not as the master but as "the servant species" (Linzey, 1994).

The second area is incarnation. Traditional doctrine affirms that God became human in the person of Jesus Christ. While this is frequently taken as a vindication of human uniqueness, some

church fathers have argued that the incarnation is the raising up of all fleshly substance (*ousia*) to be with God; the Word becoming flesh affirms all flesh, animal and human.

The third area is redemption. While much traditional interpretation excludes animals directly or indirectly from the sphere of God's redemptive purposes, it can be argued that notions of ultimate justice specifically require animal immortality. Viewed from this threefold perspective, God creates, unites, and redeems all living beings, and the focus of this divine work is not just the human species but specifically sentient, fleshly creatures.

Apart from the plausibility of these reinterpretations, there is one reason why theology needs to take animals more seriously. It lies in the traditional claim that the *Logos* (John 1.3) is the source of all life, because if so, it must follow that a theology based on the *Logos* must be able to render an account not just of the human species but of the entire created universe. In other words, the implicit promise of traditional theology is that it will deliver us from humanocentricity.

See also Blessings of the Animals Rituals; Religion and Animals—Christianity

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Andrew Linzey

RELIGION AND ANIMALS: BUDDHISM

The Buddhist tradition is, like all of the major religious traditions in the world, a series of diverse and sometimes even contradictory religious phenomena. For this reason, overly simplistic generalizations about large issues can be misleading. Attitudes toward animals, however, are one of the few areas where generalizations can be made. Generally the Buddhist tradition is unconcerned with any systematic exploration of the physical world, including the realities of nonhuman animals. It accepts most of the views of nonhuman animals that are important in the cultures and subcultures where Buddhism has developed.

At its core, Buddhism is a salvation-like concern, usually referred to as liberation, for the individual. Theoretically, each individual Buddhist attempts to discover about himself or herself the basic features of existence experienced by the tradition's founder, Gotama. Referred to often as the historical Buddha (because Buddhists believe there were previous Buddhas many eons ago), Gotama lived in the fifth or sixth century BCE. His core religious teaching was that each living being has, in the end, no lasting self. Similarly, there is no eternal deity or creator of the Earth. Instead, all is in process and subject to change.

The unifying elements in the tradition are reverence of some kind for Gotama

and his basic religious insight, and a strong, consistent, hermitlike tradition under which monks, nuns, and others adhere to time-honored rules of conduct. It is this tradition that has provided a relative unity and stability to the moral code.

Buddhist monks, who have been described by scholars as even more important in their own tradition than the church is in the Christian tradition, put together an extensive monastic code known as the *Vinaya* which reveals that early Buddhists accepted the view that all animals other than humans belong to one realm which is lower than that of human beings. Even though early Buddhists claimed that all nonhuman animals, from the simplest of living forms on up to the most complex, such as the large-brained social mammals, form a single kingdom that does not include humans, in a general way the tradition displayed poor awareness of the intimate details of the lives of animals. This may explain in part why Buddhists lumped all nonhuman animals together in a group below humans in the hierarchy of the universe.

In one very important way, however, Buddhism was clearly revolutionary with regard to the moral significance of animals, for Buddhism, along with Jainism, was important in opposing the sacrifice of animals that was part of the brahminical tradition in India which was the forerunner of the Hindu tradition. Similarly, the Buddhist tradition spread important precepts, or moral undertakings, that affirmed that killing other sentient beings was a violation of the most basic moral norms of the universe. The first precept in the tradition, which is also found in Jainism, is "I undertake to abstain from the destruction of life." This is an ethical commitment that the tradition has from its very beginnings identified as part of the core of religious living. The idea of our community, then, for a Buddhist, is not to be taken in the narrow sense of human society alone, but in the broader sense of a shared community comprised of all living or sentient beings.

Buddha Siddhartha Guataman with a cow, circa 500 BCE. Buddhists believe animals are sentient beings, and thus should not be killed. (Photos.com)

There is another, less favorable side to the Buddhist view of animals, however. The way in which early Buddhists talked about animals reveals that they thought about them in rather negative ways. For Buddhists, any animal other than a human was in an inferior position and could, if it lived a perfect life, be reborn as a human. Similarly, if a human lived immorally, he or she would be punished by being reincarnated as a nonhuman. The tradition relied, as did all of the major religions born in the Indian subcontinent, on reincarnation as an explanation for the justice of

any being's present status. Reincarnation explained not only why humans were superior to any nonhuman animal, but also functioned as a justification for many of the social divisions of the day, although Gotama himself resisted the notion that humans in the lower social divisions were less important than high-status individuals. Nonetheless, rich humans were deemed to have been rewarded for past good deeds, and the lame, the mentally disabled, and other unfortunate humans were deemed to be paying for bad acts in past lives. Below even the most unfortunate and morally corrupt humans were all other animals. The Buddhist tradition, through acceptance of these hierarchical notions of life, thus often tolerated some harsh abuses of animals. Elephants, whose natural history was poorly known by Buddhists, were captured from the wild, tamed with painful methods, and used in many different ways. Buddhism did not give approval to all such uses, for example, the use of elephants in war was condemned, but other uses of elephants, such as kings or rajahs using domesticated elephants for transportation, was widely accepted. Early Buddhists consistently spoke as if rich humans were entitled to ride around on elephants, having lived past lives in such a way as to justly deserve this reward. Sadly, though, the Buddhist scriptures also contain many indications that elephants suffered during captivity, being deprived of their naturally complex social lives with other elephants.

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Paul Waldau

RELIGION AND ANIMALS: CHRISTIANITY

Many of the important ideas that have governed our understanding and treatment of animals arise from Christian and Jewish sources or from reaction to, development of, or opposition to these sources. Many animal lovers maintain that Christian indifference has been one of the main causes of the low status of animals. Within the Christian tradition in almost every period of history there were

both strong negative and positive ideas and attitudes toward animals. Though it is true that largely negative ideas have predominated, it would be false to suppose that sub-traditions have not sustained alternative and sometimes radical viewpoints.

There are three major negative tendencies. The first may be called instrumentalism, the view that animals are here for human use. St. Thomas Aquinas, interpreting Aristotle, held that in hierarchy that God created, animals were the intellectual inferiors of humans and were made essentially for human use. According to this view, the purpose of animals was primarily, if not exclusively, for the service of human subjects. Second, and allied to instrumentalism, there has been a consistent humanocentricity or anthropocentrism that has effectively defined animals out of the moral picture. This has been achieved largely through the emphasis upon certain perceived differences between humans and animals. Animals are judged as beings with no reason or immortal soul who are incapable of friendship with human subjects. From this it has been deduced that humans have no direct duties to animals because they are not moral subjects of worth in themselves. Many contemporary secular theories, for example contractualism, owe their origin to this developing Scholastic view that animals do not form part of a moral community with human beings. The third tendency may be described as dualism, the way Western culture has made distinctions and separations between, for example, the rational and non-rational, flesh and spirit, and mind and matter. Animals are still viewed as being on the wrong side of these desirable attributes, the most important of which is rationality. As Scholastic philosophy and theology began to stress the centrality of rational intellect, and since it was almost universally accepted that animals had none, it followed that animals had no moral status. Rationality became, and in many ways still is, the key to moral significance.

But in order to see the broader picture, we need to set alongside these negative tendencies a range of positive insights, many of which are clearly biblical in origin. Three are presented here. The first centers on the notion of dominion found in Genesis 1:28. Although dominion has often been interpreted as little less than tyranny, in its original context it meant that humans had a God-given responsibility to care for the Earth, confirmed by the fact that the subsequent verses command a vegetarian diet and envisage a world in Sabbath harmony. A rival interpretation of dominion as stewardship or responsibility can be traced back to the earliest Christian writers, and came to the fore in the emergence of 18th- and 19th-century zoophily or love of animals. The second concerns the notion of covenant found in Genesis 9. Against the prevailing notion that humans and animals are utterly separate, the idea of God's covenant with all living creatures kept alive the sense of a wider kinship. The third positive insight is preserved in the notion of moral generosity, which came to prominence in the emergence of the humanitarian movements of the 19th century. According to this perspective, we owe animals charity, benevolence, and merciful treatment. Cruelty was judged incompatible with Christian discipleship; to act cruelly or to kill wantonly, was ungenerous, a practical sign of ingratitude to the Creator. The Christian tradition, which had in many ways supported, defended, and provided the ideological justification for the abuse

of animals in previous centuries, came to spearhead a new movement for animal protection.

See also Dominionism; Moral Standing of Animals; Religion and Animals—Judaism

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Andrew Linzey

RELIGION AND ANIMALS: DAOISM

Daoism (sometimes written as Taoism), one of the great religions of China, provides people with a rich sampling of core teachings that encourages humans to foster a morality and a lifestyle that will allow nonhuman animals to live freely and peacefully alongside human beings.

The Dao or the Way permeates all that exists, and is therefore present in each creature. Dao, residing in every cow and chicken, offers a measure of perfection to every living being. A contemporary Daoist notes that, in all creatures, "there is the numinous presence of the Dao" (Komjathy).

The great Daoist masters teach that no individual is isolated or enduring; everything that exists is part of a great and ongoing transformation. Daoists therefore acknowledge a link between each entity and every other entity, whether lizard, human, or vulture. We may prefer not to see ourselves in nose-picking apes or scrapping cats, we may prefer to envision ourselves as civilized, educated, or highly intelligent, but Daoism acknowledges humans as mere creatures of the earth, who share critical similarities with other living beings, and who will ultimately decompose and be recycled into other beings and objects in this ever-transforming cosmos. Daoist traditions do not envision a barrier or separation between people and animals. Dao unites humans and animals as common creatures of Planet Earth.

Daoism fosters a sense of humans as an intimate part of a much larger whole; a human is of no greater importance than a turkey or a piglet. Every hen and toad shares in this Great Unity of Being. In the words of Zhuangzi, second only to Lao Tzu: "Although the myriad things are many, their order is one . . . The universe and I exist together, and all things and I are one" (Chan 204, 186). Consequently, harmony pervades the Daoist cosmos.

Daoist philosophy harbors three interrelated moral ideals that are important to understand with regard to animals: *ci*

(compassion or deep love), *jian* (restraint or frugality), and *bugan wei tianxia xian* (not daring to be at the forefront of the world). *Ci* is a deep caring and compassion, which requires gentleness and attentiveness to the needs of all species. Early Daoists speak against harming any living being, even the wriggling worm. The second to last sentence in the *Dao de jing,* the primary text of Daoism, reminds readers, "The Way of Heaven is to benefit others and not to injure" (Chan, 176).

Ci and *jian,* when practiced together, encourage people to live simply out of compassion, to live simply so that other creatures might live without being harmed or crowded from the planet. Those who have compassion for other creatures avoid destroying habitat, and do not exploit cattle or hens for the luxuries of eating flesh, reproductive eggs, or nursing milk.

Ci and *jian* are reflected in *bugan wei tianxia xian.* To care about other creatures, to live a life of restraint and frugality, stems from "not daring to be at the forefront of the world." When we place ourselves in the forefront, we push other creatures to the back. If we imagine that we, or our needs, are more important than other creatures or their needs, then our lives become cruel and exploitative. *Bugan wei tianxia xian* teaches people to take their humble place in the universe, allowing other creatures to do the same.

The Daoist concept of *Wu wei,* action as nonaction, cautions humans, highlighting our limitations and noting that we are merely average members of a large and complicated universe. *Wu wei* reminds people that nature requires no human alterations or refinements, and that any such attempts are likely to lead to ruin. The *Dao de jing* notes that "Racing and hunting cause one's mind to be mad" (#12) and that "Fish should not be taken away from the water" (#36) (Chan, 145, 157). Breeding to acquire fatter cattle, debeaking, artificial insemination, and genetic manipulation are all contrary to *wu wei.* The Dao, which lies behind the smooth functioning of the universe, operates best without human meddling. Daoism teaches people to avoid aggressive and controlling practices such as factory farming or animal experimentation.

Daoism teaches that, if people would leave animals alone, all species will enjoy a golden age of ultimate integrity. In this world, animals will not fear humans, nor will they be domesticated or exploited. Zhuangzi states: "A horse or a cow has four feet. That is Nature. Put a halter around the horse's head and put a string through the cow's nose, that is man." Therefore it is said, "Do not let man destroy Nature" (Chan, 207). Training an animal, in Daoist teaching, is inherently harmful and cruel; training horses turns happy equines into brigands (Mair, 82). Freedom, the ability to live one's life without disturbance or the control of another, is understood to be no less ideal for horses or cattle than for human beings (Anderson, 278). And if taming doesn't turn horses into brigands, Zhuangzi suggests, it will kill them.

Daoism teaches that all things natural are preferable to human contrivance. For example, humans often imagine that animals are better off in human care, where food and water are abundant. Zhuangzi disagrees: The "marsh pheasant has to take ten steps before it finds something to pick at and has to take a hundred steps before it gets a drink. But the pheasant would prefer not to be raised in a cage where, though you treat it like a king, its spirit would not thrive" (Mair, 27).

Nonhuman animals are best left free, in their natural state.

Animals are explicitly protected by an array of Daoist precepts, the first of which is almost always an injunction not to kill. *The 180 Precepts of Lord Lao* (*Yibaibashijie,* fifth century), one of the oldest Daoist compositions, warns against killing animals, eating flesh, and harming animals (insects, birds, and mammals) by disrupting their homes, destroying their families, or through abuse and overwork. Other Daoist precepts specifically denounce slaughtering domestic animals, shooting wild animals including birds, setting traps to catch fish, capturing animals including birds, imprisoning animals in cages, digging creatures out of the earth, or even startling animals. *The Great Precepts of the Highest Ranks* (fifth century) offers a list of affirmative precepts, three out of six of which focus on the protection and benefit of other species:

> Give wisely to the birds and beasts, to all species of living creatures. Take from your own mouth to feed them, let there be none left unloved or not cherished. May they be full and satisfied generation after generation. May they always be born in the realm of blessedness.
>
> Save all that wriggles and runs, all the multitude of living beings. Allow them all to reach fulfillment and prevent them from suffering an early death. May they all have lives in prosperity and plenty. May they never step into the multiple adversities.
>
> Always practice compassion in your heart, commiserating with all. Liberate living beings from captivity and rescue them from danger. (Kohn, 175)

Daoist monastic practice forbids violence of any kind, including the taking of flesh; for centuries, monastery meals have consisted of rice, wheat, and barley, combined with various vegetables and tofu. Meat is not included in the five main food groups.

Daoism, which fosters compassion, the simple life, and humility, which discourages arrogance, exploitation, or manipulation of any kind, provides the basis for a remarkably animal-friendly religion.

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RELIGION AND ANIMALS: DISENSOULMENT

Disensoulment is the stripping away of the spirit powers or souls of animals and of the sanctity of the living world. This process occurred over the centuries, as early herders and farmers intensively exploited animals and nature and needed new myths and other psychic levers to resolve their very old beliefs in animals as First Beings, teachers, tribal ancestors, and the souls of the living world.

In the ancient Middle East, the cradle of Western culture, where animal husbandry was the key to nation and wealth building, agrarian societies invented misothery and other ideas that aided in the debasement of animals. There, the builders of the bustling city-states preached misothery in their arts and in their rising new agrarian religions. In these, the essential message was to debase animals and nature and to elevate human beings over them. The effect, spiritually speaking, was to turn the world upside down. Before domestication, the powerful souls or supernaturals or gods were animals, and primal people looked up to them; after domestication, the gods were humanoid, and people looked down on animals. In primal culture, all beings had souls, of which the greatest was the tribe's totem animal; in agriculture, humans alone have souls, and god is in human form. Animal-using agrarians stripped animals of their souls and powers and put them in what they perceived to be their proper place: far beneath, and in the service, of humankind.

See also Dominionism; Misothery

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RELIGION AND ANIMALS: HINDUISM

Hinduism, the oldest of the major religious traditions, is not a single religion, but an umbrella under which one finds very different kinds of beliefs. These include, among others, Vaishnavism, Shaivism, Shaaktism, and Tantrism, each of which in turn is a complex religious tradition that has many forms of its own. The term Hinduism was coined by European scholars in the 19th century as a description of native beliefs, other than Buddhism and Islam, which occurred in the Indian subcontinent. Hindus' beliefs are startlingly diverse, such that nontheistic beliefs sometimes coexist with theistic and devotional beliefs.

In this diverse tradition we call Hinduism, there is no single view of animals. However, the many different views one finds in Hinduism are dominated by two general beliefs that govern the ways in which nonhuman animals are conceived. First, human beings, though recognized to be in a continuum with other animals, are considered the model of what bio-

logical life should be. A corollary of this first belief is the claim that the status of human is far above the status of any other animal. The second general belief in various forms of Hinduism is that any living being's current position in the cycle of life, created by repeated incarnations, is determined by the strict law of karma. Belief in reincarnation is the hallmark of most, though not all, Hindu beliefs. These two beliefs have resulted in other animals being viewed with uncertainty. In a positive sense, animals have been understood to have souls just as do humans. In a negative sense, they have been understood to be inferior to any human, a corollary of which is the belief that the lives of animals must be particularly unhappy, at least compared to human existence.

Importantly, humans are by no means considered equal to one another in classical Hinduism, for according to the *sanatana dharma*, the eternal law or moral structure of the universe, human beings are not born equal to one another. Each human is born into that station in life for which their past karma has fitted them. Inequalities within the social system, then, are not viewed as unjust; rather, they are seen as merely the result of good or bad deeds performed in former lives. A common claim is that those who act morally are assured of a good rebirth in higher social classes, while wrongdoers are assured of being reborn into the wombs of outcasts or, worse yet, as nonhuman animal.

Despite all this, the tradition has often exhibited great sensitivity to animals. In the Srima Bhagavantam, the believer is told, "One should treat animals such as deer, camels, asses, monkeys, snakes, birds, and flies exactly like one's own children" (7.14.9, Prime, 51). A contemporary Hindu environmental ethicist argues, "All lives, human or nonhuman, are of equal value and all have the same right to existence" (Dwivedi, 203). More generally, the economics of village life in India provide many examples of coexistence with animals and environmentally sensitive ways of living.

The tradition has truly vast sources. Hindu scriptures, for example, are more than ten times the length of the Bible, and some do support the view that humans have no special privilege or authority over other creatures, but instead have moral obligations to protect other living beings. Arguments in favor of an obligation to protect other living beings rely on the widespread belief that many Hindu deities, such as Rama and Krishna, closely associated with monkeys and cows, respectively, have been incarnated as animals. In addition, the deities worshipped in India include Ganesh, an elephant-headed god, and Hanuman, the monkey god.

This sensitive side of the Hindu awareness of animals is often symbolized by the image of sacred cows wandering the streets of India unmolested and free; yet the realities for animals in Hindu societies have been and continue to be far more complicated. The traditional respect for animals has been affected greatly by economic factors that inhibit transmission of ancient values encouraging respect for animals. Nowadays, the pace of India's development as one of the leading industrialized nations is leaving behind the strong emphasis that almost all Hindu scriptures place on the innate sacredness of animals. Thus, while there is throughout the Hindu tradition a culturally significant sense of the continuity of all life, the already-pronounced sense of discontinuity between humans

and animals threatens to change for the worse.

One important ancient form of the tradition, sometimes known as brahminical religion, was challenged by the Buddhist and Jain traditions because it was, as were so many ancient religions, characterized by a heavy emphasis on animal sacrifice. This practice stemmed from the ancient scriptures known as the Vedas. The Jains and Buddhists challenged these sacrifices as cruel and unethical, and thereby had a great effect on the later Hindu views of the decency of intentionally sacrificing animals. *Ahimsa,* the historically important emphasis on nonviolence, has now become a central feature of the Hindu tradition, and some Hindu groups even advance vegetarianism as essential for a morally upright life.

Hindu social codes, embodied in the ancient Laws of Manu, continue in some ways to support a one-dimensional view of animals as completely inferior to humans. This belief that all animals are qualitatively inferior to any human is also reflected in some of the myths of the origin of animals. For example, one important myth, the Purusa Sukta in the Rig Veda, attributes the origin of all nonhuman animals to the leftover parts of a primal male (*purusa*) sacrificed by the gods. Thus, in the Hindu tradition, as with the Buddhists and with Plato (*Timaeus*) in the West, animals are seen by many as having their origin in, and thus being a degenerate form of, elevated humanity.

See also Religion and Animals—Buddhism; Religion and Animals—Jainism

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RELIGION AND ANIMALS: ISLAM

Based on a reading of the standard textual sources for the Islamic tradition, including the Qur'an, reports about the prophet Muhammad (*haidīth*s), and the classical legal texts (*fiqh*), several general points emerge in terms of animal rights. The Islamic textual tradition takes the relationship between humans and other animal species quite seriously, in contrast to Christianity, where this relationship is scarcely mentioned. Nonhuman animals are seen as having feelings and interests of their own, and the overriding ethos enjoined upon humans is one of compassionate consideration. Humans are seen as occupying a special place in Creation, that of Allah's deputies (*khalīfa*), but they are to exercise this role responsibly. Based on textual sources, it would seem that the Islamic ethical system extends moral consideration to nonhuman animals, although not on the same level as humans.

Ritual Slaughter

Ritual slaughter of animals for food (*dhabh*) is said to follow the principle of compassion for the animal being killed. According to a hadith, Muhammad enjoined his followers to "kill in a good way," stating that "every one of you should sharpen his knife, and let the slaughtered animal die comfortably." Yet, on another occasion, when Muhammad saw a man sharpening his knife while an animal waited nearby, he reprimanded him, "Do you wish to slaughter this animal twice, once by sharpening your blade in front of it and another time by cutting its throat?"

Ritual sacrifice, such as that customarily performed by Muslims on the occasion of ʻĪd al-Adha, is not prescribed as a duty in the Qur'an, but a hadith is sometimes cited to provide the sense that it is an obligation. Whether or not Muslims are obligated to perform a blood sacrifice during ʻĪd al-Adha has recently become a matter of debate.

The Qur'an and the hadiths are the main sources, along with analogical reasoning and consensus among scholars, for the body of Islamic law known as the *sharīʻa.* Shairīʻa law assumes without question that humans will make use of animals and eat them. The legal questions therefore center on how to define and circumscribe the limits of these behaviors. The issues are which animals to eat, how to kill them properly in preparation for eating and, to a lesser extent, what responsibilities humans have to the animals that serve them. Questions about whether humans have the innate right to do these things do not arise.

Islamic laws pertaining to animals are included under categories such as their treatment, their sale, how to include them in *zakāt* calculations, their lawfulness as food, prescriptions for slaughter, and restrictions on hunting. Thus, animals are discussed in terms of both their use by humans and, less extensively, the obligations humans have toward them.

The various schools of law each classified all known animals in terms of whether eating them was *halāl* (permissible), *harām* (forbidden), or *makrūh* (discouraged). All schools placed the vast majority of animals in the first, permitted category. Some animals presented special cases; frogs, for example, which would normally meet the conditions for a *halāl* designation, were determined to be *harām* on the basis of a hadith in which Muhammad forbade the eating of frogs.

Differences among the schools regarding these classifications occur mainly in cases of reasoning by analogy, such as whether or not to forbid the eating of animals that have similar names to those of forbidden animals, for example "dogfish." Another kind of ambiguity arises when an animal that would normally be considered *halāl* (such as an eel, which is a kind of fish) resembles an animal which is *harām* (for example, the snake, to which eels appear similar). The Maliki and Shafi'i schools allow the eating of fish found floating dead in the water, whereas other schools forbid it. Various schools disagree over the lawfulness of eating crustaceans and insects. Carnivores, which are *harām,* are identified in the legal tradition by their possession of fangs or claws; thus, there is disagreement over the lawfulness of eating elephants, because, although they are herbivores, their tusks resemble fangs.

Human Obligations to Domestic Animals

The Shafi'i jurist ʻIzz al-din ibn ʻAbd al-salam al-Sulami (d. 1262), in his legal

treatise *Rules for Judgment in the Cases of Living Beings* (*Qawā'id al-ahkām fī masālih al-anām*), has the following to say about a person's obligations toward his domestic animals:

- He should spend [time, money or effort] on it, even if the animal is aged or diseased in such a way that no benefit is expected from it. His spending should be equal to that on a similar animal useful to him
- He should not overburden it
- He should not place with it anything that might cause it harm, whether of the same kind or a different species
- He should kill it properly and with consideration; he should not cut its skin or bones until its body has become cold and its life has passed fully away
- He should not kill an animal's young within its sight
- He should give his animals different resting shelters and watering places, which should all be cleaned regularly
- He should put the male and female in the same place during their mating season
- He should not hunt a wild animal with a tool that breaks bones, which would render it unlawful for eating (cited in Izzi Dien, 2000, pp. 45–46)

Although the rights of nonhuman animals are guaranteed in the legal tradition, their interests are ultimately subordinate to those of humans. As Sulami argues, "The unbeliever who prohibits the slaughtering of an animal [for no reason but] to achieve the interest of the animal is incorrect because in so doing he gives preference to a lower, *khasīs,* animal over a higher, *nafis,* animal" (cited in Izzi Dien, 2000, p. 146).

Sport Hunting Despite its prohibition in Islamic law, sport hunting remained a major form of entertainment in Muslim societies, especially among the elite. In Arabia, the oryx was hunted to near extinction, and only recently have measures been taken to preserve the species. In Iran, species such as the lion, tiger, and cheetah were hunted into oblivion before modern times, and leopards have become exceedingly rare. Even gazelles, which were the favored game at royal hunting preserves up until recently, are now generally found only on government lands where private individuals may not enter without special permission.

Historically the most egregious violations of the proscription against sport hunting were in India, where hundreds or thousands of creatures at a time would be indiscriminately slaughtered in bloody orgies of killing for the amusement of the rich and powerful. The favored method, a Central Asian technique called the *qamargha*, was to go out into the wilderness and create a wide circle of beaters who would make as much noise as possible as they slowly closed the circle, forcing huge numbers of terrified creatures toward the center. When the circle was almost closed, the royal hunters would fire at will into the throng of panic-stricken animals. So horrific was the resulting bloodbath that at one point the Mughal emperor Akbar the Great (r. 1555–1605) decided enough was enough and banned the sport, though apparently only for a time.

Wildlife Preservation The Islamic legal tradition contains two institutions

that some contemporary scholars have argued could be considered forms of wildlife preserves. They are the *himā,* protected area or sanctuary, and the *harīm,* which was a greenbelt or easement around settled areas intended mainly to ensure a safe water supply. A related institution, the *harām,* refers to areas around the sacred cities of Mecca and Medina (called the *harāmayn*, the two forbidden areas) where hunting is outlawed.

The *harāmayn* were apparently established in the Prophet Muhammad's time when, according to the hadiths, he declared Mecca "sacred by virtue of the sanctity conferred on it by God until the day of resurrection. Its thorn trees shall not be cut down, its game shall not be disturbed." He also made a sanctuary of Medina, whose "trees shall not be cut and its game shall not be hunted."

The prohibition on hunting while on pilgrimage comes from the Qur'an, which states that the penalty for killing game is to offer a comparable domestic animal in sacrifice, that is, to God, by way of compensation (5:96). It would seem from this verse that killing wild animals when one is supposed to be in a state of purity is wrong because it is a crime against God, not against the animals in question. One must atone for this by paying the equivalent in one's own domestic livestock back to God. This atonement for the killing of wild animals by killing yet more domestic animals can hardly be seen to benefit the animals themselves.

Some traditional *himā*s still exist in Saudi Arabia, but they are much diminished from former times and continue to disappear. Most of these preserves are aimed at excluding sheep and goats from grazing lands in preference to cattle, camels, and donkeys, but others exist to control the cutting of firewood or to keep flowering meadows intact for honeybees.

Even in the *harām*s around the holy cities, species such as the ibex and gazelle are no longer found. In fact the laws pertaining to these preserves have been generally ignored, on the basis that development, geared largely toward the millions of pilgrims who now descend on the holy sites, is a need that overrides that of preserving nature.

What is important to note is that these areas were restricted primarily so that they might benefit humans. The *himā,* which in pre-Islamic times was an institution that allowed powerful landowners to keep others off their grazing lands, was transformed in the Prophet Muhammad's time into a means for preserving certain tracts of land for the public benefit. Significantly, the preserved areas were not to be too large, so as not to take too much land out of circulation.

In short, the institutions of *himā, harīm,* and *harām* are all clearly meant to preserve resources for human needs, not those of animals. If animals are preserved, or if they benefit from the preservation of water and vegetation, this is a secondary benefit, because they themselves are seen in the law as existing for the good of humans. Thus, in order for the institution of *himā* to be revived in Muslim regions today in a form that would actually serve to protect wildlife for the sake of biodiversity and ecosystem balance, the traditional rationale for its existence would have to be reinterpreted in light of contemporary scientific understanding. To date such an effort has not been undertaken, as few if any Islamic legal scholars seem to have ventured into the works of specialists in biodiversity.

Nevertheless, Islamic jurisprudence has entered a dynamic period in its his-

tory, and it may be hoped that in the years to come Muslims will increasingly ask their legal scholars for rulings on wildlife preservation and other issues connected with the world's ecosystems, which Islam states were created by God and belong to Him alone.

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RELIGION AND ANIMALS: JAINISM

One of the world's oldest religions, Jainism, is also distinguished as one of the faiths that cares the most about nonhuman animals. Nonetheless, animals receive scant mention in most books on Jainism. The Jains practice a religion without God that yet holds that our souls can become gods through liberation or *moksa.* It is said that our souls accumulate karmic particles through both good and bad actions, which make good or bad things, respectively, happen to us in turn. The goal is to eliminate all passions and actions that generate good and bad karma, as these literally make us too heavy to leave the realm of rebirth. The soul that has escaped the cycle of rebirth ascends to a permanent resting place at the very apex of the universe. The key to achieving divine liberation is to practice *ahimsa,* or avoiding injury to all life. The positive side of this is a reverence for all life or a universal and unconditional love for all creatures. Mohandas Gandhi was a Hindu, but adopted the Jains' principle of *ahimsa,* becoming its most famous champion.

If one acts badly in a lifetime, one might be reborn as a primitive being. There are simple one-sense beings with only a sense of touch, for example, plants and microscopic *nagodas,* which come in the form of earth bodies, water bodies, fire bodies, and wind bodies, two-sense beings which also have taste, for example, worms and leeches, three-sense beings which can also see, for example ants and moths, four-sense beings that can smell things as well, for example, bees, flies, mosquitoes, and five-sense beings that hear in addition to the other senses, for example, fish, dolphins, elephants, or any being born in a womb. There are rational and nonrational five-sense beings, which include humans, gods, hellbeings, and animals, presumably those other than the ones listed with fewer senses. A human can be reborn as a microbe, and a microbe can eventually be born human, ascending the Jains' evolutionary scale.

Inflicting injury on these creatures is wrong because of the suffering caused, and also because it produces passions in the killer leading to karma and rebirth. The Jains condemn all animal sacrifices. They build animal shelters, and never hunt or fish. They avoid any professions causing harm to animals. A Jain named Acarya Hemancandra once convinced King Kumrapala to forbid animal slaughter during the nine-day Paryusan festival in India. During that time, ordinary householders are expected to conform in part to the strictures of the Jain monks. Farming, which injures insects, is permitted because the harm is unintentional, but Jain monks beg with a bowl so that crumbs will not attract insects that would

be crushed underfoot. Monks brush the path before them to sweep away small life forms they might otherwise step on. It is prohibited to breed destructive animals, and considered noble to allow oneself to be bitten by a snake rather than kill it. Jains are vegetarians, but consume milk. According to the Jain cosmic wheel of time theory, we are now in a fifth downward cycle, meaning a decline in morality, a craving for material things and success, and increased violence and cruelty. The advent of factory farming and vivisection is viewed to be a part of this downward trend. However, Jainism holds out hope for the eventual liberation of all if even the lowly *nagodas* can eventually be born human and then achieve liberation.

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RELIGION AND ANIMALS: JUDAISM

Judaism has developed across thousands of years and under a great variety of different cultural, social, geographical, political, and technological circumstances, each of which has left its mark on the role of animals in Jewish tradition and society. According to Jewish tradition, the Written Torah, the first five books of the bible, may be understood as containing 613 commandments, which form the outline of Jewish law. The commandments are further expounded upon and extended by the Oral Torah, the living tradition of Jewish law that was first codified in the Mishnah, circa 200 CE, and further developed and expounded on in the Talmud and many other works. According to one recent count, some 138 of the commandments have some connection with animals.

Judaism has always valued the preservation of conflicting voices within the tradition, and countless references to animals are found throughout Jewish legal, philosophical, mystical, ethical, exegetical, liturgical, and homiletic literature. Furthermore, since the break-up of the Sanhedrin or High Court nearly 2,000 years ago, Judaism has lacked institutions authorized to make universally binding legal decrees and interpretations. These two factors make it difficult to formulate statements that are universally true of Judaism in all of its varied manifestations. The goal of this article is merely to outline some of the major Jewish themes, ideas, and practices relating to animal rights and welfare.

The Status of Animals According to Judaism

According to the first chapter of Genesis, after creating the animals, God created a male and a female human in the divine image. They were meant to "rule the fish of the sea, the birds of the sky, the cattle, the whole earth, and all creeping things of the earth" (Verse 26) and they were told, "Be fruitful and increase, fill the earth and master it; and rule the fish of

the sea, the birds of the sky, and all the living things that creep on the earth" (Verse 28). Some recent writers have claimed that these statements support the right of human beings to treat animals as they please. This impression is immediately tempered, however, by the next verse's call for vegetarianism: "God said, 'See, I give you every seed-bearing plant that is upon all the earth, and every tree that has seed-bearing fruit; they shall be yours for food'" (Verse 29).

On the one hand, humans are thought of as created in the image of God and fundamentally superior to animals, which they are permitted to use for their own purposes. On the other hand, humans must take the wellbeing of animals into account, and the exploitation of animals for human ends must be regulated by moral considerations. While the Written Torah contains no explicit general principle concerning animal welfare, many individual laws are concerned with particular aspects of it. These are understood to supply examples of a general prohibition against *tza'ar ba'alei hayyim* (Hebrew for "suffering caused to animals"), which is usually considered to have the legal force of an explicit biblical commandment.

Judaism's self-understanding of its concern for animals has developed in ways that parallel developments in Western moral philosophy. Some thinkers, such as Moses Maimonides (1135–1204), believe that the wellbeing of animals is of intrinsic moral importance, while others, such as Moses Nachmanides (1194–1270), believe that while only humans are intrinsically deserving of moral consideration, people must treat animals humanely in order to properly cultivate their own moral virtue.

The Limits and Applications of Tza'ar ba'alei Hayyim

The general idea of *tza'ar ba'alei hayyim* is that people should not inflict needless suffering on animals. Almost every parameter of the application of *tza'ar ba'alei hayyim* has been subject to multiple interpretations in the Jewish legal tradition. Some authorities exclude pests and insects from the rule's purview, and there are those who say it only applies to domesticated animals, a position that would seem to be contradicted by Jewish prohibitions against hunting for sport. There is also disagreement regarding the minimum intensity of suffering that is prohibited, and about what kinds of human benefits gained from animal suffering are sufficient to keep it from being considered needless. It is unclear whether the otherwise painless death of an animal constitutes *tza'ar ba'alei hayyim*, and to what extent a person must prevent suffering inflicted by one animal upon another. Beyond all of these strictly legal debates and considerations, Jewish discussions of animal welfare make constant mention of *midat hahassidut*, the virtue of piety, that is, the expectation that people should go beyond the letter of the law in demonstrating compassion toward animals.

Human Obligations toward Working Animals

While wanton cruelty towards any animal is forbidden by Jewish law, anyone who owns or works with an animal has many additional obligations towards it. For instance, Jews are required to make sure that their animals have been fed before sitting down to eat themselves.

The Torah contains a number of commandments which specifically deal with the working conditions of animals. According to Deuteronomy 25:4, one is not allowed to muzzle an ox while it is threshing grain. This commandment is understood to prohibit people from stopping any kind of animal from eating any kind of food with which it is presently working. One corollary of this rule is that a pack animal must be allowed to nibble from whatever it is carrying (Maimonides' *Mishneh Torah, Laws of Hiring* 13, pp. 1–2). Deuteronomy 22:10 prohibits people from using a mixed team consisting of an ox and an ass to plow a field. This verse eventually gave rise to rabbinic legislation prohibiting people from using any combination of animals belonging to different species to pull the same vehicle or object. One explanation for these laws is that animals often find it stressful to be forced into close contact with members of other species (*Sefer HaHinukh,* Commandment 550); another possibility is that an animal from a weaker species will have trouble keeping up with a stronger work-partner. Other work-related laws include the obligation upon humans to assist in the unloading of a pack animal that has collapsed under its burden (Exodus 23:5) and the obligation to help a fallen animal get back on its feet (Deuteronomy 22:4).

A vast section of Jewish law deals with the prohibition of work on the Sabbath and festivals. The Torah makes it clear that one's animals must also be allowed to rest on those days: "The seventh day is a Sabbath of the Lord your God; you shall not do any work—you . . . your ox or your ass, or any of your animals" (Deuteronomy 5:14). "On the seventh day you shall cease from labor, in order that your ox and your ass may rest" (Exodus 23:12). Many laws derive from these verses; for instance, an entire chapter of the Mishnah (Shabbat 5) is devoted to the question of which items one may have one's animal carry into a public area on the Sabbath. A Jew is also not allowed to lend or rent an animal to a gentile who might force it to work on the Sabbath (Maimonides' *Mishneh Torah,* Laws of the Sabbath 20, p. 3).

Interestingly, Jewish law permits humans to perform certain kinds of work necessary for their animals' wellbeing on the Sabbath, even though those tasks would otherwise be prohibited by rabbinical edicts. For instance, Jews are allowed to milk cows on the Sabbath in order to alleviate the pain caused them by swollen udders. In Israel some milking parlors are fitted out with specially designed systems so that religiously observant Jewish dairy farmers can milk their herds on the Sabbath in a manner permitted by Jewish Law.

Laws Respecting the Parent-Child Relationship Among Animals

Judaism places great stress on the importance of the human parent-child relationship, and this concern extends to parent-child relationships among animals as well. In his *Guide for the Perplexed,* which is usually considered to be the most important work of medieval Jewish philosophy, Maimonides writes that when animals see their offspring die, they

> feel very great pain, there being no difference regarding this pain between man and the animals. For the love and tenderness of a mother for her child is not consequent upon reason, but upon the activity of the imaginative faculty, which is found

> in most animals as it is found in man. (*Guide* III, p. 48; Pines, p. 599)

Several laws reflect concern for the human-parent relationship among animals. Leviticus 22:28 prohibits the slaughter of an animal together with its offspring on the same day. Maimonides (loc. cit.) states that this law is intended to prevent situations in which the parent might witness the slaughter of its offspring. Similarly, Leviticus 22:27 states that a newborn animal "shall stay seven days with its mother, and from the eighth day on it shall be acceptable as an offering by fire to the Lord." Deuteronomy 22:6–7 states that a mother bird and her eggs should not be taken together, and that the mother bird must be shooed away before the eggs are taken from her nest. Nachmanides argues that this last law is intended to preserve bird species by making sure that the mother bird will survive to produce a new future generation. This interpretation offers a foundation for the value of biodiversity in Jewish law.

Two Contemporary Applications

Sports and entertainment involving animal suffering do not jibe well with the restrictions of *tza'ar ba'alei hayyim,* and as a result Jewish law has generally taken a quite negative view of hunting for sport, bullfighting, and the like. Israeli Chief Rabbi Shlomo Moshe Amar has supported a recent ruling by Rabbi David Bardugo extending the prohibition to include horse-racing. It states that, "one ought to instruct every God-fearing person . . . not to participate in horse-races—neither in establishing them, nor by watching them: because of the pain to animals caused thereby . . ."

The use of animals in medical and biological research is another question that has generated considerable interest and activism in recent decades. In the conclusion to his comprehensive review of Jewish legal attitudes towards this question, Rabbi David Bleich writes:

> there is significant authority for the position that animal pain may be sanctioned only for medical purposes, including direct therapeutic benefit, medical experimentation of potential value and the training of medical personnel. *A fortiori,* those who eschew . . . [this] . . . position would not sanction painful procedures for the purpose of testing or perfecting cosmetics. An even larger body of authority refuses to sanction the infliction of pain upon animals when the desired benefit can be acquired in an alternative manner, when the procedure involves "great pain," when the benefit does not serve to satisfy a "great need," when the same profit can be obtained in another manner, or when the benefit derived is not commensurate with the measure of pain to which the animal is subjected.

See also Religion and Animals—Judaism and Animal Sacrifice

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Berel Dov Lerner

RELIGION AND ANIMALS: JUDAISM AND ANIMAL SACRIFICE

During biblical times animal sacrifice or *zebach* was practiced as part of Jewish religious observance. As happened in so many other religions at the time, domesticated animals were offered to God as an institutionalized means of relief from the impurity generated by human violations of moral rules or purity taboos. The animals selected for sacrifice were those that were deemed useful to humans, and both anthropomorphism and anthropocentrism can be seen in the description of these animals and not others as pleasing to God. The well-known "Thou shall not kill" was not thereby violated because, in the Hebrew tradition, this moral rule is interpreted as "Thou shall not kill unlawfully." Methods for lawful killing are defined by the Torah, which contains a written code with 613 laws of ethical human behavior, and by the later oral tradition and rabbinical commentary. The practice of animal sacrifice was discontinued after the destruction of the second temple by the Romans in 70 CE, although Orthodox Jewish prayer books to this day ask for a reestablishment of the temple sacrifices.

Another view of sacrifice appears in the criticism of the tradition, although in this criticism of sacrifice there was little emphasis on the obvious point that it was cruel to the individual animal. Maimonides, a 12th-century Jewish philosopher, argued that sacrifices were a concession to barbarism. Some modern theologians continue to argue that sacrifice in its way represented respect for animal life. A more balanced observation is that sacrifice does not necessarily involve a low view of the sacrificed animals' lives (Linzey, *Christianity and the Rights of Animals,* p. 41). This is plausible, given that the tradition contains powerful passages recognizing that the blood of humans and animals is sacred (for example, Leviticus 17:10). Ultimately, Judaism moved away from the practice of animal sacrifice, although there remain rules governing ritual slaughter or *shechita* by a specially trained religious functionary called a *shochet* when an animal is killed for food purposes.

The occurrence of these instrumental uses of animals and the ultimate rejection of the old sacrificial practices are of limited value in assessing Judaism's views of animals, as they deal with only a few domestic animals. Far more helpful in assessing Jewish views of animals is an evaluation of the ways in which Jews in their diverse communities have treated

and continue to treat the living beings in their care.

See also Religion and Animals—Judaism

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Paul Waldau

RELIGION AND ANIMALS: PANTHEISM AND PANENTHEISM

Pantheism and panentheism exist in nearly every religious tradition, especially among mystics, who hope and strive for unity with the divine.

The word pantheism stems from two Greek words, *pantos*, meaning "all," and *theos*, meaning "God." Pantheists believe that the divine and the natural world are one and the same. Whatever exists is God, and God is all that exists. The pantheist's world is divine; from lizards to piglets, from rocks with flowers to fish; God is all, and all is God.

Panentheists believe that the divine permeates the natural world, but the divine is yet more than what we see and experience. Pantheists identify ultimate reality directly and solely with the physical world, whereas panentheists view ultimate reality as within, but also more than, the natural world.

Hinduism, the dominant faith of India, expresses both pantheism and panentheism in sacred writings such as the *Upanishads* and the *Mahabharata.* In Hinduism, *Brahman* is the divine, the greatest principle of the universe. Some authors translate *Brahman* as "God." *Brahman* is the substratum underlying the universe, the unknowable, undefinable power behind and within all that exists. The Hindu *Upanishads,* composed about 2,500 years ago, teach that each individual is *Brahman:* "This Great Being . . . forever dwells in the heart of all creatures as their innermost Self . . . [and] pervades everything in the universe" (*Svetasvatara*, pp. 122–23). *Brahman* is identified with nature and nonhuman animals:

> Thou art the fire,
>
> Thou art the sun,
>
> Thou art the air . . .
>
> Thou art the dark butterfly,
>
> Thou art the green parrot with red eyes,
>
> Thou art the thunder cloud, the seasons, the seas. (*Svetasvatara*, pp.123–24)

Brahman pervades every living being. Every creature shares this ultimate reality; the ground of each individual's being

is identical with that of *Brahman.* Turkey, wombat, human being, Hindu pantheists find "in all creation the presence of God" (Dwivedi, p. 5).

With Hindu pantheism and panentheism, to understand what it means to be human is also to understand what it is to be a sparrow or a Leghorn chicken. For the Hindu, what is important about the existence of coho salmon or black angus cattle, the divine within, is the same in both human and nonhuman. The foundation and fundamental core of all beings is *Brahman.* As *Brahman* is essential to human essence, so this divine force is also essential to a pollywog wiggling in a mud puddle, or a fish struggling to escape the net of a fisherman. As a pinch of salt dissolved in a glass of water cannot be seen or touched but turns the contents to salt water, so the subtle essence of *Brahman* runs through all beings, creating their essential essence, yet this divine element cannot be perceived or touched. This subtle essence makes each living being, all that exists, holy. As all rivers are temporarily distinct but ultimately join one great sea, so all living beings appear in separate bodies. The indigo bunting sitting on your neighbor's fence, the tuna fish darting through the sea, the sow brimming with piglets, and the blue heron stepping gingerly through shallow pond waters, all are ultimately united by *Brahman.* "[A]s by one clod of clay all that is made of clay is known," so all things are one in essence, and that essence is sacred (*Chandogya*, p. 92).

The Hindu epic the *Mahabharata* teaches that those who are spiritually learned behold all beings in Self, Self in all beings, and *Brahman* in both. Hindus understand that all living beings have *atman* (usually translated as "soul"), and that *Brahman,* or God, is that soul. Panentheism is one of the core teachings in the most famous portion of the *Mahabharata,* the *Bhagavad Gita,* in which the beloved god Krishna explains what it means to be divine: "I am the life of all living beings . . . All beings have their rest in me . . . In all living beings I am the light of consciousness" (*Bhagavad*, pp. 74, 80, 86). The divine, in this case Krishna, is not only a great deity, but is also indwelling in the cockroach and the elephant. The *Bhagavad Gita* presents the divine as an essential part of who we are, as an essential part of every aspect of every creature, and of nature: "I am not lost to one who sees me in all things and sees all things in me."

Panentheism and pantheism teach that all beings share in the divine. What does this mean about the relationship between white-tailed deer and Buff Orpington hens? What does this mean for ethics? The *Bhagavad Gita* notes that we exist in the heart of all other beings and the heart of all other beings exists within our own self. Not only is the divine in all beings, but we, as part of the divine, are also part of all other living beings. In this way Hindus come to love all beings, and the pleasure and pain of other creatures becomes personal (*Bhagavad*, pp. 71–72). Those who love God also love the ladybug and the anteater, the tulip and the turkey.

This rich and pervasive pantheistic and panentheistic vision of the universe affects Hindu ethics, as it does all religions that honor the divine in nature. Consequently, *ahimsa* is central to Hinduism. *Ahimsa,* often translated as nonviolence, is more literally translated as not to harm. Practicing contemporary Hindus strive to avoid harming to any creature or to the natural world because the divine is all that exists. Devout Hindus must

extend their caring and compassion not only to other human beings, but to dogs and halibut, turkeys and hogs. As a result, many Hindus have been vegetarians for centuries, eschewing flesh in their diet, and also abstaining from reproductive eggs, such as chicken eggs.

Pantheistic and panentheistic religions, which teach that the divine is indwelling in the world around us, in all that exists in this great universe, also teaches respect for nature. Pantheism and panentheism discourage human arrogance and pride, greed and dominion, which might otherwise lead people to believe that we are superior to nonhuman animals, that we are somehow separate and more important than other earthbound creatures. Hinduism, like all great religions of the world, teaches people that every aspect of the natural world shares in the divine, is divine. For pantheists and panentheists, the spiritual life demands respect and reverence for all living beings and for the natural world in general.

Hinduism provides but one example of earth-centered beliefs and their accompanying ethics. Every religion teaches pantheism or panentheism in one form or another; each religion teaches that the world is sacred, and that every calf and garter snake holds some measure of the divine.

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RELIGION AND ANIMALS: REVERENCE FOR LIFE

Reverence for life is a concept pioneered by the Alsatian theologian and philosopher Albert Schweitzer in 1922. According to Schweitzer, ethics consists in experiencing a "compulsion to show to all will-to-live the same basic reverence as I do to my own." The relevance of Schweitzer's thought to modern debates about animals is significant. According to Schweitzer, other life forms have a value independent of humans, and our moral obligation follows from the experience and apprehension of this value. This insight is essentially religious in character and therefore basic and nonnegotiable. Schweitzer was undoubtedly prophetic. "The time is coming," he wrote, "when people will be astonished that mankind needed so long a time to learn to regard thoughtless injury to life as incompatible with ethics."

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Andrew Linzey

RELIGION AND ANIMALS: SAINTS

A priest sprinkles holy water to bless a dog during the celebration of the feast of Saint Francis of Assisi, at a church in Manila. Animal lovers brought their pets to celebrate the annual celebration of the known animal-lover saint. (AP Photo/ Pat Roque)

There is a remarkable range of material linking Christian saints with animals. The stories of St. Francis of Assisi preaching to the birds and St. Anthony of Padua preaching to the fishes are well known. Much less well known are the stories, for example, of St. Columba and the crane or St. Brendan and the sea monster. Most scholars and theologians have dismissed this wealth of material as legend or folklore, but its significance, historically and theologically, can be noted.

First, it is testimony to a widespread positive tradition within Christianity that has linked spirituality with a benevolent and sensitive regard for animals. The underlying rationale for this study of saints appears to be that, as individuals grow in love and communion with their Creator, so too ought they to grow in union and respect for animals as God's creatures. Something like two-thirds of canonized saints East and West apparently befriended animals, healed them from suffering, assisted them in difficulty, and celebrated their life through prayer and preaching. Second, despite the negative tradition within Christianity that has frequently downgraded animals, regarding them, at worst, as irrational instruments of the Devil, the literature on these saints makes clear God's benevolent concern for nonhuman creatures and the common origin of all life in God. Third, because of this common origin in God, it necessarily follows that there is a relatedness, a kinship between humans and nonhumans. According to St. Bonaventure, St. Francis was able to call creatures "by the name of brother or sister because he knew they had the same source as himself." Fourth, many of these stories prefigure a world of peaceful relations between humans and

animals where human activity is no longer injurious or detrimental to other creatures. St. Brendan's voyage, for example, culminates in the discovery of a new Eden-like land characterized by widespread vegetarianism and the absence of predation. Such stories are testimonies to a substratum within Christianity that is inclusive of concern for animal life. The ideas they embody of respect, generosity, and kinship between species reflect the themes that mainstream Scholastic tradition has almost entirely failed to incorporate into its thinking.

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Andrew Linzey

RELIGION AND ANIMALS: THEODICY

Theodicy comes from the Greek words *theos* (God) and *dike* (justice), and is a branch of theology concerned with exploring and defending the justice of God in relation to physical and moral evil. Theodical issues are frequently at the heart of debates about animal rights and animal welfare, and are used both positively and negatively in encouraging or discouraging concern for animal suffering. A great deal of historical theology has utilized theodical arguments negatively, in ways that seem to satisfy the claim that God is just and good, but at the expense of animals. The first negative type solves the problem of animal pain by effectively denying its existence. Historically, Cartesianism has played a vital part in the development of this argument, but it has not lacked modern adherents. For example, as late as 1927, Charles Raven argued that "it may be doubted whether there is any real pain without a frontal cortex, a fore-plan in mind, and a love which can put itself in the place of another; and these are the attributes of humanity." Clearly there can be no problem of animal pain to solve if such pain is illusory.

The second negative type admits of some animal pain but minimizes its significance morally. For example, John Hick holds that animal pain is necessarily different from human pain because animals cannot anticipate death. "Death is not a problem to the animals . . . We may indeed say of them 'Death is not an injury rather life a privilege.'" Clearly, if death is not a problem to animals, then the moral significance of killing is necessarily reduced.

The third negative type also admits of the existence of animal pain but denies its significance theologically. For example, Peter Geach holds that God is essentially indifferent to animal pain. "The Creator's mind, as manifest in the living world, seems to be characterized by mere indifference to the pain that the elaborate interlocking teleologies of life involve." This appeal to the world as it

now exists has historically been one of the major theodical arguments against animal welfare. In the crisp summary of Samuel Pufendorf (1632–92): "For it is a safe conclusion from the fact that the Creator established no common right between man and brutes that no injury is done brutes if they are hurt by man, since God himself made such a state to exist between man and brutes." Such an argument finds its contemporary and largely secular expression in an ecological form of theodicy that maintains that since nature is essentially predatory, we should abide by nature's rules. Nature's perceived law is baptized into natural or moral law.

Alongside these negative types, there are positive ones, too. Here are three examples. The first is that animal pain and predation, far from being the Creator's will, are actually contrary to it. C. S. Lewis, for example, held that both animal pain and carnivorousness were the result of Satanic corruption of the earth before the emergence of human beings. It follows that humans therefore have a duty not to imitate such malevolent distortion, but to fight against it. The second is that while the Creator allows pain in creation, both animal and human, as an inevitable corollary to the freedom allowed to creation itself, such pain will eventually be transformed by a greater joy beyond death. Keith Ward, for example, holds that "immortality, for animals as well as humans, is a necessary condition of any acceptable theodicy," and that "necessity, together with all the other arguments for God, is one of the main reasons for believing in immortality." Such a prospect both maintains the ultimate justice of God and justifies the alleviation of pain, as an anticipation of God's final will, in the present. The third form of positive theodicy maintains that the God revealed in the suffering of Jesus suffers with all innocents, whether human or animal, in this world, and will redeem all such suffering. From this perspective, Andrew Linzey concludes that the "uniqueness of humanity consists in its ability to become the servant species," that is, "co-participants and co-workers with God in the redemption of the world" (Linzey, 1994). Far from being indifferent to suffering, God is seen as manifest within it, beckoning human creatures to active compassion to remove its causes.

How ever we may judge the satisfactoriness of these negative or positive theodicies, it is inevitable that ethical concern for animals will continue to be influenced by one or more of them in one form or another. Concern for animal suffering rarely stands by itself as a philosophical position, and requires the support of some form of meta-ethical framework in which the problem of a specific injustice can be properly recognized and addressed only within the context of a sufficiently comprehensive vision of ultimate justice for all.

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Andrew Linzey

RELIGION AND ANIMALS: THEOS RIGHTS

Theos rights denotes God's own rights as Creator to have what is created treated with respect. According to this perspective, rights are not awarded, negotiated, or granted, but recognized as something God-given. Comparatively little attention has been devoted to the theological basis of animal rights, though it offers a coherent theoretical basis for the intrinsic value of, especially, sentient beings. Whereas in secular ethics, rights are usually correlative of duties, for example, if A has a duty toward B, it usually follows that B has a right against A, in theological ethics the reverse may be claimed. For example, Dietrich Bonhoeffer maintains that "we must speak first of the rights of natural life, in other words of what is given to life and only later of what is demanded of life." Rights thus may be characterized as what are given to creatures by their Creator, to whom humans owe a primary obligation. The value of theos rights lies conceptually in the way in which it frees ethical thinking from humanocentricity. As Andrew Linzey writes:

According to theos rights what we do to animals is not simply a matter of taste or convenience or philanthropy. When we speak of animal rights we conceptualize what is objectively owed to animals as a matter of justice by virtue of their Creator's right. Animals can be wronged because their Creator can be wronged in his creation.

Although some Christians oppose the language of rights altogether as unbiblical or contrary to creation construed as grace, the notion of rights has a long history in theological ethics. Thomas Tryon was probably the first to use it in a specifically theological context relating to animals in 1688, but it continues to be used in modern contexts as well. For example, John Cardinal Heenan stressed that "animals have very positive rights because they are God's creatures . . . God has the right to have all creatures treated with proper respect."

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Andrew Linzey

RELIGION AND ANIMALS: VEGANISM AND THE BIBLE

Many vegans, that is, those who eat no food made from animals, including dairy

products, and who do not use products made from animals, believe that the Bible, including the story of creation and the life of Jesus, presents a moral imperative for a vegan way of life.

In the many books of the Bible, only Genesis 1 and 2, honored by Jews, Christians, and Muslims, reveal the world as the creator preferred and intended creation to be. After the fall, which occurs in Genesis 3, God's perfect creation is changed. To many believers, in these first two chapters of Genesis, the divine being creates and sanctifies what is in essence a vegan world.

In Genesis 1, God grants humans rulership over the creatures, over everything that moves. God also creates people in the image of himself. Genesis 2 defines this divinely ordained rulership as God "took the man and placed him in the Garden of Eden, to till it and tend it," (Gen. 2:15). The Hebrew word most frequently translated in Genesis 2 as tend (*shamar*) also appears in Numbers 6:24, translated as protect ("The Lord bless you and protect you"). The Hebrew word most often translated as till (*'abad*) in Genesis 2, is translated as serve in other portions of the Bible, such as Joshua 24:15: "choose this day which ones you are going to serve—the Gods that your forefathers served . . . or those of the Amorites." Humans are therefore placed in the Garden of Eden to protect and serve creation, including animals.

Immediately after humans are granted rulership, God instructs the first humans as to what they may eat: "I give you every seed-bearing plant that is upon all the earth, and every tree that has seed-bearing fruit; they shall be yours for food" (Gen. 1: 29). To many readers, this means that food for humans should come from plants.

Jesus, the quintessential Christian moral exemplar, was devoted to weak and imperfect beings; he was deeply concerned for the oppressed and downtrodden. His life and teachings speak of compassion and service of the strong for the weak. Jesus provides an exemplar of Genesis 2 in action, of serving and tending creation.

Fundamental among Christian moral teachings is the commandment to love. Love is "the paramount scripture . . . essential to the Christian way of life" (Allen, 1971, p. 214). In the Christian worldview, love is limitless. Any understanding of Christian love or of God's love that limits care and affection "is spiritually impoverished" (Linzey, 1997, p. 131). The Catholic catechism notes that God surrounds animals with "providential care," that the creatures of the earth bless God and bring glory to the creator, and so we "owe them kindness" (1994, p. 2416): "It is contrary to human dignity to cause animals to suffer or die needlessly" (1994, p. 2418). Vegans believe that eating animals and exploiting them for their reproductive eggs and nursing milk causes them to suffer and die needlessly.

Scripture also notes that the human body is "a temple of the Holy Spirit" (1 Cor. 6:19). A flesh-based diet has been linked to heart disease, cancers, obesity, and numerous other serious health problems. Steve Kaufman, founder of the Christian Vegetarian Association, comments that a vegan diet is neither a burden nor a self-sacrifice, but part of a broader spiritual life that shows respect for creation, including the human body, "manifesting core values such as love, compassion, and peace."

Most Christians believe that Christianity holds the dream of universal peace

and a vision of a future world devoid of violence, and that they are to work toward this great peace. A number of Christians believe that killing animals to consume their bodies, or keeping them in cramped cages to obtain their eggs and milk, is a failure of Christian love, and cannot bring about the Peaceable Kingdom of all creation, which includes both humans and animals. The creation story, the life of Jesus, and primary moral ideals such as the peaceable kingdom and the sanctity of our bodies provide a vegan Biblical imperative.

See also Veganism

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Lisa Kemmerer

RELIGION, HISTORY, AND THE ANIMAL PROTECTION MOVEMENT

From ancient times, religion has played the same contradictory roles in shaping human relationships with animals that it has played in other areas of human life. On the one hand, religion has been a powerful force for the advancement of humanity out of our fearful, benighted past toward an open, generous, enlightened future. It was morality codified as religion that introduced concepts like compassion, altruism, and nonviolence into the human dialogue, and religion created the ethical values that enable people to live in relative peace and harmony with one another.

At the same time, religious institutions have been among the fiercest opponents of human progress, willing, even eager at times, to use violence to defend the status quo and halt the extension of compassion and love to groups considered other. All too often, religion has taught people to hate in the name of love and kill in the name of God.

Sacrifice

The origins of religion are lost in the darkness of prehistory. What we do know is that when religion was first practiced by human beings, it was organized around the cult of sacrifice. Most ancient religions were based upon sacrifices to appease angry gods or curry favor with helpful deities. Ancient temples were first and foremost slaughterhouses.

But it was also religious leaders who first called for the abolition of sacrifice.

The ideas of good and evil that have guided human thinking about ethics for more than two millennia, epitomized in the Hebrew Scriptures as "You shall love your neighbor as yourself" (Leviticus 19:18), were created almost simultaneously along a band stretching some four thousand miles from China through India, Persia, and Israel to Greece during the most remarkable period of spiritual, intellectual, and social progress in human history. During this Axial Age, as it was dubbed by philosopher Karl Jaspers,

which lasted roughly from 800 to 200 BCE, sages like Confucius, LaoZi, the founder of Taoism, Mahavira, the founder of Jainism, the Buddha, the great Hindu reformer Vyasa, a name usually taken to stand for several teachers whose names have been lost, Zoroaster, the Latter Prophets, and Pythagoras, revolutionized religion and ethics by introducing the idea that our lives should be based upon helping others rather than entirely upon self-interest.

The Origins of Animal Rights and Animal Welfare

From the animals' standpoint, what is most important here, and all too often overlooked, is that several of these teachers: Mahavira, the Buddha, and Vyasa in India, Pythagoras in Greece, and the Latter Prophets in Israel, counted animals among the neighbors whom we should love as we love ourselves. They recognized that the suffering and death of a chicken or a lobster is as urgent to the chicken or the lobster as your suffering and death are to you and my suffering and death are to me. Therefore, they taught that the chicken and the lobster are entitled to the same moral consideration to which human beings are entitled. They taught the moral equality of all sentient beings.

Thus, animal protection began as animal liberation, not as animal welfare, and was part and parcel of the same movement that pioneered human liberation. In the minds of these thinkers, animals were not second-class citizens. They were co-equal beneficiaries, along with the humans of the Axial Age movement, to end violence and oppression.

Mahavira, the Buddha, Vyasa, and Pythagoras explicitly forbade the raising and slaughter of animals for food or sacrifice. Down to the present time, the vast majority of Jains are ethical vegetarians, as are a large percentage of Buddhists and Hindus. Neither Jainism nor Buddhism has ever indulged in animal sacrifice, and in Hinduism it became a marginalized vestigial practice.

In Israel, the Latter Prophets, radical religious and social reformers who included such familiar names as Isaiah, Jeremiah, Amos, and Hosea, condemned the oppression of the poor by the rich and powerful, and also called for an end to animal sacrifice. In Isaiah, God tells the people,

I take no pleasure in blood of bulls, lambs, and goats. When you come to appear before Me who requires of you this trampling of My courts? . . . [E]ven though you multiply prayers, I will not listen. Your hands are covered with blood. (excerpted from Isaiah 1:11–17, *New American Standard Bible*).

In Hosea, God speaks just as clearly. "For I desire mercy and not sacrifice, and acknowledgement of God rather than burnt offerings" (Hosea 6:6, *New International Version*). Condemnations of sacrifice are also found in Isaiah 66:3–4, Jeremiah 7:21–23, Hosea 8:11–13, and Amos 5:21–25.

In very ancient times, Jews were permitted to eat meat only from an animal that had been offered as a sacrifice (I Samuel 14:31–35). But gradually this law was relaxed to allow Jews to eat meat as long as sacrifices were offered at the Temple in Jerusalem, the only place that sacrifice was permitted. When the Temple was destroyed by the Romans in 70 CE, bringing animal sacrifice to an abrupt halt, the leading rabbis of the day debated whether meat eating was still allowed. As so often in human history,

appetite triumphed. And so when the prophets condemned sacrifice, they were also condemning meat eating, as their contemporaries would have understood perfectly well.

Animal welfare, the belief that we may enslave and slaughter animals for our own benefit as long as we spare them any suffering that is not inherent in their use, was a compromise between unrestricted animal exploitation and abuse and the call of the Latter Prophets for an end to animal abuse and slaughter. Over time, this compromise became the normative view of Judaism, and is enshrined in the Hebrew Scriptures, for example, in Proverbs 12:10, Deuteronomy 5:14, and Exodus 23:12. This Biblical compromise holds that we may exploit and slaughter animals for our own benefit, including for food and sacrifice, as long as we spare them any suffering that is not essential to the purpose for which they are being exploited and killed. It establishes two levels of morality: one to guide our treatment of human beings, and another, lower level to guide our treatment of animals. In recent years, Jewish animal advocates, notably Dr. Richard Schwartz and Dr. Roberta Kalechofsky, have sought to move beyond the compromise and reclaim the original call of the Latter Prophets for a single standard of treatment for both human beings and animals.

Christianity and Islam

Jesus appears to have endorsed the tradition of the Latter Prophets which condemned animal sacrifice and meat eating. There is no record that he ever sponsored a sacrifice at the Temple; twice he quoted with approval the passage above from the prophet Hosea denouncing sacrifice (Matthew 9:13, 12:7), and in history's first recorded animal liberation, he freed animals being held in the Temple precincts to be killed as sacrifices (John 2:14–16). The only animal product that Jesus is said to have consumed is fish, and that only once, following the crucifixion, when he ate a small morsel of fish to prove to his disciples that he had been resurrected in the flesh, leading some scholars to suspect that this story was a legend added to the gospel for theological reasons (Luke 24:36–43). The gospels describe bread, not lamb, as the main course at the Last Supper. According to ancient Christian sources, Jesus' brother James and several of the other Apostles appear to have been vegan, and the original Jewish Christians, who learned their traditions directly from Jesus and his immediate disciples, remained vegan until their movement died out sometime around the fourth century.

Christianity never practiced animal sacrifice, but rather taught that Jesus's sacrifice of himself for the sins of humankind rendered it obsolete. And when Christianity triumphed in the Roman world, the Empire's pagan religions were forcibly abolished, bringing animal sacrifice to a permanent end in the West.

Christianity as a gentile religion owes much of its theology and practice to Paul of Tarsus, a Greek-speaking Jew who spread the new faith to the gentile populations of the eastern Mediterranean in the decades following Jesus' crucifixion. Paul rejected the Biblical Compromise, as well as the single morality taught by the Latter Prophets, in favor of a Greek philosophical tradition derived from Aristotle and the Stoics which held that animals exist solely for human benefit and we may exploit and slaughter them as we like (I Corinthians 9:9–14; 10:25–31) In this he was followed by the leading

theologians of the Middle Ages, St. Augustine and St. Thomas Aquinas, who taught the Aristotelian doctrine that only beings with rational souls, that is, human beings, are entitled to ethical treatment, and that we have no direct moral duties to animals.

From the conversion of the Roman Empire to Christianity in the fourth century, when Pythagoreanism was eradicated, until the Protestant Reformation more than a millennium later, there was no animal advocacy in Christian Europe. To the extent that kindness to animals was encouraged at all, it was on the grounds that it predisposed people to kindness toward other humans. The Catholic Church did not fully endorse animal welfare until a new universal catechism issued by Pope John Paul II in 1992 embraced both elements of the Biblical Compromise.

Judaism's other daughter religion, Islam, took the opposite tack. From the beginning, Islam incorporated animal welfare into its core ethical teachings. But Islam also continued the ancient practice of animal sacrifice, which to this day takes place once a year, at the festival of Eid-al-Adha, which celebrates the Hajj, the pilgrimage to Mecca that every Muslim whose circumstances permit is obligated to make at least once in his or her lifetime. In Mecca and around the world, millions of animals, primarily sheep and goats less than a year old, are slaughtered as a token of the believers' submission to the will of God.

The Protestant Reformation Revives Animal Welfare

As the modern age arrived in Europe, Protestant theologians like John Calvin and John Wesley discovered the Biblical Compromise in the Hebrew Scriptures and taught both of its elements: that we may exploit and slaughter animals for human benefit, and that we must spare them any suffering that is not essential to their use. In 1641, a Puritan clergyman named Nathaniel Ward wrote the Western world's first animal welfare law into the legal code of the Massachusetts Bay Colony, the so-called *Massachusetts Body of Liberties*: "No man shall exercise any cruelty or tyranny toward any brute creature which is usually kept for man's use."

It was an Anglican priest, Rev. Dr. Humphrey Primatt who was largely responsible for bringing animal welfare to the attention of the general public. In 1776, he published a small book which achieved a broad readership among England's liberal social reformers, *The Duty of Mercy and the Sin of Cruelty to Brute Animals.*

Inspired by *The Duty of Mercy,* another Anglican priest, Rev. Arthur Broome, came to see animal welfare as his Christian ministry. In 1824, Rev. Broome convened a meeting in London of leading British abolitionists and social reformers, including Richard Martin, a member of Parliament who two years earlier had sponsored the second animal welfare act in the modern world following the Massachusetts Body of Liberties. These liberal opinion leaders created an organization to educate the public about animal cruelty and to bring prosecutions against abusers under Martin's Act. The group did not challenge the exploitation and slaughter of animals for human benefit, but vigorously opposed cruelty that was not intrinsic to their use. In 1840, it received the sponsorship of Queen Victoria and became known by its present name, The Royal Society for the Prevention of Cruelty to Animals. From this beginning,

animal welfare, *tsar ba'ale hayyim* in modern dress, spread to North America, Australia, continental Europe, and around the world.

Christianity and Animal Rights

There matters rested until 1976, when yet another Anglican priest, Rev. Dr. Andrew Linzey, published *Animal Rights: a Christian Perspective.* In this and subsequent books, Professor Linzey brought the Christian view of animals full circle by moving beyond the Biblical Compromise, back to the original view of Jesus and the Latter Prophets, that nonhuman animals have moral equality with human beings. In fact, Professor Linzey goes farther by arguing that the essence of Christian ethics, as expressed in the life and teachings of Jesus, is to serve those who suffer and are powerless to end their suffering. And since, as a generality, animals suffer more grievously and have less power than human beings, they actually have a kind of moral priority. "The uniqueness of humanity," Professor Linzey tells readers in his book *Animal Theology,* "consists in its ability to become the servant species."

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Norm Phelps

REPTILES

Reptiles are poorly understood by most people, which leads to their mistreatment. In their natural environments, they may be killed by fearful humans or by those seeking their skins. Reptiles are becoming more popular as pets, but in this role they may also suffer due to human ignorance about reptilian physical needs. The traditional classification of the class *Reptilia* includes turtles, squamates (lizards, snakes, and relatives), crocodilians, and the two recognized species of tuatara. The later are relic and highly protected species found on several islands off the coast of New Zealand. All reptiles share several traits, including being ectothermic (dependent on external sources of heat) and covered with hard plates, scales, or bony shells. Reptiles live in almost all habitats, except for year-round subfreezing or deep sea environments. Within these limits, reptiles have adapted to many conditions, exploit a wide range of food items with diverse foraging methods, and have evolved diverse social systems. All tuataras, turtles, and crocodilians lay eggs, with the last group also showing a highly developed system of nest guarding and post-hatching parental care. Squamate reptiles, which constitute about 95 percent of all reptile species, have egg-laying, egg retention (ovoviviparity), and viviparous reproduction, the first two sometimes occurring in the same species. Egg brooding and postnatal parental solicitude also occur in a number of squamate species, and complex social and multigenerational groups have been documented in some lizards. Social, foraging, and anti-predator defensive behavior can differ greatly within and between closely related forms, especially in squamates. Thus it is very difficult to generalize across species, which raises problems in maintaining many species in captivity, developing effective conservation plans, studying their behavior, and understanding the way they experience their lives.

The ability of reptiles to learn, suffer, communicate, play, and socialize is generally underestimated, even by many herpetologists. Data are accumulating on many species which indicate that reptiles are not the robot-like, insensitive, simple, and stupid animals many think they are. This mistake is fostered because while reptiles do not have complex facial or vocal repertoires, tactile, chemical, and whole body visual displays are common and important in communication. The metabolic rate of reptiles is about 10 percent that of mammals and birds, and thus their behavior is often slow, for example, in the movements of land turtles, or sporadic, although there are many exceptions. Furthermore, reptiles are often ecologically specialized and critically dependent upon having proper temperature, humidity, diets, lighting, substrates, perches, retreats, and other captive arrangements to stimulate normal activity. Knowing their natural behavior aids greatly in providing appropriate captive conditions for reptiles. An indication of the bias against this constricted view of reptilian abilities is seen in the hot-blooded dinosaur controversy which elevates dinosaurs above mere reptiles by willful ignorance of the documented complexity of reptile behavior (Burghardt, 1977).

Reptiles are fascinating both in how they look and in their behavior. They are now highly popular as pets, especially rat snakes, leopard geckos, bearded dragons, and boas. A major problem is that the behavioral, nutritional, environmental, medical, and psychological needs of reptiles are rather different, indeed alien to, ours and those of our common companion animals, namely dogs, cats, birds, and rodents. However, many people keep reptiles because they seem to need less care than traditional mammalian and avian species. This leads to many problems and the premature deaths of literally thousands of animals each year. For example, reptiles can go much longer without food than other vertebrates, and many slowly starve to death or succumb to poor nutrition, insufficient temperatures for digesting food, or inadequate lighting with insufficient ultraviolet radiation.

Reptiles possess many traits that are useful for answering important questions about animal biology and behavior (Greenberg et al., 1989). Snakes possess chemosensory abilities more acute than most other terrestrial vertebrates. Reptiles can be both short- and long-lived, have behavior patterns that can be measured and recorded easily, and are important ecological components of many habitats where they occur. Many species are affected by habitat loss or changes due to human activity. Many reptiles are also killed directly by ignorant, fearful people. Others are exploited for food, skins, and the pet trade, in numbers that threaten the survival of many species, including once-common species of turtles in North America.

There are many sources of accurate information on reptiles. Several organizations and publications in the United States and Europe are devoted to investigation and dissemination of accurate information on captive reptiles, including books and pamphlets on selected species or groups. More scholarly sources are now also available. The multivolume *Biology of the Reptilia* series founded and edited by Carl Gans and subsequent coeditors has been published since the 1960s and now contains over 20 volumes covering almost every aspect of anatomy, physiology, ecology, and behavior. The Society for the Study of Amphibians and Reptiles is the largest

organization devoted to reptiles, and publishes many important publications including the *Journal of Herpetology* and the *Herpetological Review.* There are also many books published at the state, regional, country, and continent-wide level devoted to reptiles as a whole, or to various subgroups such as lizards, that contain a wealth of information on exotic or less popular species.

See also Amphibians

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Gordon M. Burghardt

RESCUE GROUPS

Animal rescue groups are typically privately funded groups, often made up of volunteers, which rescue domesticated animals and place them up for adoption. The animals may be surplus animals from public or private animal shelters, unwanted pets from the general public, or strays.

While individuals have been finding and keeping stray animals for centuries, organized animal rescue groups are a relatively recent invention, dating to the early 19th century in England. Here, in 1824, a handful of animal lovers formed the Society for the Prevention of Cruelty to Animals, the first SPCA in the world, later renamed the Royal Society for the Prevention of Cruelty to Animals (RSPCA).

In the United States, the first formal animal welfare group was formed by Henry Bergh, who founded the American Society for the Prevention of Cruelty to Animals (ASPCA) in 1866. The group was formed not to rescue individual animals but, initially, to protect animals like carriage horses in New York City and to fight other forms of cruelty. While Bergh's efforts were primarily focused on anticruelty campaigns, resulting in the passage of the nation's first anticruelty law in New York in 1866, the ASPCA, which took over New York City's animal control contract in 1894, becoming one of the first privately-run animal shelters in the country, became the model for the country's first animal rescue groups, many of whom still use SPCA in their names today.

The 19th century saw the formation of other animal rescue groups, in the United States and England, some of which still exist today. The methods of these groups varied, but all were founded in order to help alleviate the suffering of companion animals, usually cats and dogs. Often focused on picking up stray cats and dogs, providing them with medical care, and attempting to find them homes, many animal rescue groups operated and, in many areas of the world today, still operate in the absence of any formalized, municipally-run animal control agency.

These small, often volunteer-run organizations are often the only source of help for stray, sick, abused, or starving domestic animals.

Today, in most locations in the developed world, animal rescue groups operate alongside city-and county-run shelters. Many groups are species- or breed-specific, rescuing only rabbits, Great Danes, or Chihuahuas, for example. As nontraditional pets become mainstream, and as the public purchases and then discards these animals, rescue groups are popping up to handle every species from turtle to parrot to rat.

Those groups with a relationship with their local shelter are generally contacted by staff at the shelter when an animal meeting the breed or species requirement is brought in, and representatives from that group will then pick the animal up. These groups both aid their local shelters by cutting down on the volume of animals the shelter must deal with, and are often better able to find a suitable adoptive home for animals which, because of their breed, species, or temperament, may be difficult for the shelter to place.

Rescue groups that focus on rescuing and placing nontraditional pets are faced with some unique challenges. Many so-called exotic pets, for example, are in fact wild animals that are not at all domesticated, and should not even be kept as pets, because of the damage that the exotic pet industry does to wild habitats and

Marc Bekoff (editor of this encyclopedia) shares a moment with a rescued dairy cow, Bessie, at the Farm Sanctuary in California. The Farm Sanctuary rescues and cares for animals freed from factory farms, slaughterhouses, and stockyards. (Marc Bekoff)

species, and because of these animals' unique behavioral and physical needs. These groups must attempt to place birds, reptiles and other non-domesticated animals into new homes, while at the same time discouraging people who can't adequately provide for their needs from obtaining these animals in the first place. In addition, animal shelters often have to rely on these rescue groups to take their nontraditional animals because they are so overwhelmed in the first place, are often ill-equipped to deal with the specific needs of exotic animals, and the shelter adoption rates of these animals are consequently much lower than those of cats and dogs.

Some animal rescue groups specialize in rescuing animals, both domestic and wild, from disasters. In the United States, Hurricane Katrina in 2005 demonstrated the need for comprehensive disaster plans that included provisions for animals to be rescued along with people. By the devastating Southern California wildfires in 2007, local and national officials had recognized the necessity of providing for animals, and joined with numerous animal rescue groups to provide for hundreds if not thousands of companion animals during that disaster.

Animal rescue groups are funded primarily by private donations. Those which have charitable status can offer tax benefits to their donors, but many groups are operated by well-meaning individuals who have not taken the steps to incorporate or obtain tax-deductible status. Many groups have newsletters, and most engage in fundraising efforts such as walkathons, merchandise sales, or services such as boarding, veterinary care, or grooming. Groups that are staffed entirely by volunteers and that operate out of a network of foster homes will have lower operating costs than those groups with paid staff and/or a permanent facility such as an animal shelter. These groups must do additional fundraising in order to meet their expenses. Some groups, like the ASPCA in New York, operate their city's animal control contracts, and thus are paid in part by the city. Other groups may run their own private shelters, taking in animals from the public, often for a fee, but not collecting stray animals or responding to cruelty calls. While most animal rescue groups do not euthanize animals except for health reasons, some, in particular those that operate shelters, do.

Many animal rescue groups make use of foster homes that provide permanent sanctuary care to animals that, by virtue of their age, health, or temperament, are deemed unadoptable. Other groups specialize in certain kinds of animals, such as disabled animals or seniors, often keeping them as sanctuary animals, but also often offering them for adoption.

Before the age of the Internet, animal rescue groups were primarily local operations with a network of local volunteers, a relationship with their local shelters, and a list of local supporters to provide funding. In the 1980s in the United States, Project BREED (Breed Rescue Efforts and Education) was founded to provide a resource for animal shelters, the public, and rescue groups. The Project BREED directory, still published today, listed thousands of breed-specific, for dogs, and species-specific rescue groups, as well as specific information on the breed or species, to aid people who are interested in adopting a particular kind of animal.

Today, with the Internet, not only are there numerous websites that provide such information, but rescue groups are

able to operate nationwide, and even worldwide. The House Rabbit Society (HRS), a rabbit rescue organization, is one such group. Originally based in the San Francisco Bay area, the group developed a nationwide mailing list, attracting members and new volunteers from around the country, leading to chapters or volunteers in almost every state. With the Internet, HRS has gone international, with representatives in Europe, Asia, Canada, and Australia.

Most rescue groups today, in fact, use the Internet for public outreach, to advertise their adoptable animals, to fundraise, and to attract supporters. One important website for many groups is Petfinder, which allows those groups without their own websites or the technology to easily update a website to quickly and easily list their adoptable animals for the public to see, along with photos and, now, videos.

Animal rescue groups have, especially compared to breeders and pet stores, strict adoption procedures that typically include an adoption application, an interview, and often a home visit. These requirements are often stricter than those found at animal shelters, and are put in place to ensure that animals end up in a safe, loving, permanent home.

Animal rescue groups can be found around the world today, although developing nations, which often have greater problems with stray animals, tend to have fewer groups with fewer resources.

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Margo DeMello

ROYAL SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS (RSPCA), HISTORY

At the beginning of the 19th century, the English would have been surprised to hear themselves praised for special kindness to animals. City streets were crowded with horses and dogs that served as draft animals and beasts of burden, as well as with herds of cattle and sheep being driven to slaughter. Many of these animals were obviously exhausted or in pain, as were many of the horses and donkeys used for riding. Popular amusements included cockfighting, dog fighting, rat killing, bull running, and the baiting of wild animals. Elsewhere in Europe, England was generally known as the hell of dumb animals, and early 19th-century English humanitarian crusaders sadly agreed with this criticism. By the end of the century, however, officials of such organizations as the Royal Society for the Prevention of Cruelty to Animals routinely claimed that kindness to animals was a native English trait and that, within Europe at least, cruelty was to be associated with foreigners, especially those from southern, Catholic countries.

This shift in opinion reflected real changes. The 19th century saw a series of administrative and legal breakthroughs with regard to the humane treatment of animals, as well as steadily widening public support for animal welfare, and for the laws and societies dedicated to pro-

tecting animals from cruelty and abuse. Although the first animal protection bill to be introduced in Parliament failed miserably in 1800, in 1822 a pioneering piece of legislation was enacted. Known as Martin's Act, after its originator and chief advocate Richard Martin, it aimed to prevent cruel and improper treatment of cattle, which included most farm and draft animals, but not bulls or pets. Later legislation was passed in 1835, 1849, and 1854, and periodically extended protection until all domesticated mammals, as well as some wild mammals in captivity, were covered.

These extensions did not inspire universal rejoicing. For example, the first extension of the provisions of Martin's Act, in 1835, specifically prohibited the keeping of places dedicated to fighting or baiting bulls, bears, badgers, dogs, and cocks, which had become local institutions in many rural communities. Bull baiting or bull running, where people and dogs chased an animal through village streets before cornering and killing him, were particularly cherished traditions of this type and, perhaps for that reason, particularly obnoxious to humanitarian reformers. When, supported by the 1835 act, they attempted to suppress such observances, they often encountered physical as well as moral resistance. For example, the bull running at Stamford, Lincolnshire survived several attempts at suppression. Finally, in 1838, the local magistrates and the RSPCA successfully enforced the ban by calling in twelve London policemen and a troop of dragoons.

When the Society for the Prevention of Cruelty to Animals was founded in 1824, one of its primary goals was to ensure that the provisions of the new legislation actually took effect. The SPCA funded its own special corps of constables, and instructed civilian sympathizers in how to arrest the variety of aggressive wrongdoers who might be encountered in the streets, including livestock drovers and recreational sadists, as well as cabmen and wagoneers. Despite the initial obstacles it faced, the SPCA (RSPCA beginning in 1840, when Queen Victoria granted the Society permission to add the prefix "Royal" to its name) was successful on every front. As legal protections for animals expanded, so did the Society's membership, in both numbers and social prestige. It boasted a series of royal patrons, and the aristocracy was heavily represented on its governing board.

By the 1900s, the RSPCA epitomized respectable philanthropy, the kind of charity routinely remembered in the wills of the prosperous. With such powerful backing, the size of the RSPCA increased from its initial complement of only a few men, to eight officers by 1855, 48 by 1878, and 120 by 1897. In its first year of operation, the society conducted 147 successful prosecutions under Martin's Act. By the end of the century successful prosecutions peaked at over 8,000 per year, before horses, the most frequent victims of prosecuted offenses, were replaced by motor vehicles.

One reason that cab horses and draft horses figured so prominently in RSPCA prosecutions was that there were many them, and they were abused in plain sight on the public streets. But another was that their abusers were apt to belong to the part of human society where the middle and upper-class members of the RSPCA expected to encounter depraved behavior. Indeed, it is likely that some humanitarians viewed the animal protection laws as a useful supplement to existing legal and social mechanisms for controlling unruly humans. When animals suffered

at the hands of the genteel, the RSPCA and kindred organizations found it more difficult to prosecute or often even to acknowledge that a problem existed. For this reason, such sports as steeplechasing, foxhunting and, indeed, hunting of all kinds, were subjects of contention within the mainstream Victorian humane movement. The hardest case of all in these terms was posed by vivisection, an exclusively middle- and upper middle-class pursuit. Although John Colam, then the Secretary of the RSPCA, offered strong testimony against the use of vivisection in teaching when he testified before a Royal Commission on vivisection in 1876, few of his constituents shared his strong views. As a consequence, committed antivivisectionists withdrew from the mainstream humane movement and, for at least several generations, they languished while it prospered.

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Harriet Ritvo

ROYAL SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS (RSPCA) REFORM GROUP

The Royal Society for the Prevention of Cruelty to Animals (RSPCA) is the oldest, largest and most influential animal protection organization in the world, and so its vigor and radicalism or lack of same are of great importance for the whole movement internationally.

Frustrated by the ineffectiveness of the RSPCA in dealing with the modern cruelties of factory farming, animal experimentation, and the increasingly internationalized abuse of wildlife, some members of the RSPCA, led by Brian Seager, John Bryant, and Stanley Cover, formed the RSPCA Reform Group in 1970. They supported the attempt by Vera Sheppard to persuade the RSPCA to oppose foxhunting and other cruel sports, and succeeded in 1972 in securing the election to the RSPCA Council of five Reform Group supporters, including Bryant, Seager, Andrew Linzey, and Richard Ryder. Over the next eight years, until the end of the decade, the Reform Group faction succeeded in changing the world's oldest and largest animal welfare organization beyond recognition. In 1976, Ryder was made Vice Chairman, and was then Chairman of the RSPCA Council from 1977 until 1979. During these years of reform, the Society not only came out against cruel sports but, for the first time, developed comprehensive animal welfare policies across the board, elevating the welfare of farm, laboratory, and wild animals to a priority status equal with the welfare of domestic species. Against stiff opposition, the reformers set up expert staff departments to deal with these

areas of abuse, and revived the Society's campaigning function, which had been allowed to lapse since the Edwardian era. Publicity, parliamentary, and scientific facilities were established, and the Society even gave its support to Douglas, Lord Houghton's successful initiative, the General Election Coordinating Committee for Animal Welfare, to persuade all major British political parties to include officially, for the first time, animal welfare policies in their election platforms in 1979. Before the end of Ryder's first term of office, which was followed by a temporary reversal of the Society's performance initiated by conservatives, an undercover plainclothes section of the RSPCA's Inspectorate was also established and perhaps most important, the Society initiated the establishment and funding of a powerful political lobby for animals in the European Community, subsequently to be named Eurogroup for Animal Welfare.

In 1906, pro-foxhunting members had changed the constitution of the Society's ruling Council so as to bring in rural representatives, thus strengthening their position.

Tensions persist to this day between, on the one hand, the nationally and internationally-minded campaigners and, on the other, the dogs and cats rural conservatives. During the 1990s, some five thousand pro-foxhunting people infiltrated the Society in a vain attempt to prevent the banning of hunting with hounds by the Labour government in 2004. The modernists continued to resist this attempted takeover of the RSPCA and, with the support of the High Court, several hundred members were ejected. Supported by the RSPCA, much new European and British legislation has been passed, culminating in the Animal Welfare Act of 2006, which marked the end of an era.

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Richard D Ryder

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SANCTUARIES

There are thousands of sanctuaries for animals around the world, havens offering protection to individuals rescued from circuses and other forms of entertainment, from medical research laboratories, from factory farming, from the pet trade, and indeed from all situations in which they are shamefully neglected or horribly abused, as well as orphan animals whose mothers have been killed for food, for sport, or for any other reason. There are sanctuaries for animals of all kinds, from hens to elephants, and while some are small enterprises in backyards, others are big operations that require a large staff and considerable funding. Unfortunately, once a refuge has been created it tends to grow, an indication of the number of desperate creatures needing care. Fortunately, there are also a growing number of people around the globe who are not only aware of, but care, sometimes desperately, about animal suffering.

Chimpanzees are classed as an endangered species and it is illegal to hunt and sell them; however, these laws are seldom understood, let alone enforced. I became involved with sanctuaries for orphan chimpanzees in Burundi in l990. This was when The Jane Goodall Institute (JGI) initiated a conservation project there, and people began telling us about the pet chimpanzees in the country, many of them held in appalling conditions. One of these, whom I went to see for myself, was Whiskey. His owner came to greet me and led me through his noisy garage to a cement-floored 6-foot-by-6 foot space that had once been a lavatory. The only light came through a hole in a corner of the corrugated iron roof. A five- or six-year-old male chimpanzee with a collar around his neck was chained to a pipe in the wall. Whiskey held his hand towards us, stretching as far as he could, but his chain was only two foot long and we were out of reach, so he turned and stretched back with one foot. When I went in and crouched down beside him, he put his arms around my neck.

Whiskey's mother had been shot for the illegal live animal trade so that her infant could be stolen and sold as a pet or to attract visitors to a hotel or bar. He had been captured in neighboring Zaire (now the Democratic Republic of the Congo), then smuggled over the border and sold in Bujumbura. At first he had been part of a human family, sitting with them at table, riding in their car, and playing with the children, until he was about four years old, when they realized how strong and potentially dangerous he was. Then he was banished to his prison cell. Eventually we (formerly JGI-Burundi) persuaded his owner to hand him over to what we called The Half Way House. This was a small backyard facility where other ex-pets were waiting until we could

raise the money for a permanent sanctuary. But in 1994, because of the ethnic violence in Burundi, we had to move all of them, 20 by then, to Kenya, where a new sanctuary, Sweetwaters, had been built for them.

That is how it always starts. An individual chimpanzee looks, from his place of fear and confusion and pain, into your eyes, and reaches out to touch you. The very first African sanctuary began when one tiny and badly wounded infant was confiscated from a hunter, who had shot her mother in neighboring Zaire, and taken to a British couple, Dave and Sheila Siddle, who run a cattle ranch in Zambia. They nursed her back to health and were given a permit to keep her. And so, of course, government officials brought them the next confiscated infant. And the next, and the next. And when people realized that, at last, there was a place where young chimpanzees would be properly cared for and loved, youngsters began arriving from other parts of the world. Of course, as the Siddles' chimpanzee family grew, so did their expenses. They had to fence in a large area of their land, and build strong cages for night quarters and where the chimpanzees could be cared for if they were sick or injured. The Chimfunshi Animal Orphanage is now home to more than 100 chimpanzees.

There are now 13 sanctuaries in Africa that care for orphan chimpanzees, including the Tchimpounga Chimpanzee Rehabilitation Center in the Republic of the Congo, which JGI manages. In Zambia, Kenya, and South Africa, where there are no wild chimpanzees, the orphans are considered refugees from neighboring countries. This gives a total of over 600 chimpanzees in sanctuaries. Of course, the number is constantly changing as new orphans arrive and, inevitably, a few die. The best place to check on the African chimpanzee sanctuaries is the Pan African Sanctuary Alliance (PASA), www.pasaprimates.org. There is an additional colony of chimpanzees belonging to the New York Blood Center located in Liberia. Dr Fred Prince is working to move these ex-experimental chimpanzees to a safe sanctuary. It must be mentioned that there are also five sanctuaries that care for orphan gorillas, two in Cameroon, one in Gabon, one in the Republic of the Congo, and one in DRC. These sanctuaries care for over 78 gorillas. Another sanctuary in the DRC cares for over 50 bonobos.

Often I am asked why we do not return our orphans to the wild. The answer is that we would if we could, but it is a very difficult process. First, it is necessary to find an area of suitable chimpanzee habitat where there are few wild chimpanzees, who are territorial and typically kill strangers, especially males, and no people, for our orphans have no fear of humans and would wander into a village and either be hurt or hurt someone. We are actively searching for ideal places for reintroduction in Congo-Brazzaville, for our sanctuary is currently operating over capacity. If we are successful we shall then have to ensure that our youngsters acquire the skills they need to survive in the wild. One sanctuary that has successfully released chimpanzees into the wild is H.E.L.P. in the Republic of Congo-Brazzaville.

Conservationists often accuse us of wasting money by caring for captive individuals rather than spending our precious dollars on trying to save wild chimpanzees and their vanishing habitat; however, I feel we have no choice. After all, ever since I began my research into chimpanzee behavior at Gombe,

I have stressed the importance of individuality. Each chimpanzee has his or her own, unique personality, and each plays an important role in his or her society. This thinking was not fashionable among scientists back in l960, but is widely accepted today. From the beginning I insisted that the chimpanzees had feelings and emotions similar to ours. (After all, I had learned during my childhood that this was true for my dog.) Thus to abandon an orphaned chimpanzee would be, for me, as unethical as abandoning a small human child. However, I know also that it is desperately important to do everything we can to protect the remaining wild chimpanzees and their habitat. And so JGI struggles to achieve both of these goals.

A final and important point is that our orphans serve as ambassadors for the wild chimpanzees. Most people, even if they live near a forest, have little or no opportunity to observe chimpanzees. When visitors from the villages or from a nearby town come to see the sanctuary chimpanzees, they are typically amazed to see how like humans they are. A number of people, after watching the youngsters kissing and embracing, using tools, playing, and so on, have said that they will never purchase, trade, or eat chimpanzees or other apes again, and never go to a restaurant that serves ape meat. We especially encourage children to visit. And we aim to provide research opportunities for students from universities to study chimpanzee behavior.

Another criticism often leveled at those working to save orphan chimpanzees or other animals in Africa is that we have got our priorities wrong. Surely, in view of the poverty and suffering of the people of Africa, we should not be wasting money on animals. We realize only too well the desperate need of hundreds of thousands of Africans, and JGI is working hard to improve the lives of the people living around our sanctuaries. We are modeling these efforts on our highly successful TACARE (Lake Tanganyika Catchment Reforestation and Education) program, which continues to improve the lives of over 150,000 people in 24 villages around the Gombe national park. This program, in addition to facilitating the introduction of tree nurseries, agroforestry, the most suitable environmentally sustainable farming techniques, and conservation education, also provides primary health care through the regional health authority, AIDS education, and family planning. Micro-credit banks enable women to start their own environmentally sustainable projects, thus earning some money for themselves, often for the first time. Gifted girls can apply for scholarships to go from primary to secondary school. Around the world, it has been shown that as women's education and self-esteem improves, family size drops. In Uganda there is also a developing community outreach program. And in the Congo, in the villages adjacent to the Tchimpounga Chimpanzee Rehabilitation Center, a similar program is in its early stages. We have built a health dispensary and a school, introduced our education program Roots & Shoots, and are in the planning stages of many other projects to help people to help themselves. Of course, in and of themselves, our sanctuaries provide ongoing jobs for local people, help to boost the local economy and, when tourism is possible, bring foreign exchange into the country.

Unfortunately, it is not only in Africa that chimpanzees desperately need the help of dedicated people. In the Americas,

Europe and Asia chimpanzees have been mistreated, often shockingly, in zoos, circuses and other forms of entertainment, and in medical research laboratories. Many of these were taken from Africa, snatched from the dead bodies of their mothers as infants. Others were born in captivity. We owe it to these unfortunate individuals to provide them with safe havens where they can live out their lives in relative freedom once they have been rescued.

In the UK, Jim Cronin founded the Monkey World Ape Rescue Centre, which he runs with his wife, Alison. Originally this center was built to provide a home for the infant chimpanzees smuggled into Spain from West Africa and used as photographers' props in tourist resorts. Jim worked with a British couple who lived in Spain, the Templars, and with the police, to stop the illegal trafficking, and also with tourist agencies, persuading them to warn visitors of the cruel practice. Jim has now rescued chimpanzees and other primates from many parts of the world. In America, Wally Swett began taking in abused animals, mostly primates, discarded by the pet and entertainment industries. His Primarily Primates is situated in San Antonio, and now provides sanctuary for several groups of chimpanzees. Patti Regan, at the Center for Orangutan and Chimpanzee Conservation, Vachula, Florida, and April Truit, at the Primate Rescue Center, Inc., Nicholasville, Kentucky, have both built small sanctuaries for ex-pet and ex-entertainment chimpanzees.

A very difficult challenge is to create sanctuaries for chimpanzees who have been used and abused in medical research laboratories. These individuals are typically full grown, and often they have been housed alone for most of their lives, so that it can take years to re-socialize some of them. The very first rescue of a group of ex-lab chimps, released onto a manmade island at Lion Country Safaris in Florida, is described by Linda Koebner in her moving book *From Cage to Freedom.* They are still there.

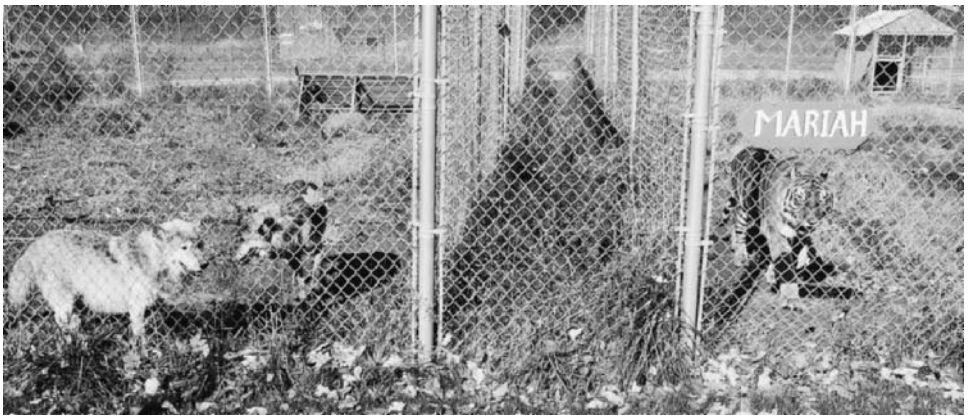
Years later, the Chimpanzee Health Improvement, Maintenance and Protection Act or CHIMP Act, H.R. 3514, sponsored by U.S. Representative James Greenwood, was passed by both House and Senate in 2000, and signifies the U.S. government's commitment to partner with the private sector to provide sanctuaries for chimpanzees retired from medical research. In December 2006, President George W. Bush signed the Chimp Haven is Home Act into law, which prohibits the removal of or research on retired chimpanzees living in federal sanctuaries. Chimp Haven (http://www.chimphaven.org/index.cfm), a nonprofit organization, has received $24 million from the National Institutes of Health (NIH) to build and manage a sanctuary on a 200-acre site of forested land donated by the citizens of Caddo Parish in Louisiana. Chimp Haven must raise funds themselves equal to 10 percent of the government grant.

There are other sanctuaries in North America. Richard Allen and Gloria Grow of the Fauna Foundation have built a sanctuary for 15 chimpanzees near Montreal in Canada. It was the first sanctuary of its kind, built to house chimpanzees infected with AIDS and hepatitis as well as clean individuals. It serves as a precedent, inspiring others to make the same commitment. The next sanctuary for ex-lab chimps was built by Carole Noon in Florida. The first group to be housed there comprised 21 of the so-called Air Force chimpanzees from the Holloman Air Force Base in New Mexico. Some of these are descendents

of the original group that was captured in the wild for the space research that culminated in sending the first astronauts to the moon.

In 2002, Carole Noon took on the biggest chimpanzee rescue in history when the Coulston laboratory in New Mexico was finally closed down after accumulating countless violations of the animal welfare act for years, and the whole facility was bought with an incredibly generous grant from the Arcus Foundation. Dr. Noon's first task was to make immediate improvements to the existing facility. The chimpanzees were sleeping on concrete or metal flooring with no blankets or straw, given only one piece of fruit each per week, and many had no contact with each other even visually. Gradually the Florida facility will be enlarged, and more and more of these chimpanzees will move to the relative freedom of grassy islands with shade and climbing structures, and be cared for by humans who understand and love them.

Wherever a sanctuary is located, the chimpanzees rescued from abuse have so much to teach us. Many have lived alone for years, deprived of everything that a chimpanzee needs to enjoy life. Often they have acquired psychotic behaviors, such as rocking from side to side, banging their heads on the wall, mutilating themselves, showing sudden violent outbursts of rage, or huddling alone in a corner for hours on end. Many can never fully recover psychologically. But it is inspirational to watch how they can gradually manage to lose some of their abnormal behavior, and learn to live in chimpanzee society, and there is much they can teach us. Not so long ago, psychiatrists and psychologists used to raise chimpanzees in conditions designed to replicate the abnormal early experiences of psychologically disturbed humans. It was argued that this would be helpful to scientists seeking to better understand mental illness in people and thus help human patients. Now there are hundreds of chimpanzees who have been exposed



Mariah, a Siberian tiger, right, is penned next to two timberwolves, Apache and Noshoba, at Noah's Lost Ark animal sanctuary in Berlin Center, Ohio. Mariah was raised by an elderly woman who also took care of wolves. When brought to the sanctuary, Mariah began losing weight and was not adjusting well to her new environment. The original owner suggested her enclosure be placed next to the wolf enclosure. She immediately began gaining weight. Ellen Whitehouse, who has run the sanctuary with her husband for the past five years, calls the wolves "the best tiger baby sitters." (AP Photo/Tony Dejak)

to all manner of abnormal conditions. It is important that sanctuaries open their doors to scientific observation of a strictly noninvasive, non-disruptive nature. Surely there are lessons we can learn from the rehabilitation of our closest relatives that will benefit the thousands of humans who, like the chimpanzees, carry deep psychological scarring from past traumatic experiences.

Further Reading

Editor's Note: For general information about animal sanctuaries see:

http://www.pasaprimates.org

The Pan African Sanctuary Alliance, or PASA, is an alliance of sixteen primate sanctuaries from all over Africa. The Web site lists the sanctuaries and provides information on most of them. It also provides an extensive list of resources about animals, endangered species and conservation, sanctuaries, animal behavior, and related topics.

http://www.taosanctuaries.org/sanctuaries/species.htm

The Association of Sanctuaries, TAOS, was founded in 1992 as a not-for-profit organization to assist sanctuaries in providing rescue and care for displaced animals. It accredits superior sanctuaries for wild, farmed, and companion animals. Provides a worldwide list of accredited sanctuaries.

http://www.cwu.edu/~cwuchci/index.html

The Chimpanzee and Human Communication Institute at Central Washington University in Ellensburg, Washington, provides sanctuary to a group of adult chimpanzees who communicate with humans and each other using American Sign Language (ASL).

Jane Goodall

SANCTUARIES, ETHICS OF KEEPING CHIMPANZEES IN

The mandate of sanctuaries is to provide for both the physical and psychological requirements of chimpanzees, a new life in which to heal and recover from previous abuses, and a life rich providing for their complex needs, striving to replace and fulfill a chimpanzee's natural requirements. Sanctuaries consist of a team of committed humans who tend to the chimpanzees; a board of directors, donors, management, care staff, veterinarians, and volunteers, all of whom support a new life for the chimpanzees.

Chimpanzees do not live in sanctuaries by choice. Their native environment and natural daily lives are often in sharp contrast to what sanctuaries can provide. In even greater contrast is the emotional and mental status of chimpanzees in sanctuaries. In addition, previous psychological damage from being subjects of research, animal actors, roadside zoo attractions, or household pets exacerbates these chimps' emotional maladies.

An ever-challenging mission of sanctuaries is to mitigate the damage done to chimpanzees in captivity, while going far beyond to provide an environment in which they can heal and thrive emotionally. Sanctuaries must also provide a physically stimulating and enriching environment to give their charges a healthy life. Captive chimpanzees are completely dependent on our intelligence and compassion.

Chimpanzees are extraordinary and complex, emotional, and sensitive. They are fully aware of themselves as captives. Key to restoring chimpanzees' sense of self and confidence is freedom of choice. Environmental designs and enrichment programs within sanctuaries must provide that freedom of choice through creative and constructive methods to help heal and nurture chimpanzees. Although seemingly simplistic, the value of freedom of choice cannot be overemphasized.

The physical strength and athletic ability of chimpanzees is remarkable. Sanctuaries are responsible for the safety of their charges, as well as that of their human caregivers. Careful planning and sound design of enclosures which prevent harm and escape yet provide for the chimpanzees' physical and emotional needs have proven successful at many model sanctuaries. The use of open chimp islands with mature trees and large climbing structures provides for the basic needs of exercise, fresh air, enrichment, and natural behaviors.

Sanctuaries have the obligation to provide enclosures and enrichment that serve the chimpanzees, with little regard for how this may perceived by humans. In contrast, traditional zoos have a perceived obligation to provide a living photographic image for the pleasure of their admission-paying customers. Zoo exhibits are often designed by architects to appear as if the display is natural and the chimps are content. They are designed to keep chimps in front of the public, even though chimpanzees require solitude and privacy, variety and change. Sanctuaries exist for the chimp's approval, not the public's. With this mandate, sanctuaries can design enclosures and provide enrichment that maximizes choice, stimulation, and interest for their charges.

Some of the more progressive zoos understand the emotional needs of the chimpanzees in their care, designing spacious exhibits and providing a wide variety of enrichment elements on a daily basis. Although a cardboard box would not be found in a chimpanzee's natural habitat, a chimpanzee's natural habitat would not be limited to a large rock and plastic tree, either. Progressive zoos and responsible sanctuaries are able to reconcile the difference between a clean and sterile chimp environment which may be attractive to humans, but deprives intelligent chimpanzees with emotional and physical stimulation. The most content chimps in the best sanctuaries may have the messiest enclosures. Responsible guardianship also mandates the cleanliness of the chimps' environments, achieved through routine daily cleaning and maintenance.

Providing for comfort and natural behaviors is also critical for chimpanzees' wellbeing. Although chimpanzees have coarse hair covering most of their bodies, it is not dense. Some sanctuary individuals may have very thin hair coverage or be completely bald, which may be attributable to age, poor nutrition, or often to emotional disorders resulting in hair-plucking behaviors.

Their native equatorial Africa remains warm throughout the year, as it has throughout their evolution. Therefore strong consideration must be given to chimpanzees' low tolerance and emotional discomfort when chilled or cold. Healthy chimpanzees are muscularly dense, usually with few fat reserves for warmth or protection from the elements. Proper sanctuaries will ensure proper ambient heating, as well as providing further options for warmth and comfort, such as blankets and other nesting materials. Even in the heat of summer, chimps will make a new bed or nest every night in which to sleep. Sanctuaries should provide a variety of materials to encourage this activity, with items such as blankets, sheets, leaves, newspaper, or cardboard, for example.

Progressive sanctuaries exercise sound judgment when providing enrichment for their chimpanzees. There is an inexhaustible list of safe foods, toys, natural browse, and so on which can be used to enhance and stimulate a chimpanzee's

daily life. However, even the most benign objects have the potential to be a hazard. Caretakers are well informed on safe and proper use of enrichment by the chimps, and whether or not an individual's toys must be limited for their own safety.

If new residents in a sanctuary are not familiar with enrichment, there are safe protocols established to introduce enrichment and allow for timely introduction of new items. Chimpanzees cannot live in a bubble, because environmental enrichment may involve accidents. Caretakers' experience and intelligence play an important role in maintaining a margin of safety, just as experience and intelligence play a role in our safety every time we drive a car or allow our children to play at the beach.

Nutrition and food opportunities play a critical role in the health and wellbeing of chimpanzees. Wild chimpanzees forage for food six to eight hours every day. Their natural diet is varied and mostly vegetarian, measuring approximately 60 percent fruit, 30 percent other vegetation, and 10 percent animal matter (Nowak, 1999, p. 183). Food may take on greater importance in a captive chimp's life, in part due to boredom. Nonetheless, captive chimps are exceedingly motivated and excited by food. A sanctuary's responsibility with regard to feeding chimps is important both nutritionally and psychologically. There must be a balance between feeding opportunities and nutrition. It is not unusual for former pets or circus performers to arrive at a sanctuary with poor eating habits and medical sequela, such as diabetes. Some chimps from research studies may arrive with a preference for pre-packaged chow biscuit and reject fresh produce. Optimal physical and emotional health can be attained by providing a varied and well-rounded diet daily. Regardless of convenience and cost, to deny chimpanzees a variety of produce, natural foods, and freedom of choice is unacceptable.

Sanctuaries are responsible for forming social groups of chimpanzees. This responsibility is not for the inexperienced or unintuitive. The desired result is a cohesive and dynamic social group while minimizing the risk of injury or possible death to an individual unprotected and unable to defend himself. Although there are no guarantees of harmony, careful planning and consideration, enclosure design and introduction techniques must be properly administered. It is the sanctuary's responsibility to oversee all aspects upon which the final outcome relies.

The greatest responsibility of a sanctuary is to those individuals in their immediate care for whom the sanctuary has accepted lifetime guardianship. Sanctuaries are often faced with the difficult choice of denying a home to yet another chimp in need. These facilities make an effort to help place the chimp in another sanctuary or at least offer advice to benefit the chimp, but sound sanctuaries know their capacity. Decline in the overall success of a sanctuary can occur when accepting another chimp compromises the care of those to whom the sanctuary is already committed. However, reasonable circumstances may allow for stretching resources on an emergency or temporary basis. But a chronically overpopulated sanctuary ceases to be a refuge and becomes a place that chimps may need to be rescued from.

Philosophically, how humans can and should interact with chimpanzees greatly determines the safety and contentedness of both humans and nonhuman primates. True sanctuaries treat their charges with respect and dignity. For the sentient and

intelligent chimpanzee, a life behind bars is hell. It is the sanctuary's responsibility to make every effort to equalize the power and offer pride and dignity to the powerless. An angry chimpanzee is a very dangerous chimpanzee, to both his human caregivers and the social group. Gaining trust and respect is a two-way street, and how both parties interact, chimps with humans and humans with chimps. is generally indistinguishable. The humans, however, must take the initiative and have inexhaustible patience and compassion.

Daily, sanctuary staff plays a critical role in the emotional recovery and stability of the chimpanzees in their care. Staff's arrival should be met with excited pant-hoots in anticipation of food and the arrival of a trusted friend with whom the chimps have a bond. Once a friendship is developed, it is sacred, and is held in the highest regard. A chimp will not befriend anyone just for food, which alone indicates a more complex and sophisticated emotional capacity. Befriending a chimpanzee is a significant accomplishment. There are many chimps who may forever refuse the friendship of a human, and in their rebuffs they will attempt to physically injure or assault the very caregiver whose patience and olive branch remain proffered. The role of the caregiver often means ever remaining an honorable and true friend even to the most jaded of chimpanzees, because often it is these individuals who've suffered most at the hands of other humans.

In 2007, the National Center for Research Resources of the National Institutes of Health permanently adopted a temporary 1995moratorium on breeding chimpanzees. Although this was met with criticism from many in the biomedical research community, it was applauded by animal welfare and animal rights advocates as an ethically and morally sound decision. The greatest number of captive chimpanzees in the United States live in research institutes. Lesser numbers are those from the entertainment industry and zoos, or pets. The current and future need for sanctuaries is far greater than the number of sanctuary homes available. For this reason and the obvious wrongness of breeding into captivity, sanctuaries do not breed chimpanzees. Failed contraception may result in a birth, which realistically enhances and stimulates chimpanzee group dynamics, but at the expense of yet another chimp living an incarcerated life.

Regarding euthanasia, the Chimpanzee Health Improvement, Maintenance, and Protection (CHIMP) Act signed by President Clinton in 2000 states that "The CHIMP Act prohibits routine euthanasia. No chimpanzee can be killed simply because they are no longer of "use," the facility is overpopulated, or they are too costly to maintain. Euthanasia as a humane option during an intractable illness is permitted."

This is a significant moral and ethical advancement in a country where millions of dogs and cats are euthanized annually due to overpopulation. There is hope for a county's moral conduct when the responsibility to preserve lives transcends speciesism to include great apes.

Most animal rights advocates believe that regardless of how a chimp comes to a sanctuary, whether it is research, entertainment, a roadside zoo or the pet trade, fundamentally humans have failed. Chimpanzees should not be kept captive for the use of humans. It is impossible to provide an environment that exactly mimics their natural habitat. The goal for sanctuaries is that they eventually

become unnecessary, to serve chimpanzees in need until there is no more need.

Reintroductions of chimpanzees in Africa to their native habitat have been marginally successful. However, sheer logistics all but eliminates this as an option for non-African chimpanzees. The ultimate goal is for chimpanzees to thrive in the wild, and although the era has passed where no human intervention is necessary to protect wild populations, most animal advocates believe that strict effective protection and respect for chimpanzees, other primates, and all natural wildlife must become realized if they are not to perish before our very eyes.

Sanctuaries are the self-appointed guardians of some of the most complex and remarkable beings with whom we share this earth. Chimpanzees' exquisite evolutionary achievement and their human-like familiarity account for both their intrigue and the cause of their demise. Humans reign supreme over this world, and many believe that with that dominion comes not the privilege to exploit and discard at will, but rather the responsibility to protect and preserve. The restorative power and potential of sanctuaries have been proven and must continue to advance, but ultimately to preserve chimpanzees in their wild habitat is essential.

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Lee Theisen-Watt and Chance French

SCHOLARSHIP AND ADVOCACY

Traditionally, a strong distinction has been drawn between scholarship and advocacy. The scholar's job, it was held, was limited to providing an understanding of a problem or issue, independent of any advocated position on it. In the positivist philosophy of science supporting that distinction, understanding can be independent or neutral, and can provide credible information of use to advocates on all sides of the issue.

This contrasts with the legal system, in which a lawyer explicitly advocates for a particular party, namely the client. The lawyer's brief is a presentation of facts and their application to relevant case law on one side of the issue, that is, either the innocence or guilt of a defendant. Historically, the term advocate was used in a legal context and the word derives from the Latin *ad* (for or toward) and *vocare* (to call), and later from the French *l'avocat* which means legal counsel or lawyer. In contemporary use it is broadened beyond the legal context to refer to taking up the cause of another. In a free society, any individual can advocate for any cause.

Scholarship is a researcher's day job, and he or she can advocate for any issue in her free time. However, in practice, when a scholar acts or speaks as a private citizen, the public interprets the pronouncement as being that of a scholar, an expert who works in a space outside of the fray of callings, causes, and partisanship. Scientists as individual citizens have been powerful after-hour advocates both outside of and within their primary areas of scholarship. Noam Chomsky, the seminal thinker on modern linguis-

tics, for example, was a major advocate for the Left; after inventing the atomic bomb, Albert Einstein was a strong advocate against its use.

The more difficult question is the role of advocacy within the actual enterprise of scholarship. Contemporary philosophers and sociologists of science challenge the received view that it is possible for a scholar to take no position on the material he or she investigates. One major idea in this challenge is field theory. Both the object of investigation and its investigator are embedded in the same field or system. With regard to the object of investigation, the strategy of breaking it down into small bits, isolating them, and controlling for all other variables is thrown into question. If the targets of study, particularly involving social or cultural topics, are inherently embedded in a field or system, investigations must include, rather than control for, those contexts.

Far from being independent or outside of the scholarly enterprise, the investigator is embedded within that field, and so necessarily has a position (attitudes, values, biases) on it. Although presented as facts or findings, scientific findings are actually social constructs, products of political, social, economic, and even personal forces. Although science can take as its regulating ideal the goal of understanding, independent of these forces and treating them as contaminants, in practice science is messier. Independence of view, the view from nowhere, is a fiction. For example, although scientists strive to maintain the same external, objective non-relationship to animate objects as they do to inanimate objects of study, they do form a relationship even with the likes of mice and rats, as described in Davis and Balfour's *The Inevitable Bond: Examining scientist-animal interactions.* A bond or relationship implies an evaluative view of the another being, including recognition of his or her interests and the pull to advocate for those interests.

Although a possible and even admirable ideal, there is no value-free inquiry. Scholarship occurs in an enterprise that is value-laden. Scholars bring their values to it, those values are changed through the research, and the results of the research influence society's values and practices.

Is an enterprise that is value-laden in these ways distinguishable from advocacy? Are scholars necessarily advocates?

To look more closely at the advocacy side of the question, it's necessary to distinguish advocacy from activism. Activism is one form of advocacy, emphasizing vigorous action for a cause—protests, strikes, sabotage, boycotts, and sit-ins. But advocacy has a quieter, more slow-burning side as well. Much of the work of contemporary animal protection organizations involves exposing the public to animal abuse and exploitation through an array of printed and other media—leafleting in the mall or showing a video on a truck jerry-rigged for that purpose.

This quiet activism makes no claim to scholarship, as typically no new knowledge or understanding is developed. But is it even education? Although an exposé may be factual and the information it provides is often new to the targeted audience, it presents only one side of an issue and explicitly advocates for that side. Although we loosely refer to it as educational, it is closer to propaganda, in that it propagates or promotes a particular view or practice.

From advocacy as activism and advocacy as exposé, consider classroom education. A teacher may or may not be a researcher, but the curriculum he or she presents relies more on research findings

than on material developed by advocates. So is it proper for a teacher to be an advocate in the classroom or, the other extreme, is a teacher necessarily, even unwittingly, an advocate? Is she required to and can she, actually and metaphorically, take off her Obama button before entering the classroom? The earlier argument regarding scholarship applies roughly to pedagogy. Ideally, a teacher presents all sides of an issue or, better still, fosters critical thinking applicable to understanding any issue. But, in practice, teaching, like scholarship, is value-laden. Choice of curriculum, questions raised, even style of teaching all occur within a context of personal and professional assumptions and values that have leanings, that are evaluative and that, at least implicitly, are advocatory.

In response to the recognition that both pedagogy and scholarship are advocatory platforms, many critics have suggested that the scholar, the main concern here, present her position on issues raised by the research. An investigator of the history of meat-eating would, in effect, indicate what she typically has for dinner and why. The investigator explicitly presents her perspective and reflects on the way in which that perspective informed the investigation. The effort to be transparent by indicating how the issue under study is informed by the author's values inoculates the reader against this personal bias. Whether subtracting that perspective or, better, critically adding it to others, the reader can take it into account.

The recognition that all scholars are advocates even while on the job legitimizes wearing those two hats, scholar and advocate. This enriches both the academy and the animal protection movement as it fosters reciprocity between the two. Animal protection organizations currently employ scholars from many fields as part of their own research and policy development efforts. Other scholars, remaining in universities, can be recognized as advocates without losing their credibility as independent investigators of the issues for which they advocate.

This is particularly the case for fields that investigate issues that are necessarily evaluative. For examples, a philosopher of ethics develops a theory that nonhuman animals should be taken into consideration when we evaluate whether an act is good or bad. The thesis itself is necessarily advocatory, and therefore no heads turn when that philosopher joins forces with those who work to implement it in treatment of animals. A second example, that of a political scientist studying social justice movements, uses the animal protection movement as an example. It is difficult for this investigator to not be influenced by her views on animals and the movement in their behalf, whether negatively or positively. Again, no criticism of the scholar would follow if she ended the study with recommendations intended either to assist or constrain that movement.

Another example is research that establishes that individuals of a particular species have sophisticated intellectual and social capabilities. An investigator in the natural sciences is more likely to maintain the traditional posture of neutral or independent observation, contemporary challenges to that claim notwithstanding. However, a number of such investigators eventually become advocates. Some do so because they feel the need to compensate animals for using them purely as objects of study, particularly when that study involved deprivation or harm to those animals. Arguably, a scholar whose use of animals had a cost to them is obligated to become an advocate for their benefit.

In some instances, this advocacy is part of a collective action within the particular field of scholarship. Psychologists, ethologists, and veterinarians have established advocacy organizations to advance the interests of animals used as objects of study within their respective fields.

In addition, scholars have developed a multi-disciplinary field devoted to the study of human-animal relationships. In fact, scholars within this burgeoning field of Human-Animal Studies (also known as Animal Studies and Anthrozoology) debate the issue of the relation between scholarship and advocacy. Many HAS scholars are after-hours advocates, having self-selected the field to integrate their professional and personal lives. Their research and teaching varies from unabashed advocacy to the declaration of bias, as discussed earlier, to overcorrection to avoid even the appearance of bias. It appears that the overcorrection approach, motivated by the need for this new field to gain credibility, is giving way in the second generation of HAS scholars to the declaration of bias approach.

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Kenneth J. Shapiro

SENTIENCE AND ANIMAL PROTECTION

Why is it important for humans to understand the nature of sentience in the animals under our protection? Put simply, a sentient animal has feelings that matter. Sensation is interpreted as emotion; the strength of emotion determines the strength of the motivation to seek satisfaction and avoid suffering. Moreover, the emotional reactions of a sentient animal are governed by experience. If it learns that it can cope with the challenges of life, then it can achieve a state of wellbeing. If it learns that it cannot cope, then it will suffer. The human duty of care to sentient animals is, at the least, to protect them from suffering. Ideally our aim should be to give them a life worth living.

Animal Protection: Our Responsibility

Sentient animals deserve more than our protection; they deserve our respect. This moral principle derives from the recognition that the animals humans use for their own purposes on the farm, in the laboratory, or in the home are able to experience emotions ranging from comfort and pleasure to pain and suffering. Our aim should be to keep them fit and happy: to create within reasonable limits a physical and social environment wherein they can achieve a sense of wellbeing, defined in terms of both their physical and emotional state. This applies whatever our intentions for the animal may be: to love it, eat it, to use it in scientific procedures to find a cure for cancer, or to establish the safety of a detergent.

Within the European Union, farm animals have, since the signing of the Treaty of Amsterdam in 1997, been reclassified not as commodities but as sentient creatures, and this has generated new legislation that takes their sentience and capacity to suffer into consideration. In the UK, the Animals (Scientific Procedures) Act of 1986 creates an obligation to

minimize cruelty to laboratory animals resulting from pain, suffering, distress or lasting harm. On the other hand, at the time of writing (2008), federal anti-cruelty laws do not yet apply to farm animals kept for commercial purposes, although a proposed Farm Animals Anti Cruelty Act is under consideration.

Those with a direct responsibility for animal care need skills that can only be acquired through education, understanding, and experience. They include, of course, the promotion of animals' physical welfare through the provision of appropriate food, shelter, and protection from disease. They must also recognize that the welfare of a sentient animal is also determined by how it feels as it seeks to achieve a sense of wellbeing, that is, meet its physiological and behavioral needs, when faced by the challenges of life. To this end, we need to explore the nature of sentience itself.

Sentience

Most dictionary definitions of sentience resort to apparent synonyms such as "feeling and sensation, consciousness and awareness" that have little biological meaning. "Sensation" is too broad, since all animals from the simple amoeba are responsive to stimuli. "Conscious" and "aware" are terms used by most biologists only in the context of human perception. To understand animal sentience we need to explore, without preconceptions, the nature of stimulus and response. To give two examples, simple orders of vertebrates such as reptiles and fish respond to, and seek to avoid, stimuli likely to cause harm, but do they suffer? Many dogs display extreme distress when separated from their owners. Indeed, most vets will treat more dogs for separation anxiety than for all the varieties of infectious disease. We may conclude that dogs suffer from separation anxiety, but that may be just because we think we understand dogs better than fish.

Animal sentience implies much more than simple response to sensation. A frog with its head removed but spinal cord intact will respond to a nociceptive stimulus to its foot (a pinch) by withdrawing its leg. Nociceptive is a term used by physiologists to describe reflex or conscious evidence of response to a painful stimulus, but not its complex consequences for a sentient animal. A sentient, conscious rat will respond similarly to a nociceptive stimulus (an electric shock) from the floor of its cage. If these shocks are repeated, the rat will learn to associate them not only with the physical sensation of pain but also an emotional sense of distress. This physical and emotional impact will motivate the rat to seek ways to avoid receiving further shocks. If it discovers a way to escape the source of the shock, it will learn that it can cope and feel better. If it is helpless to avoid repetition of the stimulus, it may develop extreme anxiety or learned helplessness, that is, it will feel progressively worse.

Animal sentience therefore involves not just feelings but feelings that matter. The behavior of animals is motivated by the emotional need to seek satisfaction and avoid suffering (Fraser and Duncan, 1998). Marian Dawkins (1980, 1990) has pioneered the study of motivation in animals by seeking to measure their strength of motivation, that is, how hard they will work to obtain a resource or stimulus that makes them feel good or avoid one that makes them feel bad. Many of these emotions are associated with primitive sensations such as hunger, pain, and anxiety. Some species may also experience higher feelings such

as friendship and grief at the loss of a relative, and this may expand the range of their sentience. However, we humans should not underestimate the emotional distress caused by hunger, pain, and anxiety. These emotions may be primitive, but that does not make them any less intense.

Sentient animals perceive their environment and this motivates their behavior. Control centers in the central nervous system constantly process information from the external and internal environment. Most of this information, for example our perception of how we stand and move in space, is processed at a subconscious level. However, any stimulus that calls for a conscious decision as to action must involve some degree of interpretation. Scientists define these stimuli as positive, aversive, or neutral. In effect, when presented with the stimulus, the animal will ask itself "do I feel good, bad or indifferent?" This is an emotional, that is, sentient, response. The sentient animal, within which category we must include *Homo sapiens,* may also interpret the incoming information in a cognitive fashion, that is, apply reason. However they, and we, are usually and most powerfully motivated by how we feel.

To illustrate this point, consider the primitive sensation of hunger. Central nervous system centers responsible for control of appetite and satiety receive a variety of internal and external stimuli, for example, low blood glucose, the sight or smell of food, or a conditioning stimulus such as the bell that preceded the meal for Pavlov's dogs. This information is categorized and integrated in the form of an emotion. If the animal feels hungry, it will be motivated to seek food. If a good meal arrives, it will feel pleasure. If no food is available, it will feel bad.

This psychological model of mind makes a clear distinction between the reception, categorization, and interpretation of incoming stimuli. Moreover, it is consistent with new research in neurobiology. Keith Kendrick (1998), for example, has made recordings from single neurons within the brains of sheep presented with external stimuli, or photographic images of external stimuli. A wide range of images, for example, sacks of grain, bales of hay, trigger signals in a family of neurons that convey the generic information "food." A second set of stimuli or images, for example, dogs and men, forms another category of information that we may call "predator." These categories of information then proceed to a second control center for emotional interpretation. "Food" alone is interpreted as a positive emotion: good. "Predator" becomes a negative emotion: bad. However, when the sheep is presented with a picture of a human carrying a sack of food, two categories of information, food and predator, are evaluated together and interpreted as a single, unconfused emotional message, namely good. The animal's decision as to how or indeed whether to respond is therefore determined by how it feels at the time, good or bad. Moreover, this is not a simple yes/no decision. The intensity of its feelings will vary. It will, for example, feel more or less hungry, more or less afraid, and this will determine the strength of its motivation to respond in a positive or negative fashion.

The traditional stimulus/response concept of animal psychology proposed by Pavlov and Skinner held that the behavior of most nonhuman animals involved no more than simple reactions to stimuli that directly or indirectly predict a reward or punishment, for example, a bell that presages the arrival of food or an electric shock. This hypothesis can

accommodate sentience, just, but precludes cognition. Moreover, it struggles with the concept of strength of motivation, that is, the emotional measure of how much feelings matter. There is now abundant evidence that mammals and birds can employ cognition to interpret incoming sensation in a reasoned fashion. One of the first and best proofs of animal cognition was the classic experiment of Edward Tolman (1948). He introduced rats to mazes with two exits. In one group, a food reward was provided at one exit only. After an average of 12 trials, almost all rats unerringly took the route to the exit where food was provided. In the other group, no reward was offered, in the first instance, at either exit. Unsurprisingly the rats showed no consistent preference as to route. However, when these rats were subsequently offered food at one exit only, they learned the correct route after only three to four trials. During the first stage of the trial they had, in the absence of any reward, been acquiring an education: gathering spatial information for interpretation and use at such time as they might need it.

The study of animal cognition is a necessary guide to our understanding of and respect for animals under our protection (see Shettleworth, 1998). However, we should not infer that the capacity of an animal to suffer is proportional to the extent of its cognitive ability, still less to its apparent similarity to humans. Pain, for example, is a physical and emotional phenomenon. Cognitive interpretation of the sensation of pain can make things either better or worse. The emotional response of a woman to severe abdominal pain will differ according to whether the pain arises from normal childbirth or stomach cancer.

The first big message to be taken from the story so far is that animal sentience involves feelings that matter. The second message is that sentient animals do not just live in the present. Table 3 first describes the sequence of events involved in perception, categorization, and interpretation of incoming sensation and how this motivates a sentient animal to respond. It then lists what happens next. Having evaluated incoming sensation in emotional, and possibly cognitive fashion, the animal makes a measured response designed to make it feel better. Having acted, the animal then assesses, emotionally and possibly cognitively, the effectiveness of its response. If it judges that its response has been effective, then it is likely to feel better when a similar event occurs in the future. It has learned to cope. If it judges that its response was ineffective, or if it was prevented by environmental or other constraints from behaving in a way designed to improve how it feels, then it is likely to feel worse.

Stress and Suffering

The importance of sentience to evolutionary fitness was recognized by Charles Darwin. The fact that the emotional response of an animal to stimuli is governed by its past experience carries obvious survival advantages in a challenging environment, whether the challenges be wild or domestic. To illustrate this point, consider the difference between fear and anxiety. Fear is an adaptive emotional response to a perceived threat, which motivates action designed to deal with that threat. It is also an educational experience, since the memory of previous threats, actions taken in response to those threats, and the consequences thereof will obviously affect how the animal feels the next time it

Table 3 A sentient perception of stimulus and response: Sequence of events

1. Perception of incoming stimuli as categories of information
2. Interpretation of information categories positive and negative emotions stored information
3. Motivation or aversion: (the measure of behavioral need)
4. Measured response from repertoire of available behaviors
5. Emotional (and possibly cognitive) assessment of effectiveness of action
6. Modification of mood and understanding in light of experience

encounters such a threat. If it learns it can cope, then it will acquire confidence, if it discovers it cannot cope, then the adaptive sensation of fear can proceed to a non-adaptive state of suffering from chronic anxiety or learned helplessness.

Thus, stress and suffering are not the same. Animals are equipped to respond and adapt to challenge in circumstances that permit them to make an effective response. If so, then they learn that they can cope. An animal is likely to suffer when it fails to cope or has extreme difficulty in coping with stress:

- Because the stress itself is too severe, too complex or too prolonged
- Because the animal is prevented from taking the constructive action necessary to relieve the stress

Care of the Sentient Animal

Animals under human protection deserve a fair deal, a sense of wellbeing in life and a humane death. This does not mean that their lives should be entirely free of stress. Our responsibility is to protect them from suffering. Suffering can certainly result from failure to cope with primitive stresses such as hunger and thirst, heat and cold, pain, fear, and exhaustion. It may also involve higher emotions such as frustration and boredom, loneliness and depression. However, sentience implies the capacity not just for suffering but also for pleasure. Our duty to sentient animals should therefore include the possibility of promoting elements of positive welfare within the reasonable constraints of, for example, viable livestock farming. At the very least, our aim should be to give them a life worth living.

See also Whales and Dolphins, Sentience and Suffering in.

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John Webster

SENTIENTISM

Sentientism, a term coined by Andrew Linzey in 1980, denotes an attitude that arbitrarily favors sentient beings over the nonsentient. The term is historically parallel to that of speciesism, coined by Richard

Ryder in 1970. Although Linzey was one of the early advocates of sentiency as the basis of rights, he subsequently warned against claiming too much for any one form of classification as the basis of moral standing or rights. Raymond Frey specifically argues that sentiency as the basis of rights "condemns the whole of nonsentient creation, including the lower animals, at best to a much inferior status or . . . at worst possibly to a status completely beyond the moral pale." The issue is how to recognize the value and moral relevance of sentiency as a criterion, while avoiding falling into the error of previous generations who have isolated one characteristic or ability—for example, reason, language, culture, or friendship—and used it as a barrier to wider moral sensibility. There is a need to be aware that, as our own moral sensibilities develop and our scientific understanding increases, all moral categories and distinctions are themselves liable to change.

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Andrew Linzey

SHELTERS, NO-KILL

The animal rights movement has been steadily gaining converts in the United States, and its scope and influence continue to grow. To those who work for animal rights, while there is still a long way to go to persuade the majority of consumers to make more ethical decisions in their daily lives around what they eat, wear, and purchase, there is no question that the acceptance of animal rights is greater now than at any time in our history. It is hardly surprising then that the issue is taking center stage in the area of companion animals, animals with which millions of people have a deep, personal relationship.

Unlike animals on factory farms, in research laboratories, or in circuses, dogs, cats, and other domestic companion animals enjoy very high esteem in the psyche of the public. In the United States, for example, Americans share their homes with ninety million cats and seventy-five million dogs. Every year they spend more than forty billion dollars on their care, and they donate hundreds of millions of dollars more to charities that promise to help companion animals, with the largest of these having an annual budget in excess of one hundred million dollars (Winograd, 2007). However, the agencies that the public expects to protect animals are instead killing millions yearly.

Today, shelter killing of companion animals remains the leading cause of death for healthy dogs and cats in the United States; between four and five million are killed in our nation's shelters every year (Merritt, 2007; Winograd, 2007). These numbers are staggering. Increasingly, however, animal advocates are working to oppose this life ending. The growing No-Kill movement in the United States is not only calling into question the shelter killing of animals, but is moving to end the practice altogether.

In the Beginning

The modern humane movement began in earnest in the United States with the 1866 founding of the nation's first humane society in New York City. Today we know it as the American Society for the Prevention of Cruelty to Animals.

While the ASPCA focused much of its effort on trying to protect working horses, abolishing vivisection, and outlawing hunting and other conduct it viewed as exploitive, it labored equally hard to protect the city's stray dogs, particularly against the cruel practices of city dogcatchers. As in most American cities of the 19th century, dogs were kept in rough sheds, with no food or water for several days, until they were killed by drowning, beating, or shooting.

The ASPCA worked to outlaw and reform these conditions, succeeding in forcing city dogcatchers to provide food and water, advocating that strays be treated kindly, replacing existing methods of killing with more humane ones, and forcing the city to build a more modern dog pound. Its efforts were highly successful and influential.

In a very short period of time, Canada and twenty-five states and territories across North America had used the ASPCA as a model for their own independent humane societies and SPCAs, and the numbers continued to grow. By the end of the first decade of the 20th century, virtually every major city in the United States had an SPCA or humane society (Winograd, 2007).

Unintended Consequences

While most of these agencies initially focused on oversight of dog pounds, advocacy to increase the status of animals, direct action to assist animals in need, and cruelty prosecutions, most ultimately moved toward direct administration of animal shelters. The guaranteed source of income provided by municipal contracts helped sway many of them to abandon their traditional platforms around horses in favor of administering dog control for cities and counties. In many American cities, pound work was placed in the hands of the SPCA. Within a decade or two, most mainstream humane societies and SPCAs did little more than kill dogs and cats. In 1910, for example, the Animal Rescue League of Boston adopted the following policy, more or less identical in practice to most shelters of the time:

> We keep all dogs we receive, unless very sick or vicious, five days; then those unclaimed are humanely put to death except a limited number of desirable ones for which we can find good homes. We keep from twenty to thirty of the best of the cats and kittens to place in homes and the rest are put to death. . . We do not keep a large number of animals alive. (Winograd, 2007)

From the ASPCA in New York City to humane societies throughout California, the 20th century saw a national shift away from a tenacious focus on saving lives to pound work that resulted in high rates of killing. A critic of this shift summarized it as follows:

> Historically, SPCAs made the tragic mistake of moving from compassionate oversight of animal control agencies to operating the majority of kill shelters. The consequences in terms of resource allocation

> and sacrificing a coherent moral foundation have been devastating. (Duvin, 1989)

Today, key changes in society's attitudes towards animals, as well as other technical and demographic changes, have increased the criticism of current sheltering practices, called them into question and, most important, provided a solution to the problem.

Demographics for Change

In the United States, people hold the humane treatment of dogs and cats as a personal value, reflected in laws, the proliferation of organizations founded for their protection, increased per capita spending on animal care, and great advancements in veterinary medicine.

In addition to the integration of companion animals in people's lives, three other key changes in our relationship with dogs, cats, and other companion animals since World War II have become evident. The first is technical. Veterinarians have gained the ability to perform widespread and high volume sterilization of animals easily, safely, and at relatively low cost. By partnering with veterinarians, shelters are able to dramatically reduce births and thus the number of animals surrendered, and subsequently killed, in shelters.

The second change is economic. The growth of the middle class after World War II meant a spread of America's wealth across a wider range of people. This wealth, combined with an unfolding humane ethic, meant donations and bequests to animal welfare organizations increased on a scale previously unimaginable. The wealth made available to these agencies, combined with a prospering economy, resulted in shelters with very significant annual budgets. By the 1980s, top organizations had assets ranging from forty million to one hundred million dollars, a net worth which continues to grow. Today, giving to animal-related charities is the fastest growing segment in American philanthropy (Duvin, 1989).

The third and perhaps most important change is suburbanization. People moved from farms into cities, and eventually out of cities into suburbs. These households had yards, nearby parks, and open space. Since animals were no longer seen as needed for farm-related work, suburban households became homes for animal companions, and often homes for multiple animals. Americans began to view animals, particularly dogs and cats, very differently and opened their hearts and homes as never before, vastly increasing the number of homes available for animal companions.

These moral, technical, economic, and demographic changes offer the ability to end the era of mass killing in American shelters. And that is exactly what one city, under the leadership of its local SPCA, sought to accomplish.

San Francisco Achieves Success

In 1994, San Francisco became the first community in the nation to end the killing of healthy dogs and cats in its animal shelter system (Clifton, 1995). By the turn of the millennium, roughly eight out of ten dogs and cats in city shelters were being released alive, either back to their caretakers or to new homes. At a time when shelters were killing the majority of animals entering their facilities, this citywide achievement was over twice that of any other major urban area and approximately three times the national average (Clifton, 1995).

The success of San Francisco involved a paradigm shift from a reactive and traditional public health orientation to a proactive and community-based adoption and rescue agency. This involved putting in place programs and services that had a measurable lifesaving impact, rather than basing shelter responses and operations on tradition or longstanding practices.

The mandatory programs and services, collectively called the No-Kill Equation, developed in San Francisco include the following, which must be implemented rigorously enough so that they replace killing in their entirety:

- a feral cat trap-neuter-release program
- high-volume, low- and no-cost spay/neuter
- working with rescue groups
- foster care
- comprehensive adoption programs including evening and weekend hours and offsite adoption venues
- animal retention efforts
- medical and behavior socialization, prevention and rehabilitation programs
- proactive stray redemption efforts
- public relations/community involvement, and
- volunteerism

The model has since been used with great success by other communities, many of which have even surpassed San Francisco's rate of lifesaving.

The Current State of Sheltering

Unfortunately, this success has not been met with universal celebration but, in many cases, by an entrenched defeatism. Traditional shelter proponents blame pet overpopulation caused by public irresponsibility for the continued killing in many shelters, and suggest that the success of San Francisco had more to do with the particular demographics of a city described as progressive, educated, and affluent, than with program implementation.

Without denying public irresponsibility, four important factors weigh heavily against this interpretation as the cause of shelter killing. First, over the past five years, by embracing not only the no-kill philosophy but the programs and services which make it possible, several animal control shelters in communities across the United States have achieved unprecedented lifesaving success, saving in excess of 90 percent of all impounded animals. Not only are death rates plummeting and adoptions increasing in these communities, but these results have been achieved in a very short period of time, virtually overnight, underscoring that saving lives is less a function of any perceived pet overpopulation and more a function of a shelter's leadership and practices.

Second, current estimates from a wide range of groups indicate that between four million and five million dogs and cats are killed in shelters every year (Clifton, 2007). Of these, given data on the prevalence of aggression in dogs in society based on dog bite extrapolation (Bradley, 2005), and rates of lifesaving at the best-performing shelters in the country from diverse regions and demographics, about 90 percent of all shelter animals are salvageable (No Kill Advocacy Center, 2008). The remainder are either hopelessly ill or injured, or vicious dogs whose prognosis for rehabilitation is poor or grave. That

would put the number of salvageable dogs and cats at roughly 3.6 million on the low end and 4.5 million on the high end of the spectrum.

But even at the high end this means that, nationally, shelters only need to increase their adoption market by 2–3 percent in order to eliminate all population control killing. Today, there are about 165 million dogs and cats in homes. Of those, about 20 percent come from shelters. Three percent of 165 million is 4.9 million, more than all the salvageable animals being killed in shelters (Keith, 2007). This is a combination of what statisticians call stock and flow. In layman's terms, some of the market will be replacement life, that is, a companion animal dies or runs away and the owner wants another one, some will be expanding markets, that is, someone doesn't have an animal companion but wants one, or they have one but want another. But it all comes down to increasing market share, that is, where they get their companion animals from.

No-kill advocates believe that these same demographics show that every year about twice as many people are looking to bring a new dog into their home as the total number of dogs entering shelters, and every year more people are looking to bring a new cat into their home than the total number of cats entering shelters (Winograd, 2007; Merritt, 2007). Moreover, not all animals entering shelters need adoption; some will be lost strays that will be reclaimed. Some cats are feral or wild and need sterilization and return to their habitats. Vicious dogs, and animals that are irremediably suffering or hopelessly ill/injured will not be eligible for adoption. From the perspective of achievability, no-kill advocates point out, the prognosis is very good.

Third, many downplayed the significance of San Francisco's accomplishment for other communities by arguing that such a result could only be achieved in an urban community, not a rural one, because of poverty and antiquated views of animals. When No-Kill was achieved in the rural Tompkins County, New York animal control shelter, it was argued by some that it could not be done in the South. When it was achieved at an animal control shelter in Charlottesville, Virginia, these same groups claimed it could not be similarly achieved in developing communities that are seeing tremendous population growth and urban sprawl, because the influx of new people and animals would overwhelm the infrastructure of animal control, forcing shelters to kill. The 90 percent rates of lifesaving in the communities in and around Reno, Nevada, a more than 50 percent drop in killing and doubling of the adoption rate in less than one year, despite rapid population growth and approximately 16,000 dogs and cats entering the system annually, disproves that, too (Brown, 2008).

These and other cities have either achieved No-Kill, are close to doing so, or have begun moving aggressively in that direction by implementing the programs and services of the No-Kill Equation. Building the capacity to save lives after years of failing to do so may take time, but that does not obviate the fact that shelter killing is a result of shelter practices and not pet overpopulation. Furthermore, no-kill shelter advocates say, the argument that success in less affluent, more rural, or Southern areas is precluded by some peculiarity of lack of caring is not only wrong, elitist, and mean-spirited; it is simply another example of making excuses. It ignores the success in rural Tompkins County. It ignores the tremendous suc-

cess in Charlottesville, Virginia. It goes against a study by a South Mississippi humane society that found 69 percent of people with unsterilized dogs or cats would get them spayed/neutered if it was free, a fact which is not surprising for a state with some of the lowest per capita income levels in the United States (Winograd, 2007).

Fourth, no-kill shelter advocates note that these arguments mimic the claims in other areas of animal rights that reject practical or utilitarian considerations over ethical or rights-oriented ones. Just as the animal rights movement rejects other ideas that violate the rights of animals even in the face of some human benefit or other practical consideration, it too should reject the idea that killing them is acceptable because of the claim, even if one were to accept it as fact, that there are too many for the arguably too few homes which are available.

What the Future Holds

Since No-Kill is a nascent movement, it is still undergoing a turbulent period prior to acceptance and sustainability. It is also highly dependent on the actions and success of committed individual leaders. For No-Kill to succeed in the long term, advocates believe that shelters must build a culture of accountability and lifesaving that allows agencies to continue on their path to No-Kill even when their visionary leaders move on to other pursuits.

To do that, shelters need to create a no-kill-oriented board of directors, staff, and volunteer corps, and share their success publicly until the community accepts it. Shelter reform legislation, which lays out the roles and responsibilities of shelters, must also be codified and enforced. This will provide a defense against backsliding later, by creating the expectation of lifesaving among a shelter's board, volunteers, and the community at large.

The more successful this effort is, the more No-Kill will shift from being personality based, a result of the efforts of individual leaders, to becoming institutionalized as the doctrine of the shelter and the expectation of the community. Given the increasing acceptance of broader animal rights issues, even when people do not have a personal connection or relationship to the animals involved, the long-term prognosis for the success of the No-Kill paradigm is good. Underpinning the philosophy is the building of a new consensus, which rejects killing as a method for achieving results. But even within the philosophy, there are some contradictions and challenges which need to be resolved and which will increasingly rise to the forefront.

Animal activists are not suggesting that hopelessly ill or injured sheltered animals be put up for adoption, and few, if any, are calling for truly vicious dogs to be adopted into homes in the community. Under the prevailing No-Kill philosophy, these animals would not be counted under killing for purposes of population control (Keith, 2007).

While more than 90 percent of dogs and cats entering shelters are neither hopelessly suffering nor vicious and would fall outside this limited range of exceptions, however, it does not follow that the remainder should be killed. The reality is that, while fewer than 10 percent of shelter animals are ineligible for adoption, the vast majority are not suffering and as long as they are not suffering, their killing raises a host of ethical issues. In fact, not only are some unadoptable animals living without pain, they enjoy a good quality of life and can continue to

do so, at least for a time. These include, for example, cats diagnosed with feline leukemia, animals in the early stages of renal disease, and aggressive dogs.

The fact that shelters cannot and should not adopt out vicious dogs, for example, does not mean that killing them isn't ethically problematic. Today, the great challenge in sheltering is between No-Kill advocates working to ensure that healthy animals, animals with treatable medical conditions, and feral animals are no longer killed in shelters versus the voices of tradition, which argue that killing under the guise of euthanasia is both necessary and proper. As the No-Kill paradigm's hegemony becomes more established, however, the humane movement will have to confront other ethical quandaries within even this philosophy.

These ethical quandaries, for example, killing dogs that are aggressive but can lead happy lives in sanctuaries, giving hopelessly ill animals hospice care as opposed to what is considered mercy killings or true euthanasia in shelters, will become paramount. In fact, even today the very idea of killing is being challenged by a small but growing movement of sanctuaries and hospice care groups. They argue for a third door between adoption and killing (Johnson, 2008). That these issues have not been rigorously debated as a movement does not mean animal advocates must wait to demand that these animals be saved as well. From the animal rights perspective, compassion must be embraced whenever it presents itself, especially when it gives meaning to an animal's right to live.

The right to life is universally acknowledged as a basic or fundamental right, because the enjoyment of the right to life is a necessary condition of the enjoyment of all other rights. A movement cannot be rights-oriented and ignore the fundamental right to life. If an animal is dead, the animal's rights become irrelevant.

In addition, it is the relationship between Americans and their animal companions that can open a door to larger animal rights issues. In their daily interactions with their dogs, cats, and other animal companions, people experience an animal's personality, emotions, and capacity for both great joy and great suffering. They learn empathy for animals. It is not a stretch to say that someone who is compassionate and passionate about their animal companions would, over time and with the right information, be sympathetic to animal suffering on farms, in circuses, in research facilities, and elsewhere. The No-Kill philosophy which seeks to save companion animals in shelters can provide the bridge.

Moreover, given the public's progressive attitudes regarding companion animals, and the ability to end the population control killing of these animals in shelters, to achieve that goal would set a powerful precedent for the rights of other animals, and should therefore be a goal which the animal rights movement should seek and support.

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Nathan J. Winograd

SIGNALS AND RITUALS OF HUMANS AND ANIMALS

Ritual is a universal feature of human behavior. While rituals differ from culture to culture, the defining features that distinguish them from ordinary behaviors are surprisingly consistent across all human societies. Rituals tend to be formal, stereotyped, repetitive, and traditional. They are therefore easily distinguished from other behaviors. Rituals help pattern and predict social interactions. For example, when two people meet, they have expectations about how the social interaction will proceed. In Western societies, meetings commence with a handshake and a simultaneous "How are you?" or some similar formality. While none of us invented the handshake, we all recognize it as a greeting ritual.

Religious rituals are particularly easy to detect, as they tend to be more elaborate than other rituals. They also generally include music, chanting, or dance, which further distinguishes them from other behaviors. Masks, icons, special settings, extraordinary garments, and even distinctive languages may be used to further demarcate religious ritual from the ordinary. While religious rituals frequently appear to be shrouded in mystery, their formality and elaborateness make it clear to participants and observers alike that they are rituals. Nobody mistakes Sunday morning church for the Sunday afternoon football game.

The same underlying features of ritual that allow us to recognize it across widely diverse human cultures also enable us to recognize ritual in nonhuman species. Wild dogs, wolves, and chimpanzees all perform highly ritualized greeting ceremonies that include muzzle-to-muzzle contact, hugging, and choral vocalizations whenever the members of a social group meet. Wolf spiders, salamanders, and sandhill cranes all perform intricate dances as part of their courtship. Parrots and Pacific humpback whales engage in improvisational, synchronized singing during mating and group rituals. Chimpanzees have been observed to engage in occasional drumming of tree trunks and sporadic group rain dances. Ritual conveys significant social information about participants in both human and animal groups. It permits and promotes social interaction by creating frameworks of expectancy that lay the foundation for the prediction of behavior by others. But to fully appreciate the similarities between human and animal rituals, and to understand why they are similar, we first need to understand ritual's less complicated parent, signals.

Signals as Cooperative Communication

We all use signals in everyday life. Colored lights that regulate traffic flow

and sirens that alert us to possible danger are examples of common human visual and auditory signals. Animals, too, use many different kinds of signals to communicate with other members of their groups. The scent marking of dogs, the alarm calls of monkeys, and the changing colors of Siamese fighting fish are all signals that convey information about the state, condition, or intent of the sender. Some signals, such as the croak pitch of male frogs, directly convey the physical and physiological characteristics of the sender. Since croak pitch is a function of body size, larger males produce deeper croaks. This direct relationship between body size and sound pitch makes it possible for both females and competitor males to estimate the size of unseen males based solely on their croaking. Such indexical signals convey reliable information about a signal sender because they are directly linked to attributes that cannot be concealed or manipulated by the sender.

Most signals used in human and animal communication are not indexical, but still provide reliable information about the sender. They have evolved over time because they benefit both the sender and the receiver. Numerous conventional signals, such as the pecking response of herring-gull chicks to red dots, are the result of genetically programmed fixed-action patterns. Such signals automatically elicit or release evolved preprogrammed behaviors in signal receivers. In the case of the herring chicks, pecking at the red dots on the mother's bill provides the chick with food. Grouper fish exhibit innate responses to the dance performed by sucker fish. Even when reared in isolation, groupers exposed to the sucker fish dance lie down on the sand, spread their fins, and allow the sucker fish to clean the algae from their scales. Such genetically encoded fixed-action pattern signaling systems have evolved because the benefits they provide for both the sender and receiver outweigh the costs involved in signaling.

Although it was once thought that all animal signals result from these genetically programmed fixed-action patterns, ethologists have since found that many animal signals are much more complex, incorporating both genetic and learned components. The alarm calls of vervet monkeys provide a good example of such complex signals. Vervets inhabit woodland areas in eastern Africa, and use alarm calls to alert other members of the social troop to the presence of predators. Vervets emit a bark in the presence of a jaguar, a cough in the presence of an eagle, and a chutter in the presence of a snake. Young vervets have an innate tendency to respond to calls and to make different calls in response to different stimuli. However, young monkeys are not born with preprogrammed knowledge of jaguar, eagle, and snake calls. They

A sage grouse fans his tail and puffs up his chest to attract females. (Photos.com)

must learn the specific call to emit for each particular predator. While vervets are preprogrammed to learn these calls, young monkeys must hear the different calls used within the appropriate context in order to learn the correct call for each particular predator.

This innate capacity to learn species-specific signals during a particular developmental period is seen in many other species. The courtship songs of many birds involve both genetic programming and developmental learning; male birds are genetically primed to learn their species' song, but must be exposed to it during a specific developmental window in order for learning to occur. In humans, both music and language learning integrate this same combination of genetic predispositions and culturally-transmitted learning during specific developmental periods.

Signals as Deception

Sometimes signaling contexts involve senders and receivers who have conflicting interests. Under such circumstances, there is great incentive for signalers to use deception in order to influence receiver responses. Camouflage, mimicry, and deception are widespread throughout the animal kingdom. Many species have evolved color patterns and special structures to deceive potential predators and prey. Viceroy butterflies fool potential predators through their mimicry of the unappetizing Monarch. Angler fish lure unsuspecting prey with a specially-evolved mouth appendage. Females of the predatory firefly genus *Photuris* mimic the mating flashes of the related genus *Photinus* in order to lure *Photinus* males close enough to attack and consume them. Humans bluff, cheat, and lie in cards, war, and love.

Honest Signals

Signal receivers clearly have an incentive to detect dishonest signals and prevent such manipulation. Receivers should seek out signals that provide honest information. In many species this has resulted in the evolution of quality signals that provide receivers with reliable information about the general condition of the sender. In birds, the intensity of plumage color is negatively correlated with parasite load; the brighter the plumage, the healthier the bird. Females seek out males with the most brilliant plumage. As a result, the color brilliance of males has evolved to be a quality signal for females. In humans, a similar quality signal is provided by facial symmetry, which is positively correlated with health. Numerous studies have shown that males and females worldwide find symmetrical faces more attractive. In various songbird species, male song repertoire size is an important quality signal for females. Males with large song repertoires are less likely to be infected by malarial parasites and more likely to bring larger caches of food for their offspring.

Quality signals that benefit the receiver frequently incur costs for the sender. Male peacocks with the longest, brightest tails and male songbirds with the largest repertoires not only expend more energy on the development and maintenance of these traits, they also attract more predators than less showy individuals. Biologist Amotz Zahavi has proposed that such high cost signals are adaptive for signalers precisely because they handicap the sender. Since only those peacocks and songbirds with sufficient resources are able to successfully produce and maintain the longest, showiest tails and the largest and most captivating song repertoires, it would be impossible for

less fit competitors to fake these signals. Likewise, Mazeratis and mega-mansions constitute culturally-constructed quality signals in contemporary human societies, since only the wealthiest can afford the direct, maintenance, and opportunity costs of such luxuries.

Ritual as a Signal

Rituals are the costliest of signals. The four basic elements of ritual, formality, pattern, sequence, and repetition incur high time, energy, and resource costs for ritual performers. Yet these four features make up the structure of ritual in species as diverse as horned toads, chickens, and humans. Laboratory experiments have shown that these elements of ritual are optimally effective in engaging and focusing attention, heightening discrimination, enhancing multidimensional generalization, and improving associative learning. The formality of ritual captures the attention of the audience and focuses it on the signal elements most likely to evoke receiver response. Ordinary traits and behaviors may be exaggerated in order to make them extraordinary. The eyes of a peacock's long, iridescent tail prominently displayed during his ritual dance, the changing body colors of male squid as they gently jet water over a potential mate, and the ornate garments worn by human brides all represent formal elements of ritual that engage and focus the attention of ritual participants.

By exaggerating and elaborating ordinary features, the formality of ritual alerts brain structures such as the reticular formation, the basal ganglia, and the amygdala which function to prime emotions and prepare the body to react. Once attention is focused, the sequence, pattern, and repetition of ritual optimize the processing time critical for memory and learning.

Ritual has other impacts on neuroendocrine function as well. Changes in the levels of neurotransmitters, neuromodulators, and hormones of both the sender and the receiver occur during ritual, resulting in changes in the physiological, immunological, and behavioral responses of ritual participants. Biologist Russell Fernald's studies of cichlid fish from Lake Tanganyika in Africa dramatically illustrate ritual's effects on physiology. He found that antagonistic displays between cichlid males induce major changes in the hormones, external appearance, brain neuron sizes, and even the gene expression of winners and losers. Fernald observed aggressive and brilliantly colored black, yellow, blue, and red males almost instantly morph into much less aggressive drab brown satellite fish when ousted from their territories by rivals. If the satellite later acquired a new territory, his color, hormones, hypothalamic neuron sizes, and gene expression changed again. Similar neuroendocrine changes have been recorded in songbird responses to ritual as well. The ritualized vocalizations of male songbirds impact female sexual receptivity by inducing hormonal changes in the female, but they also impact the brain neurons and song-related genes of the signaler. In wolves and nonhuman primates, ritualized dominance and submission behaviors can alter participants' cortisol, dopamine, and testosterone levels. Across animal species, the ability of ritual to alter individual neurophysiology and behavior is critical to its adaptive value.

The Relationship of Human and Animal Signaling Systems

Many human signaling systems share deep phylogenetic roots with our closest primate kin. Like bonobos and chimpan-

zees, humans everywhere use similar facial expressions to identify and convey basic emotional states. Likewise, laughter, body language, and shouts of alarm are universally understood within both chimp and human societies. Yet, the most elaborate and distinctive human rituals, including synchronized chanting, music, and dance, are notably rare in other primates. While our distant cousins, the pair-bonded gibbons, do engage in male-female singing duets, the ritualized use of collective song and dance is conspicuously absent among all of our closest kin, including gorillas, bonobos, and chimpanzees.

Collective song and dance are, however, found in many other animal species. Wolves and wild dogs engage in choral howling, humpback whales sing synchronized group songs, and a multitude of bird species chorus, sing, and dance. Across human and nonhuman species alike, such ritualized behaviors evoke emotional and physiological responses that impact individual health and behavior while defining, facilitating and patterning social interaction. Understanding the nature and function of animal ritual not only broadens our understanding of nonhuman species, it also deepens our understanding of ourselves.

See also Music, Dance, and Theater—Music and Animals;

Music, Dance, and Theater—Music as a Shared Trait among Humans and Animals.

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THE SILVER SPRING MONKEYS

In 1981 the Institute for Behavioral Research (IBR) in Silver Springs, Maryland was raided by police as a result of accusations of cruelty to animals. It was the first time in American history that a scientific research laboratory had been raided by police as a result of alleged cruelty to animals, and it quickly became a landmark case that set legal and political precedents across the United States.

The research at the IBR, led by Dr. Edward Taub, was funded by the National

Institutes of Health, and focused on somatosensory deafferentation research in primates, in which one or both forelimbs had all sensation surgically removed. The extent to which the animals then used or could use their limbs was evaluated. It was believed that voluntary movement was impossible in the absence of sensory feedback, a conclusion disproved by the research at IBR.

In the earl summer of 1981, an animal activist named Alex Pacheco asked Taub for a job at IBR. Taub told Pacheco that there was no paying job available at the Institute, but that he was welcome to work at the laboratory on a volunteer basis. Taub was not aware that Pacheco was one of the founding members of People for the Ethical Treatment of Animals (PETA). During his five months at IBR, Pacheco took photographs of the conditions in the facility. In addition, while Taub was away on vacation, he brought five scientists, two zoo veterinarians and three animal activists, two of whom were primatologists, into the facility to witness the conditions in the laboratory.

On September 22, 1981, in response to the affidavits of the five scientists alleging grossly unsanitary conditions and inadequate care, and the photographs provided by Pacheco, the Montgomery County police raided IBR, confiscating the primates, and seizing laboratory records. Taub was subsequently charged with cruelty to animals. In November 1981, Taub was found guilty of providing inadequate veterinary care to six of the seventeen primates. The other 113 charges were dismissed. Taub appealed the conviction, demanding a second trial before a jury, and was found guilty on a single count of inadequate veterinary care. He appealed to the Maryland Supreme Court, which dismissed the case because, it argued, the Maryland anti-cruelty statute did not apply to federally-funded research. The NIH subsequently determined that the IBR facilities and program violated several aspects of NIH animal research policies, and first suspended and then terminated Taub's funding.

The case has had a tremendous impact on the animal research debate and on resulting public policy. At the time of the police raid, Congress had scheduled hearings on several animal research bills. The news coverage of the raid and the publicity generated by Pacheco's photographs refocused the Congressional hearings, which spent one of the two scheduled days grilling representatives of the various federal agencies about their oversight of research. NIH also found its own policies too vague to deal adequately with the events, and initiated a major revision of its animal research policies. The research community, particularly the American Psychological Association and the Society for Neuroscience, were very concerned about the case, and rallied behind Taub to defend him from his critics. In contrast, two laboratory animal veterinarians testified for the prosecution that the conditions pictured at IBR were grossly substandard for the care of primates. Subsequently, PETA and NIH fought over the fate of the Silver Spring monkeys, especially the deafferented animals whose nerves were destroyed; they ultimately ended up at the Delta Primate Research Center. The monkeys continued to be the focus of court battles well into the 1990s until the last animal was euthanized because of failing health.

Andrew N Rowan

SIZEISM

Sizeism is a form of speciesism that specifically relates to a failure to empathize

with or give small animals the same consideration that would be given to large animals. This is manifest when people carry out invasive procedures in small animals that they would not do if the animal was larger or older. Moreover, if those procedures were carried out on large and adult animals they would normally be given an anesthetic. The reasons for doing such mutilations relate to research, agricultural practices, and cosmetic procedures in companion animals. Furthermore, there are good physiological reasons to suspect that young animals feel pain just as much as large or adult animals. In fact there is growing evidence that young animals may feel more pain then when they are adults. Examples of the surgical procedures performed include amputation of digits in rats, mice, and puppies compared with horses and cows; docking of tails in lambs, piglets puppies, kittens, and calves compared with adult animals; castration in lambs, piglets, puppies, kittens, and calves compared with adult animals, particularly dogs and cats, and cardiac puncture and intracerebral injections in mice and rats compared with cardiac puncture in horses, dogs, sheep, and cows. Intracerebral injections are normally carried out only in mice.

David B. Morton

SOCIOLOGY OF THE ANIMAL RIGHTS MOVEMENT

Behavioral scientists have used several approaches to understanding the sociology and psychology of those who oppose the use of animals. Some researchers have distributed surveys; other investigators have collected qualitative data based on extended interviews with animal activists. All of these studies show that animal activists are a diverse group with varying philosophies and approaches toward the treatment of animals, but who often share some common characteristics.

Virtually all research indicates that women are much more likely than men to be involved in animal protection. This was also true of the Victorian Era antivivisection movement. The reasons for the current and historical predominance of women among rank and file activists are unclear. Animal activists tend to come from middle- and upper class backgrounds and are much more likely than the average American to be Caucasian. As a group, their median income is higher than average and they tend to be well educated; a 2006 study reported that 79 percent of activists attending a national animal rights meeting had undergraduate or graduate degrees. Relatively few activists live in rural areas or small towns. Most studies indicate that two-thirds of animal activists consider themselves vegetarians or vegans, and the overwhelming majority share their homes with companion animals.

Activists tend to identify with the moderate to left side of the political spectrum. Most activists indicate that they also support the goals of other social movements. Among these are the environmental, women's, and gay rights movements. Several studies have reported that the majority of activists are not affiliated with mainstream organized religions, and a substantial proportion report being atheists or agnostics. However, several researchers have pointed out that the animal rights movement itself has quasi-religious characteristics.

Public attitudes toward the animal rights movement are mixed. Several

surveys have reported that a majority of Americans have positive attitudes toward the animal rights movement. For example, a 1994 public opinion poll reported that most respondents had either a very favorable or a mostly favorable view of the animal rights movement. On the other hand, fewer than 10 percent say that they agreed with both the agenda of the animal rights movement and its strategies. A 2003 Gallup Poll found lukewarm support for animal rights. The poll found that 96 percent of Americans believed animals deserve some protection, and 25 percent of those believed that animals should have the same rights as humans. While 62 percent of Americans believed that there should be strict laws governing the treatment of farm animals, only 38 percent believed that there should be no laboratory testing of animals, and only 35 percent believed that there should be no medical research on laboratory animals.

See also Gender Gap and Policies toward Animals; Student Attitudes toward Animals.

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Harold A. Herzog

SPECIES ESSENTIALISM

Essentialism is the claim that every member of a real kind shares some one quality with all and only others of that kind. What is now in doubt is that such kinds, which may well exist, can ever be identified with biological species. One can question whether, to be a dog, it is necessary to share some quality with all and only dogs, and whether it is necessary to suppose that there are pure dogs, having no other qualities than dogs require. Biologists typically blame Aristotle and his followers for species essentialism, for supposing that there are real, discrete biological kinds such that there are perfect specimens of each such kind. The truth is that Aristotle insisted that there were no absolute divisions in nature; we could conveniently classify living things, but would always find that there were hybrids and intermediates in any system.

Aristotle was correct: the existence of cross-species hybrids and the supposed existence of ancestral species from which several modern species have evolved show that nature is a continuum. A species is a set of interbreeding populations, not a natural kind. There need be no one quality that every member of a species shares with all and only others. Not all members even resemble all their conspecifics (members of the same species) more than they resemble creatures of other species. Nor is there any perfect specimen of a given species; any member of a species, however unusual, is equally and perfectly a member.

Nothing says that any individual can have fertile intercourse with any conspecific of the other sex, nor that every individual of that species shares any one particular character with every other, nor that its failure to have some fea-

ture shared by most is any real defect. Realizing this may have moral as well as scientific benefits; we no longer need to think that unusual specimens are defective. On the contrary, diversity within a population is an evolutionary advantage. Some groups, closed off from others, will be highly uniform, others will not, yet the differences do not grow into true species differences unless the group happens to split up. Sometimes one species will turn into two only because some crucial, intermediate population has perished, without any change in any other population. It is not even entirely true that genetic information cannot pass between real species. Occasional hybrids aside, viral infection transfers genetic material. New species are also formed by symbiosis, collaboration between organisms originally of very different species.

With respect to the human species, it turns out not to be a natural kind; it is just the relevant set of interbreeding populations. There may have been and there may yet be more than one such human species. What the individuals concerned were or will be like, and what our duties might be toward them, cannot be settled by deciding on their species**.**

See also Evolutionary Continuity.

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Stephen R. L. Clark

SPECIESISM

The term speciesism was first coined by Richard Ryder in 1970. In 1985, the *Oxford English Dictionary* defined speciesism as "discrimination against or exploitation of certain animal species by human beings, based on an assumption of mankind's superiority." This definition marked the official acceptance of speciesism into the language. Peter Singer did much to establish its use.

Speciesism became a useful campaigning term from 1970 onwards. Ryder was a member of the Oxford Group of anti-speciesist thinkers of the period, which included Ros and Stanley Godlovitch, John Harris, Andrew Linzey and, a little later, Peter Singer and Stephen Clark. The term first appeared in Ryder's leaflets and then in Godlovitch and Harris's seminal *Animals, Men and Morals* (1971), to which Ryder contributed a chapter. Ryder turned down Singer's invitation to coauthor *Animal Liberation*, which emerged in 1975, but the term was employed here by Singer. Ryder helped popularize the term on British radio and television, arguing that treating the suffering of different species equally follows logically from Darwinism. Richard Dawkins, too, in his classic *The Selfish Gene* (1976), used the term *speciesism* in supporting those who campaign for animals. The RSPCA's *Declaration Against Speciesism* was signed by 150 delegates at

the world's first animal liberation conference held at Trinity College, Cambridge, in 1979, and was extensively used by Ryder when he was RSPCA Chairman, and as Director of the Political Animal Lobby, in the successful campaigns to put animals into British and European politics.

By drawing the parallel between speciesism, sexism, and racism, campaigners have been able to attract the attention, and often the support, of liberals, democrats, and others who might otherwise have remained indifferent to the interests of nonhumans. Thus, although the concept has proved useful on the philosophical level, for example, as a means to address the subject without any commitment to the idea of rights, it has had value on the psychological and political levels also.

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Richard D. Ryder

SPECIESISM: BIOLOGICAL CLASSIFICATION

Speciesism is the attribution of weight given to species when evaluating the ethical treatment of individuals. When we say that all, and only, human life is sacred, we are embodying speciesism in a basic moral principle. When we treat nonhuman animals as mere means to our ends, while condemning the same attitude in the case of human beings, we are incorporating speciesism into our practices. The question is whether we are justified in drawing such a line, that is, in granting humans a different, and higher, status.

A deep-seated tradition tends to give differential treatment of members of other species an air of respectability. Recently, however, speciesism has been equated with racism and sexism as a form of arbitrary discrimination. Some philosophers have pointed out that if we reflect on the human rights theory, we realize that we have already settled similar questions of relevance. People generally believe that race and sex should play no role in our morality. To be consistent, the same judgment should be made in the case of species membership. In this view, the very idea of human equality tells us that speciesism is ethically objectionable.

This, however, does not solve the problem, for one should explain what is wrong with racism and sexism. The answer seems evident. Races and sex are biological classifications. As such, they are concerned with purely physical characteristics such as skin color and reproductive role, rather than with psychological properties such as the capacity for being harmed or benefited. Since ethics is an autonomous theoretical subject, endowed with its own standards of justification; criteria coming from different disciplines have no bearing on it. Against this, it can be said that there is a correspondence between race or sex and the possession, or lack, of some characteristics that are morally relevant, so that group member-

ship may be appealed to as a mark of this difference. This can be called the correspondence approach. Thus, for example, racists often claim that members of other races are less intelligent than members of their own race. However, even if the claim were true, this approach would not work. First, if the underlying reference is to other characteristics, drawing a line through race membership is uselessly confusing. Second, what we shall find will be overlap, not mutual exclusion, between races, and to treat individuals, not on the basis of their own qualities, but on the basis of what is allegedly normal for their group, would be irrational.

Thus it seems that racism and sexism are in fact arbitrary discriminations. But can we really say the same for speciesism? Many have disputed this. Since it is undeniable that species is a biological characteristic just as race and sex are, the objections to the parallel have focused on the correspondence approach. While seen as unacceptable in the case of humans, this approach has claimed to be sensible in the case of other animals, because the gulf between us and them is allegedly so large as to prevent overlap.

However, since the work of Charles Darwin, we have abandoned the idea of a gulf between us and the other animals; we see the animal world as composed of a multitude of organisms that resemble one another in some ways, but differ in others, and we hold that differences among species should be viewed as differences in degree rather than in kind. Moreover, if some people want to stick an arrangement of beings in a linear, ascending scale, they still have to be concerned with the presence within our species of disabled, disturbed, or brain-damaged individuals. All in all, it seems that racism, sexism, and speciesism are arbitrary discriminations. If this conclusion is sound, we can only preserve our valued belief that there are no morally relevant barriers within our species at the price of abandoning the belief that there is a morally relevant barrier around our species.

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Paola Cavalieri

SPECIESISM: ETHICS, LAW, AND POLICY

The term speciesism, coined in 1970 by Richard Ryder, has become a widely used tool for describing how some humans have thought of and treated other living beings. It is useful to review how speciesism works as a concept, and how that concept can be used to gain an understanding of the nature and history of ideas about other animals that still dominate many people's thinking.

To understand why speciesism troubles some people, consider how this notion works as a concept. The term works well to describe a long-prevailing attitude that has two basic features. On the positive or inclusive side, speciesist attitudes expressly include any and all humans

in a moral circle, such that all humans are then understood to be so important as to merit moral and legal protections. Coupled with this important inclusive move honoring any and all humans is an equally decisive negative move, namely, exclusion of all other living beings from basic moral or legal protections whenever such exclusion benefits any humans in any way. Speciesism is thus a two-step process of inclusion and exclusion.

Speciesism as an idea is rooted in a biological category, namely, membership in the human species. Attitudes grounded in speciesism are by no means the only biologically-based attitudes that have played an important historical role in humans' views and actions. Racism and sexism, for example, are also biologically based views. Exclusions on the basis of racist or sexist views, it is now well known, have some peculiarly unfair features. It is not the qualities of the individual that determine how that individual is treated, but instead mere membership in a particular biological class. Favoring members of one race over another, or privileging members of one sex over members of the opposite sex, ignores the fact that members of the disfavored group can, on their own terms, be truly deserving of protections.

The exclusion of all other animals' interests simply because they are not members of the human species has these peculiar features as well. It ignores the fact that some nonhuman animals can be quite deserving of humans' moral concern and legal protections even though they are not members of the human species.

Speciesism has become a valuable tool for describing moral views, legal protections, existing policies, and the reasoning of some people who insist that only humans merit moral and legal protections. As such, the word and the underlying concept are now widely used when humans discuss the moral status of other animals. In particular, the word has helped many focus on the structure of the species-based thinking that underlies the ways many people justify the current status quo under which some human societies and governments deny nonhuman animals basic protections, whether moral or legal. In modern, industrialized societies, such justifications are not only common, but also systematic and persistent. They are the bedrock of many modern legal systems under which all humans are deemed legal persons while all nonhuman animals are relegated to the unprotected category of legal things. Modern property notions in some legal systems, such as that of the United States, are speciesist in nature. Humans cannot be owned by another human because humans are, by definition, legal persons. But legal persons can, of course, own any nonhuman, for all living beings outside the human species are in the category of legal things, along with chairs, automobiles, and other inanimate objects. This kind of arrangement is a paradigmatic example of speciesism in action. But this need not be so. As is well known, property notions in the law have been malleable over time. At one point, it was legal to own other humans, but such ownership is not legal in most legal systems today. Some legal systems already outlaw the ownership of some nonhumans (chimpanzees, for example), and it is thus possible that in many legal systems the idea of legal property will be severely qualified or even eliminated altogether with regard to certain nonhuman individuals and species.

Despite the prevalence of speciesist reasoning and justifications, these ideas nonetheless can take altogether peculiar

forms. For example, speciesist attitudes promote justifications that even the minor interests of humans, such as cosmetic appearance, recreation, or convenience, outweigh the major interests of other animals, such as keeping their lives, and remaining free from captivity and experimentation. This is one reason that even though many people feel that it is immoral for humans to be cruel to other animals, severe cruelties and deprivations are nonetheless tolerated in many industrial practices, such as factory farming, slaughterhouses, circuses, and even zoos. Captivity and its deprivations and cruelties are often rationalized as acceptable because some humans own and generate income from harsh uses of particular nonhuman animals. or because our society as a whole still goes forward on the belief that public exhibition of captive animals is educational in some way or another. When such reasoning prevails, the minor interests of the humans involved, namely making money, or enjoying the limited educational benefits that captivity might offer, prevail over the major interests of the captive nonhumans.

Overriding the interests of other animals has traditionally been supported by assertions that other animals exist for humans. Aristotle made such a claim (*Politics,* Book I, Section 8) in the fourth century BCE, and three centuries later Cicero made similar human-centered or anthropocentric claims (*De Natura Deorum,* II, p. 14). Such claims are still made in great earnestness not only by the food production and entertainment industries, but also by some religious institutions. For example, the revised 1994 *Catholic Catechism* claimed, "Animals, like plants and inanimate things, are by nature destined for the common good of past, present and future humanity." (Paragraph 2415).

There are, however, many in religious circles who, following the lead of exemplary figures like Francis of Assisi or Albert Schweitzer, dispute claims that other animals are by nature destined for our use. Asserting that humans have a moral obligation to other living beings, many have challenged justifications that invoke speciesist reasoning, that is, that humans deserve the privilege of using other animals merely by virtue of being members of the human species. Such challenges question justifications which assume that there is no moral problem when basic moral or legal protections, such as the protection of life, liberty, and freedom from intentional infliction of avoidable harm, are denied to any and all nonhumans.

The exclusions that speciesist claims require are sometimes framed as morally justified because the focus is solely on the human side of the issue. Inclusion of all humans is, of course, a highly respected position today, especially because everyone is painfully aware that there have been long stretches of human history in which exclusion of many humans was not only tolerated, but even promoted as morally acceptable. But speciesist attitudes entail more than an affirmation of all humans because, by definition, they also require the all-important exclusion of any and all nonhumans from moral and legal protections whenever doing so benefits humans in even a minor way. Exclusion is as fully a core feature of speciesism as is the inclusivist feature that honors humans.

It is precisely this exclusion, not the inclusion of all humans, which is the target of anti-speciesism advocates. Such challenges focus on ways in which it is unfair to exclude all other animals solely because those other beings are not members of the human species. Challenges to

speciesist attitudes, claims, and practices have often taken their cue from the fact that many cultures and religions have not promoted speciesist views. In fact, the speciesist claim that there is such a profound divide between humans and all other animals that it is moral to deprive all other animals of protections has by no means been universal. For example, many indigenous peoples have viewed other living beings as morally important, as have many religious traditions.

Speciesist views have lately, however, taken some particularly virulent forms, as evident in scientific research, commercial ventures, and environmental destruction. A feature of many contemporary speciesist claims is that their proponents often treat exclusive focus on humans in the same manner that fundamentalists in religions treat the belief that they alone have revealed truth. In other words, some proponents of speciesism will accept no possible challenge to their exclusion of all other animals. Those who challenge speciesist views appeal to open-minded and closely-reasoned inquiries arising out of a passionate commitment to accurate description of the surrounding world and the actual realities of various nonhuman animals.

Another feature of speciesism is that it is part of institutions that may be religious or secular, philosophical or non-philosophical, or science-driven or nonscientific altogether. As such, species-based exclusions are widespread and continue to lead to important, visible consequences which can be measured by the historian, theologian, philosopher, natural or social scientist, or public policy analyst, although doing so can lead to extreme disfavor in academic, government, or business circles.

One can, it should be noted, exclude from the list of speciesist acts those actions by individual humans chosen in order to ensure one's own or one's family's immediate survival. What stimulates and continues to drive the charge of speciesism is the crass justification of many avoidable, nonessential human activities. Instrumental use of other animals, sport hunting, factory farming, testing of cosmetics, biomedical experiments that can be conducted without animals, roadside animal shows and recreational animal parks involve intentional, avoidable damage to other animals' interests, are paradigmatic examples of speciesism.

Historically, the first proponents of speciesism often compared the exclusion of all nonhuman animals to the exclusions of racism and sexism. Despite the emotional value of drawing analogies between speciesist practices and the historically pervasive, biologically-based means of exclusion along the lines of race and sex, there are several basic problems in doing this. Analogies of speciesism to human-on-human forms of discrimination such as racism, sexism, or slavery are at best partial comparisons, and they are often so emotionally charged that others object to what seems to them a comparison of humans to other animals. Importantly, discriminations against other humans are, in at least one important respect, unlike discriminations across the species line, for discrimination against other humans for whatever reason is subject to the obvious challenge of inconsistency. The theologian James Cone once said of any Christian minister who backs racism, "He is an animal . . . We need men who refuse to be animals and are resolved

to pay the price, so that all men can be something more than animals." (Cone, 1969, p. 80). Here a speciesist devaluation is invoked in order to challenge racist exclusions, and this suggests important differences between speciesism and racism. The species line is, in biological terms, qualitatively more significant than are race-based divisions, the latter often being culturally-influenced and easily manipulated. Racial divisions, then, are subject to a particularly forceful objection based on a lack of consistency because not all humans are being treated the same.

For many reasons, reliance on analogies to humans discrimination against other humans is not likely to be totally illuminating with regard to the reasoning or practices of speciesism, even if such comparisons are useful in some respects. For example, such analogies can have limited value, for they can help some people discern that the exclusivist attitudes many have toward other animals are, like the prejudices people have with regard to members of other races or toward the opposite sex, supported by flimsy reasoning, bias, and ignorance which can blind us to our own exploitation and oppression of other living beings.

Unfortunately for members of all species other than humans, perpetuation of speciesist views remains a central feature of the most influential secular and religious institutions in Western culture, thereby anchoring the human-centeredness or anthropocentrism of traditional ethics. Some who challenge speciesist forms of ethics, namely, those forms of ethics that favor only members of the human species, reason that fundamental changes can be achieved only incrementally, that is, only by breaching the species line at a particular point. One well known attempt to breach the species barrier is The Great Ape Project (Cavalieri and Singer, 1994), an effort based on the notion that it is in the interest of many other animals if some nonhumans are now brought into the protected circle. The Great Ape Project has thus focused on humans' closest genetic cousins, reasoning that a first step in dismantling the traditional prejudices which draw their life from speciesist beliefs and practices confining fundamental protections to members of the human species can be taken now on behalf chimpanzees, bonobos, gorillas, and orangutans, because so much good science clearly shows that these nonhumans are deserving of fundamental protections. It remains to be seen if creating protections for our closest evolutionary cousins will reduce barriers to granting important moral and legal protections to other animals generally.

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Paul Waldau

SPORTS AND ANIMALS

Sports may be best understood as a quest for entertainment and excitement, whether experienced personally as an active participant, or vicariously as a spectator. Sports are about competition, tension, and resolution, and serve as outlets for some socially acceptable forms of violence. The greatest satisfaction is achieved when one side wins and the other loses.

How do animals figure into sports? Animals may be used as a source of entertainment themselves, or as a tool to increase people's excitement during sporting competitions. The incorporation of animals and sport can take any of three different forms: animals competing against other animals for the entertainment of humans, humans competing against animals, and humans competing with animals against some other arbitrary measure, such as time. In some cases, more than one of these may apply. For example, sport hunting with dogs involves dogs cooperating with humans against other animals. Additionally, animal sports such as hunting, bull-fighting, pit sports can be considered consumptive if a participant dies, thereby removing it from the gene pool/ecosystem. Non-consumptive sports, where everyone usually lives to compete again, include racing, catch-and-release fishing, rodeo, and many dog sports.

The pursuit of excitement that plays such a large part in sport applies in especially large measure to those events considered blood sports, where the object of the game is the death of a participant. These activities surface in man's earliest writings, and feature animals on sometimes grand scales.

Hunting, as one of the earliest blood sports, did not originate as a sport at all, but instead as a means of procuring necessary food. Hunting wild animals for entertainment appeared in ancient art and literature after the advent of agriculture, and described the beginnings of a perceived gap between man and the natural world. Ancient Greek writings portrayed hunting as a confrontation between culture and nature, a war by humanity against the wilderness. Hunting was seen as cultivating manly virtues necessary in combat, and since the lives of prey animals were assumed to have no intrinsic worth, and therefore warranted no concern, no thought was given to their suffering. The kill was the end goal, and the anticipation and effort required to arrive at this result were merely added benefits.

Hunting inspired great excitement and satisfaction, not only for participants, but also for spectators. The public delighted in bloody staged hunts (*venationes*) conducted by the ancient Romans for the entertainment of the assembled masses. Gladiatorial battles fought on colossal scales featured scores of animals pitted against human soldiers, slaves, or other animals. Even as some classical writers lamented the gruesome spectacles as the source of man's inhumanity to man, wealthy rulers continued to keep, exhibit, and hunt exotic animals for pleasure (Cartmill, 1993, p. 44). Objections centered not on the brutality of the sport toward the creatures involved, but on how the violent behavior demonstrated by human sponsors and participants could extend to further violence against people.

As the medieval period gave way to the Middle Ages, a civilizing process changed social perceptions regarding behavior and the appropriate balance between pleasure and restraint (Elias & Dunning, 1986). With regard to sport, the pleasure manifest in the excitement of the hunt's kill became tempered with restraint in the form of increasingly complex rules. Putting stipulations and codes of behavior on sport hunting was designed to prolong the action, increasing anticipation and pleasurable tension before the kill. During this time, too, quiet murmurs of discontent were occasionally heard as dismay over cruel treatment of animals portended an emerging welfare attitude. Cruelty, however, would not go away quickly, as people found new and increasingly grisly ways to amuse themselves using animals.

If fox hunting was the domain of the landed gentry, pit sports found favor with all social classes. As the civilizing process deemed it increasingly inappropriate to settle disputes using physical violence against people, pit sports provided an acceptable outlet for daily frustrations, as well as spirited entertainment for visiting royalty, foreign ambassadors, and the unwashed masses. Bull-baiting, bear-baiting, cockfighting, and dog fighting pitted animals against other animals in mortal combat. All occurred with regularity across England and Europe, and later North America. Baiting involved tethering an animal to a stake, then allowing one or several dogs to attack the restrained creature. All manner of beasts were baited, including bears, bulls, badgers, apes, mules, and occasionally horses. For some time it was believed that bull-baiting was necessary to ensure flavorful, tender meat, and was compulsory before a bull could be butchered (Thomas, 1983, p. 93). Baiting sports became illegal in England in 1835.

As opposed to animals used for baiting, pit fighting contestants were often highly valued and vigorously prepared for battle. Value was a subjective term, and referred not to the animal's intrinsic worth, but instead to its value in terms of the fight. Animals that exhibited prowess in the ring were granted better treatment and valued higher than their less capable brethren. Roosters used for cockfighting were brought up on special diets and exercised to increase their stamina. Wattles and combs were cut off to reduce targets for opponents (behavior not considered cruel to the animal), and artificial spurs were strapped to their feet to increase the lethality of attacks. Spirited wagering accompanied matches, and flaring emotions occasionally spurred spectator riots. Gambling also accompanied organized dog fights. Breeds such as the Staffordshire bull terrier and, later, the American Pit Bull Terrier, their aggressive tendencies rerouted from the baiting arena to the dog-fighting pit, were trained by sacrificing smaller, docile dogs for practice. Although largely outlawed today, organized underground networks continue to engage in cockfighting and dog fighting, and large sums of money are often recovered from police raids, along with dead, injured, and mutilated animals. Disgraced former Atlanta Falcons football quarterback Michael Vick made headlines in 2007 when his Bad Newz Kennels dog-fighting operation was uncovered, revealing over 70 fighting dogs in various states of health, with the result that Vick and three others were convicted and sentenced on federal charges.

The ritualized Spanish sport of bullfighting developed out of Roman gladiatorial battles, combined with the rites

of Mithraism, an early religion of the Roman Empire. Some consider the pageantry of bull-fighting to be an art form. It remains a popular spectator sport in Spain and Mexico, though interest is waning in Spain, invariably ending with the death of the bull. Matador gorings are not uncommon, and occasionally deadly.

The Romantic period's changing ethic and outcry against cruelty, including the use of animals in some sports, might have been lauded as a sign of an enlightened public concern for animal pain and suffering. However, early changes in doctrine regarding proper treatment of animals arrived out of concern not for the animals themselves, but that mistreatment of animals would lead to depravity against men. This anthropocentric view was combined with various interpretations of the Old Testament, which ensured human dominion over all animals, but cautioned against unnecessary suffering. The resulting combination of religious piety and bourgeois sensibilities led to the banning and social stigmatization of many previously popular animal sports. Hunting, however, remained largely outside these restrictions, with the separation between legitimate meat acquisition, predator/vermin eradication, and pleasurable entertainment used as justification.

The American West had its own evolution of thought regarding animal sports. Early settlers were amazed at the number and diversity of game animals, and greed brought on by the fur trade and apparent inexhaustibility of animal resources led to some mind-boggling excesses. The demise of the passenger pigeon and great buffalo herds are two of the most impressive examples of human myopia, much of it carried out in the name of sport. Theodore Roosevelt was an enthusiastic sportsman, killing thousands of animals on hunting trips across North America and Africa. He believed that shooting game was necessary "to cultivate that vigorous manliness" that comes from close contact with nature (Mighetto, 1991, p. 34). He was also concerned that continued exploitation of resources could lead to wildlife shortages, a sentiment shared by a small but influential group of men of his time. He is credited with cofounding the Boone and Crockett Club in 1888, one of the first conservation organizations. The members of the club were not so much concerned with animal welfare as worried that overhunting would leave future generations without adequate stocks of game species. Land for habitat was set aside in establishment of the first wildlife preserves to help ensure future sport hunting opportunities.

During this time, too, the sport of rodeo emerged as a series of competitive activities associated with the cattle drives of the American South and Midwest. Cowboys, bored by endless days in the saddle, amused themselves by holding impromptu contests of skill and bravery, including bull and bronc riding, calf roping, and steer wrestling, among others. When the great cattle drives ended, rodeo continued on as an organized sport, and still enjoys a wide audience across the United States and Canada.

Today, moral concerns related to animals in sport lie with the welfare and capabilities of animals themselves, a shift from the anthropocentric and largely utilitarian mindset. This change in climate around some controversial aspects of sport such as rodeo calf-roping and bronc riding, open field coursing, canned hunts, and rattlesnake roundups, for example, has lent encouragement to nonconsumptive sports such as racing, catch-and-release fishing, and flyball,

Bull riding competition at the National Finals Rodeo in Las Vegas, Nevada. (AP Photo/Joe Cavaretta)

and cooperative sports such as dog agility, rally obedience, and freestyle, among others. Even among supposedly nonconsumptive sports, well-publicized events have altered public sentiment regarding the human desire for competition and success. The catastrophic breakdown and subsequent euthanization of the thoroughbred filly Eight Belles after the 2008 Kentucky Derby focused a harsh spotlight on the entire thoroughbred racing industry, and led to the questioning of competitive breeding practices that may emphasize early brilliance and speed at the expense of durability and soundness. Questions have been raised concerning the morality of requiring animals to perform physically and psychologically demanding activities for human benefit. These concerns are countered by advocates who believe it may be more inhumane to deny an animal the opportunity to perform an activity it has been expressly bred to do and actively enjoys. Others whether the sport of dog breeding/exhibition, which contributes to a decline in health and welfare of some breeds due to increasingly exaggerated physical constructs, is perpetuated in pursuit of some unattainable standard. Does the life of the bull up until the fight, the vast majority spent at pasture, living a good life, compared with the relatively short, but ultimately fatal time in the ring as a performer, justify the sacrifice? Research supporting the idea that animals are capable of complex emotions and thought is rapidly causing us to reinterpret our treatment of animals during sporting events. Sport hunting has become increasingly polarized, with a huge base of popular support, countered by a vocal opposition. People will always enjoy the competition, excitement, and culminating resolution of sport. It remains to be seen how the changing mores of society will ultimately influence man's inclusion of animals as part of sporting entertainment.

See also Blood Sports; Entertainment and Amusement: Circuses, Rodeos, and Zoos; Fishing as Sport; Hunting, History of Ideas.

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Cindy McFadden

STEREOTYPIES IN ANIMALS

A stereotypy is a repeated, relatively invariant sequence of movements that has no obvious function. It is the repetition of the same behavior pattern which makes the stereotypy so obvious to an observer, and the abnormality is also indicated by the distinction from useful repetitive behaviors such as breathing, walking, or flying. Among the most striking abnormal behaviors shown by some animals in zoos and in confined conditions on farms are stereotypies such as route-tracing, bar-biting, tongue-rolling, or sham-chewing. As an example, a female mink, in a cage 75 x 37.5 cm and 30 cm high on a mink farm, would repeatedly rear up, cling to the cage ceiling with her forepaws, and then crash down on her back.

Stereotypies can be shown by humans with neurological disorders, by those with some degree of mental illness, and by those in situations where they have little or no control over aspects of their interaction with their environment. People with no illness may show stereotypies when confined in a small cell in prison, or when exposed to situations like waiting for an important interview, or for their wife to give birth.

The causes of stereotypies in nonhuman animals seem to be very similar to those in humans. Frustrated individuals, especially those unable to control their environment for a long period, are the most likely to show the behavior. Individuals treated with particular drugs, especially psychostimulants such as amphetamines and apomorphine, may show stereotypies, but it is not clear what this tells us about the causation of stereotypies. Animals with irritant disease conditions such as sheep scab show rubbing and oral stereotypies. Many stereotypies seem to be related to oral movement or to locomotion, so the control systems for such movements are clearly susceptible to being taken over by whatever causes repetition. The age of the individual and the amount of time in the housing condition can affect the stereotypies shown, for example, horses changing from crib-biting to wind-sucking, or from side-to-side pacing to head-weaving, and confined sows changing from bar-biting to sham-chewing. Movements can also become more complex with age.

In most cases we do not know whether a stereotypy is helping the individual to

cope with the conditions, has helped in the past but is no longer doing so, or has never helped and has always been just a behavioral abnormality. None of the studies that demonstrate a relationship between the extent of occurrence of stereotypies and opioid receptor blocking or opioid receptor density measurement tell us with certainty whether or not stereotypies have any analgesic or calming function, but in all cases the stereotypy indicates that the individual has some difficulty in coping with the conditions, so it is an indicator of poor welfare. Animals that have larger home ranges in natural conditions have been found to be more likely to show stereotypies in zoos. Some stereotypies must indicate worse welfare than others, but any individual showing them has a problem.

Stereotypies are sometimes ignored by those who keep animals, and may be taken to be normal behavior by those people if they see only disturbed animals. For example, zookeepers may see route-tracing by cats or bears, laboratory staff may see twirling around drinkers by rodents, and farmers may see bar-biting or sham-chewing by stall-housed sows without realizing that these indicate that the welfare of the animals is poor. A greater awareness of the importance of stereotypies as indicators of poor welfare is resulting in changes in animal housing. More complex environments that give the individual more control, and hence result in the occurrence of fewer stereotypies, are now being provided in good animal accommodations. These environments also give opportunities for a larger proportion of the full behavioral repertoire to be expressed, and for the patterns of movements in the repertoire to be varied. The consequent reduction in frustration and increase in the proportion of an individual animal's interactions with an environment that is under its control can improve its welfare.

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Donald M. Broom

STRESS AND LABORATORY ROUTINES

For almost as long as animals have been used in tests and experiments that harm them, the practice has drawn criticism concerning animal suffering. The focus of that criticism is usually on how the experiments may cause pain, distress, and death to the animal subjects. It doesn't require much imagination to conclude that having a household product dripped repeatedly onto the eye causes pain and stress for a rabbit (Draize test), or that being given cancer is nasty for a mouse.

Often overlooked in the vivisection debate is the animals' experience out-

side the experiments themselves. When data are not being collected, most of an animal's time in the lab is spent in a cage. Thus, day-to-day routines of laboratory life play a big role in the animals' overall welfare. What are these routines, and how may they affect the animals' welfare?

Animals' Sensitivity

To appreciate an animal's potential vulnerability to stressful events or stressors in a laboratory, it helps to have some understanding of an animal's sensory world. The species most commonly used in research are the house mouse and the Norway rat. American laboratory veterinarian Larry Carbone has estimated that there are now upwards of 100 million of these rodents used each year in American labs.

Although there are some important differences between rats and mice, there are many similarities in how they sense their worlds. Both species rely heavily on smells and sounds to communicate. Mice leave tiny droplets of urine wherever they go, and other mice can read a lot of information from these cues, including age, sex, individual identity, social and reproductive status, and even parasite load. Both species use many sounds in the ultrasonic spectrum, that is, above human hearing. Both are mostly nocturnal, preferring to explore and forage in low light.

Other species commonly used in laboratories include rabbits, hamsters, rhesus monkeys, dogs, and cats. Each of these species has a suite of senses adapted to the natural habitats in which they evolved. Be it through good vision, hearing, touch, and/or smell, each is acutely tuned in to their surroundings.

Laboratory Environments

Laboratory settings are profoundly different from natural settings. Animals are kept in small, usually metal cages whose area is thousands of times smaller than the smallest home ranges of their wild counterparts. Cages tend toward barrenness, with little opportunity to engage in such natural behaviors as burrowing, climbing, exploring, foraging, and choosing social partners. Many animals are housed alone, and many have no shelter to hide in. Studies in which animals are given a preference, for example, between a cage with or without company, or a shelter, indicate that meeting these needs is very important to these animals. Lack of tactile contact with other rats, for instance, is believed to underlie the self-biting and tail manipulation observed in isolated rats.

Many seemingly silent laboratory activities produce intense noise in the ultrasonic spectrum to which rodents are sensitive. These include computing equipment, cage washers, hoses, running taps, squeaky chairs, some fluorescent lighting, and husbandry procedures such as emptying food pellets into hoppers. Loud noises can trigger seizures, reduce fertility, and cause various metabolic changes. Chemical solvents used to clean cages, and detergents, perfumes, and companion animal scents on human handlers are known to be aversive to rodents. Feeding regimens, consisting of cakes of processed chow, tend to be monotonous.

In sum, laboratory environments are highly restrictive, and they afford the animals little opportunity to perform highly motivated natural behaviors, or to control their situation. It is sometimes claimed that laboratory-bred animals are unlike their wild ancestors, and that they don't

have the same needs. But animals bred in cages for hundreds of generations still retain their ancestral behaviors, as shown by studies in which they are released into natural habitats.

Routine Sources of Stress

Animals in laboratories are commonly subjected to a variety of husbandry, monitoring, and sampling procedures. These include cage cleaning and moving, picking the animal up, and restraining the animal for other routine procedures such as weighing, injections, and gavage or force-feeding. Blood is often required to monitor animals' progress before, during, and/or after a study, and various methods are used to bleed the animal. In rodents, blood may be drawn by needle from the tail vein, from the tail by cutting off the tip, or from just behind the eye with a very thin broken glass tube called a micro-pipette, a technique called post-orbital puncture. In rabbits, blood is often drawn from the ear, where veins are easily seen. Monkeys can be trained to offer a forearm to have blood taken in return for a treat, but routinely they are restrained instead.

It may be asked why procedures that don't cause physical pain, such as handling and cage maintenance, can be stressful to animals in labs. Context helps provide an answer. Life in the wild, while not always safe or easy, nevertheless provides a starkly different living situation for an animal. In the wild, animals have responsibilities. They exercise much more control over their lives. They decide when and where to forage or explore, what to eat, who to associate with and who to avoid, how much light they are exposed to. If they get too hot, they seek a cooler place, and vice versa. If they tire of eating a certain food, they can choose to go in search of another.

In the laboratory, these decisions are not theirs. The loss of autonomy and opportunity to engage in meaningful behaviors can cause stunted brain growth and the development of abnormal behaviors such as stereotypies, self-mutilation, excessive aggression, etc. It is well established that these circumstances, coupled with unpleasant or painful stimuli, can produce harmful levels of stress. In the laboratory, the appearance of someone wearing a white laboratory coat often precedes a painful or otherwise unpleasant event, so we may expect animals to become stressed.

Why Study Stress?

There has been a large amount of research on stress, partly because prolonged stress can make individuals more vulnerable to illness. In turn, stress may be an important confound, that is, an undesirable factor that makes it harder to interpret the meaning of experimental results. Many scientists, interested in the possible effects that day-to-day laboratory routines might be having on animals' stress levels in the laboratory, have set out to measure stress responses to these procedures. Most of these studies have involved caged mice or rats, but there are also data on stress responses in monkeys, hamsters, rabbits, and several wild species.

How to Measure Stress?

There are various ways to measure stress in animals that can't be asked how they are feeling. One of the most common is to measure blood components, especially the stress hormone corticosterone. To do this, blood is

typically collected and analyzed before and after the stressful event. Because blood collection is itself stressful, it is important that the blood be collected quickly to minimize this confound. One method is to have a tube permanently inserted into a vein so that blood can be automatically drawn at any time without causing any additional stress to the animal.

Other blood measures associated with stress include growth hormone, glucose, insulin, epinephrine, and prolactin. Glucose and epinephrine (more commonly known as adrenaline), for example, are released into the bloodstream as a preparation for a fight-or-flight response to a perceived threat. Other, less invasive measures include blood pressure, heart rate, and body temperature, all of which tend to rise with stress. Behavioral measures of stress include freezing in place, that is, remaining completely still, a classic fear response in small mammals, moving and rearing less and, in rodents, defecating more. However, some nonstress situations might also cause increased activity, so one has to be careful in interpreting the meaning of results.

Stress Responses to Laboratory Routines

Jonathan Balcombe has reviewed eighty previously published studies documenting the potential stress associated with three routine laboratory procedures commonly performed on animals: handling, blood collection, and gavage. Handling was defined as any noninvasive manipulation occurring as part of routine husbandry, such as picking the animal up, moving the cage, and/or cleaning the cage. Most of these studies were performed on mice and rats.

In rodents, handling procedures generated average maximal increases in blood corticosterone levels ranging from 63 to 338 percent above a baseline measured before the stressor. Heart rates rose by between 20 and 46 percent, and blood pressure by between 15 and 34 percent. Blood collection caused comparable increases in corticosterone, though one study documented an increase of 595 percent among ten male mice bled from the tail tip. In three studies of rabbits bled from the ear vein, blood glucose levels rose between 24 and 120 percent. Six studies of monkeys bled from a leg vein documented cortisol increases from 40 to 66 percent. Force-feeding of rats generates a suite of short- and long-term stress responses, including corticosterone increases up to 596 percent, weight loss, death of liver cells, and death.

These responses were not fleeting. Typically, they lasted from 30 to 60 minutes, and sometimes longer. This is consistent with a lasting painful and/or emotional response rather than a brief feeling of excitement or anticipation. Overall, these results indicate that despite their routine use in laboratory studies, these procedures are acutely stressful for animals. As one of the scientists who conducted some of these studies noted: "Care should be exercised in dismissing a procedure as non-stressful just because it is simple or routine."

Several studies have also addressed the possibility that animals might be stressed by witnessing another animal in pain or distress. Being in a room where other rats were subjected to routine cage changes, handling and weighing, blood collection, or killing (by beheading) caused significant increases in various stress measures in rats. Mice and monkeys have shown similar witnessing effects. In a study conducted at McGill University in 2005, mice were injected with painful irritants into the

stomach or paws. This caused these mice to writhe in pain. When a writhing mouse could be observed by another mouse, the witnessing mouse became more sensitive to pain, but only if the writhing mouse was a familiar individual. This result suggests that mice can show empathy for another whom they know, such as a mate, a social companion, or a sibling.

In summary, routine procedures commonly performed in laboratories are stressful to the animals being used. It may be concluded that significant fear and stress are predictable consequences of routine laboratory procedures. Animals can remember past events that were painful or unpleasant, and they can anticipate and fear a repeat performance. As science reveals more about the sensitivities and emotions of animals once dismissed as unfeeling things, whether or not humans should be deliberately harming animals in laboratories is likely to come under closer scrutiny.

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Jonathan Balcombe

STRESS ASSESSMENT, REDUCTION, AND SCIENCE

What Is Stress?

Evidence is gradually accumulating that the majority of mammalian research animals, particularly rodents, are mentally stressed by their living conditions. Stress in rodents will be specifically addressed because they account for about 90 percent of all research animals. Stress is generally defined as a state in which an individual perceives that the needs for adaptation to a new or excessive demand or to a different environment exceed the personal resources that they have available. Thus psychological as well physical components play a role in the stress response, at least in the more complex animals. The physical aspect of the stress response is fuelled by stress hormones that flow through the body, altering every organ and biochemical function, with wide-ranging effects on metabolism, growth, and reproduction. These changes may not necessarily result in a reduction in physical fitness, at least initially. In addition, the animals' physiological systems will be affected to a varying degree according to the threshold of the stress response for each individual animal.

Why Care If Laboratory Animals Are Stressed?

If animals are under stress, they can have permanently raised concentrations of stress hormones. In the case of rodents, those that cope by increasing their physical activity show high stimulation of the sympathetic autonomic nervous system and consequent release of epinephrine

and norepinephrine, whereas in those who cope passively, the parasympathetic nervous system is activated. In both cases, the hypothalamus/adrenal/pituitary axis is stimulated, leading to greater release of corticosterone. Other stress-induced biochemical changes can include reduced concentrations of sex hormones and compromised immune systems. Although it is true that stress does not always compromise health and welfare, and that the stress response is necessary for survival in the wild, stress, particularly when elicited repeatedly, disturbs the body's homeostasis and imposes a cost on the body. This cost arises if stress-induced mediators such as adrenal hormones, neurotransmitters, and cytokines are released too often. Another problem, more pertinent to animal research than to animal welfare, is that the degree to which a given stressor elicits these responses will vary between animals, even between those of a similar species and strain. These uncontrolled variables make such animals unsuitable subjects for scientific studies.

Researchers often dismiss questions concerning environmental influences on their experimental data by claiming that such effects cancel out because all of their control animals are housed under the same conditions. But the conclusions drawn from such experiments are specific to the stressed animals and cannot necessarily be extrapolated to healthy animals. The increasing use of genetically modified mice since their advent twenty years ago amplifies this problem. Genetically modified mice either lack a specific gene or gene-pair (knock-out mice) or carry a piece of foreign DNA integrated into their own chromosomes (transgenic mice), and are used to deduce the functions of particular genes. Studies are beginning to show that an animal's environmental conditions can completely change the results of genetic studies. As stated by Poole (1997): "It is essential that the stress status of laboratory animals is monitored and controlled because stress may alter the experimental data obtained from those animals."

How Do We Know If Laboratory Animals Are Stressed?

The most practical method for determining whether laboratory animals are stressed is by observing their appearance and wakeful behavior. Of course, taking blood samples and measuring concentrations of stress hormones would appear to be a more accurate way to evaluate stress levels, but this process alone can actually cause stress. Symptoms of stress in rodents which are easily observable include redness around the eyes and on the scruff of the neck, reflecting inflammation. These symptoms mainly arise from excessive grooming of themselves and their cage-mate(s), an activity that is seen in a range of stressful situations. Other behavioral responses to stress include increases in total activity and rearing onto the hind legs. However, individual rodents, even those from the same strain, cope with stress in different ways. Coping mechanisms may vary even within the same rat. Active copers show more active behavior, driven by the fight or flight response, whereas passive copers respond by hiding or, if that is not possible, by freezing. Although, with practice, it is fairly easy to determine whether or not rodents are stressed just by observing them, many laboratory rodents continue to be housed in a stressful environment. This is partly because rodents are nocturnal and most of the observations of their behavior are made during the day when researchers are performing experiments. Unless the

rodents' light/dark cycle is reversed, this means that most observations will be made when the animals are asleep, and so any behavioral indicators of stress will not be manifested.

What Makes Laboratory Animals Stressed?

Although laboratory animals do not lack essential physical needs such as food and water, there are many major and minor environmental perturbations encountered in animal facilities that can significantly contribute to a stress response in the animals. For example, when an animal is moved to a new cage, increases in blood pressure, heart rate and locomotor behavior occur, which are indicative of a stress response. With regard to the environment in the rooms inhabited by laboratory animals, the lighting, temperature and humidity are usually well controlled. However, there are many uncontrolled sources of noise in animal facilities, most of which derive from human activities. These include high-pressure hoses, cage cleaners, and air-conditioners or heaters, squeaking doors, carts, and movable chairs, and jangling keys. Rodents, in particular, are sensitive to these noises, and studies show that this sensitivity does not diminish with time, as is commonly assumed. These noises can alter rodents' behavior and even adversely affect their health. Yet, surprisingly, many scientists are unaware that loud noises in their animal facilities can affect research outcomes and compromise their data.

The noise and vibration of building construction have caused major problems with rat behavioral studies and experiments requiring unstressed control rats. One study in rats (Shepherd et al., 2004) even showed that building-induced stress rapidly inhibited glucose absorption by the intestinal transporter, GLUT2. Several studies have shown that noise in animal care facilities can reach as high as 90–100 dB. Such levels of noise can induce physiological and behavioral responses in laboratory rodents such as increased plasma corticosterone levels, reduction in body weight, decrease in gastric secretion, changes in immune response and tumor resistance, and a decrease in reproductive function. Much of the noise in institutional animal facilities is caused by personnel activity, because measurements have shown that environmental noise levels decrease dramatically at night and during the weekends.

Apart from noise problems, research animals are often housed in small cages with no source of enrichment, such as wheels, shelves, or tubes. Such devices enable animals to exert some control over their environment, such as escaping an attack from a cage-mate by moving to another level in the cage or hiding. Often, researchers are unwilling to include such items in their animals' cages because other researchers do not. However, rigorous standardization of the environment, particularly if it leads to barren surroundings, increases the risk of obtaining results that, because they are specific to a narrow set of conditions, cannot be compared with other researchers' results. The word boredom is used to describe the experience of animals who spend their lives in highly monotonous environments. Sometimes the animals fill the time with abnormal behaviors including excessive grooming of self and cage-mate(s), and repetitive patterns of movement known as stereotypies. The excessive grooming can cause regions of inflammation, especially on the neck area. These behaviors disappear when the animals are provided

with a chance to make choices, such as to enter a tunnel which provides them with low light conditions and the security of a confined space, or to move to a different level of the cage to avoid the aggressive overtures of a cage-mate.

How Can We Reduce the Stress?

Although the effective control of all environmental variables all the time is impossible, reasonable attempts could be made to control those variables most likely to interfere with the work. In order to ensure the validity and usefulness of animal experimentation, it is necessary to provide conditions that minimize stress-related activities and that allow the animals to perform the behaviors normal for their species. Probably the problems that require the most immediate attention are the absence of adequate species-specific enrichment items and the lack of adequate noise control. To address the need for appropriate items of enrichment, normal and aberrant behaviors for each species could be agreed upon institutionally and a list made available to all investigators. Designing cage environments to suit animals' psychological and physiological needs would be far preferable to the minimalism, otherwise known as standardization, that is currently employed. The exact conditions used to achieve these goals would probably vary between laboratories, but the end result would be similar. Both the welfare of research animals and the quality of the science would be markedly improved, leading to data that could be meaningfully applied to our quest for medical knowledge.

With regard to the noise issue, the latest edition of the *Guide for the Care and Use of Laboratory Animals* recommends that noise control should be considered in facility design and operation. To the greatest extent possible, activities that might be noisy should be conducted in rooms or areas separate from those used for housing animals, especially rodents. In addition, the guide suggests that excessive and intermittent noise can be minimized by training personnel in alternatives to practices that produce noise, and by the use of cushioned castors and bumpers on carts, trucks, and racks. However, it is difficult to estimate the degree to which these particular recommendations are currently being followed. A recent survey (Baldwin et al., 2007) indicates that such precautions to minimize noise are still often ignored in animal facilities in the United States. In addition, the guide's recommendations for noise levels may not be adequate to protect research animals. While the guide specifies a value of 85 dB SPL as the maximum allowable noise level, studies in the literature have shown that noise intensities as low as 73 dB SPL can significantly increase the concentration of stress hormones in the plasma of rodents.

There are several relatively simple and inexpensive solutions to the noise problem. For example, noise levels in an animal facility have been reduced by as much as 15 dB using readily available industrial and architectural acoustical panels. Electronic noise-canceling equipment is now available, and the cost of this technology is becoming more reasonable. Animal research facilities are a prime site for justifying installation of such systems. Principal investigators with research animal programs can be provided with data on environmental stressors, particularly noise, that is recorded in the rooms in which their animals are housed. With minimal additional effort, continuous tracking of significant changes in noise,

temperature, air flow, and light intensities could be added to facility monitoring, enabling remedial actions to be effected in hours or days, rather than weeks, months, or even years.

Husbandry and laboratory technicians should be made aware that typical, apparently minor, noise sources that they either encounter or produce may affect their animals' level of stress, and that this may confound research outcomes. They must also appreciate the importance of performing their duties quietly, and of reporting noisy incidents, either acute or chronic, to their supervisors and to the principal investigators. Even the jangling of keys can disturb rodents and produce variable alterations in their physiology. Riley (1981), who demonstrated that mice in conventional animal facilities had plasma corticosterone values more than ten times greater than mice from special low stress housing, stated that "few technicians or research scientists are good judges of moderate stress." At present little formal training is required for animal caretakers and animal technicians in universities in the United States. Although the American Association for Laboratory Animal Science operates animal technician education programs, little emphasis, if any, is placed on the deleterious effects of noise on the validity of data obtained from experimental animals. Such information should be a required component of institutionally conducted training courses required prior to working with animals.

The United Kingdom Farm Animal Welfare Council sets forth the following basic requirements for farm animal in its Welfare Code in terms of freedoms. These are: Freedom to express normal behavior by providing sufficient space, proper facilities, and company of the animal's own kind, and freedom from fear and distress by ensuring conditions and treatments that avoid mental suffering. These freedoms are described as being ideals that anyone with responsibility for animals should aim to provide. Many researchers believe that we are just as surely required to ensure that these freedoms are also provided to laboratory animals.

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Ann Baldwin

STUDENT ATTITUDES TOWARD ANIMALS

Since the publication of Singer's *Animal Liberation* in 1975, print and electronic news media, movies and television sitcoms, and textbooks and popular books

have increasingly concerned themselves with issues relating to the treatment of animals. As a result, students have been exposed to and have formed opinions about issues ranging from hunting and trapping to the use of animals in research, product testing, and the classroom. The diversity of their views is indicated by a study which distinguished 10 different attitudes toward animals found in the American public. Some of these are ecologistic, humanistic, moralistic, dominionistic, aesthetic, utilitarian, and negativistic. While there is a considerable diversity of attitudes, individuals hold hard attitudes. This means that at an early age individuals form strong views toward animals, and these particular views are enduring.

Numerous studies have established that gender is the most powerful predictor of an individual's general attitude toward animals. For example, one investigator found that, in 10 of 15 countries studied, with a trend in the same direction in the remaining five countries, women opposed animal research significantly more than men (Pizer, Shimutzu, and Pifer, 1994). The reasons for this gender gap are not fully understood, but implicate differences in parental views of girls and boys, such as the importance given in the socialization of girls to developing caring and nurturing relationships.

Age is also an important variable, with younger people being more concerned with animal welfare. It is not known whether the link to age is a generational one, that is, younger people like animals more, or whether it is true of this cohort, in other words, that these people will retain these views as they get older. Studies on vegetarianism showed that a greater number of young people are vegetarian than had been the case in the previous decade. Another group of investigators suggests that "decline in [laboratory] work with animals stems largely from changing student attitudes" and that these attitudes "... are in tune with current widely shared concerns for the natural environment and animal welfare" (Driscoll, 1992). These studies suggest that the concern with animal welfare is changing and is not just a youthful phase.

The correlation between attitudes toward animals and amount of education, specifically science education, is also unclear. One study found no significant relation between degree of scientific knowledge and attitude, while a second found that more scientifically knowledgeable young adults were less likely to oppose animal research.

Attitudes toward animals are also related to political and ideological positions. Liberalism, as compared to conservatism, is associated with more pro-animal views. As compared to a group of college students, animal rights activists attending a large national protest are more likely to have a high degree of confidence that moral behavior will really produce positive results, and to have a moral philosophy that rejects relativism and relies on universal principles. Further, those who take up the cause of animals are also more likely to be concerned about discrimination against certain classes of people. Support for animal rights is associated with more tolerance of human diversity, specifically, acceptance of rights for women, homosexuals, and ethnic minorities. Concern for the welfare of human and nonhuman animals is typically held by the same individual. One final variable is personality type. People who rely more on intuition and feeling and are more focused on relationships are more likely than thinking types to oppose animal research.

In terms of actual positions on the issues, there is as indicated a diversity of views. Taking attitudes toward animal research as an example, evidence as to the general level of opposition to the use of animals in research is mixed. Although a number of studies found that on average individuals espouse a middle position, the extensive study of individuals in 15 countries discussed earlier found a high level of opposition.

See also Dissection, Student Attitudes to; Sociology of the Animal Rights Movement; Student Rights and the First Amendment.

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Kenneth J. Shapiro

STUDENT OBJECTIONS TO DISSECTION

Increasingly, students have been objecting to dissection in the classroom on ethical grounds and demanding the student rights option, a policy that guarantees the right of a student to an alternative educational exercise. As a legal issue, their objections pit the rights of students to freedom of religion or, more broadly, of conscience, under the First Amendment of the federal Constitution against teachers' rights to academic freedom. The claim against dissection is based on the civil liberties of a human animal, the student, and only indirectly implies a claim to rights for animals. To date, in several cases, the courts appear to be sympathetic to student claims.

A second issue raised by dissection in the classroom is whether using animals in laboratory exercises is an effective way of teaching anatomy, medicine, or behavior. Based on over 30 published studies, it is clear that the use of alternatives such as computer software, models, and transparencies are at least as likely to achieve the intended instructional goals. Increased technological advances, such as imaging that allows the student to view, for example, the nervous system at any level, to rotate the image, to make certain layers opaque and others transparent, to cut away certain layers, and to repeat these operations in reverse, add an overwhelming advantage to alternatives.

Supporters of dissection frequently argue that hands-on experience is essential to the student's education. There is no evidence supporting this claim. Further, the term must be redefined to reflect current practices. Increasingly, as techniques of observation and intervention become more sophisticated, both for scientist and surgeon, hands-on is coming to refer more to the microscope, computer, and television monitor than to direct observation and manipulation of organs and body parts.

A number of studies have explored the impact of the experience of dissection on student attitudes and psychology (Balcombe, 2000; Shapiro, 1991; Hepner, 1994). There is evidence that it generally decreases sensitivity and empathy. In a study of adults formerly involved in classes involving dissection, it was found that most people remember

their first lab dissection vividly, with strong associated feeling, and many consider it an important experience of their childhood or adolescence. For a minority of these, the memory has some features of a traumatic event; it is easily remembered and negatively emotionally loaded. Interviews with these adults and with students currently involved in classroom dissection suggest several reasons why this experience is emotionally loaded for most individuals, and negatively so for a minority: (1) Unresolved issues around the early exploration of death by young people in this culture are part of what gives emotional loading to the experience of dissection. Whereas children are exposed to death and violence graphically through television and other media every day, often they are shielded from direct exposure to serious illness, dying, and death when it strikes loved ones. For this reason, the killing, dying, and death of a frog or rat in the classroom tends to assume significant psychological importance. (2) Dissection teaches lessons that are, for some, strikingly at odds with the constructive adolescent self-discovery process. Instead of being associated with individuality, integrity, and privacy, the body is objectified, reduced to internal workings, and publicly displayed. (3) In dissection, there is public encouragement and sanction of the otherwise censured impulse to kill and/or mutilate. This likely arouses a developmentally early form of evil called defilement, a common childhood experience exemplified by pulling the wings off a butterfly or tormenting other small animals. The impulse to defile is a mixture of disgust and fascination at the suffering of another individual.

See also Alternatives to Animal Experiments in the Life Sciences; Alternatives to Animal Experiments: Reduction, Refinement, and Replacement; Student Attitudes toward Animals; Student Rights and the First Amendment.

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Kenneth J. Shapiro

STUDENT RIGHTS AND THE FIRST AMENDMENT

The free exercise clause of the First Amendment to the U.S. Constitution provides that "Congress shall make no law. . . prohibiting the free exercise" of religion. Although the U.S. Supreme Court has not yet had an opportunity to interpret this First Amendment guarantee in the precise context of a student objection to dissection and vivisection in the classroom, the Court has guaranteed First Amendment protection in cases that are relevant to the issue.

The Supreme Court has long drawn a distinction between belief and conduct in the context of interpreting the constitutional guarantee of freedom of religion. In *Cantwell v. Connecticut* (1940), the Court held that the free exercise clause "embraces two concepts—freedom to believe and freedom to act. The first is abso-

lute but, in the nature of things, the second cannot be. Conduct remains subject to regulation for the protection of society." That is, government cannot regulate religious belief and can only regulate religious conduct, a notion that was upheld in *Thomas v. Review Board* (1981).

The legal framework established by the Court and Congress involves six elements for evaluating the suitability of the regulation of conduct that is claimed to be protected by the free exercise clause of the First Amendment. First, the regulation must constitute state action. The reason for this requirement is that, with certain exceptions not relevant here, the U.S. Constitution protects us only from the action of some branch of government. Although there may be other federal and state laws that apply to the actions of private institutions, a claim under the First Amendment requires that the student show that there is a legally relevant relationship between either federal, state, or local government and the challenged regulation, so that the regulation may be treated as an act of the state itself. For example, a requirement to vivisect or dissect imposed by a state university would constitute state action. The same requirement imposed by a private school, even one that receives state money, may not qualify as a state action, depending on the relationship of the private institution to the government.

Second, the First Amendment's guarantee of freedom of religion protects only religious or spiritual beliefs and does not protect bare ethical beliefs. It is important to understand, however, that the Supreme Court has held quite clearly that the religious belief need not be theistic or based on faith in a God or Supreme Being, and that the claimant need not be a member of an organized religion. So, for example, a person who accepts reverence for life as a spiritual belief, but who does not believe in God per se, would qualify for First Amendment protection. Finally, it is not necessary that the belief be recognized as legitimate by others who claim to be adherents of a religious or spiritual doctrine. So, for example, it is not relevant to a claim that the killing of animals is contrary to Christian belief that others who identify themselves as Christians feel that animals have no rights and should not be the subject of moral concern.

Third, the student who asserts a First Amendment right must be sincere. If, for example, a student objects to vivisection on the ground that it violates the student's belief in the sanctity of all life, the fact that the student eats meat, wears leather, and trains fighting dogs for a hobby may indicate that the student's asserted concern for the sanctity of all life is insincere and should not be protected.

Fourth, the state action must actually burden the religious belief. This requirement is not usually a problem in the context of student rights to oppose animal exploitation, because in most cases the state is conditioning the receipt of a benefit, that is, an education, on the performance of an act, that is, vivisection or dissection, that is proscribed by the student's religious belief system.

Fifth, once it is determined that the state is placing a burden on a sincerely-held religious or spiritual belief, then the state may have the burden to prove that the regulation serves a compelling state interest. That is, the state must prove that there is a very important reason for the regulation. In the last decade, the U.S. Supreme Court has stated that if a law is neutral and of general applicability, the state does not have to justify it by a compelling state interest even if the law

has the incidental effect of burdening a religious practice. Normally, schools argue that the state has a compelling interest in establishing educational standards. That may very well be true, but if the school has exempted other students from having to vivisect or dissect because, for instance, they happened to be ill on the day of the lab, then the objecting student can show that the requirement of dissection or vivisection is not being neutrally applied, and the claim that the state has a compelling interest in particular educational standards has less force.

Sixth, the state must show that the requirement is the least restrictive means of satisfying any state interests. For example, if there are educationally sound non-animal alternatives to the vivisection/dissection requirement, then the state must allow such alternatives. The quality and availability of educational materials that do not use animals has improved significantly in recent years.

In addition to the protection afforded the free exercise of broadly defined religious and spiritual beliefs protected by the First Amendment, there may be other federal and state laws that are relevant to the student's claim, depending on the particular case. Other relevant federal laws concern freedom of speech and association, due process and equal protection, procedural due process, and civil rights. Other relevant state laws include state, as opposed to federal, constitutional guarantees, as well as laws concerning contract, tort, and discrimination within educational institutions.

Several states (California, Florida, Illinois, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, and Virginia) have provided for a limited statutory right to object to vivisection and dissection. These laws usually apply to students in kindergarten through high school, and provide the student with the right to choose a non-animal alternative without being penalized. Other states have or are developing educational policies approving of alternatives.

See also Dissection, Student Objections.

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Anna E. Charlton

T

TELEOLOGY AND TELOS

Following the Scientific Revolution, epitomized in Newtonian physics, the fundamental metaphor encapsulating society's conceptual characterization of nature was the machine. As articulated most clearly in Descartes, even biology came to be seen as best expressed in terms of physics and chemistry, culminating in the ascendance of molecular biology, and reductionism as the aim of science in the 20th century.

It is thus important to recall that historically the longest reigning approach to understanding nature was the teleological, functional worldview of Aristotle, which held sway from 300 BC until the Newtonian revolution. In Aristotle's conceptual scheme, emerging from his orientation as a biologist and as a philosopher of ordinary experience, teleology meant that the world was an assemblage of functions defining the natures or essences of natural kinds of things. A thing was what it did; its essence was its final cause. Contrary to some of his predecessors such as the atomists Democritus and Leucippus, there was no ultimate science of all things for Aristotle. Explanation, for Aristotle, was optimally done by reference to the laws and regularities specific to the sort of thing being explained, not by invoking general laws that apply to everything. If any science was the master science, it was biology, because the functional categories natural to explaining living things were the model for all explanation. Contrary to Descartes, physics became the biology of dead matter. Thus for Aristotle, rocks fell when dropped because their natural place was the center of the Earth, which was also the center of the universe.

Since the Aristotelian worldview became, in the hands of Thomas Aquinas, the worldview of medieval Catholicism, teleological explanations acquired a patina of conscious design by God never envisioned by Aristotle, and thus became seen by scientific revolutionaries as inherently equated with religion and superstition. Spinoza's blistering and unfair attack on references to final causes became emblematic of how scientists dismissed teleology.

It is essential to recall that teleological explanations do not entail either conscious divine design or consciousness on the part of the entity being explained teleologically. To say, for example, that the adrenal gland secretes adrenalin to prepare the body for fight or flight does not entail that it was consciously designed to do so or that it consciously strives to do so. In the same vein, saying that the thermostat regulates the room's temperature does not entail reference to awareness on the part of the thermostat. Darwin's account of natural selection is thus benignly teleological, and clearly not incompatible with a mechanistic account of a genetic

basis for selection. Similarly, it would be difficult to teach physiology without reference to functions and bodily purposes, yet such talk is not at loggerheads with the reduction of physiology to molecular mechanisms. Again, ecological explanations are inherently functional and teleological in explaining ecosystemic interactions. Obviously, explanations of human behavior by reference to conscious intentions are a form of teleological explanation, but not every teleological explanation involves reference to conscious intentions.

The notion of an animal's telos—the pigness of a pig, the cowness of a cow, its ultimate end—was rescued from the cemetery of dead ideas by Bernard Rollin's *Animal Rights and Human Morality* (1981) with the emergence of animal ethics in the 1970s and 1980s. The first contemporary book on animal ethics was Peter Singer's pioneering *Animal Liberation* (1975), based philosophically on the ethical theory known as utilitarianism, which defines morally good action as that which maximizes the pleasure of sentient beings in a given situation, or minimizes their pain. Since at least higher animals are sentient and capable of feeling pleasure and pain, they are to be included in the scope of moral concern, and our treatment of them is to be judged morally in terms of pleasure and pain. In Rollin's view, pleasure and pain are inadequate tools for analyzing human obligations either to animals or people. For Rollin, not all harm done to animals can be rationally encompassed under the rubric of pain. Causing fear in animals, or boredom, or immobilization, or separation from others they naturally interact with, as in pack or herd animals; in short many of the consequences of how we keep animals in agriculture or zoos, or use them in experimentation, are not naturally or reasonably characterized as pain, though certainly many such uses do involve pain. Indeed, it is demonstrable that animals will endure physical pain to escape from traps or to avoid a highly confined environment such as that of hens in battery cages.

In Rollin's construction of animal ethics, drawn from logically extending the basic moral principles we use in our societal ethic to evaluate treatment of people, it is patent that what we do to animals matters to them, but there are more sorts of mattering than what we call pain. According to Rollin, what we owe animals morally can best be captured by reference to the fundamental needs and interests embodied in their biological and psychological nature or telos. As the song goes, "fish gotta swim, birds gotta fly."

Rollin then argues that the societal ethic of Western democratic societies such as the United States protects key features of human nature such as speech, property ownership, assembly, and belief from oppression for the sake of society as a whole, by building protective fences around them known as rights. The Bill of Rights is a paradigm example. Violation of these elements of human nature matters to people. By the same logic, the concept of rights determined by telos should be extended to animals, and encoded in law, as restrictions on how animals are used. Rollin also argues that much of modern industrialized agricultural and research uses of animals significantly violate the interests dictated by their telos, for example, keeping a breeding sow in a 2' x 3' x 7' cage or crate for her entire productive life, or a nocturnal burrowing animal in a polycarbonate cage under illumination.

If one examines emerging laws for animals, and non-legislated changes in animal use across Western societies, one can indeed find evidence that the public

is greatly concerned that animal telos be respected. This is particularly manifest in Europe, where many agricultural systems violative of animals' basic interests have been abolished. In the same way, zoos that fail to respect animal telos, the state of the art fifty years ago, have largely been eliminated. Austere and impoverished environments for laboratory animals are being modified in favor of environmental enrichment, mandated by U.S. laboratory animal laws, as is control of pain and distress.

As far as providing a guidepost for fair treatment of the animals we utilize for human benefit, the notion of respect for telos provides a commonsensical, intuitively plausible consensus template for actualizing our moral obligations to other creatures.

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Bernard E. Rollin

TOXICITY TESTING AND ANIMALS

There is a movement to refine, replace, and reduce the number of animals used in toxicity experiments in scientific research. The term "the 3Rs" was generated by Russell and Birch in their 1959 book *The Principles of Humane Experimental Technique.* The 3Rs refer to reduction, replacement, and refinement of whole animal use in scientific research. The concept of alternatives does not necessarily refer to a complete eradication of animals from the research arena, but to an attempt to decrease the suffering of laboratory animals by reduction, replacement, and refinement.

A reduction alternative substantially decreases the number of whole animals necessary to perform a test. A number of *in vitro* assays are now being used as screening tests for the Draize test, a test for ocular irritancy, reducing the number of animals required to fully evaluate the potential irritancy of a chemical. A reduction in the numbers of animals could be possible if testing techniques are refined and made more sensitive in screening processes. A replacement alternative is one that entirely eliminates the need for whole-animal testing. For example, a replacement could be the use of an invertebrate instead of a vertebrate animal. Refinement alternatives are those that improve the design and/or efficiency of the test, therefore lessening the distress or discomfort experienced by laboratory animals. An example of a refinement to the Draize test is that the test is no longer performed using substances that are known to be severely irritating to the eye.

History of the Movement to Refine, Reduce, and Replace

By the 18th and 19th centuries, animal research had become commonplace. According to Andrew Rowan, author of the book *Of Mice, Models and Men: A Critical Evaluation of Animal Research,* several medical advances influenced

public perception concerning the benefits of animal research, including the development of ester anesthesia (1846), antiseptic surgical practices (1860s), and the identification of many disease-causing bacteria. Not everyone was in favor of using animals in experimentation, and the formation of organizations that opposed animal cruelty also started to appear at this time, particularly in Europe. The surge in animal protection was influenced by Darwin's theory of evolution, Jeremy Bentham's utilitarian argument against using animals ("The question is not can they reason, nor can they talk, but can they suffer"), and the prevailing Victorian sentiment of the time, that preventing cruelty to animals was seen as an extension to preventing cruelty to human beings.

The National Anti-Vivisection Society (NAVS) was the first organization formed to oppose animal experiments. Formed in 1875, with the help of Miss Frances Power Cobbe, the society helped motivate England's Parliament to pass the first national antivivisection law, the Cruelty to Animals Act, in 1876. The law required all experimenters to have permits, and it established guidelines for researchers. However, the Cruelty to Animals Act did not ban animal research entirely, and was therefore opposed by some antivivisection societies.

The first American antivivisection organization was formed in 1883, followed by the formation of the New England Anti-Vivisection (NEAVS) in 1895. The results obtained by American antivivisection, however, were far less impressive than those in England. The U.S. scientific community resisted most attempts to regulate the use of animals in research. Although U.S. antivivisection bills were frequently introduced in Congress beginning in the 1890s, none passed.

The antivivisection movement lost momentum after World War I, when the focus for animal humane societies shifted to establishing humane education programs and enforcing animal cruelty laws. During the 1950s, many humane societies established programs concerned with the humane care of laboratory animals, but such organizations were not publicly opposed to animal experimentation, and many humane societies compromised with medical establishments. For example, in 1952, the Metcalf-Hatch bill was passed in New York, which mandated pound seizure. Pound seizure required shelters to sell their cats and dogs to institutions that performed animal research. Andrew Rowan attributes the marginalization of the antivivisection movement to the success of well-organized, powerful lobbying efforts of medical researchers opposing antivivisection efforts, the lack of antivivisection resources, and the lack of credibility of antivivisection societies, which supported unorthodox medical theories such as repudiation of germ theory and vaccinations.

In the 1960s, the first efforts to raise funds for the development of alternative tests were successful, and groups formed with the specific aim of incorporating alternatives in accordance with the 3Rs philosophy. In 1962, the first European trust for moneys dedicated for the search of alternatives to animal testing appeared in the name of the Lawson Tait Trust. This British group formed the trust with the goal of working with medical researchers. Now known as the Human Research Trust, the fund continues to play an important role in funding the development of alternatives. The U.S. group, United Action for Animals, formed in 1967 and campaigned specifically for replacement alternatives. In 1969 the UK group, Fund

to Replace Animals in Medical Research (FRAME), raised funds and launched a quarterly publication called *Alternatives to Laboratories Animals* (ATLA) to disseminate pertinent information to scientists concerning the search for alternatives. In 1973, the Lord Dowding Fund, established by the National Antivivisection Society, began dispensing research grants to individuals *not* holding licenses under the UK Cruelty to Animals Act for research projects that did *not* involve the use of live animals for experiments likely to lead to the alleviation of human or animal suffering.

Private companies also donated to the search for alternatives to animal testing. A report that the Draize eye irritancy test seemed amenable to alternative options spurred animal activist Henry Spira to begin his campaign against the cosmetic industry to deter use of the test. The Draize test was a good test to challenge, because the suffering rabbits endured from the test could be made visible to the public. Spira pursued a very public campaign by exposing people to graphic images of suffering animals and asking society "if another shampoo was worth blinding rabbits." The illustration in Figure 1 was run as a full-page ad in the *New York Times* in 1980. Cosmetics companies were vulnerable because they promoted beauty, which contrasted starkly with appalling images of rabbits undergoing a Draize test. Cosmetic corporations are also reliant upon the public's financial support, in the form of purchasing products, for their longevity. Spira did not insist that the cosmetics industry end all animal testing immediately. Instead he asked cosmetics companies such as Revlon to donate money (one-hundredth of one percent of Revlon's net profit = $170,000) to search for alternatives and, in the meantime, to reduce the number of animals being used in Draize testing. Other companies followed suit. Avon and Bristol-Myers Squibb allocated one million dollars to John Hopkins University to establish the Center for Alternatives to Animal Testing (CAAT) in 1981, and in 1982 Colgate Palmolive provided $300,000 for the investigation of the chorio-allantonic membrane system (see CAAT web site: http:// http://caat.jhsph.edu/).

Legislation and the 3Rs

European legislative initiatives to aid in the search for alternatives to animal testing appeared well before U.S. attempts. In 1971**,** Council of Europe Resolution 621 suggested that an alternatives database be established. The first grant to be given to a group to aid in the search for alternatives to animals in testing was given to FRAME in 1984.

In the United States, by 1981, there were seven bills on alternatives and/or regulation of animal experimentation pending in the Subcommittee on Science, Research, and Technology of the House Committee on Science and Technology. In a subcommittee hearing, a draft of the bill that incorporated aspects of the seven prior bills was generated and referred to the House Committee on Energy and Commerce. Eventually, in 1985, the provisions of this bill were incorporated into the Health Research Extension Act, requiring those awarded research monies by the National Institute of Health to consider the use of alternatives.

Validation of Alternative Tests

The major obstacle to reduction, refinement, and replacement of animals in toxicity testing is validation of alternative

tests by appropriate regulatory agencies. Validation of *in vitro* tests required the establishment of new agencies to coordinate the processes of development, acceptance, and dissemination of information between scientists, regulatory agencies, and the public. Directive 86/609/EEC regulates the use of animals for experimental and other scientific purposes in the European Union. A Communication from the Commission to the Council and the Parliament in October 1991, pointing to a requirement in Directive 86/609/EEC for the protection of animals used for experimental and other scientific purposes, led to the establishment of the European Centre for the Validation of Alternative Methods (ECVAM). The U.S. National Institutes of Health Revitalization Act of 1993 established criteria for the validation and regulatory acceptance of alternative testing, and recommended the creation of a process to scientifically validate alternative methods so that they can be accepted for regulatory use. This Act prompted the creation of the Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM) and its support center, The National Toxicology Program Interagency Center for the Evaluation of Alternative Toxicological Methods (NICEATM). ICCVAM uses information from toxicological test methods to support human health or environmental risk assessments, and represents 14 different U.S. regulatory agencies. The recommendations regarding the usefulness of test methods provided by ICCVAM allows regulatory agencies to assess the risks of various test methods and make regulatory decisions.

Validation of alternative tests has proved to be an obstacle in the search for alternatives. Animal testing has long been the standard method companies utilize to test the safety of their products, and regulatory agencies have accepted animal tests as valid. Regulatory agencies have to be convinced to accept the validity of newer, alternative methods. There are many obstacles to convincing regulatory agencies, such as the Consumer Product Safety Commission, the Environmental Protection Agency, the Occupational Health and Safety Association, and the U.S. Department of Agriculture, to accept new methods of testing. Some obstacles include tradition, prior regulations, lack of validated *in vitro* methods, lack of a process to determine validity, and resistance from the biomedical community. Understanding the mechanisms by which *in vitro* tests work takes effort and training by those evaluating them. There is a certain comfort level in familiar tests that have always satisfied regulations.

There are a few alternative tests that are validated by the relatively newly formed ICCVAM, and therefore are accepted by regulatory agencies as qualified substitutions for traditional testing, including the Local Lymph Node Assay and Corrositex. The process of validation by ICCVAM is seen as a major success for the alternatives movement, because validating alternatives has been a complicated process. Validation of tests for toxicity will aid in the European drive to ban animal testing for cosmetics. There is currently a ban currently on finished cosmetic products tested on animals in the European Union. A future aim is to ban animal testing of cosmetic product ingredients, effective September 2009.

Validation of alternative methods will need to extend globally as the United States develops, imports, and exports more products. ICCVAM has a firm relationship with ECVAM, and both groups

will be instrumental in the validation of alternative processes. In the last few weeks of 2000, the ICCVAM Authorization Act was passed, which firmly established the organization's role in validating alternative methods in the future. Another success for the alternatives movement was the acceptance of an animal-friendly approach, Test Smart, toward the numerous studies that will be conducted in the future by various agencies to determine the hazardous potential of 2,200 U.S.-produced chemicals, namely, the High Production Volume Chemical Challenge. A future endeavor of ICCVAM will be to pursue alternatives to animal tests used to assess the toxins contained in popular anti-wrinkle treatments such as botox.

Replacement, refinement, and reduction will continue in the United States and Europe, decreasing pain and distress for laboratory animals. Total replacement of animal testing, however, will not take place in the near future. Some animal testing seems necessary at this point in time in order for regulatory agencies to fulfill their responsibility to the public to provide safe consumer products.

See also Alternatives to Animal Experiments: Reduction, Refinement, and Replacement

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Nicole Cottam

TRAPPING, BEHAVIOR, AND WELFARE

For an activity that affects millions of wild animals each year, little is known about the full impact of trapping on individual animals, wildlife populations, and ecosystem health; reviews and extensive references can be found in Papouchis, 2004 and Fox, 2004a,b. Political forces and lobbies have greatly influenced trapping research, especially in the United States, where commercial fur trapping and predator control trapping are considered sacred cows. Many scientists working with animals believe that trap researchers and wildlife management agencies should establish research protocols that ensure that behavioral and welfare parameters are included in trap research, and standards should be developed that adequately measure all trapping related impacts. Traps that fail to meet these standards should be immediately prohibited. By resisting and undermining efforts to reduce adverse effects of trapping, wildlife management agencies and trap researchers open themselves to public and scientific criticism, and face increasing pressure to address these issues. Animal rights advocates believe that, ultimately, as society places greater

value on wildlife and the humane treatment of all animals, use of traps and other management methods known to harm individual animals, wildlife populations, and ecosystem health will no longer be condoned.

More animals are trapped in the United States than in any other nation. Roughly three to five million animals are trapped and killed in the United States annually by commercial and recreational trappers (Fox, 2004a). Millions more are trapped and killed by wildlife damage and predator control trappers, researchers, and wildlife managers. Notably, there are few comprehensive assessments of the effects of trapping on animal welfare, behavior and physiology, and wildlife population dynamics.

The paucity of research on the effects of trapping on animal behavior and welfare reflects fundamental flaws and political biases in current trap-testing programs and the development of national and international mammal trap standards (Fox, 2004b). For example, the U.S. government is currently conducting a national Best Management Practices (BMP) trap-testing program to test leghold traps and other restraining traps on animals commonly trapped by recreational and commercial fur trappers. The BMP program was implemented as a result of pressure from the European Union to prohibit use of leghold traps in those countries that still allow their use. Instead of banning leghold traps, however, the U.S. government threatened trade reprisals if the fur ban was implemented, and instead agreed to conduct a national trap-testing program of traditional restraining traps. According to Tom Krause, editor of *American Trapper* magazine, one of the stated goals of the BMP program is to "maintain public acceptance" of trapping (Fox, 2004a). However, while injury rates, capture efficiency, and selectivity are part of the testing protocols, behavioral and overall physiological analyses are not. Previous studies that have considered the behavioral and physiological responses of animals caught in traps have shown that the trauma of being caught in a trap can alter the behavior of released animals, reduce survival rates, and disrupt the social dynamics of territorial species. That behavioral and physiological assessments are not part of the BMP trap testing protocols suggests that trapping proponents are unwilling to conduct comprehensive evaluations of traditional trapping devices for fear that such information could challenge the status quo and require that wildlife management agencies question the appropriateness of certain trap types and trapping practices.

Assessing the Impacts of Trapping

Research on trapping in the United States has focused primarily on trap injury rates, selectivity, and efficiency. In an effort to standardize the assessment of the injuries caused by body-gripping traps, several injury or trauma scales have been developed to quantify trap-induced injuries in restraining traps, and time to unconsciousness and death in killing-traps (Colleran et al., 2004). Physical trauma, however, is not the only measurement of trap impact. Psychological distress, fear, physiological stress, and pain can also be observed and assessed in trapped animals through behavioral analyses and stress-related hormonal and blood-cell measurements. However, at present no scoring system for restraining traps integrates physical injuries with behavioral and physiological responses (Proulx, 1999). Without such analyses, no com-

prehensive evaluation of the full impact of trapping on animals or the dynamics of wildlife populations can be made.

By intentionally underestimating the adverse effects of traps on animals, use of inhumane traps can be more easily justified by those with a vested interest in ensuring their continued use. The steel-jaw leghold trap, a device condemned as inhumane by the American Veterinary Medical Association, the American Animal Hospital Association, the World Veterinary Association, and the National Animal Control Association, is still one of the most widely used traps in the United States today. Leghold traps can cause severe swelling, lacerations, joint dislocations, fractures, damage to teeth and gums, limb amputation, and death (Papouchis, 2004). Many injuries result from the animal's struggle to escape, while others are incurred from the clamping force of the trap's metal jaws on the animal's limb. Unpadded steel leghold traps have been shown to cause significant injuries to a number of commonly trapped species, and generally fail to meet basic trap standards with regard to injuries.

These traps are widely used by the U.S. government in its federal predator control programs. While more than 80 countries have banned the controversial device, leghold traps remain legal in most U.S. states and public land systems. In 1995, the European Union banned the use of leghold traps in member states and sought to bar the import of furs from countries still using these traps. The United States, one of the world's largest fur producing and consuming nations, continues to defend commercial fur trapping and the use of the leghold trap, and even threatened the EU with a trade war if it prohibited the importation of fur from countries allowing the use of leghold traps (Fox, 2004b).

In addition to leghold devices, kill-traps are commonly used by wildlife managers and commercial fur trappers throughout North America. Kill-traps, also called rotating-jaw traps, have been shown to cause extreme trauma, pain, and stress to trapped animals. Conibear traps and other common models of kill-traps may not cause instant death, because of the numerous variables needed to produce a killing blow to the neck or head, that is, a correct-sized animal entering the trap at the correct angle and speed.

While few studies of kill-traps conducted in the United States have included comprehensive trap impact assessments, several studies conducted outside the United States have analyzed the behavioral, physiological, pathological, and/or clinical responses of trapped semi-aquatic mammals in drowning sets. Most of these studies have been conducted in Canada and other countries, where trap researchers are often more independent and less influenced by political lobbies than in the United States. Killing traps employed underwater reduces their efficiency, so that when the strike is of insufficient strength or improperly placed to kill the animal, they act as restraint devices, and death is caused by drowning. Leghold and submarine traps act by restraining animals underwater until they drown. Most semi-aquatic animals, including mink, muskrat, and beaver, are adapted to diving by means of special oxygen-conservation mechanisms. The experience of drowning in a trap must be extremely terrifying; animals have displayed intense and violent struggling, and death was found to take up to four minutes for mink, nine minutes for muskrat, and 10 to 13 minutes for beaver (Gilbert and Gofton,

1982). Mink have been shown to struggle frantically prior to loss of consciousness, an indication of extreme trauma. Because most animals trapped in aquatic sets struggle for more than three minutes before losing consciousness, Proulx (1999) concluded that they did not meet basic trap standards and could therefore not be considered humane.

Capture Myopathy and Post-Release Survival

The survivability and fitness of trap-injured wildlife remains largely unknown because of the lack of research in this area. However, several published reports document long-term adverse effects of capture and handling in carnivore species including black bears, grizzly bears, and otters, as well as reduced post-release survival as a result of trapping related injuries (Hartup et al., 1999; Powell and Proulx, 2003, Papouchis. 2004, Lossa et al. 2007; Cattet et al. 2008). Restraint in a trap can cause psychological stress or fear for an animal, as well as physical and physiological damage, including various forms of capture myopathy, a stress-induced condition in wild animals that frequently occurs following prolonged capture or chase also called capture myopathy (Hartup et al., 1999; Cattet et al., 2008) and can disrupt behavior and the social dynamics of territorial species (Banci and Proulx, 1999). Hornocker and Hash (1981) suggest that intensive trapping contributes to behavioral instability and home range overlap among resident adults.

Carnivores released with internal trap injuries to feet, limbs, teeth, or other body parts may be so severely injured that they are unable to survive in the wild due to their physiology and the methods by which they obtain food (Van Ballenberghe, 1984, p.1428). Tooth damage from biting on the trap and claw loss may also affect a carnivore's ability to catch wild prey (Lossa et al., 2007). Restricted blood flow to the limbs caused by leghold traps can lead to gangrene and subsequent reduced survival if a trapped animal is released without an examination of internal injuries and subsequent rehabilitation.

A recent study on the long-term effects of trapping and capture on bear found that "[s]ignificant capture-related effects might go undetected, providing a false sense of the welfare of released animals" (Cattet et al., 2008: p. 973). In measuring blood serum levels to assess muscle injury in association with different methods of capture, the authors found that both grizzly and black bear suffered significant physiological damage, including capture myopathy. The proximate cause for capture myopathy is likely a combination of fear and anxiety accompanied by muscle exertion. Fear is the single most important factor in capture myopathy. Wild animals frequently die of capture myopathy, but death may occur hours, days, or weeks after capture and release. Cattet et al. (2008) showed that injuries were most severe as a result of being captured in leghold restraining devices. The authors emphasized that such injuries may not be detectable to the naked eye, and cautioned all wildlife researchers who capture wildlife with traps to seriously consider the long-term effects of trapping wildlife, regardless of species.

It seems plausible that different species also will respond similarly when faced with similar stressors. This possibility should at the very least challenge persons capturing wild animals to evalu-

ate their capture procedures and research results very carefully. (Cattet et al., 2008: pp. 986–987).

Minimizing Impacts of Trapping in Wildlife Research

Whether trapping animals for scientific research, relocation, or reintroduction programs, wildlife researchers and managers require state-of-the-art, humane live traps. They need to know, for example, if a particular trap type may negatively alter an animal's behavior after it is released. Powell and Proulx (2003) argue that researchers should choose traps that minimize pain, stress, and discomfort, if for no other reason than to minimize the effect on the behavior and survival of animals, which ultimately affects research results.

Non-target animals trapped in leghold traps and then released may be so severely injured that they are unable to survive in the wild. Redig (1981) reported that 21 percent of the bald eagles admitted to the University of Minnesota Raptor Research and Rehabilitation Program over an eight-year period had been caught in leghold traps. Of these, 64 percent had sustained injuries that proved fatal. Oftentimes, trap-related injuries may be internal and therefore less readily apparent. Furthermore, the somatic and psychological stress to wild animals that can result from trapping can suppress their immune systems and significantly compromise their post release recovery (Jordan, 2001).

As animal ethologists and ethicists continue to demonstrate the cognitive, emotional, and behavioral similarities between humans and other animals (Fox, 2001), it will become increasingly difficult to justify continued testing and use of traps known to inflict fear, pain, and suffering on wildlife. Ideally, in the field of wildlife research, trapping will be replaced with less invasive methods that preclude the need for trapping. Track plates, hair traps, remotely triggered cameras, and DNA hair testing offer non-invasive alternatives to trapping. When trapping is necessary, researchers should ensure that traps minimize physical injury as well as behavioral and physiological stress. Researchers must also be aware that when they conduct what appears to be benign, least-invasive research that involves trapping, there may be post-release impacts that affect individual animal(s), and ultimately their research results (Powell and Proulx, 2003; Cattet et al., 2008).

See also Predator Control and Ethics; Wildlife Abuse; Wildlife Services

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U

URBAN WILDLIFE

The 21st century continues to bear witness to the relentless growth of human populations, along with the cities that have become our principal habitation. In 2008, an unheralded boundary was crossed when more humans globally came to live in cities than outside them. The transition from humans living in small social groups to a massive, urban, cosmopolitan populace has taken place in less than one percent of the time we have been identifiable as a species. We are, it seems, villagers confronting the challenges of big city life, and seemingly poorly equipped to deal with problems ranging from obvious social discord to our near-suicidal mistreatment of the natural world. Proponents of concepts such as biophilia and nature deficit disorder tell us that one of the more important consequences of urban life is that we are also becoming increasingly alienated from the natural world, in ways that can produce a lack of empathy, concern, and connection to other living things, humans included.

Abetting a moral and personal alienation from nature is the ever-growing burden of the urban ecological footprint. Cities not only dominate, directly and indirectly, the global ecology, they are also important ecosystems in their own right (Hadidian & Smith, 2001). The urban environment is characterized by both a high degree of landscape heterogeneity and a rapid change of landforms, primarily as a result of constant development activities. Wild animals that have long been urban residents, for example, squirrels, must cope with these, and species that are colonizing urban habitats, for example coyotes, must adapt. An ever growing and expanding zone of human-animal contacts characterizes city and suburb, wherein the majority of interactions are undoubtedly positive, while the more noticed, discussed, and attended to are undoubtedly negative. Any wild animal living in the urban environment can be, and certainly at one time or more has been, labeled a pest. Historically, wildlife authorities in North America have conducted pest control by using traditional approaches—hunting, trapping, and poisoning being preferred. Derived largely from an agricultural context, such practices have been deemed necessary as economic measures, but are harshly criticized for their moral presuppositions (Fox and Papouchis, 2004; Robinson, 2005).

Controversy and polarization arise from differing ethics of how we ought to relate to and live with nonhuman animals. Both specific practices, as well as the principles underlying the treatment of wild animals in the urban context, are rightly being questioned. Traditional wildlife control practices, such as the drowning of nuisance animals that have been caught in traps, deserve obvious criticism, because

science informs us that the method itself is inhumane (Ludders et al., 1999). Less obviously, but equally important, ethics tells us that the principle of conducting lethal control should be criticized as inhumane when it fails to establish a justifiable rationale for removing an animal in the first place.

The variety of wildlife conflicts within the urban or humanized environment is extremely diverse, the context always challenging. Beaver build dams in the floodplains from which they were long ago trapped out, but in which they are naturally appropriate occupants, while humans are not. Coyotes, at home in a variety of landscapes, including highly populated urban centers, prey on cats and dogs, bringing urbanites face to face with the realities of living with predators. Deer, after decades of propagation and habitat management to increase their numbers, become so abundant that it is claimed they are destroying entire forest ecosystems, not to mention Mrs. Smith's prized roses. Human culpability, in creating the fragmented landscapes of suburbia with edge habitat that promotes high deer and coyote densities, or occupying floodplains better left alone, typically goes unmentioned as either a causative or correctable factor when discussing how to address wildlife problems. Humans seem to always be the last to assign their own responsibility for conflicts with wild animals, while being the first to impose solutions on them that disregard the natural processes and balances that will provide the most lasting, environmentally responsible, and humane alternatives available. The ethics of such situations are being raised, whether invited and recognized, or not (Lynn, 2005b).

In many cities around the world numerous different species of urban wildlife can be seen. Here, a squirrel perches on top of a trash can looking for food. (Photos.com)

Contemporary human-wildlife conflicts have scientific, political, and moral dimensions that are not well addressed by traditional approaches in wildlife management. There is a critical need for a dialogue about these shortcomings to coincide with a growing recognition of the need for a dialogue on ethics in all fields of wildlife, as well as biodiversity management (Eggleston et al., 2003; Minter & Collins, 2005). Addressing this need through urban wildlife can provide a bridge to the social and biological dimensions of wildlife issues that addresses the real and practical concerns and needs of urbanites who, as the demographic dominating the political environment, are the decision-making majority. The superstructure of this bridge is ethics, to

help guide and inform the wildlife profession and the policies by which it operates. A practical ethic guiding our response to human-animal conflicts is both warranted and necessary.

Practical ethics is a very old paradigm of ethics that focuses on the full range of moral values that inform our lives, such as what is right, good, just, and caring. It looks to moral theories and concepts, as well as individual cases and their empirical realities, for insight in making ethical decisions. By honoring the insights coming from many moral theories, practical ethics creates a reservoir of concepts to triangulate on the best understanding of a moral problem. Because it is especially attentive to concrete and specific cases, practical ethics provides more fitting and contextual guidance for our thoughts and actions. Altogether, we term this a situated moral understanding (Lynn, 2005a). This is the approach in ethics that should inform urban wildlife policy and management, as well as articulate a vision of our place in a mixed community of people and animals.

It is fairly straightforward, not to mention scientifically defensible, that such principles as justification, proof of benefits, necessity, feasibility, minimization of harm, and humaneness all be included in an ethic for urban wildlife. But what about questions regarding intrinsic value? Here, the idea is that animals have value in and of themselves, independent of their extrinsic value, that is, what uses someone might have for them. The extrinsic value of animals is dominant in public discourse, but it may not be dominant in the public mind. Consider for example the many wildlife managers who treat wildlife as fungible units of ecosystems, but hold entirely different feelings of love and duty to the individual dog or cat they have brought into their lives. Some animals are pets, and some are pests, it seems, without much thought being given to what all animals are in the first place, which is individuals with their own unique life histories, personalities, interests, and accomplishments. Attending to questions of intrinsic value can help us sort out these tacit understandings. We cannot make wise decisions about urban wildlife management without acknowledging the intrinsic and extrinsic values at play.

Ethics, as it relates to urban wildlife, offers hope that a reconnection with nature can be made in a way that helps revitalize what is best about our relationship with the natural world. Where studies have been conducted to examine the attitudes and beliefs of urbanites toward wildlife a great deal of empathy and concern has been found (Kellert, 1997). These qualities, apparently fundamental to our species, seem to be amplified by the urban experience, perhaps because urbanites no longer rely directly on wild species for subsistence needs, or because urban living affords us the opportunity to view animals as subjects and members of a mixed community, not simply as objects for human use. We are becoming increasingly aware that our urban environments are not simply environmental wastelands, but are in their own way thriving and complex ecological communities. That is to say, they are at least potentially so, assuming we take prudent care of our urban spaces and all their inhabitants. Acknowledging that urbanites are a part of, and not apart from, the natural world will go a long way toward a needed rebalancing of values. Such acknowledgement also allows us to view

and experience our relationship with urban wildlife in new and different ways. For example, instead of seeing the coyote family inhabiting the green spaces in our community as frightening and alien predators, we can see them for what they truly are: natural and vital components of a dynamic and vibrant ecosystem deserving of respect and understanding. Such changes of mind would imply not only recognition of an obligation to work with natural processes, but to give urban communities, human and nonhuman both, the moral consideration to which they are due.

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UTILITARIANISM

The term utilitarianism is often used to describe any ethical stance that judges whether an action is right or wrong by considering whether the consequences of the action are good or bad. In this broad sense of the term, utilitarianism is equivalent to what is sometimes called consequentialism. It is opposed to rule-based ethical systems, according to which an action is right if it is in conformity with moral rules and wrong if it is in violation of these rules, irrespective of its consequences.

An example may help to make this more concrete. Is it wrong to break a promise? Those who base ethics on a set of moral rules and include keeping promises among these rules would say that it is. On the other hand, a utilitarian would ask: What are the consequences of keeping the promise, and what are the consequences of breaking it? In some situations the good consequences achieved by breaking the promise would clearly outweigh the consequences of keeping it.

This gives rise to a further question: What kind of consequences are relevant? According to the classic version of utilitarianism, first put forward in a systematic form by the English philosopher and reformer Jeremy Bentham, what ultimately matters is pleasure or pain. Thus classic utilitarians judge acts right if they lead to a greater surplus of pleasure over pain than any other act that the agent could have done. Bentham included in

his calculations the pleasures and pains of all sentient beings. In rejecting attempts to exclude animals from moral consideration, as virtually everyone did in his day, Bentham wrote: "The question is not, Can they reason? nor Can they talk? but, Can they suffer?"

Nowadays there are many who continue to call themselves utilitarians who, while still holding that the rightness of an act depends on its consequences, think that the idea that pleasure and pain are the only consequences that should count is too narrow. They argue that some people may prefer other goals. For example, a writer might be able to achieve a life of luxury by working for an advertising agency, but may prefer the long and lonely work of writing a serious novel. Bentham could claim that she thinks that she will get more lasting pleasure from writing the novel, but it is also possible that she simply considers writing something of lasting literary value to be more worthwhile, irrespective of how much pleasure it is likely to add to her life and the lives of others, than writing advertising copy. Considering such cases has led to the development of a form of utilitarianism known as preference utilitarianism. Preference utilitarians judge acts to be right or wrong by attempting to weigh up whether the act is likely to satisfy more preferences than it frustrates, taking into account the intensity of the various preferences affected. In this view, too, animals will count as long as they are capable of having preferences, and an animal who can feel pain or distress can be presumed to have a preference to escape that feeling.

Utilitarianism has great appeal because of its simplicity, and because it avoids many of the problems of other approaches to ethics, which can require you to obey a rule or follow a principle, even though to do so will have worse consequences than breaking the rule or not following the principle. On the other hand, this very flexibility may also mean that the utilitarian reaches conclusions that are at odds with conventional moral beliefs. Hence one of the most popular ways of attempting to refute utilitarianism is to show that it can, in appropriate circumstances, real or imaginary, lead to the conclusion that it is right to break promises, tell lies, betray one's friends, and even kill dear old Aunt Bertha in order to give her money to a worthy cause. To this some utilitarians respond by retreating to some form of a two-level view of morality, based on the idea that at the level of everyday morality we should obey some relatively simple rules that will lead us to do what has the best consequences in most cases, while in some special circumstances, and when assessing the rules themselves, we should think more critically about what will lead to the best consequences. Other, more tough-minded utilitarians say that if our common moral intuitions clash with our carefully checked calculations of what will bring about the best consequences, then so much the worse for our common moral intuitions.

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Peter Singer

UTILITARIANISM AND ASSESSMENT OF ANIMAL EXPERIMENTATION

Many defenders of animal experimentation maintain that the practice is justified because of its enormous benefits to human beings. While it is true that animals die and suffer, the defenders say that is morally insignificant when compared with experimentation's benefits. It is important to notice that this utilitarian defense of the practice assumes that animals have moral worth. Unless animals had moral worth, it would make no sense to say that we must include their deaths and suffering on the scales. If they are without value, or their value were morally negligible, the impact of experimentation on them would never enter the moral equation.

Utilitarians can judge conflicts between members of different species by saying that the moral worth of an action would be the product of the moral worth of the creature that suffers, the seriousness of the wrong it suffers, and the number of such creatures that suffer.

Many defenders of research often speak as if utilitarian cost-benefit calculation is easy. Frequently they cast the public debate as if the choice to pursue or forbid animal experimentation were the choice between your baby or your dog. However, this way of framing the question can be grossly misleading. The choice has not been, nor will it ever be, between your baby and your dog. Single experiments on single animals don't confirm biomedical hypotheses. Only a series of related experiments can confirm such hypotheses. Animal experiments are part of a scientific framework. Thus, we must change the moral question to: Is the practice of animal experimentation sufficiently beneficial to justify its costs?

Whatever the precise details of this utilitarian analysis, animal experimentation clashes with the moral codes against doing evil to promote some good, and inflicting suffering on one creature of moral value to benefit some other creature of moral value. That is, we do an evil to animals to provide good for humans. Moreover, the evil we do, inflicting suffering on animals, is definite, while the good we promote, preventing the suffering of humans, is only possible. Additionally, the creatures that suffer will not be the ones that benefit from that suffering. Dogs pay the cost of experimentation; humans reap the benefits.

The force of these codes of conduct is deep in our ordinary morality. Although undergoing a painful bone marrow transplant to save the life of a stranger is noble, we think that requiring a person to undergo that procedure would be wrong. Even if we think people should be required to make some sacrifices for other members of their species, most of us think that requiring the ultimate sacrifice would be inappropriate. For instance, even if we assume that nonhuman animals have less moral worth than humans, most people think there are some sacrifices animals should not have to make.

Abandoning these codes of conduct, though, would mean that nonconsensual moral experiments on humans could be justified if the benefits to humans were substantial enough. It would also require abandoning the idea of the moral separateness of creatures, a view central to all Western concepts of morality. For

instance, virtually everyone would be opposed to requiring people to give up one of their kidneys to save someone else's life. Thus, even if we assume that animals have less value than humans, this latter imbalance means that researchers must show staggering benefits of experimentation to justify the practice morally.

Moreover, when determining the gains relative to the cost of animal experimentation, we must include not only the costs to animals, which are direct and substantial, but also the costs to humans and animals of misleading experiments. For instance, we know that animal experiments misled us about the dangers of smoking. By the early 1960s, researchers found a strong correlation between lung cancer and smoking. However, since efforts to induce lung cancer in nonhuman animal models had failed, the government delayed acting.

Furthermore, since we should include possible benefits on the scales, we must also include possible costs. For example, some researchers have speculated that AIDS was transferred to the human population through an inadequately screened polio vaccine given to 250,000 Africans in the late 1950s. Although the hypothesis is likely false, something like it might be true. We know, for instance, that one simian virus (SV_{40}) entered the human population through inadequately screened vaccine. In fact, several hundred thousand people have been exposed to SV_{40} through vaccines and, in *in vitro* tests, the virus causes normal human cells to mutate into cancerous cells. Therefore it is difficult to know how researchers could possibly claim that there would be no substantial ill-effects of future animal experimentation. These possible ill-effects must be counted.

Finally, and perhaps most important, the moral calculation cannot simply look at the benefits of animal experimentation. It must look instead at the benefits that only animal research could produce. To determine this utility, the role that medical intervention played in lengthening life and improving health, the contribution of animal experimentation to medical intervention, and the benefits of animal experimentation relative to those of nonanimal research programs have to be ascertained. Since even the American Medical Association recognizes the value of non-animal research programs, then what goes on the moral scales should not be all the supposed benefits of animal experimentation, but only the increase in benefits compared with alternative programs. Since we do not know what these other programs would have yielded, determining the increase in benefits would be impossible to establish.

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V

VEGANISM

Vegans (pronounced VEE-guns) are people who choose not to eat any animal products, including meat, eggs, dairy, honey, and gelatin. Vegans do not wear fur, leather, wool, down, or silk, or use cosmetics or household products that were tested on animals or contain ingredients that were derived from animals. Most vegans also do not support industries that feature captive and/or performing animals, including circuses, zoos, and aquaria.

The American Vegan Society (2006) defines veganism as "an advanced way of living in accordance with Reverence for Life, recognizing the rights of all living creatures, and extending to them the compassion, kindness, and justice exemplified in the Golden Rule."

The word vegan was derived from the word vegetarian in 1944 by Elsie Shrigley and Donald Watson, the founders of the UK Vegan Society. Shrigley and Watson were disillusioned that vegetarianism included the consumption of dairy products and eggs. They saw vegan as "the beginning and end of vegetarian," and used the first three and last two letters of vegetarian to coin the new term.

An April 2008 "Vegetarianism in America" survey conducted by Harris Interactive Service Bureau indicated that 7.3 million American adults are vegetarians; approximately one million of these are vegans. The poll also indicated that 11.9 million people are "definitely interested" in following a vegetarian-based diet in the future: http://www.prnewswire.com/cgi-bin/stories.pl?ACCT=104&STORY=/www/story/04-15-2008/0004792955&EDATE=.

A Mintel survey showed that U.S. sales of vegetarian and vegan food increased by 64 percent from 2000 to 2005, and that the vegetarian food market was forecast to grow to over $1.7 billion in sales by 2010. The increase is attributed to concerns about animal welfare, personal health, and/or the environment.

Ethical Reasons for Veganism

Approximately 27 billion cows, pigs, chickens, turkeys, and other animals are killed for food each year in the United States ("Chew on This," People for the Ethical Treatment of Animals. Retrieved March 13, 2007, http://www.goveg.com/feat/chewonthis/). Our modern factory farming system strives to produce the most meat, milk, and eggs as quickly and cheaply as possible and in the smallest amount of space possible.

Some people, such as Jewish Nobel Prize-winning author Isaac Bashevis Singer, have equated the treatment of animals in slaughterhouses with the treatment of humans during the Holocaust. Having fled Nazi Europe in 1935, Singer took a room above a slaughterhouse and

watched as cows were prodded, kicked, and sworn at as they were herded down a ramp to their deaths. He proclaimed that "as long as human beings go on shedding the blood of animals, there will never be any peace" (Dujack, 2003).

There is evidence of cows, chickens, pigs, and other meat animals being raised in poor conditions, where they may be fed high-bulk food, such as grains, or substandard or inappropriate food. They are sometimes kept in very small spaces in order to raise as many animals as possible. Most disturbing, there is evidence that, at slaughterhouses, animals are not always humanely killed, as, for example, when stun-guns do not work. U.S. Department of Agriculture inspection records documented 14 humane slaughter violations at one processing plant, including finding hogs that "were walking and squealing after being stunned [with a stun gun] as many as four times" (Warrick, 2001). During slaughter, animals are hung upside-down and their throats are slit, sometimes while they're still conscious. Many are still alive while they're skinned, dismembered, or scalded in defeathering tanks.

A survey conducted in 2004 by the Social Responsibility Initiative at Ohio State University suggested that the majority of people, even those who are not vegetarians or vegans, are concerned about farmed animal welfare. Surveys were sent to 3,500 randomly selected Ohioans, and 56 percent responded. Of the respondents, 92 percent agreed or strongly agreed that it is important for farm animals to be well cared for, 85 percent indicated that the quality of animal lives is important, even though some animals are used for meat production, and 81 percent said that the wellbeing of farm animals is just as important as the well-being of companion animals: http://www.smallfarms.cornell.edu/pages/quarterly/archive/fall06/Fall_2006_Page_20.pdf.

According to Mintel's *Eggs and Egg Substitutes—U.S., June 2004,* consumers who are concerned about animal welfare choose to buy eggs from hens that are not raised in cages. Vegans also believe that it is wrong to use animals for their milk or eggs. It is estimated that each vegetarian saves more than 100 animals every year.

Health Reasons for Veganism

Animal products, particularly meat, eggs, and dairy, are generally high in saturated fat, cholesterol, and concentrated protein. Numerous studies have linked the consumption of certain animal products to serious illnesses, such as heart disease, strokes, diabetes, and breast, colon, prostate, stomach, esophageal, and pancreatic cancer.

Unlike animal products, plant-based foods are cholesterol free, generally low in fat, and high in fiber, complex carbohydrates, and other vital nutrients. Researchers from the University of Toronto have found that a plant-based diet rich in soy and soluble fiber can reduce cholesterol levels by as much as one-third (Fauber, 2003). According to David Jenkins, professor of nutrition and metabolism at the University of Toronto, "the evidence is pretty strong that vegans, who eat no animal products, have the best cardiovascular health profile and the lowest cholesterol levels" (Callahan, 2003).

Studies have shown that, on average, vegetarians and vegans are at least 10 percent leaner and live six to ten years longer than meat eaters. The ADA has reported that "vegetarians, especially vegans, often have weights that are closer to de-

sirable weights than do non-vegetarians" (American Dietetic Association, 1993).

In *Dr. Spock's Baby and Child Care,* the late Dr. Benjamin Spock, an authority on child care, wrote, "Children who grow up getting their nutrition from plant foods rather than meats have a tremendous health advantage. They are less likely to develop weight problems, diabetes, high blood pressure, and some forms of cancer" (Spock, 1998).

According to the ADA and Dietitians of Canada, "well-planned vegan and other types of vegetarian diets are appropriate for all stages of the life cycle, including during pregnancy, lactation, infancy, childhood, and adolescence" (ADA Web site).

It is possible to get most vital nutrients from a vegan diet; however, because vitamin B-12 is primarily found in animal sources, vegans need to take a multivitamin or B-12 supplement to get ample B-12. Vitamin B-12 is also found in nutritional yeast and many fortified cereals and soy milks.

Environmental Reasons for Veganism

The process of turning cows, pigs, chickens, and turkeys into meat, pork, and poultry takes a toll on the environment. According to *E: The Environmental Magazine,* almost every aspect of animal agriculture, from grazing-related loss of cropland and open space, to the inefficiencies of feeding vast quantities of water and grain to cattle in a hungry world, to pollution from factory farms, can cause an environmental disaster with wide and sometimes catastrophic consequences (Motavalli, 2002).

The November, 2006, United Nations report *Livestock's Long Shadow* indicated that raising animals for food generates more greenhouse-gas emissions than all the cars, trucks, trains, ships, and planes in the world combined. The report concluded that the livestock sector is "one of the top two or three most significant contributors to the most serious environmental problems, at every scale from local to global," and that the livestock industry should be "a major policy focus when dealing with problems of land degradation, climate change and air pollution, water shortage and water pollution, and loss of biodiversity": http://www.nhbs.com/livestocks_long_shadow_tefno_150529.html.

When Gidon Eshel and Pamela Martin of the University of Chicago compared the amount of fossil fuel needed to cultivate and process various foods, including running machinery, providing food for animals, and irrigating crops, they found that the typical U.S. diet generates nearly 1.5 tons more carbon dioxide per person per year than a vegan diet with an equal number of calories (*New Scientist*, 2005).

The Environmental Protection Agency has reported that factory farms pollute our waterways extensively. Animals raised for food produce approximately 130 times as much excrement as the entire human population, 87,000 pounds per second (PETA Vegetarian Starter Kit).

Livestock waste emits ammonia, nitrous oxide, carbon dioxide, and other toxic chemicals into the atmosphere. A study by Duke University Medical Center showed that people living downwind of pig farms are more likely to suffer from tension, depression, fatigue, nausea, vomiting, headaches, shallow breathing, coughing, sleep disturbances, and loss of appetite than the general population (Schiffman et al., 1995).

Raising animals for food also requires massive amounts of water and land. It takes 2,500 gallons of water to produce a pound of meat, but only 60 gallons of water to produce a pound of wheat, and a meat-based diet requires more than 4,000 gallons of water per day, whereas a vegan diet requires only 300 gallons of water a day (Robbins, 1987). Approximately 3 1/4 acres of land are needed to produce food for a meat-eater; food for a vegan can be produced on just 1/6 of an acre of land: http://www.goveg.com/world Hunger-animalAgriculture.asp.

In the United States, animals are fed more than 70 percent of the corn, wheat, and other grains we grow (PETA). The world's cattle consume a quantity of food approximately equal to the caloric needs of 8.7 billion people; around 1.4 billion people could be fed with the grain and soybeans fed to U.S. cattle alone.

See also Religion—Veganism and the Bible

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Heather Moore

VEGETARIANISM

Vegetarians are of two main types: those who include some animal products in their diet and those who do not. The former are usually called vegetarians and the latter vegans. Vegetarianism refers to these dietary regimes, but more importantly, to the belief system that supports vegetarian practice. Paradoxically, not all vegetarians subscribe to such a belief system. They may, for example, just not like the taste of meat, But most, especially vegans, do have an outlook that proscribes eating animals. Many people today, whether or not they are vegetarians, recognize that livestock production, especially by means of large-scale intensive or factory farming, causes the worst abuses of animals and is an extremely wasteful way of securing food.

There have been vegetarians in all eras of recorded history. Often their dietary choices have been regarded as either subversive or eccentric, but their voices, although in the minority, seldom go unheard by people of conscience. In what follows, a number of arguments that can and often do contribute to a vegetarian stance will be summarized.

1. *Health.* Whether a vegetarian diet is as healthy as or healthier than one including meat is a subject of much controversy. It may seem that good health is simply a matter of one's long-term self-interest, but some philosophers, notably Immanuel Kant, have argued that we have duties to ourselves, and others such as Aristotle have argued that we must always strive to attain a virtuous or morally praiseworthy kind of life. In both of these views, health, and thus a sound diet, would be a precondition of our being able to carry out any moral obligations, including duties to ourselves and acting virtuously, and is therefore itself a matter of moral concern. Persons to whom we have responsibilities likewise have a stake in our health, as does society, which has an interest in our being productive, non-burdensome members. If a vegetarian diet were healthier overall, as vegetarians contend, then it would be the one we should

A piglet declares, "No, I don't have any spare ribs!" in an advertisement supporting vegetarianism from People for the Ethical Treatment of Animals (PETA). PETA also advocates a vegan lifestyle—using no animal products, including milk and eggs. (PETA)

choose for both our own self-regard and our concern for others.

2. *Animal suffering and death.* There is no method of rearing food animals without pain and suffering, and how ever this is done, death is the animals' fate. Confinement, transportation, and slaughtering are the main sources of abuse in the process of extracting consumer products from animals. Factory farming, a widespread phenomenon of our time, maximizes the problems, and its cruelties are well documented. Utilitarians are typically concerned with promoting pleasure and other interests of sentient beings, and with reducing or eliminating pain, suffering, and other conditions that frustrate such beings' welfare. Vegetarian diets are conducive to realizing these desirable outcomes. Animal rights theorists hold that many animals are irreplaceable individuals who have morally significant interests and hence rights, including the right to live and not be caused gratuitous pain and suffering. From this view, even totally painless meat production that gave great pleasure to human eaters, and that might therefore satisfy utilitarian ethical demands, would still be unacceptable, because death is an ultimate harm to rights-bearers.

3. *Impartiality and moral wellbeing.* An impartial person who is well informed about animals understands that they have morally significant interests, such as staying alive and having a certain wellbeing, health, and contentment which can only be respected if we refrain from eating them. Using animals instrumentally for food violates the condition of impartiality and demonstrates speciesism.

4. *Ecological concerns.* Large-scale meat production by agribusiness causes great environmental depletion and degradation, including huge demands on water and fossil fuel supplies, deforestation, desertification, and loss of wild animal habitat, an infusion of greenhouse gases, and excrement influx into waterways. A worldwide shift to vegetarian diets is seen as a way to lessen or eliminate these impacts, and as a necessity in view of the unsustainability of the meat economy.

5. *World hunger and social justice.* Food animal production that relies on feeding animals in feedlots rather than letting them naturally forage is extremely wasteful, yielding far less protein output than the protein input required to make it work. Vegetarian diets would aid in freeing up resources to feed the world's hungry by undermining the artificially created economy of scarcity.

6. *Interconnected forms of oppression.* Some ecofeminists have argued that various forms of domination, oppression, and exploitation are causally and conceptually intertwined. Those who are more powerful than others tend to exercise control over them, see them as inferior, and treat them as merely serving their own interests. A vegetarian way of life can contribute to breaking out of this traditional pattern by changing the dynamics

of food production, distribution, and consumption.

7. *Universal compassion and kinship.* Evolutionary considerations of biological kinship reinforce the idea that humans should exercise compassion toward other animals. Vegetarianism accords with a compassionate approach to life.
8. *Universal non-violence (ahimsa).* Mohandas Gandhi taught that violence begets more violence, that nonviolence (or *ahimsa*) is a superior moral force, and that humans have a duty to avoid causing harm to other sentient beings whenever possible, and to minimize it when it cannot be avoided. A vegetarian diet minimizes harm to sentient nonhumans.
9. *Religious considerations.* Some religions, notably Jainism, Hinduism, and the Pythagorean cult in ancient Greece, share a belief in reincarnation and in the ensoulment of humans and nonhuman animals. The Pythagoreans held that animals may contain the souls of former humans and thus should not be eaten. Many Hindus, Jains, and Buddhists refrain from eating animals out of respect for kindred beings with souls. Vegetarianism is sometimes advocated for the benefit of abstinence or spiritual purification. Some Jewish and Christian thinkers have taught that God granted humans stewardship rather than dominion over nature. Islam has also been presented as a stewardship religion, with the stronger proviso that causing grievous harm to nature is a direct offense to Allah. Vegetarianism may be seen as required to carry out the task of stewardship. Finally, both Buddhism and the wisdom traditions of Indigenous peoples teach that a spiritual identity and unity bind together all living things. Although this precept most often entails that animals should be killed only out of necessity, reverentially, and without wastefulness, it sometimes issues in a prescription for a vegetarian or semi-vegetarian diet.

Taken in combination, these arguments have considerable persuasive force, and converge on a vegetarian commitment. To many, that commitment focuses attention on our relationship with the rest of nature, as well as on the need to choose a way of life that is morally and ecologically responsible**.**

See also Veganism

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Michael Allen Fox

VETERINARY MEDICINE AND ETHICS

Given the centrality of ethics to the veterinary profession, it is surprising how little attention veterinary medicine has devoted to ethical issues. A study of veterinary practice conducted in the early 1980s showed that veterinarians spend more time managing ethical issues than in any other single activity. It is also arguable that the major challenges facing veterinary medicine in North America are societal ethical questions: What should be done about the welfare of food animals raised in intensive confinement systems? Ought the legal status of animals as property be modified, and if so how? Given the strength of the human-companion animal bond, graphically illustrated during Hurricane Katrina, ought the value of companion animals be raised from mere market worth? How should veterinarians respond to the thinking underlying increasing public demand for non-evidence-based alternative medicine? How does one determine and weigh considerations of animal quality of life in medical decision-making?

Organized veterinary medicine and veterinary educational institutions have exhibited little understanding of or formal training in dealing with ethics. Indeed, historically veterinary ethics amounted to little more than veterinary etiquette, with ethical codes addressing issues like advertising, the size of one's sign, sending Christmas cards, and totally ignoring issues like teaching surgery using multiple animals in sequential procedures, or regulation of the use of animals in research, or the historical absence of analgesia in veterinary teaching, research, and practice.

This disregard for genuine ethical issues came from a variety of sources, including the historical subordination of veterinary medicine to agriculture and the general failure of science and medicine to embrace ethics, captured in the mantra that science is value-free. But as society has become more concerned about animal welfare issues and animal treatment, and has also grown more litigious, ethics is ignored by professions at their own peril. It is thus imperative for nascent veterinarians to enjoy at least a rudimentary understanding of the logical geography of ethics.

At the outset, it is essential to distinguish between Ethics 1 and Ethics 2. Ethics 1 is the set of beliefs about right and wrong, good and bad, just and unjust, fair and unfair, that all persons acquire in society as they grow up. One learns Ethics 1 from a multiplicity of sources—parents, friends, church, media, teachers, and so on. For most people, these diverse teachings are haphazardly stuffed into one's mental hall closet, and are not critically examined or much discussed. Yet the chances of their forming a coherent whole are negligible. Consider, for example, what parents teach about sexual ethics, versus what one learns from friends, college roommates, and films.

Ethics 2, on the other hand, is the systematic study and examination of Ethics 1, addressing such questions as whether the beliefs in question are consistent, why

and if one must have ethics, whether there is a coherent way to affirm that some ethics views are better than others, how one justifies Ethics 1, statements, etc. One learns Ethics 2 from philosophers, since philosophy is the branch of knowledge whose purpose is to critically examine what we take for granted.

Some further distinctions must be made. Under Ethics 1, we can distinguish three subclasses, social ethics, personal ethics, and professional ethics. A moment's reflection makes one realize that, if we wish to avoid a life of chaos and anarchy where, as Hobbes put it, life is "nasty, brutish, and short," ethical notions must be binding on everyone in society. That is what one may call the social consensus ethic, and it is most clearly found reflected in the legal system. The social consensus ethic does not dictate all ethical decisions. Much is left to an individual's personal ethic, his or her own beliefs about right and wrong, good and bad. Such ethically-charged issues as what one eats, what one reads, what charities one chooses to support are, in Western democracies, left to one's personal ethic, with the proviso that the societal ethic trumps the personal on matters of general interest.

What is professional ethics? A profession is a subgroup of society entrusted with work society considers essential, and which require specialized skills and knowledge, for example, law, medicine, veterinary medicine, accounting. Loath to prescribe the methods by which a profession fulfills its function, society in essence says to professionals: "You regulate yourselves the way we would regulate you if we understood in detail what you do. If you fail to do so, we will hammer you with draconian regulation." Not to respect this charge is to risk loss of autonomy, as has occurred in the United States with unethical accounting practices.

Some years ago, Congress became concerned about excessive use of antibiotics in animal agriculture, both as growth promotion and as a way of masking poor husbandry, since such overuse led to the evolution of dangerous antibiotic-resistant pathogens. When it became clear that veterinary medicine was partly responsible, Congress considered withdrawing the privilege of extra-label drug use from veterinarians. Had this indeed transpired, veterinary medicine as we know it would have been dealt a mortal blow, since veterinary medicine relies on human drugs used in an extra-label fashion.

It is important to stress that every area of ethics is subject to being rationally criticized, else one could make no moral progress. For example, U.S. societal ethics was criticized during the Civil Rights era because segregation was logically inconsistent with the fundamental principles of American democracy.

Similarly, though most people don't realize it, personal ethics is also subject to rational criticism. For example, it can be argued that a person cannot logically be both a Christian and an ethical relativist, that is, one who believes that good and bad vary from society to society or person to person.

Finally, professional ethics can be rationally criticized, as when Congress was about to punish veterinary medicine for indiscriminate dispensing of antibiotics despite its commitment to ensuring public health.

But before one can deal with an ethical issue, one must realize that it is an issue, and identify all relevant ethical components, even as in medicine one must diagnose before one can treat. However,

identifying all ethically relevant components of a situation is not always easy, as we perceive not only with our sense organs, but also with our prejudices, beliefs, theories, and expectations.

There exists a heuristic device to help veterinarians hone in on all ethical aspects of a case. This involves reflecting on the ethical vectors relevant to veterinary practice, and applying the ensuing template to new situations. Veterinarians have moral obligations to animals, to clients, to peers and their profession, to society in general, to themselves, and to their employees. Ethically charged situations present themselves, where any or all or various combinations of these obligations occur and must be weighed. In every new situation, the veterinarian should consider each of these ethical vectors and see if they apply to the case at hand. In this way, he or she can minimize the chances of missing some morally relevant factor.

The question of a veterinarian's moral obligation to animals is so important to veterinary medicine that I have called it the Fundamental Question of Veterinary Ethics. The issue, of course, is to whom does the veterinarian owe the primary obligation, owner or animal? On the Garage Mechanic Model, the animal is like a car, where the mechanic owes nothing to the car, and fixes it or not depending on the owner's wishes. On the Pediatrician Model, the clinician owes primary obligation to the animal, just as a pediatrician does to a child, despite the fact that the client pays the bills. When I pose this dichotomy to veterinarians, the vast majority profess adherence to the Pediatrician model as a moral ideal. Happily, though animals are property, society's ever-increasing concern with animal welfare is putting increasing limitations on what humans can do with animals.

Leaving obligations to animals aside for the moment, how does one deal with ethical questions regarding people, assuming one has diagnosed all the relevant ethical components? In the simplest cases, of course, the answer is dictated by the social consensus ethic which, for example, prohibits stealing, assault, murder, etc. So, for example, throttling an obnoxious client, however tempting, is not a real option. In other cases, of course, one appeals to one's personal ethic.

None of this, however, helps us to resolve the Fundamental Question of Veterinary Ethics, since the societal ethic has historically been silent with regard to the moral status of animals and our obligations to them, and few people have bothered to develop a consistent personal ethic theory for animal treatment.

However, as society has developed increasing concern for animal treatment, a characterizable ethic has begun to emerge. In essence, society has demanded that we protect animals' basic natures and interests even as we use them, just as we protect humans. This means applying the notion of rights to animals. Though animals are legally property and cannot strictly have rights, the same result is being achieved by a proliferation of laws limiting how people can use animals. Thus U.S. laboratory animal laws require pain and distress control, forbid repeated invasive uses, require exercise for dogs, etc. And some European and U.S. laws have forbidden sow stalls. This mechanism is the root of what I have called animal rights as a mainstream phenomenon. This also explains the proliferation of laws pertaining to animals as an effort to ensure their welfare in the face of historically unprecedented uses.

This new ethic is good news for veterinarians, as they can now expect more and increasing social backing for their priority commitment to animals, which I have called the Pediatrician Model. Veterinary medicine must engage and lead in providing rational answers and laws protecting animal wellbeing in all areas of animal use. Not only will job satisfaction increase, but as the status of animals rises in society, so too does the status of these who care for them.

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VIRTUE ETHICS

A virtue ethics is any system, theory, or approach in ethics or morals that regards virtues as a central component. Today, virtue ethics is experiencing a revival. The term virtue refers to traits of character and personality that predispose individuals, including nonhuman animals, to act in good or right ways. In contrast, a vice is a trait inclining them to act in bad or wrong ways. For example, in companion animals as well as people, loyalty and affection are virtues, and meanness and laziness are vices. Due to the influence of Greek, Roman, and Christian thought, virtue ethics dominated Western morals until the 1700s, when it was replaced by approaches based on duties, rights, consequences, utility, and welfare. The latter are centered on externally observable actions and their consequences, rather than on the internally non-observable psychology or mindset required by virtues, such as, dispositions, motivations, purposes, intensions, attitudes, and the like.

Today, ethicists agree that virtues are a central component of ethics and morality, but there the agreement ends. The disagreements today concern how virtues are connected to the other central components of ethics. To be complete, a theory of ethics needs three parts: (1) a theory of virtues that explains what kinds of traits morally good agents ought to have, (2) a theory of duties and rights that explains what makes some actions morally required and others morally prohibited, and (3) a theory of the good that explains why some consequences, things, states of being, and conditions are good and others bad. During the ancient and medieval eras, Plato, Aristotle, Thomas Aquinas and most others believed that virtues were directly tied to real human and animal natures, essences, or souls created and implanted by God or nature. Part of this belief was the idea that everything and everyone have real purposes (*telos* in Greek) given by nature or God. Consequently, virtues were the traits that enabled individual persons and animals to achieve their natural or God-given purposes.

Modern science and evolutionary biology refute the old belief in real natural purposes. According to evolution, individuals and species populations result from three interrelated processes: reproductive success, genetic variation, and environmental adaptation. These processes are largely random and unpredictable. Consequently, the ancient and medieval belief connecting virtues to natural or divine purposes is no longer plausible. In response to this objection, religious thinkers have proposed ways of fitting their doctrines into the worldview

of contemporary science, and virtue ethicists have attempted to find some alternative foundation for virtues.

In their responses, ethicists have constructed theories of virtue in ways that are either indirect or direct. One indirect way is to derive virtues from the consequences of actions. According to Alasdair MacIntyre, individuals derive their purposes and goals from their social communities, and virtues are the traits needed to achieve those goals. When people possess certain virtues, Julia Driver's theory proposes, they are more likely to produce good than bad. In Thomas Hurka's account, virtues are intrinsically good states of character that result when individuals love that which is intrinsically good and hate what is intrinsically bad. A second possible kind of indirect account would see virtues as the intrinsically good states of character that result when individuals love right actions for their own sake and hate wrong ones (see Copp and Sobel, 2004, pp. 515–516).

The direct way to construct a virtue ethics is to explain and defend virtues without appealing to any other foundation. Rosalind Hursthouse proposes that a virtue is a disposition to act in a characteristic way for characteristic reasons. Calling his theory agent-based, Michael Slote thinks that virtues are admirable traits of character that are morally primitive or fundamental, since virtues are used to derive and explain moral judgments. Finally, Robert Adams argues that virtues are intrinsically excellent on their own independent of other considerations.

Except perhaps for MacIntyre's and Hursthouse's theories, nonhuman animals are conceivably virtuous in all these direct and indirect ways. For instance, even though being loved by a human may be of greater value, the affection of a companion animal is arguably intrinsically good. However, at issue for any theory of virtues, whether or not it attempts to include nonhuman animals, is the extent to which rational reflection and self-consciousness, in contrast to instinctive and conditioned dispositions and behaviors, are necessary for traits of character to be genuinely virtuous. To what extent, for example, does courage require knowledge and assessment of true danger rather than merely an instinctive or conditioned reaction to a stimulus? Is it truly virtuous when a pet loyally serves an abusive master*?*

See also Telos and Teleology; Utilitarianism

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Jack Weir

W

WAR AND ANIMALS

From elephants to pigeons, all manner of animals have been drawn into humanity's wars, to be used as offensive and defensive forms of weaponry or to serve as couriers and, more recently, as disposable subjects for chemical and biological weapons experimentation.

Hannibal of Carthage used Indian elephants in his ambitious plan to defeat the Roman army on their home soil via a journey to Italy over the Alps in 215 BC. With 50,000 foot soldiers as reinforcement, the elephants plowed into the Roman ranks like modern-day tanks, trampling the enemy and creating general chaos.

Horses were perhaps the most commonly employed of wartime animals because of their endurance, agility, and speed. Among the first to launch a war using horses were the tribal Hyksos from modern day Turkey, who conquered Egypt around 2000 BC with horse-drawn chariots, from which their archers could deliver their arrows with deadly accuracy. In 450 BC, Attila the Hun used horses with the addition of saddles and a new invention, the foot stirrup, which gave his warriors superior balance and leverage to accurately fire an arrow, swing a sword, or throw a spear. Horses would continue in much this same capacity in the centuries to follow, serving as a mobile foundation from which strategic assaults could be launched.

With their innate devotion to humans and superior physical senses, dogs have been one of the more easily exploited animals in military history. The ancient Egyptians, Romans, and Greeks depended on barking dogs to give early warning of approaching enemies. Also common were heavy-set dogs trained to maim and kill. Cloaked in armor and wearing collars studded with metal spikes, these Molosers would be unleashed on enemy infantry to tear out the throats and bellies of soldiers and horses. The advantages of using dogs as weapons were not lost on later strategists, either. Upon arriving in Jamaica in 1494, one of Christopher Columbus' first acts was to unleash a large hound on a reception party of ceremonially painted natives, killing six of them within minutes. Subsequent conquerors of the New World brought their own detachments of killer dogs, and easily routed every native community in Latin America.

Like dogs, pigeons have played a recurring role throughout centuries of warfare. News of the conquest of Gaul (modern France and Belgium) in 56 BC by Caius Julius Caesar was dispatched to Rome via a homing pigeon with a papyrus message tied to one of its legs. Similarly trained birds were also present at the battle of Waterloo in 1815, when Wellington used them to convey word of his overwhelming victory against Napoleon's

forces. And during the Prussian siege of Paris in 1870, the French depended on pigeons to keep in touch with those inside the city. They devised a means of copying messages onto a primitive version of microfilm, thereby allowing more information to be compacted into a portable size. Over the course of four months, 150,000 official memorandums and one million personal letters were transported by birds.

Commencement of the war to end all wars in 1914 saw the largest mobilization of animals in history. Three million horses, mules and oxen, 50,000 dogs and other creatures were ensnared in this protracted and devastating conflict. World War I would prove fatal for most of them, because for the first time they were pitted against mechanized weaponry and lethal chemical agents.

A dashing cavalry charge typical of earlier wars was impossible given the nature of this new battlefield landscape, which was fraught with artillery craters big enough to contain a house, bottomless pits of sucking mud, and miles of impossibly tangled razor wire. Trapped in this quagmire, whole regiments of horses were easily mowed down with a single machine gun. Eyewitness accounts describe pitiful scenes of horses which, upon hearing the retreat bugle, struggled to return to the defensive line despite being horribly wounded. The bodies of soldiers and horses killed during the day often had to be used as stepping stones to prevent teams of pack animals and their human handlers from being pulled under and smothered by the mud.

Some horses seemed to know in advance when an attack was imminent. One former polo pony on the British side would stamp her feet and neigh loudly a full five minutes before enemy planes appeared overhead. Others heard the faint whistle of incoming mortars and, like the soldiers, dropped to their bellies and pressed their heads to the ground.

Dogs, too, played a key role in this war, although their use as attack animals was no longer needed, given advancements in other forms of weaponry. Swift canines were invaluable for relaying messages in the heat of battle, as were carrier pigeons, and the two often worked in tandem. Of particular note was one greyhound named Satan who turned the tide of the battle for Verdun. The town was being smashed by a German battery when the besieged French spotted the black dog racing toward them. A German bullet caught Satan and sent him crashing to the ground, but moments later he staggered back to his feet. Despite one shattered hind leg, he pressed forward and limped the remaining yards to his friends. The note tied to his collar stated that reinforcements were on the way, and in his saddle pack were two homing pigeons, which the soldiers used to send back the location of the enemy so that artillery could knock out the German position. Thanks to the courageous actions of these animals, Verdun was saved.

Every country had its own Red Cross organization during World War I, and they all trained mercy dogs to locate wounded soldiers lost on the battlefields. Whenever they found a wounded soldier, these dogs collected the soldier's helmet or a piece of uniform and returned to the trench to lead stretcher-bearers back to his location. One such dog named Prusco located more than a hundred wounded soldiers and was strong enough to drag many unconscious men into sheltering craters before fetching the ambulance team.

The years leading up to World War II saw vast improvements in mechanized forms of transportation, weaponry, and

wireless communication, thereby reducing the need to conscript so many animals, particularly horses. Even so, dogs continued to be needed to support the troops in various capacities. A civilian organization called Dogs for Defense formed in 1942 to issue a public call for dogs, and Americans donated 40,000 canines, many of them household pets. Those that made it through a basic doggie boot camp went on to work as sentries, patrolling the defensive perimeters of military facilities with an armed human escort. Others worked as scouts in the field with detachments of soldiers, where they alerted to potential ambushes.

The German shepherd Chips was among the most celebrated dogs of this war. He first worked as a tank guard and marched in Patton's Seventh Army through eight campaigns in Africa, the Mediterranean, and Europe. The dog's mettle under fire was further tested on the coast of Sicily where, against the commands of his handler, he bolted down the beach and leapt into what was thought to be an abandoned pillbox. In fact it held six German soldiers poised to open fire with a machine gun. In spite of being wounded in the scuffle, Chips subdued the gunner and frightened the other soldiers into surrendering. For his actions, he received the Purple Heart and the Silver Star, medals usually reserved for humans.

At the end of the war, the public was outraged to learn that the Army planned to euthanize the surviving war dogs rather than return them to their families. Yielding to protests, the Department of Defense agreed to release the dogs following a brief retraining period to reacclimate the animals to civilian life. Several hundred dogs went home, including Chips. His family reported that he didn't seem much changed from his wartime adventures, except that he seemed less interested in chasing the garbage men when they rattled the cans.

Several thousand canines were again deployed in the Korean War (1950–1953) and, as in World War II, they primarily worked as sentries and scouts. DOD strategists determined that whenever the dogs were used in times of imminent contact with the enemy, they reduced casualties by more than 65 percent. A decade later, during the Vietnam conflict, scout dogs in particular were vital in helping soldiers avoid jungle ambushes and hidden explosives. A harmless-looking footpath could harbor spring-loaded poisoned spikes and shrapnel-packed mines, and it was up to the scout dogs to identify these hazards in time to avoid disaster. Walking off-leash in front of the unit, these canines worked in silence and signaled when something was amiss by sitting down or returning to the handler's side. By war's end in 1972, the dog teams had been credited with discovering more than a million pounds of enemy supplies, seven tons of ammunition, and 4,000 enemy booby traps. By some estimates, they saved as many as 10,000 soldiers' lives.

Remembering public protest over the treatment of decommissioned military dogs after World War II, the government reclassified all canines as equipment rather than personnel, meaning that they could be disposed of in any manner. Just as the United States formally announced its withdrawal from Vietnam, orders were issued to leave the dogs behind. Most of them were given to the Army of the Republic of Vietnam, which had little interest in or experience with working with dogs in such a manner. American GIs who credited the dogs with saving their lives thought it the height of betrayal not

to bring them home as well. To this day, some combat veterans wonder if their canine comrades perished from neglect or were killed and eaten, as was customary throughout much of Asia at this time.

In the decades since, dogs have continued to be used to patrol airbases and military installations domestically and overseas. Approximately 1,000 canines are currently deployed in Afghanistan and Iraq, working as patrol dogs or in the detection of hidden explosives. The military dogs of today are inducted soon after being weaned and assigned to Air Force-operated kennels to become acclimated to the sound of gunfire and helicopters. After they've mastered the basics, they begin to work alongside human handlers in more specialized training. Belgian Malinois make up the majority of modern military dogs, but even diminutive canines such as beagles are of use, because their size is advantageous for working in close quarters such as submarines. In the Middle East, dogs specializing in explosives detection by scent are in particular demand, because even in this high-tech era, nothing has proven as reliable as the canine nose, which can pick up specific scents at up to a third of a mile.

Today's soldiers feel just as strongly about their canine comrades as their Vietnam-era counterparts. The passage of House Resolution 5314 in November 2000, the first federal law to stipulate an adoption alternative to euthanasia for retiring war dogs, has resulted in many of the animals being able return to America

Spec.4 Rayford Brown of Florence, South Carolina, and his tracker dog relax for a moment at Fire-Base Alpha Four, a U.S. outpost near the DMZ in south Vietnam on January 2, 1971. Such dogs are used to track enemy troops and find booby traps and mines. Many people are concerned with the ethics of using animals in war. (AP Photo/stf)

to live out their remaining days with loving families.

Other animals continue to play a role in the military, although they are not as well publicized as dogs. Each year an estimated 300,000 primates, pigs, goats, sheep, rabbits, mice, cats, and other creatures are experimented on by the U.S. Department of Defense or other contracted private entities. They are subjected to experimental chemical and biological weapons, or purposely shot and burned so their wounds can be studied for weapons efficiency. Animal advocacy groups have demanded greater accountability from these research programs and, with increased media coverage of how the military exploits animals, the public is becoming vocal in its disapproval.

There is not one member of the animal community that has not been affected at one time or another by man's wars. The only way to repay them is to ensure that they are treated with greater respect and kindness in times of peace. Perhaps in the future they will be involved in our conflicts as little as possible, for ultimately the involvement of animals in wars of our own making dehumanizes us all.

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www.militaryworkingdogadoptions.com: A nonprofit organization dedicated to promoting the adoption of retiring war dogs.

www.petcem.com: Hartsdale Pet Cemetery is home to the first War Dog Memorial, which was dedicated after World War I.

www.scoutdogpages.com: A Web site devoted particularly to the role of scout dogs in the Vietnam War.

www.uswardogs.org: United States War Dog Association is an online archive of military dog history and current news.

www.vdhaonline.org: This veterans' organization puts veteran dog handlers in touch with one another and educates the public about the role of canines in the Vietnam War.

Mary E. Thurston

WAR: USING ANIMALS IN TRANSPORT

Nonhuman animals have often been exploited by humans and the victims of human conflict. Recent examples include the loss of life suffered by birds in the U.S.-Iraq War, the killing of cats and dogs in London prior to World War II, and the current ongoing impact of the Rwanda and Congo conflicts on Mountain gorillas. Outcomes

have been horrendous and are indeed incalculable.

The direct exploitation of animals by humans as tools of war has been particularly extensive. These animals include dogs, pigeons, horses, donkeys, camels, elephants, cats, and dolphins. During the Great War, at least 20,000 pigeons were used and died, as well as over a million horses just in the French campaign alone; few survived. Many individual animals, most given personal names, have been praised and awarded for their bravery and courage under fire, and they are now glorified in statues and other tributes that memorialize their efforts. The most famous of these is the newly erected Brook Gate memorial in Hyde Park in London.

Pigeons have been used, and some would say exploited, by humans for millennia. During the Great War, the U.S. Pigeon Service had some 54,000 pigeons in service, and individuals were given ranks such as captain. In England, the Dicken Medal of Gallantry was awarded to 32 pigeons for their courageous flights under fire. Three horses, 24 dogs, and a cat have also been awarded the Dicken Medal, the most recent a British springer spaniel, for service in Iraq.

Another classic example of the use of animals by humans in war is the case of mules and donkeys during the Great War. Mules, which are a hybrid created by mating a male donkey and a female horse, had been the main means of transport in most theaters of war since the Roman and Greek armies used them for pack work and riding. Animal transport was still vital in many areas, such as the hot, dry, and mountainous conditions at Gallipoli. The British Army turned to those units that had served in India, where mules had proved invaluable on the rugged Northwest Frontier. Well-trained mules had proved their ability to march for over fourteen hours along the most difficult and dangerous paths, especially in mountainous areas.

Mules endured terrible conditions in the trenches of France; the muddy ground was unsuitable for them. Most of the ammunition at Passchendale, for example, was delivered by mules over ground that was hardly passable, transformed into lakes of deep mud. Many hundreds drowned in mud and shell holes. However, their good health and their length of life at the front won accolades from all quarters. Their powers of endurance and resistance to bad conditions were legendary. Unlike horses, few fell sick, and they were incredibly brave under fire. Mules are highly intelligent and have amazing stamina.

Many thousands of donkeys, which are slightly smaller than mules, also served in the Great War. In the East Africa Campaign of 1916–17, over 30,000 died a terrible death from tsetse fly, others from the supposed antidote, arsenic. Donkeys served with all of the Allied armies in France. Small enough to weave their way along the trenches, they carried food and ammunition to the soldiers on the front lines. One account relates how they saved the soldiers at El Salt. Food and ammunition were running out and the troops were stranded. Two hundred donkeys were loaded up and, marching all night over appalling country, they covered the forty miles to save the stranded soldiers.

During the Gallipoli campaign, donkeys were mainly used to carry water to the soldiers, but mules made the most valuable contribution in the transportation of vital materials up the treacherous ravines to the front lines. Each mule carried two boxes of ammunition as they sure-footedly trotted up the steep

The Animals in War memorial, in Hyde Park (London, England) was dedicated in 2004 by Princess Anne. It was designed to honor the animals who have served in wars throughout history. (Mark Bridge)

hillsides under fire. When a mule was hit, it was unhitched, the ammunition removed, and the caravan went on. The challenges of transporting goods from the beaches to the soldiers in the mountains were an ongoing cause for concern during the campaign, and those who served at Gallipoli were aware of how much they owed to the mules and their Indian drivers for the supplies of guns and ammunition, food and water that they carried up razor-sharp cliffs to the front lines.

Mules were beneficial during the Second World War, to Italian forces in the European Alps, the British and other Allied forces in Burma and in China. Hundreds of mules were abandoned by Allied forces at Dunkirk in 1940.

Even before the Carthaginian Hannibal led his war elephants over the Alps to defeat the Romans, elephants were exploited by humans for many purposes. Elephants were first tamed more than 4,000 years ago, and were used for transport and recreation, and also killed for their ivory. Elephants were employed extensively in wars in India and Southeast Asia, as when the Magadha Empire defeated Alexander the Great in 327 BCE, and in the 300-year war between Burma and Thailand up to 1593. Elephants have been used in numerous conflicts, even to modern times, in World War II, and by Saddam Hussein against the Kurds.

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Rod Bennison and Jill Bough

WHALES AND DOLPHINS: CULTURE AND HUMAN INTERACTIONS

Culture is seen by many as a uniquely human attribute. But if we define culture in any way that includes the generally-accepted forms of human culture, such as religion, language, art, technology, symbolism, social conventions, political structures, and pop culture, then nonhumans have culture too. The key to culture is social learning, or learning behavior from others. Once behavior is imitated, emulated, taught or transferred between individuals through any form of social learning, culture can happen. With culture, the processes of genetically driven evolution are changed. Behavior can sweep through a population, or be entrenched in it by cultural conservatism. Group-specific badges, such as ethnolinguistic markers, can evolve and drive cooperation within, and competition between, culturally marked groups. These processes have dominated the recent history of humans, but they occur in other species, including oceanic species, as well, and they can affect how these species interact with humans.

In the centuries since humans have traveled the oceans, interactions between humans and whales have mostly involved humans intentionally killing whales. The scale of the slaughter was extraordinary; whaling was the principal cause of death among most large whales in the 20th century. But as whaling ran its course in the 1970s, human-caused deaths did not cease. Whales are killed, often slowly and painfully, by entanglement in fishing gear, by ship strikes and, as has been recently discovered, by noise.

Humans can affect whales in ways other than through a fast or slow death. We can injure them, disturb them, and affect their behavior. Humans' profound alterations of the marine habitat have closed some niches and opened others. In the North Pacific, gray whale calves seem to be an important food for some killer whales. In the North Atlantic there have been no gray whales since their extirpation several hundred years ago. During the course of whaling, killer whales in all oceans scavenged the carcasses of other species of whale killed by whalers. But when whaling virtually stopped in the 1970s, the killer whales moved on. In many parts of the world they have started removing fish from long lines, to the consternation of fishermen. The destruction of sea otter populations along the Alaskan Aleutian archipelago in the 1980s, and consequent restructuring of almost the entire near-shore ecosystem, seems to have been the result of a prey shift by just a few killer whales, perhaps some of those that had subsisted largely on whale carcasses in the heyday of whaling.

That diet shifts by just one nonhuman predator should have such significant conservation and management consequences is partially a tribute to the killer whale's power, size, and intelligence. But as with another voracious predator, the human, there is another important factor: culture.

Culture is defined in many ways, but the essence is that individuals learn

their behavior from each other in such a way that groups of individuals acquire distinctive behavior. When behavior becomes determined by culture rather than by genes or individual learning, then it can take some unusual forms and have immense consequences. Humans are the prime example. Human culture includes some wonderfully useful features that enrich our lives. These include language, technology, art, and music. But some forms of culture, such as Kamikaze cults, guns, and fast-food restaurants are harmful to individual humans, and others, such as nuclear weapons, rabid religious beliefs promoting violence, and fossil-fuel burning, threaten us, and in many cases others, as a species.

Because of the capabilities of our brains and the opposability of our thumbs, human culture has reached extraordinary heights and depths, literally and figuratively. But other animals have culture. It has been found in fish, rats, and many other species, but is best known in songbirds, primates, and cetaceans. The cultures of different species vary characteristically. For instance, songbirds seem to be cultural primarily in their songs, whereas culture has a particular role in the foraging and social behavior of chimpanzees. In one important respect, whale and dolphin culture seems closest to that of humans. In several species of whale and dolphin, social groups that use the same habitat behave differently, in an analogous fashion to multicultural human societies.

And as human culture profoundly affects our interactions with others species, their cultures may also influence interspecies relationships. Here are some examples that have arisen over recent years during our dealings with whales and dolphins.

The bottlenose dolphin is the best-studied cetacean. It is found in many parts of the world, and has been studied in several of them. The site of one of the longest and most detailed studies is Shark Bay, Western Australia. The dolphins in Shark Bay have a wide diversity of feeding strategies, ranging from using sponges as tools to probe beneath the surface, to stranding intentionally on beaches, to attacking very large fish. It seems as though these strategies are largely passed on through social learning, perhaps principally from mother to offspring, and so are a form of culture. One of the strategies, begging for fish from beachgoers, has important negative consequences: the calves of the dolphins who exhibit this behavior have higher mortality, and the behavior only involves a few animals. On the other side of Australia, in Moreton Bay, there are two communities of bottlenose dolphins. They use the same waters, but one regularly feeds on discards from prawn-trawlers, probably a cultural behavior. The other does not. The communities rarely interact. They will be differentially affected by human activities, such as changes in trawling activity due to overexploitation of the prawns.

On a more positive note, 25–30 bottlenose dolphins in Laguna, Brazil essentially run a fishing cooperative with local human fishermen, in which the dolphins and fishermen follow a strict protocol, with the dolphins herding the fish into the nets and feeding on the entrapped fish, to the benefit of both. This has been going on for generations, the cooperative fishing culture apparently passed from mother to daughter in the dolphins, and father to son in the humans. There are other dolphins in the Laguna area who do not participate in the cooperative fishing, and sometimes try to disrupt it. There are

In this photo from the U.S. Navy, Sergeant Andrew Garrett watches K-Dog, a bottle nose dolphin attached to Commander Task Unit 55.4.3, leap out of the water while training near the USS *Gunston Hall* in the Persian Gulf on March 18, 2003. Commander Task Unit 55.4.3 is a multinational team from the United States, Great Britain, and Australia conducting deep/shallow water mine clearing operations to clear shipping lanes for humanitarian relief and conducted missions in support of Operation Iraqi Freedom. Many people are concerned with the ethics of using dolphins to detect mines. (AP Photo/ U.S. Navy, Brien Aho, HO)

reports of similar human-dolphin fishing cooperatives in other places, including one involving a different species, the Irrawaddy dolphins in Burma.

In a similar vein, there was for many decades a whaling cooperative in Twofold Bay, Australia. Generations of killer whales would herd baleen whales into

the hunting areas of shore-based whalers, and then scavenge the dead animals once the whalers had done their work

From a cultural perspective, the most interesting whales and dolphins may be those which form permanent matrilineal groups. In such species, most female whales swim in the same social unit as their mothers while both are alive. In killer whales and pilot whales this often extends to the males, so that there is no dispersal from the natal social unit by either sex. In such cases the female-dominant pods can develop distinctive cultures. The most easily studied parts of these cultures are vocal repertoires. Pods of killer whales have distinctive dialects and are grouped into clans, which are recognized by vocal similarity, but seem to be based upon common ancestry. Sperm whale social units associate preferentially with other units from their own clan, even though units from two or more clans may share particular waters. In humans, dialects are markers of rich cultural differences between ethno-linguistic groups, and so it seems to be in the whales. The non-vocal cultural differences are those that are most likely to interact with anthropogenic effects on the ocean habitat.

The two principal sperm whale clans off the Galapagos Islands can be distinguished by their codas–Morse code-like patterns of clicks. But they use the waters differently. Groups of the Regular clan (click-click-click-click) primarily use the waters close to the islands, and have convoluted paths as they search these waters for deep water squid. In contrast, the groups of the Plus-one clan (click-click-click-click-pause-click) are generally further from shore and move in straight lines. Under most conditions, the groups of the Regular clan appear to have greater feeding success, but in the years when El Niño strikes and the waters warm, losing much of their productivity, all whales in the area have less success, but the Plus-one clan is less affected and does relatively better. Global warming seems likely to increase the frequency and strength of El Niños as well as the prevalence of El-Niño-like conditions. Preserving the cultural inheritance of the Plus-one clan may be crucial to the survival of the sperm whales in these waters.

More is known about killer whale cultures. Cultural differences have been recognized across several tiers of social structure—matrilineal units, pods, clans, communities, and types—and span a wide variety of behavior. Apart from the vocal dialects evident within all tiers, there are differences in foraging behavior, social behavior, and play behavior. The southern resident community has a ritualized greeting ceremony when pods meet, and is known for breaching and leaping from the water. For a short while, its members had a strange distinctive fad: pushing dead salmon around. In contrast, the northern residents do not show the greeting ceremony and rarely breach, but have a rubbing beach that they use regularly.

Some of these differences interact with human behavior. Most dramatically, when killer whales were captured for the display industry, they were fed fish. This was fine for the residents, who eat fish. But transient killer whales primarily eat mammals, and a transient who was also caught with the residents died of starvation rather than eat fish.

This is an example of cultural conservatism taken to the extreme, but culture can play it either way. Sometimes it promotes conservative behavior, preventing adaptive responses to changed circumstances, but in other situations culture

can allow a species to quickly adopt to new environments as animals learn new ways of life from one another. The spread of scavenging from human whalers and feeding from long lines by killer whales noted previously are two examples in which social learning likely helped spread an activity which some humans found extremely annoying.

When culture becomes a major determinant of behavior, as it appears to have done with killer whales and sperm whales, it can take dramatic forms, as a look at human behavior so clearly shows. Cultural conservatism and cultural opportunism are joined by group-specific cultural badges and maladaptive behaviors. We do not know why groups of apparently healthy whales and dolphins mass strand on beaches, but it seems likely that a usually sensible cultural imperative such as stay with the group whatever happens plays a part. Thus we need to view the behavior of cultural animals with a different perspective, and this must carry through when we are implementing conservation measures.

This came to a head with the transborder southern resident killer whales, whose small population in the inland waterways between British Columbia and Washington was declining. They differ from the northern residents north of British Columbia, a healthier population, by only one known base-pair of genes in their genetic code, but also by a host of cultural traits. Should the southern residents be specifically protected under endangered species legislation? The Canadian listing committee (COSEWIC) thought so, and listed them as endangered. The U.S. equivalent, the National Marine Fisheries Service (NMFS), thought not, and listed all killer whales in the area as depleted. However, after protests and legal challenges, the NMFS changed its perspective and upgraded the southern residents to endangered in 2006.

Cultural species may, through a new and rapidly spreading form of behavior, quickly become embroiled in a conflict with humans or, through their cultural conservatism, they may not react appropriately when we change their environment. But cultures, like genes, have evolved through natural selection, and they mostly have an important role in allowing animals to live their lives. Just as we seek to preserve genetic biodiversity, we must preserve the cultural diversity of such species, so that the cultured species of the ocean, like sperm and killer whales, have the knowledge to survive when we change their habitat.

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Hal Whitehead

WHALES AND DOLPHINS: SENTIENCE AND SUFFERING

Whales, dolphins and porpoises, collectively known as cetaceans, are remarkable nonhuman animals that exhibit

complex social lives. Recent research on this large group of animals not only informs us about their conservation status and provides fascinating insights into their unique ways of life, but also tells us a great deal about their capacity to suffer, both as individuals and as groups.

The size range of this group of marine mammals is quite extraordinary, ranging from the colossal blue whale, the largest animal ever to have lived on the Earth, to the small, rare, and critically endangered Vaquita and Maui's dolphin. Cetaceans have adapted to life in a range of habitats, from the murky river and estuarine waters of the Ganges and the Amazon to busy coastal areas, right out past the edge of the continental shelf to the almost extraterrestrial remoteness and depths of the Earth's great oceans.

Their capacity to communicate, navigate, migrate, find a mate, feed, and give birth in some of the oceans' more challenging environments has given rise to a number of unique and amazing adaptations. Most notable is cetaceans' use of sound. They use sound not only to communicate with those in close proximity but, for some species, over much greater distances, even across ocean basins. In the toothed cetacean species (*Odontocetes*), sound is also used to echolocate, helping them to find food and also providing three-dimensional information about the world around them.

Since the nature of the aquatic world which they inhabit is largely alien and inaccessible to humans, there are some significant challenges associated with studying cetaceans; researchers often have to piece together information about the complex lives of these marine mammals from fleeting glances of surface behavior, underwater encounters, or stranding events.

However, dedicated long-term studies of particular groups and individuals in the wild are starting to reveal some intriguing insights into the fascinating lives of whales and dolphins. For example, scientists recently discovered that the male boto, a South American river dolphin, uses seaweed, a stick, or a lump of clay to attract a mate (Martin and da Silva, 2008), a unique activity among mammals. Humpbacks, fin whales, orcas, and sperm whales all have a large number of spindle neurons, special cells previously believed to be unique to humans and other great apes, which are found in the areas of the brain associated with social organization, empathy, and speech (Hof and Van der Gucht, 2007). Certain cetaceans may have very specific roles within societies (Lusseau and Newman, 2004) and, perhaps most remarkable of all, there is now compelling evidence that some cetaceans societies exhibit cultural transmission between groups, transmitting knowledge on hunting skills or foraging methods, and some show evidence of having developed distinctive dialects (Whitehead et al., 2004).

The evolving field of cetacean science is beginning to unravel some of the mysteries of the lives of these great river and ocean dwellers and, in turn, inform us a great deal about their sentience and even their sapience. An important consequence of such insights is that the scientific community now has a duty to ask itself some searching question about the ability of these animals to suffer as a result of human activities. We are the human guardians of cetaceans and their habitats, and our improved understanding of their lives heralds the realization that we have even greater responsibility towards protecting them.

A southern right whale cow swims with a calf. Right whales, who can weigh up to 100 tons, got their name from whalers, who said they were the "right" whales to hunt. Their numbers were greatly reduced by the whaling industry. (Photos.com)

So, how do cetaceans suffer as a result of human activities? The answer is: in very many ways. Besides the more obvious acute threats such as hunting, trade in cetacean products, which drives hunting practices, and the estimated 300,000 cetaceans that die annually worldwide as a result of becoming entangled in fishing gear, cetaceans also provide a major attraction in one of the world's captive entertainment businesses: dolphinaria. Despite the apparent smile of the bottlenose dolphin, the most common dolphin species in captivity, the very medium in which captive dolphins exist is oftentimes barely recognizable as the sea environment it is intended to imitate; captive dolphins are usually trapped inside sanitized and chemically controlled tanks, perhaps the human equivalent of solitary confinement, rather than free-swimming in ocean currents, with tides and waves, surrounded by other species. Evidence suggests that captive dolphins are far from content and often have significantly shorter lives in captivity than in the wild (Rose et al., 2006). Ironically, it is the public's desire to get close to cetaceans in captivity that is one of the driving factors behind the brutal dolphin drive hunts in Japan (Vail and Risch, 2006) and it is this same desire that stimulates dolphin-assisted therapy, an expensive and expanding industry which has no scientifically proven benefits over any other animal-assisted therapies (Marino and Lilienfeld, 2007; Brakes and Williamson, 2007).

There are also many more insidious, but no less threatening, pressures on cetaceans and their wellbeing. There is considerable evidence that these threats are increasing and they include the degradation of dolphin habitat from ocean

noise, chemical pollution, marine debris, fisheries extraction, harassment, disturbance, and ship strikes, to the many and varied threats which may result from climate change, the resultant changes in ocean circulation, temperature, salinity, prey availability, and ocean acidification (Simmonds, 2006).

Scientists have developed methods for evaluating the various threats to cetaceans and continue to attempt to quantify how these threats will impact cetaceans at the population and species level. However, further effort needs to be expended to determine how these myriad threats will act synergistically and how they will influence the lives of cetaceans at the individual level, which will of course also better inform us about wider population and species implications. Some methods have been developed for evaluating physical injuries incurred, for example, from ship strikes or entanglements, but there has been little attempt to truly quantify the psychological suffering resulting from various threats. For example, the short- and long-term effect on conspecifics of the removal of a particular individual from a population has to date received little attention. This is in part due to the difficulty associated with collecting and interpreting these types of data. However, our growing understanding of the complex lives of these animals suggests that removal of key individuals may play an important roll in both the welfare of the remaining individuals and/or the long-term conservation status of a population (Lusseau and Newman, 2004).

Limited data are available on the suffering of whales and dolphins during hunting. The data show that during Japanese whaling operations whales take, on average, several minutes to die. These data also demonstrate that in some instances death takes a great deal longer than a few minutes; some whales last an hour or even longer (Brakes et al., 2004). This does not compare well with other forms of commercial meat production. For example, in many countries it is a legal requirement that an animal slaughtered in a slaughterhouse should be irreversibly stunned before being slaughtered so that it does not regain consciousness. Hunted whales and dolphins are not afforded anything close to the same level of protection at the time of slaughter, despite the considerable profit that the sale of their meat can yield. Furthermore, very little is known about the deaths of most of the cetaceans that die as a result of entanglement, as it often takes place below the ocean surface and usually beyond regulatory oversight. Postmortem data from recovered cadavers indicate that the diving reflex, which enables a dolphin to hold its breath, is so powerful that dolphins tend to asphyxiate rather than drown in nets.

Our growing understanding that cetaceans are sentient, sapient animals with complex social lives also engenders a moral responsibility for researchers to ensure that their research efforts do not harm their subject animals. Moreover, there is also arguably an experimental imperative to ensure accuracy, and that researchers do not inadvertently influence the very systems or variables they are attempting to measure. However, conflicting pressures on scientists to collect and publish data, which in the case of cetacean research is often in difficult and/or remote areas which can be expensive and logistically challenging to monitor, has driven a burgeoning interest in the use of telemetry data, where satellite or radio tags are attached to cetaceans, often with varying degrees of invasiveness, to collect data remotely. These methods tend

to collect data on just a few specific variables in isolation, without recording the wider context of the animal's behavior, environment or interactions with conspecifics and other species. There is some concern that the instrumentation effect may not always be taken into consideration, thus confounding the interpretation of some of the results and potentially limiting their value.

Furthermore, a growing understanding of cetacean cognitive ethology and the complexity of cetacean societies is accompanied by an ever more pressing need to recognize the interests and intrinsic rights of these intelligent animals. In his book *In Defense of Dolphins*, Thomas I. White asks whether dolphins qualify as persons and, therefore, whether they should be afforded the level of protection associated with personhood. As with the great ape debate, such a paradigm shift in the philosophy of our relationship with other animals would alter not only the way in which the global community views cetaceans, but also require fundamental legislative reform to meet the responsibilities associated with such a revelation.

In the meantime, this leaves us with some important practical questions for the protection of whales, dolphins, and their habitats. How human cultures protect them as individuals, populations, and species, and how we work to recognize their intrinsic rights as sentient individuals deserving of the status of personhood is also likely to influence their conservation status as well as their individual and group wellbeing. One thing is certain; there is a great deal more for us to learn about these amazing animals. As we consider how we treat our marine cousins and what we need to do to protect them in the coming centuries, we must also overlay the likely growing pressures from offshore power production, climate change, fishing activities, and the other myriad threats which are likely to further impinge upon their livelihoods and habitats.

It is perhaps easier for us to empathize with the great apes with whom we share a more recent ancestral lineage; it may be more challenging to make the same required leap in thinking for us to welcome cetaceans and other species under this mantle. Although cetaceans are, like us, warm-blooded mammals who suckle their young, their environment is almost entirely alien to us, as is their method of seeing the world through sound. Through our growing understanding of their complex lives, we can perhaps slowly begin to gain better insights into the true implications of our actions on them as individuals, groups, populations and, perhaps, even as cultures.

See also Affective Ethology; Consciousness, Animal

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Philippa Brakes

WHALES AND DOLPHINS: SOLITARY DOLPHIN WELFARE

Dolphins are extraordinary, intelligent, and undoubtedly self-aware (Simmonds, 2006). Biologist Philippa Brakes puts forward the proposition that we should change our relationship with them, and there is a compelling case to recognize them as nonhuman persons and award them rights under our laws (White, 2007). Dolphins are immensely popular, which should ensure their welfare and conservation, but this popularity actually creates problems. The difficulty of balancing our enthusiasms for interacting with these wonderful animals and protecting them from harm is particularly marked in the case of solitary-sociable dolphins.

Many solitary-sociable dolphins are young animals. They may have lost their mother and become detached from their school. In the UK, it is easy to see how this might happen. A dolphin swimming south, away from the Moray Firth population in Scotland, could travel hundreds of miles with little chance of meeting others of its own kind. Alternatively, it is possible that some dolphins naturally disperse away from their natal population to spend some time living alone.

What is arguably unnatural, however, is the relationship that wild solitary dolphins can develop with humans. A number of stages in the development of such relationships have been proposed (abridged from Wilke et al., 2005):

Stage 1. The dolphin first appears and remains in a new home range, sometimes restricting itself to a small area, often less than 1 km^2. The dolphin does not yet approach humans.

Stage 2. Local people become aware of its presence and attempt to swim with it. Dolphin appears curious but remains at a distance from swimmers.

Stage 3. The dolphin becomes familiar with the presence of one or more people and interacts with only a limited number. Its behavior may include swimming in close proximity or diving side by side, and it allows itself to be touched, including having its dorsal fin held to allow swimmers to be pulled along.

Stage 4. The presence of the animal becomes widely known. Inappropriate human behavior may provoke unwanted and possibly dangerous behavior by the

dolphin, including dominant, aggressive, and sexual behaviors directed at humans.

However, not everyone agrees that solitary sociable dolphins are created by such a process or that they are at risk. There are web sites and organizations dedicated to promoting swimming with solitary dolphins. They argue that the dolphins' behavior is entirely natural. The term ambassador dolphin has been coined for them, encompassing the notion that they are emissaries for their species. This line of argument can also draw on the long history of positive interactions between human and dolphin, with examples ranging from our earliest cultures to very recent stories of dolphins rescuing people from drowning or from sharks, accounts that are too detailed and frequent to be dismissed as flights of fancy.

Many of the historical stories appear to involve what we would now recognize as solitary-sociable dolphins. A recent example of one such dolphin was Dave, a bottlenose dolphin, later determined to be a juvenile female, who arrived on the coast of Kent in the southeast of the UK in April, 2006 (Simmonds and Stansfield, 2007; Eisfeld et al., 2008). She adopted a small range, a few kilometers long, close inshore on a coastline that is one of the most densely populated in the UK. Many people regularly bathe here, and leisure boating and recreational angling are also popular. At first, Dave was wary of people. Then she started to associate with one or two regular swimmers. As the presence of a small friendly dolphin became more widely known, more people came to seek her out, and she was even promoted by the local Chamber of Commerce as a tourist attraction. Many people, perhaps inspired by what they had seen on TV or in dolphinaria, tried to interact with her and, over time, she increasingly allowed this.

By September, 2007, she was avidly seeking out swimmers and kayaks to play with, and there were incidents where the robustness of her play caused alarm, including a couple of cases where she prevented people from leaving the sea. Dave also had some shallow wounds on her body by this time. In October, 2007, Dave received a life-threatening wound, with about a third of one tail fluke torn away, probably because of entanglement in fishing line. She was treated with antibiotics and monitored carefully. Her swimming seemed to become stronger over the next few days, but then she disappeared. It seems likely that she died.

The life history of another of these animals, a small female known as Marra, who was first noticed trapped in a dock in Maryport in Cumbria, northeast England, in January, 2006, was strikingly similar to that of Dave. Marra also adopted a small range, and again, the same basic stages in habituation to people followed. Over time she too was seen to be increasingly wounded, ultimately suffering an untimely death from an infection likely caused by her wounds and exposure to contaminated near-shore waters. Three out of the four UK solitary dolphins monitored since 2006 have now almost certainly died as a result of their friendly behavior; the third animal was killed by a boat propeller, and the fate of the fourth animal is unknown (see Simmonds and Stansfield, 2007, and www.wdcs.org/solitaries).

A coalition of welfare groups and local volunteers attempted to keep Marra and Dave safe. The coalition consulted widely around the world and concluded that it would be better if the young dolphins did not become habituated. Outreach pro-

grams were developed to try to persuade the local community and visitors to leave the dolphins alone, but they failed. The allure of increasingly friendly dolphins was too great, and people could not resist joining them in the water, thereby largely unwittingly changing the behavior of these animals, making them more vulnerable to harm.

The stories of Dave and Marra are being repeated across the world. There are many other solitary-sociable dolphins. Many are bottlenose dolphins, but there are also solitary-sociable Risso's dolphins and belugas. Orcas can also show this behavior, and the famous case of Luna, a juvenile living in Nootka Sound in Canada, killed in March, 2006, by a tugboat propeller, is now the subject of a remarkable award-winning film. Friendly whales and dolphins are vulnerable not only to accidental harm, but also to deliberate attack. There are at least four examples of such animals being deliberately killed by humans, while others have mysteriously disappeared (Samuels et al., 2000; Frohoff et al., 2006). On the other hand, it is suggested that some solitary-sociables reunite with their own kind, and there is at least one famous example of a solitary-sociable who has mainly survived apart from his species for several decades.

A case can be made that a fully habituated solitary dolphin benefits from the presence of its human friends, because they may be meeting its social needs. But they may actually be inhibiting the animal from seeking its own kind, and are almost certainly putting it at risk from other dangerous human interactions.

Dolphins deserve their reputation for being gentle and friendly. Very few dolphin-human interactions have ended in serious harm to people, all the more remarkable bearing in mind the animals' size and superior aquatic abilities. The weight of scientific opinion is that we are generating increasing numbers of animals that lose their natural fear and seek to interact with us. The fact that we are increasingly invading their environment may be facilitating this. Thus, we need to work out how to offer them better protection or how to prevent this habituation to humans.

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Mark P. Simmonds

WILD ANIMALS AND ETHICAL PERSPECTIVES

Few ethicists today doubt that humans have duties toward domestic animals, but the question of duties to wild animals is more vexing. Some of the leading issues are hunting and trapping, animal

suffering, appropriate levels of management intervention, poisoning, habitat degradation, feral animals, restoration, and endangered species.

Duties to wild animals, if they involve care, also involve noninterference, sometimes called hands-off management. In 1988, with the world watching on news media over a two-week period, two gray whales were rescued from winter ice off Point Barrow Alaska. A Russian icebreaker opened a path to the sea; considerable time and expense was required. But perhaps there is no duty to save stranded whales; human compassion may have become exaggerated.

In February 1983, a bison fell through the ice into the Yellowstone River and struggled to get out. Snowmobilers looped a rope around the animal's horns and attempted a rescue. They failed, and the park authorities ordered them to let the animal die, and refused even to mercy-kill it. "Let nature take its course," is the park ethic.

In 1981–82, bighorn sheep in Yellowstone developed conjunctivitis or pinkeye. Partial blindness often proves fatal on craggy slopes. More than 300 bighorns perished, over 60 percent of the herd. Wildlife veterinarians might have treated the disease, as they would have with any domestic herd, but the Yellowstone ethicists claimed that the disease should be left to run its natural course. Humane caring was not a criterion for decision. Rather, the sheep were left to be naturally selected for a better adapted fit.

If suffering is a bad thing for humans, who seek to eliminate it, then suffering is also a bad thing for wild animals. Some respond that here human nature urges compassion, and why not let human nature take its course? Do unto others as you would have them do unto you. But compassion is not the only consideration, and in environmental ethics it plays a different role than in a humanist ethics. Animals live in the wild, subject to natural selection, and the integrity of the species is a result of these selective pressures. To intervene artificially is not to produce any benefit for the good of the kind, although it may benefit an individual bison or whale. Human beings, by contrast, live in a culture where the forces of natural selection are relaxed, and a different ethic is appropriate.

Wild animals are often impacted by human-introduced changes, which can change the ethic. Colorado wildlife veterinarians have made extensive efforts to rid the Colorado bighorns of a lungworm disease, in contrast to the Yellowstone authorities who refused to treat their bighorns with pinkeye. Arguments were that the lungworm parasite was contracted, some think, from imported domestic sheep, or that, even if it is a native parasite, the bighorns' natural resistance is weakened because human settlements in the foothills deprive sheep of their winter forage and force them to winter at higher elevations. There, undernourished, they contract the lungworm first and later die of pneumonia.

The difference is that with the introduced parasite, or the disrupted winter range, or both, natural selection is not taking place. Letting the lungworm disease run its course would not be an instance of letting nature take its course and, both in concern for the species and in concern for suffering individuals, treatment was required.

The ethic changes again where an endangered species is involved. In the spring of 1984, a sow grizzly and her three cubs walked across the ice of Yellowstone Lake

A gray wolf, also known as a timber wolf, remains alert. The habitat of wolves throughout Eurasia and North America continues to dwindle for these predators. (Photos.com)

to Frank Island, two miles from shore. They stayed several days to feed on two elk carcasses, when the ice bridge melted. Soon afterward, they were starving on an island too small to support them. This time park authorities rescued the mother and her cubs and released them on the mainland.

The relevant difference was a consideration for an endangered species, much interrupted by humans who have long persecuted grizzlies. The bears were saved lest the species be imperiled. Duties to wildlife are not simply at the level of individuals; the ethic is that one ought to rescue individual animals in trouble where they are the last tokens of a type.

Wolves have recently been reintroduced to Yellowstone National Park, having been exterminated there early in this century. The restoration earned protests from some in the ranching community. Such restoration arises, according to most advocates, from a duty to the wolf as a species, coupled with the fact that the wolf was historically, and ought to be again, the top predator in the Yellowstone ecosystem. Conservationists also realize that problem wolves will have to be relocated, sometimes killed, and believe this is an acceptable killing of individuals in order to have the wolf species present. It removes wolves who turn to killing sheep or cattle, not their natural prey; it also protects ranchers against losses. In the recommended mix of nature and culture, if we are to have wolves, we must kill wolves.

Duties to animals can conflict with concern for endangered animal or plant species. In a 1996 case, the U.S. Fish and Wildlife Service moved to poison 6,000 gulls at Monomoy National Wildlife Refuge off Cape Cod, in order to save

35 piping plovers, an endangered species. A U.S. District Court rejected an appeal by the Humane Society of the United States to stop the killing.

San Clemente Island, off the coast of California, has both endemic plant species and a population of feral goats, introduced by Spanish sailors two centuries ago. To protect plants numbering in the few hundreds, the Fish and Wildlife Service and the U.S. Navy have shot tens of thousands of feral goats. The Fund for Animals protested that it is inhumane to count a few plant species more than many mammal lives. But again the ethic of species triumphed.

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WILDLIFE ABUSE

Although not all hunters engage in excessive or especially cruel methods of hunting, some do, leading to slaughters and endangerment of animals such as passenger pigeons and buffalo. Methods of hunting captive animals, moreover, are seen by most to be not only inhumane but also unsporting. Hunting seems to be lessening in popularity in the United States. According to figures from the U.S. Fish and Wildlife Service, the number of hunters 16 and older declined by 10 percent between 1996 and 2006—from 14 million to about 12.5 million (U.S. Department of Commerce, 2006, p. 22) Hunting organizations point to changing demographics, urbanization, and decreased access to hunting land as the cause for the shift. However, with the growing increase in outdoor activity overall, a possible cause is a change in values.

Membership in humane-based organizations is at an all-time high, and in the last several years, states have passed a record number of animal-friendly laws. At the same time, the number of Americans who participate in other humane wildlife activities like bird watching and photography continues to rise. Wildlife watching appears to be increasing at a rate of about 16 percent from 1996 to 2007 (U.S. Department of the Interior and U.S. Department of Commerce, 2006, p. 36).

The Changing Face of Wildlife Management

Organized wildlife management in this country dates back to the early 20th century, and was partially a reaction to the wholesale slaughter of many of the country's most prolific species. At the end of the 19th century, the commercialization of wildlife was reaching epidemic proportions. Hunters were killing large numbers of animals for their fur, skins and parts; the most notorious case was the American buffalo, which hunters brought to the brink of extinction.

A second, even more troubling massacre followed. The passenger pigeon was once the most common bird on the continent, perhaps in the world—migrating in flocks that took days to pass overhead.

Seals being clubbed during a cull on the Namibian coast. The practice generates a war of words between the government and animal rights activists who object to the practice, which will see 80,000 pups clubbed to death in a year. (AP Photo/STR/Seal Alert)

Thanks to shooters' unwavering zeal, the last known passenger pigeon, "Martha," died in Ohio on September 1, 1914.

Conservation leaders at the time developed a new set of ideals, and slowed the commercialization of wildlife. Most notably, Aldo Leopold suggested a wildlife management model, later labeled the North American Wildlife Conservation Model, that held the fundamental principle that wildlife belong to all people and are managed in trust by the government. According to his model, wildlife managers have a responsibility to sustain animal populations forever.

The North American wildlife conservation model sets limits by restricting activities as a means of protecting wildlife. The conservation model commands thorough consideration in the killing of wildlife, although it views wildlife as resources and the killing of wildlife as harvesting, ideas that fewer and fewer Americans agree with.

Although the North American wildlife conservation model has been the dominant philosophy for the past century, the system shows signs of inevitable unraveling. The model sits squarely on the shoulders of consumptive users of wildlife, that is, hunters and fishermen, because license sales directly fund state agencies responsible for wildlife management.

Wildlife Abuse

Those responsible for the buffalo and passenger pigeon massacres are rightly notorious as people who simply didn't understand the power that humans wield

over nature. The tragic stories of these animals are chalked up as examples of ecological ignorance and unknowing people unable to control their impulses. These stories from the past are more than history, though. They are windows into something else, perhaps something darker in the human character, the inexplicable lust to kill.

Captive Hunting

Often occurring at places with names like game ranches and shooting preserves, captive hunts are actually commercial killing fields where customers pay large sums to kill animals inside enclosed areas.

The victims, ranging from zebras to Himalayan mountain sheep to endangered species like the scimitar-horned oryx, are bred on ranches or purchased from dealers. Sometimes dealers visit petting zoos and roadside zoos looking for living targets like warthogs, rhinos, and exotic deer.

Whether bred or bought, they are typically semi-tame, perhaps hand-reared animals who have lost most of their fear of humans. They might look like wild animals, but they are domesticated enough to trust people, and that trust makes them particularly easy targets. Some captive hunts utilize tiny pens, while others convey the illusion of more space by covering hundreds of acres. But the size does not matter. Ranch hands, who call themselves guides, know all of the haunts and hiding places. They can always lead the customer straight to the target. In some cases, animals are killed at their scheduled feeding time, which is why the operators of even the largest canned shoots can advertise with perfect confidence, "No kill, no bill!"

Killing Contests

In wildlife killing contests, participants attempt to kill as many animals as possible for money, hundreds or even thousands of dollars, and prizes. The events conclude at a checkout station where participants pile up the dead animals for photographs before dumping the bodies elsewhere.

Pigeon Shoots In pigeon shoots, tame birds are released from boxes called traps to be shot from 30 yards away. Nine traps are lined up in front of the competitor. Sometimes electrified to shock the birds into flight, the traps pop open one at time in a random sequence, with each pigeon on the receiving end of two rounds of shot. The shooter gets points for each shot bird that lands within a large ring. Often, wounded birds escape the ring to the surrounding area and suffer for days before succumbing to their injuries. At the end of the day, prizes are awarded based upon who shot down the most birds into the ring.

Coyote Contests Coyote calling contests, in which contestants compete for prizes to see who can kill the most coyotes in a specified period of time, are found across the West and Midwest. Coyote hunters sometimes gather at bars the night before a hunt to bet on winning teams and who will kill the biggest animal. Contestants use two basic techniques, both involving mechanical, commercially-manufactured calls: imitating coyote distress cries, and those of downed prey animals, usually deer or rabbits. The coyote then comes to investigate. Instead of finding a fellow coyote in trouble or a meal, the coyote instead encounters a two-person team of

hunkered-down, camouflaged killers. One is a shooter with a high-powered, long-range, tripod-balanced, scope-mounted rifle, often equipped with an electronic range finder. The other is a spotter, using powerful binoculars to search the countryside for any signs of a coyote on a mission of mercy or in search of dinner. It is not unusual for several hundred coyotes to be killed in the course of a three- or four-day contest. How many are wounded by difficult, long-range shots and left to wander off and die slow, painful deaths is something that contest aficionados never talk about.

Prairie Dog Contests At prairie dog-killing contests, participants set up shooting benches at varying distances from a prairie dog colony, and they each fire as many as a thousand rounds of ammunition at the unsuspecting animals to see who can kill the most in a specified period of time. The kills glorify the cruelty they inflict, with contestants typically cheering the explosion of varmint vapor with each shot. Contestants receive extra points when a prairie dog flies into the air upon impact. Some shooters aim for specific body areas, hoping to throw the animal in a certain direction, and some kill multiple animals with one shot. Shooters have a number of phrases to characterize the slaughter, including Montana mist, Dakota droplets, red mist, and dog popping.

Stocking

State wildlife agencies should be stewards of the environment. But some agencies raise and release non-native ring-necked pheasants for target practice. Native to China, these pheasants don't thrive everywhere in the United States. Yet to meet hunter demand, wildlife agencies release hundreds of thousands of birds each year that have little chance of survival. Because they are pen-raised, stocked pheasants often lack the skills necessary to fend for themselves. In some states, hunters wait in parking lots for trucks bringing crates of these birds, or line up before release for the first shot. The pheasants who survive this initial gauntlet usually succumb to harsh weather, starvation, or predators.

Wildlife Penning

Although dog fighting and cockfighting are illegal in every state, the cruel practice of penning wildlife for fighting may be found across the Southeast. Coyotes and foxes are caught by the heavy steel jaws of leghold traps, often suffering excruciating pain and terror. Traps can tear flesh, cut tendons and ligaments, and break bones. When the animals struggle to free themselves, they aggravate their injuries. Trapped animals have even chewed or twisted limbs off in an effort to escape. Later, the animal is removed from the trap and packed into a cramped cage with other injured animals to be sold and transported, often across state lines. Untreated for their injuries, the coyotes and foxes are released into an enclosure. In the pens, packs of hound dogs are released to chase the animals, which are exposed to repeated, prolonged, and unavoidable pursuit. Even though some pens have escape shelters, the trapped animals often meet an agonizing and terrifying end when torn apart by packs of dogs.

Targeting Bears

In many states, bears are targeted with some of the most inhumane practices,

particularly baiting, hound hunting, and spring hunting. Bear baiting involves using piles of donuts, rotten meat, or other garbage to lure bears into the shooters' sights. As the bears eat, hunters in nearby tree stands pick them off at close range. Hound hunters sometimes use packs of GPS-equipped hound dogs to chase bears until they're so exhausted they have no choice except to climb a tree in a futile attempt to escape their pursuers. Once the bear is treed, the so-called hunter simply shoots him down. Spring bear hunting involves shooting bears when they have just come out of hibernation and sows are still nursing dependant cubs. When their mothers are killed, the cubs are left to die from starvation, exposure, or predation.

Poaching

Many poachers kill animals solely for trophies to hang on their walls. A poacher may kill an elk or deer, chop off the head and antlers, and then simply leave the rest of the body behind. Some stockpile the antlers or send trophy hunting magazines macabre photographs of the bodies. Officials estimate that for each one of the tens of millions of wild animals killed legally every year, another is killed illegally. And with scarce wildlife enforcement resources and countless acres of open land, only a miniscule percentage of poachers are ever caught and punished for their crimes.

Doves

Mourning doves are the traditional bird of peace, and to many a welcome backyard visitor. They delight millions of birdwatchers and people who simply attract these gentle birds to their backyard feeders. But a minority of Americans view mourning doves as nothing more than live targets, sometimes referring to them as cheap skeet. More than 20 million doves are killed each year, earning them the tragic distinction of the most-hunted animal in the United States. Studies consistently reveal that, after being shot, nearly one in three birds is wounded and simply left to die. Because they are so small, and at their lightest weight during the shooting season, many hunters don't even bother eating them.

Since doves are not overpopulated and do not damage crops or property, hunters can't even claim that there is any excuse to kill them. Shooting doves also damages the environment, since dove shooters favor cheap lead shot. Most of the shot falls to the ground, where it quickly accumulates and poisons the soil and the groundwater. Doves and other birds frequently ingest lead pellets, which are toxic to them and the birds who prey upon them.

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Andrew Page

WILDLIFE CONTRACEPTION

Interest in wildlife contraception has grown sharply among animal advocates, since it was demonstrated in the late 1980s that contraceptive vaccines could be used safely to prevent pregnancy in free-roaming wild horses. These so-

called immunocontraceptives were first injected into the famous wild horses of Assateague Island National Seashore, Maryland, by researchers using darts and dart guns (Kirkpatrick et al., 1991). The ability to administer contraceptives to free-ranging wildlife by dart, without capturing or handling them, raised the possibility of using such agents to manage populations of deer, elephants, and other species that are often controlled by sport hunting or other forms of systematic killing often referred to as culling.

Many animal advocates feel that such a nonlethal means of wildlife population control would be a very desirable alternative to hunting and culling. Indeed, various forms of wildlife contraception have now been applied, usually as part of a research study, to free-ranging white-tailed deer, elk, African elephants, African lions, prairie dogs, coyotes, pigs, kangaroos, koalas, Canada geese, pigeons, and many other species. Yet many questions remain about the ethics of contraceptive use on free-ranging wildlife, ranging from narrower questions about the effects of specific contraceptive treatments on the health, behavior, and genetics of treated wildlife, to questions about when, where, and whether contraceptives should be used on wildlife in the first place.

In the policy arena, the debate over the merits of wildlife immunocontraception is most commonly waged in strictly human-centered utilitarian terms; arguments weigh the costs and benefits of contraception to the human community. Can contraception reduce the number of deer-vehicle collisions on the roads, or the damage to backyard shrubs and gardens? How fast? At what cost? Can this be accomplished faster by culling? Is contraception safer than hunting or culling? The interests of the animals themselves may receive lip service, or not be recognized at all.

One important ethical argument rooted in human-centered values is whether contraception will reduce the availability for human use of an important wildlife resource. A common criticism of proposals to manage African elephant populations with contraception, which is now feasible in many circumstances (Delsink et al., 2007) is that native peoples would thereby lose the economic opportunities provided by hunting or culling, such as selling ivory, imposing fees for trophy hunting, and consuming, distributing, or selling meat. In that context, opponents may characterize contraception as a foreign concept being forced on native peoples by Westerners whose attitudes towards animals differ markedly from those of the natives. This can be a very effective argument in policy debates, regardless of whether it is supported by facts.

The questions shift when the interests of the animals themselves are incorporated into the ethical calculations. In an expanded utilitarian discussion, the interests of the human community are balanced against the interests of the animals. How grave are the consequences of wildlife overpopulation for the human community? If the impacts can be characterized as trivial or frivolous, perhaps minor damage to lawns or ornamental shrubs, or the presence of fecal matter on lawns or sidewalks, does this really justify major intervention such as contraception or killing in the lives of wild animals? Or perhaps conflicts between people and wildlife can be resolved without wildlife population control, by excluding wildlife from sensitive areas, modifying the behavior of wildlife, or encouraging people to make simple changes in their own

behavior. This living with wildlife view is promoted by many animal protection organizations such as the HSUS and MSPCA (Hadidian, 2007). For example, securing food, removing bird feeders, using bear-proof trash containers, and applying aversive conditioning make human settlements less attractive to black bears, and may reduce or eliminate the need to control bear population size. In this expanded utilitarian approach, people benefit by the reduction of impacts from wild animals, and wild animals are spared suffering or death.

In the case of more serious conflicts between wildlife and people, a utilitarian approach may justify the use of contraception or even killing of wildlife to protect human interests or a broader ecological community of plants and animals. To take one well-known example, the release of rabbits, red foxes, housecats, and other animals of European origin into Australia has had dramatic and harmful impacts on the native wildlife of Australia, causing extinctions of some species and threatening the existence of many more. Wildlife managers have responded by killing these introduced animals on a massive scale, using shooting, trapping, explosives, poison, infectious disease, and other techniques, many of which are widely perceived to be extremely cruel (Oogjes, 1997). While the control of such species might be justified by utilitarian calculations, the associated animal suffering and death weigh heavily against current control practices.

Threats to public health and safety associated with wildlife populations at high densities also push utilitarian calculations toward active control of wildlife numbers. Personal injuries and property damage associated with deer-vehicle collisions, as well as the injuries and deaths sustained by the animals themselves, may justify the application of population control, especially if such methods are perceived as more humane than death by vehicle. Wildlife population control in response to wildlife impacts that are strictly economic, such as limited crop damage or livestock depredation, is ethically problematic, since the utilitarian calculations differ sharply depending on whether or not it is you who are experiencing the damage. Those who work with livestock generally like the idea of government-sponsored predator control; taxpayers are less enthusiastic since they bear the cost but share little of the benefit, and some may even favor the interests of predators over those of stockmen. Of course the predators themselves favor it least of all.

The principal utilitarian argument for the use of contraception is that, in case of serious human-wildlife conflicts or harmful ecological impacts, contraception may provide a more humane and less invasive method of wildlife population control than other management alternatives. Here we must enter the tricky ethical ground of deciding on the wild animal's behalf what course of human action is in his or her best interest. The common assumption, on which the utilitarian case for contraception is made, is that from the animal's perspective, foregoing reproduction is preferable to death and the suffering that may be associated with death. Many animal welfarists are comfortable with this argument, since it is also a fundamental ethical assumption of spay-neuter campaigns advanced for cats and dogs; the invasiveness of sterilization is justified by the prevention of suffering and death that would have been experienced by dogs and cats for whom good homes could not be found.

Not everyone accepts this argument. Just as many Europeans consider surgical sterilization of companion animals to be an unethical mutilation (Salmeri et al., 1991), it has been argued that contraception deprives female wild animals of activities fundamental to their natures; the ability to try to carry out those activities should not be sacrificed even at the risk of early death. When reversible, of course, contraception does not pose such a stark choice; contraception may cause only a delay of reproduction, not a lifetime deprivation, which weakens the case in opposition.

A related ethical argument in opposition to wildlife contraception is that it is unnatural or playing God. Often this argument is voiced by sport hunters, who feel that they themselves are the natural population control agents for wildlife, and that they fill the ecological niche left empty by the natural predators that have been displaced by modern civilization (Porton, 2005). They perceive contraception as yet another agent of the civilization that has made such a mess of nature in the first place.

Sometimes it may be possible to obtain an answer of sorts to the question of the animals' interest in contraception or death from the behavior of the animals themselves. For example, female white-tailed deer will generally abandon their young to their fates when threatened by predators. This suggests a preference for delaying reproduction rather than risking death, which one might argue supports the view that the animal would prefer reversible contraception to death. Whether the behavioral expression of preference is intentional, incidental, or a product of Darwinian natural selection or something else is another question.

The best interest of the animal may also depend on the nature of the contraceptive. The attractiveness of the contraceptive first used on wild horses at Assateague Island (PZP, or porcine zona pellucida) rests not only on a relatively high level of effectiveness, but on the capacity to administer it without handling the animal, which is typically stressful to wildlife, and on the absence of serious side effects with respect to the health and behavior of the treated animal (Kirkpatrick & Rutberg, 2001). Contraceptives that pose health risks to the animal, as some steroid contraceptives do for cats, or that change natural behavior in important ways, will compare less favorably to alternatives (Munson, 2006). As implied above, permanent sterilization might be considered more invasive than reversible contraceptives, and therefore less preferred from the viewpoint of the animal's interest. If conserving genetic variability in the population is an important value, permanent sterilization is also less desirable than reversible contraceptives because it effectively removes the treated individual from the gene pool.

Thus, the ethical logic of all of the arguments presented above rests on a utilitarian foundation, that is, weighing the interests of people and animals against each other to reach an outcome that produces the most good for the most community members. Even when the interests of animals are weighted equally with those of people, however, this does not constitute an animal rights view in the strict sense. Rather, the animal rights view sets firm limits on what is right to do to a wild animal, and what is wrong, just as the Bill of Rights in the U.S. Constitution was written to limit what the government can do to restrict the behavior of individual citizens, regardless of the will of the majority. Depending on exactly what rights one believes animals

should have, what boundaries cannot be transgressed, one may or may not oppose wildlife contraception. One strongly held rights view is that free-ranging wild animals should be able to live free of systematic manipulation by people, to fulfill their basic natures and experience their lives on their own terms (Porton, 2005; Hammer, 2006). Contraception of free-ranging wild animals is such a systematic manipulation, at minimum denying animals the experience of reproduction and its consequences, or at least denying the animal the control over its own reproductive schedule. Consequently, wildlife contraception is not justified under the ethical premise of no systematic manipulation. In an odd parallel with sport hunters, those who advocate this right perceive contraception as an unnatural intervention; of course, rather than advancing hunting as the alternative, they argue against any intrusive intervention.

The animal rights position against systematic manipulation of free-ranging wild animals raises some difficult ethical questions. It is easier to make a no intervention argument for free-ranging wild animals living in relatively natural habitat, large tracts of land where the human footprint is shallow. It is more difficult to advance this argument for free-ranging wildlife living in cities, towns, and suburbs, where human actions and activities dominate the environment. Even from a rights perspective, intervention in the lives of animals that thoughtfully considers their interests might appear more ethical than the indifference to the interests and rights of wild animals which commonly prevails in the day to day activities of human communities.

Other framings outside the formalized structures of utilitarianism and rights language may provide a more robust ethical foundation for guiding the use of contraception on free-ranging wild animals. The language of guardianship is advancing as a way to think about the respectful treatment of companion animals, and may also help guide human relationships with wild animals. This ethic shares features with relationship- and context-based feminist ethics of care, and may offer a platform that extends beyond the single-species focus of traditional wildlife management to broader aspects of the biological community.

In particular, a guardianship ethic may help resolve ethical paradoxes within the rights concept. Compassion, care, connectedness, and responsibility are built into the common notion of guardianship, but so also are respect for and recognition of the interests and autonomy of the object of guardianship. Because guardians ideally encourage the autonomy and independence of their charges, a guardianship ethic could minimize or preclude human intervention, including contraception, in the lives of wild animals occupying habitats where human impacts are minimal. In a guardianship framing, animals that live in human-dominated environments might require, and deserve, thoughtful humane intervention, potentially including contraception, to reduce animal suffering and facilitate amiable coexistence with people.

See also Animal Reproduction, Human Control of

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WILDLIFE SERVICES

Wildlife Services, a program of the U.S. Department of Agriculture and part of the Animal and Plant Health Inspection Service, spends more than $100 million annually to kill more than one million animals, primarily birds, and hundreds of thousands of mammals such as black and grizzly bears, beavers, mountain lions, coyotes, and wolves (USDA-APHIS-WS 2008a). Wildlife Services was a major force in eliminating wolf and grizzly bear populations in the continental United States by 1940 (Robinson, 2005; Mighetto, 1991; Dunlap, 1988).

Wildlife Services aerial guns, traps, and snares animals, and broadcasts a panoply of dangerous toxicants that harm a variety of taxa, for the purported benefit of the agricultural industry. Between 2004 and 2007, Wildlife Services killed 8,378,412 animals (USDA-APHIS-WS, 2008a). The numbers of mammals in the overall kill has increased in recent years. In 2004, for instance, the agency killed 179,251 mammals, compared with 207,341 in 2006 (USDA-APHIS-WS, 2008a). Wildlife Services has escalated the numbers of endangered species it killed in recent years for a total 2,481 individuals, primarily gray wolves, since 1996 (USDA-APHIS-WS, 2008a). The average number of endangered species killed between 1996 and 2004 was 177.5. In comparison the average number of endangered species killed between 2005 and 2007 was 294.3, representing a 66 percent increase in the numbers of endangered species killed in the past three years (2005–2007), as compared to the previous nine (1996–2004) (USDA-APHIS-WS, 2008a).

Yet Wildlife Services cannot accurately count each poisoned individual. Many toxic bait sites go undocumented. Grizzly bears may trigger an M-44, a device that expels deadly sodium cyanide, only to die unnoticed in the wilderness. Numerous family dogs have been exposed to M-44s, as have people (Keefover-Ring, 2007). Tens of thousands of birds, poisoned by DRC-1339,

an avian toxicant, rain down from the sky, forcing some homeowners to scoop them up with pitchforks (Antone, 2008; Slabaugh, 2008). Because the toxicant can take three days to act, many birds are not found and included in the agency's statistics (see Johnston et al., 2005). Wildlife Services sprays pesticides from helicopters onto cattails in wetlands to reduce breeding sites for migratory blackbirds to benefit the sunflower industry (USDA-APHIS-WS, 2008b). These treatments likely cause harm to wetland functionality, water quality, and wildlife habitats.

Why the killings? Wildlife Services is designed to help agribusiness reduce losses caused by wildlife. Because its focus is on utilitarian values (USDA-APHIS-ADC, 1994), little energy is afforded to conservation concerns, people's diverse values for wildlife (Kellert, 1996), or even an emphasis on non-lethal wildlife controls (US GAO, 1995, 2001). Biologists, economists, and federal oversight agencies have, however, criticized the efficacy of Wildlife Services. Biologists have dubbed the agency's predator-control program the sledgehammer approach to wildlife management because of the breadth of extermination (Treves and Karanth, 2003; Stolzenburg, 2006; Mitchell et al., 2004). Large-scale predator-killing programs are unsustainable and environmentally harmful. Few livestock producers actually experience predator problems, because most unintended cattle and sheep deaths come from birthing problems, disease, or weather, but not predation (Keefover-Ring, 2008). An economic study shows that lamb prices, wages and hay costs, but rarely predators, harm sheep producers (Berger, 2006). More ominous to many, several federal agencies have determined that Wildlife Services' practices prove hazardous.

Wildlife Services presents a national security threat, according to federal oversight agencies. In a series of audits since 2001, the USDA's Office of Inspector General has sanctioned Wildlife Services for its unsafe handling of lethal biological agents, toxins that could be used in biological warfare (Fleischman, 2002; USDA-OIG, 2004a, b, 2005, 2006), particularly sodium cyanide and Compound 1080, both of which can be used in chemical warfare and are extremely toxic to humans. In March, 2008, the Environmental Protection Agency issued a notice of warning letter to Wildlife Services for its illegal and unsafe placement of M-44s that resulted in the injury of a U.S. Fish and Wildlife Service biologist and the death of his hunting dog. In November, 2007, Wildlife Services itself admitted that it had experienced a series of accidents that involved its aerial gunning program, its hazardous chemicals inventory, and more (USDA-APHIS-WS, 2007). The aerial gunning program, for instance, caused ten fatalities and 28 injuries to federal employees and contractors in the years between 1979 and 2008 (Keefover-Ring, 2008).

Despite this track record, Wildlife Services skirts around disclosure laws. For instance, in July 2000, WildEarth Guardians, a nonprofit organization whose mission is devoted to protecting and restoring wildlife in the American West, requested documents pursuant to the Freedom of Information Act concerning aircraft accidents. The response arrived in October, 2007, seven years late, and incomplete. A major report was missing, and 82 of 400 pages were redacted. Wildlife Services finds federal disclosure laws inconvenient. Despite its pub-

lic status and funding sources, Wildlife Services, according to critics, remains publicly unaccountable.

Most of Wildlife Services' budget comes from federal tax dollars, but states and counties also contribute. The agency also receives funding from private contributors such as the Woolgrowers Association and the Cattlemen's Association (USDA-APHIS-WS, 2008a). This biologically and fiscally expensive program burdens taxpayers.

To many, Wildlife Services appears to kill America's wildlife in order to benefit agribusiness. In fact, it is the mission of Wildlife Services' parent agency, the Animal and Plant Health Inspection Service (APHIS), to "protect the health and value of American agriculture and natural resources" (USDA-APHIS, 2008). It argues that the government's role "in preventing and controlling damage caused by wildlife is sensible" because "wildlife belong in common to the country's citizens" (USDA-APHIS-ADC, 1994, Chapter 3, p. 51). Yet taxpayers are unwittingly funding the deaths of hundreds of thousands of animals each year. Those deaths are conducted in ways that are harmful to the environment, the public, protected species, and family pets.

Viable nonlethal alternatives to using dangerous toxicants, traps, and aerial gunning are available but go unused. While practical and time-tested nonlethal aids are available to the livestock industry and farmers, the federal government neither actively uses them, nor does it appear to spend significant resources developing new ones. To some, Wildlife Services appears to shoot first and deflect questions later. In 2008, WildEarth Guardians released a report to Congress calling upon it to defund Wildlife Services' lethal animal control measures.

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Wendy Keefover-Ring

WOLVES AND ETHICAL PERSPECTIVES

Religious and ethical perceptions of wolves are unsurprisingly intertwined with the ways that wolves come into conflict or cohesion with human interests. From ravenous beasts, to protective gods, to wildlife superstars, wolves have played various symbolic roles throughout history. Because the human imagination is entangled with the physical landscape, wolves have alternatively been decimated, persecuted, respected, or allowed to flourish based on the degree to which humans have considered them a part of their moral and sacred communities.

Wolves as Kin

As a species particularly well equipped for symbolic thought, humans have long looked to other animals for their behavioral cues, adapting and adopting various nonhuman animals as social models. For many small-scale societies that depended on coordinated hunting as a means of subsistence, wolves were often treated with admiration and seen as teachers and masters of the hunt. Recognition of the similarities between wolves and humans was often reflected positively through a kinship-based ethic and oral narratives describing the manner in which wolves aided hunters, religious specialists, and warriors in times of need.

Kinship relations, based on physical proximity and mythic importance (the

two often being related), between humans and nonhumans were and remain important for many Amerindian peoples. Spiritual power could be given or withheld by animals, and was believed to be dependent on individual and corporate rituals that ensured proper respect toward particular animals. The Skidi Pawnee are perhaps best remembered for their social correspondences with wolves, but other plains-based tribes, such as the Tonkawa and the Cheyenne, ritually reenacted oral narratives through elaborate dances that explained their origins as hunting peoples, expressed their cultural dependence on wolves, and were intended to ensure productive hunts. Origin myths of the Paiute, Cree, Blackfoot, and Arikara recall how a wolf helped to form the Earth itself. For indigenous peoples in northwestern North America, such as the Nootka, Kwakiutl, and Quillayuk, wolf people played a special role in initiation ceremonies that served to ritually incorporate young people as members of their respective societies.

For cultures such as these, an emphasis on the permeable boundaries between humans and nonhuman animals was and is common. In many ways, wolves' high degree of sociability makes them likely candidates for special attention. To name just a few characteristics, wolves have elaborate systems of communication; they are socialized and learn valuable skills through play; they coordinate their movements and hunts to accomplish goals that could not be accomplished in isolation; they interact in ways that increase intragroup bonding while regulating distances between other wolf populations; breeding adults form strong pair bonds, and they spend extended periods of time caring for their young. Shared social relationships between wolves and humans may also lead to a historical identification with their fate as a species. In recent years, certain native peoples, including the Nez Perce, have identified their own historical persecution with that of wolves, and therefore have welcomed the reintroduction of wolves as a symbol of renewed tribal strength.

Wolves as Outlaws

Prior to concentrated eradication efforts by humans, wolves occupied territory stretching throughout nearly all of the northern hemisphere, from Mexico City and southern India, northward all the way to the arctic extremities. Yet the same evolutionary adaptations that made wolves one of the most successful and wide-ranging carnivores also brought them into conflict with human communities. In various parts of the world, herding communities that depend upon domestic stock for their livelihood often fear the damage that wolves can incur upon their flocks and/or herds. In such a context, wolves are frequently labeled in negative terms as thieves, varmints, villains, or attributed preternatural powers. The Abrahamic religions, Judaism, Christianity, and Islam, for example, arose in a predominantly pastoral context, and in these traditions wolves are commonly metaphors of destruction or deception (for biblical examples, see Gen 49:27, Jer 5:6, Matt 7:15, John 10:12, Acts 20:29). Even when pastoral economies and lifeways were left behind, wolves' metaphorical roles as sources of pollution or agents of evil persisted as a way of categorizing spiritual and physical threats.

Especially in central and northern Europe, perhaps because of their association with scavenging human corpses on

medieval battlefields, wolves were depicted as unwelcome transgressors of the boundaries between civilization and wilderness. This is imaginatively embodied in werewolf folklore, fairy tales that cast wolves as cunning predators, like "Little Red Riding Hood," popular bestiaries of the Middle Ages (books that assigned specific human characteristics, such as greed or valor, to various animals) in which wolves were depicted as symbols of humankind's baser instincts; and epic literature, such as *Beowulf*. These mythic and popular images served as moralistic warnings to humans, while also incarnating dark fears of the uncultivated forest.

It is difficult to gauge the precise impact of such tales upon actual wolf populations, but there is evidence that the fears expressed in these stories served to justify acts of retributive justice in both Europe and, later, in North America. Convicted criminals in 10th-century England, for example, could avoid jail by delivering a prescribed number of wolf tongues to authorities. In France, beginning in the ninth century and continuing well into the 19th century, special groups of wolf hunters were organized to exterminate wolves for payment. In short, wolves were understood as the epitome of the outlaw creature, unable to remain in their proper place away from domesticated property, and therefore were the frequent target of vigilante justice.

Wolves as Deities

If wolves have been the ultimate criminals to some, they have been an object of reverence and even worship for others. Ancient gods like the Greek huntress Artemis or the Teutonic war-god Odin had powerful wolf companions. According to legend, Rome was founded by twin boys nursed by a she-wolf. Likewise, in Inner Eurasia, the Turks and the Mongols believed themselves to be descended from a wolf. Permeable lines were also sometimes believed to exist between deities and wolves themselves, as in the case of the shape-shifting sun god Apollo, the patron of shepherds, who took the form of a wolf in some Greek legends, signaling perhaps the dual capacities of the gods in Hellenistic culture to protect and destroy.

Though agriculturally-based societies have typically had ambivalent relationships with wolves, the worship of wolves in Japan was widespread among mountain farmers up until the 19th century. According to historian Brett Walker, the wolf was known as the Large-Mouthed Pure God and, when properly treated, was believed to protect the people's crops from the ravages of wild boars and deer. The power of wolves could also be harnessed in talismans and charms that served to protect their wearers from disease and infertility, among other misfortunes. The Ainu, an indigenous Japanese tribe, worshipped wolves as their divine ancestors. The modernization of Japan in the late 19th century, however, led to the waning of wolves' sacred status. In a span of a few decades, the two subspecies of wolves in Japan were eradicated, vividly demonstrating how changing ideologies can be expressed on the physical landscape.

Wolves as Symbols of Wilderness

Japan was certainly not the only country to experience a dramatic reduction of wolves. Much has been written on the Puritan encounter with the howling wilderness of New England and, for most of the early settlers in America, wolves

figured predominantly as treacherous actors on a divine stage, harassing livestock that were allowed to roam free outside of colonial settlements. Economic interests often mixed with biblical injunctions to protect the flock, and wolf bounties were legislated early to fulfill a dual purpose: secure economic prosperity and perform a spiritual catharsis on the land by clearing it of unwanted threats.

In the colonial context, the means of wolf eradication, though lethal, were geographically limited. In North America at large, the scale of this eradication became magnified over the 19th century as advances in technology and a growing government bureaucracy linked progressive ideals with national economic interests. Despite early calls for animal protection and conservation in the late 19th century, wild predator animals remained ensconced in the category of the unworthy. Wolves in particular represented the epitome of the bad animal, a quintessential varmint with neither sporting manners nor moral qualms about their violent acts.

Cultural and religious constructs, however, are not static. A sense of loss, better ecological understandings of the importance of wolves to their habitats, and support for biodiversity, have led to calls for the reintroduction of wolves in selected areas. As wild places and creatures diminished in an increasingly urbanized United States, old myths began to lose their weight, and new values began to emerge. Ecological studies played no small part in such changing views. One notable conversion experience comes from Aldo Leopold, an early 20th-century government forester whose writings had a tremendous influence on ecological discourse and the field of environmental ethics. Leopold recalled in his posthumously published *A Sand County Almanac* (1949/1987) that when he was young and "full of trigger itch," he once shot a mother wolf during a timber survey assignment in the American Southwest, arriving in time to see the "green fire" dying in the wolf's eyes. This moment etched itself upon his memory and altered his view of the human place in the biotic community. In order to "think like a mountain," Leopold later argued, one had to consider the wolf's integral place in the larger ecosystem. In the absence of natural predators, deer would denude the mountain, encouraging erosion and degrading the entire ecosystem. Humans, Leopold concluded, have a great responsibility, not to be superior, but merely a "plain member and citizen" of the natural world.

Since Leopold's time, the status of wolves has undergone a substantial shift in North America, and even worldwide. In the affluent and increasingly urban and suburban context of a post-World War II America, people were becoming more receptive to ideas like Leopold's, more willing to question the role of the government in controlling wildlife according to progressive-era management philosophies, and more interested in visiting the wildlands that constituted America's natural heritage. The immediate threat of wolves, both real and perceived, had largely passed into legend. A trickle of disapproval from select scientists over indiscriminate predator control would turn into a flood of public sentiment in the latter part of the 20th century. During this period, wolves became the icon of choice to represent endangered species, ecologically threatened lands, and a vision of humanity that placed less emphasis on dominance over the nonhuman world.

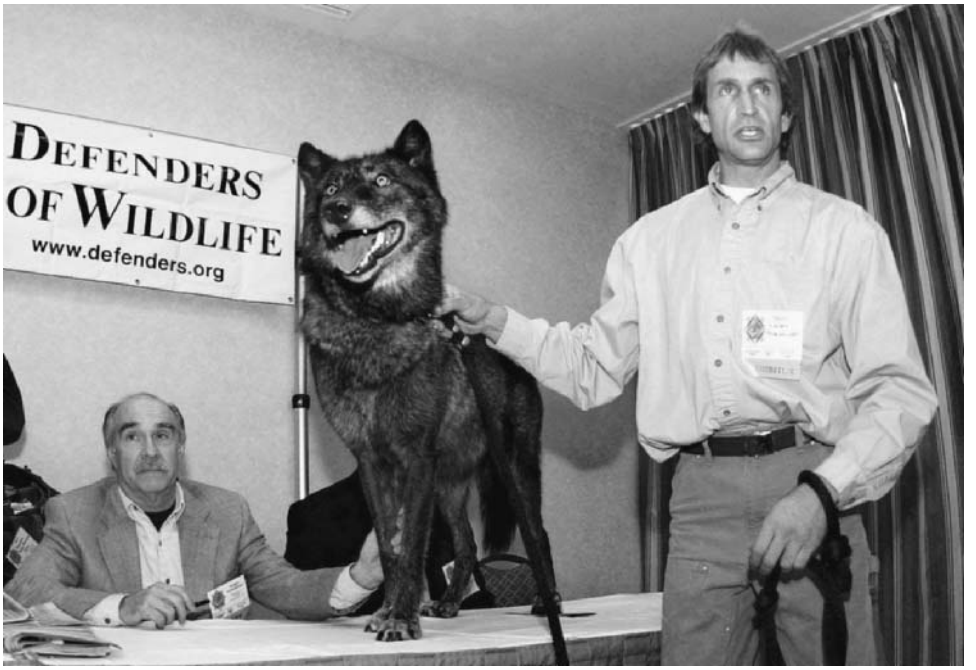
Wolves now grace the publications and websites of numerous environmental advocacy groups, and the proliferation of wolf images in the media oftentimes indicates an empathetic stance toward what was once an object of derision. Even the howls that were once considered portents of death and evil are assuming new associations, and listening for wolf howls with park rangers has become a popular nighttime tourist activity at several Canadian national parks and wolf education facilities in the United States. Preeminent wolf biologist L. David Mech remarked that since the wolf has come to symbolize disappearing wilderness, "the creature now symbolizes [all] endangered species and has become the cause célèbre of numerous animal-interest groups," which has resulted in "wolf deification" (1995, p. 271). This deification does not have the same connotations as it formerly did in the context of Japan or ancient Greece, but it does perhaps signal a growing appreciation for, and an extension of, religious and ethical concern to wolves.

Wolf Reintroduction in the United States

In human relationships with nonhuman animals, religious and cultural narratives may serve to reinforce kinship relations and concomitant ethical obligations with specific species or individual animals. Religious and cultural narratives may also, inasmuch as they indicate what is outside the realm of sacred consideration, reinforce the unworthiness or the object status of certain or all animals. In the context of gray wolf reintroductions in North America, which began in Yellowstone and Idaho in 1995 and was followed by the reintroduction of Mexican gray wolves to the Southwest in 1998, religious rhetoric was sometimes used to capture the sense that wolf recovery may signal a rapprochement between humans and nature. As Hal Clifford, executive editor of *Orion* magazine, expressed it,

> This is the renaissance of the land. The wolf sings it into being. The wolf is all the connections of the land, and that includes our connection, too. As we make room for the wolf we take another step toward embracing the complexity of the world—the glorious, magical complexity that is the expression of God in all things—and we begin to stitch ourselves into the fabric of place. (Clifford, 2005, p. 194)

As Clifford indicated, for some people wolf restoration signaled the fruition of Leopold's "green fire" experience: a willingness to accept a humbler human role as part of a larger biotic community. Other people, particularly livestock owners and those living near rural reintroduction sites, are much less enthusiastic about the prospect of wolves close to home, and regard wolves as an unwelcome animal unnecessarily foisted upon struggling rural communities. For people who are against wolf reintroductions, the idea of going backward, reviving the presence of animals that were intentionally trapped, poisoned, and shot out of existence, constitutes a regressive plunge that decivilizes the land and threatens to disrupt humans' position as nature's rightful manager. Moreover, inasmuch as wolves may require changes in human uses of land, their presence threatens the religious and cultural narratives that encourage, or are interpreted as encouraging, the idea of human dominion.



Rami, a gray wolf from Mission Wolf, a sanctuary located in Silver Cliff, Colorado (http://www.missionwolf.com) patiently stands on a table during a news conference as handler Kent Weber talks about the animal and why we should respect wolves and other animals. (AP Photo/David Zalubowski)

The reintroduction of wolves thus highlights a collision of narratives, in which different groups assert alternative visions of humans and their relationships to and within the natural world. It could be argued that wolf reintroduction has exposed conflicting priorities over inherited traditions and stories, ways of life, and notions of what makes such a life worth living, and the authority to enact this way of life as people work toward an ideal vision of the future. Particularly in the context of wolf reintroduction areas, in which people must negotiate not only the symbolic meaning of wolves, but their tangible impacts on local human communities and the larger biotic community, the iconic status of wolves brings variant views of the natural world forward for necessary discussion. Sophisticated treatments of the ethical factors involved in wildlife management are also becoming more prevalent, and one can expect to see more work in this area as ethicists call attention to and offer prescriptions for bridging the gaps between ideas, policy, and practice (see, for example, Jickling and Paquet, 2005; Lynn, 2002, 2006).

Once and Future Wolves

Wolves have clearly been symbolically powerful in various ways throughout human history, and they continue to be so for many people. Historically, across cultures, humans have treated wolves in radically diverse ways depending on their social and geographical contexts. Wolves have been magnets

for expressions of loathing and devotion and, in various regions where they are now recovering, they have been iconic animals that illuminate social divisions and conflicting suppositions about shared relationships between humans and the natural world. For the foreseeable future, the prospect of wolf recovery is likely to challenge various groups and individuals to grapple with their relationships to one another, their local landscapes, and why it might be of value to adjust human lifestyles and livelihoods so that wolves may repopulate portions of their former historical ranges.

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Gavin Van Horn

X

XENOGRAFT

The demand for transplantable tissues and organs is much greater than the supply. Many people on transplant waiting lists die every year; in the United States alone one person dies approximately every 90 minutes waiting for an organ transplant (Satel, 2006). Physicians and medical researchers have long been fascinated by the idea that nonhuman animals might become an appropriate source for organs, and that xenografts, organs or tissues transplanted between animals of different species, could even solve the organ scarcity problem. Supporters of this idea have imagined setting up farms on which animals would be kept at the ready for human beings who need new hearts, livers, kidneys, lungs, or other body parts.

The idea that no one need die waiting for an organ is an attractive one, but there are many obstacles, both technical and ethical, in the way of xenografts becoming the solution to this problem. Technically, organs from nonhumans have not yet been shown to be viable for use in humans. In fact, every effort of this kind, from the implantation of a chimpanzee heart into a 68-year-old man in 1964, through the transplantation of a baboon's heart into the infant Baby Fae twenty years later, to the 1994 attempt to transplant a pig's liver into a 26-year-old woman, has ended dismally. In every case, the patient died shortly after receiving the xenograft.

Yet even if the technical problems are solved someday, the moral problems would remain. The central ethical challenge to xenografting concerns whether taking organs from healthy animals for use in human beings can be justified. A number of serious moral arguments conclude that animals may not be treated in this way, even if doing so would offer a human being a considerable chance of living longer. For example, Tom Regan's claim that many animals, including those which might become attractive organ sources for humans, "have a distinctive kind of value in their own right, if we do; therefore, they too have a right not to be treated in ways that fail to respect this value" would, if correct, imply that xenografting is immoral. An allied view, based on the argument from marginal cases, would also condemn xenografting unless we were willing to regard the mentally handicapped or other marginal members of our species as potential sources of transplant organs as well.

Those who favor developing xenografting as a reliable method of obtaining organs often point out that we take animal lives for many less serious reasons than obtaining organs for people who will die without them. For example, we eat and wear animal products when there is no real life or death need to do so. Further, xenografting is just a particularly visible

way in which animals are used in medical research, education, and therapy; a great deal of what happens to any patient in very many medical encounters involves the suffering and death of animals, in drug testing, or as research subjects for physicians and surgeons. Finally, there is great interest among those who are involved in xenograft research in using pigs rather than primates as sources of organs. Whereas primates are scarce, expensive, and disturbingly humanlike, pigs are breakfast food; if it is morally legitimate to raise pigs in confinement settings and then eat sausage, why is it not morally legitimate to genetically engineer pigs in laboratories and then use their organs for people who may die without them? The answer to this question may simply be that it is not morally legitimate to use animals for food and clothing, even though people commonly do, and not defensible to use animals as we have done in medical research, testing, and education.

Recently, medical researchers have shown interest in placing human organs into animals. A goal of such reverse xenografting might be to preserve reproductive organs that would be otherwise damaged by, for example, cancer treatments. This work remains highly experimental, and raises ethical questions similar to those discussed above.

See also Genetic Engineering; Genethics; Marginal Cases

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James Lindemann Nelson

Z

ZOOS: HISTORY

When measured by today's standards, zoos of the 1800s and early 1900s are often said to have been collections of newly-caught wild animals that lived short lives in prison-like barred cages for the pleasure of the paying public. When taken in the context of their times, however, those zoos developed many of the philosophies and husbandry practices of today's professionally managed zoos.

With few exceptions, the earliest collections of captive wild animals were privately-held menageries that were symbols of wealth and power. The ancient Egyptians are thought to be the first people to keep collections of wild animals. Animals of religious significance were kept as representatives of gods. In 1490 BC, Queen Hatshepsut directed an animal collecting trip through Africa to fill her royal menagerie and to trade with neighboring countries. Chinese emperor Wen Wang, of the Chou dynasty, kept a variety of plants and animals in a 1,500-acre Intelligence Park around 1100 BC. Like the menageries in Egypt, it was intended primarily to show the wealth of the empire.

By the third century BC, private collections of animals in Greece were used for study, experimentation, and as pets. Alexander the Great opened the first public menagerie in Alexandria in Egypt.

Wealthy Romans kept small menageries and aviaries in their villas. By the second and first centuries BC, most captive animals were kept on exhibit in imperial menageries until they were sent into the arena to fight people or other animals, or killed for food. The public was charged an admission fee to see them.

In the 1200s, Kublai Khan's collection in Asia held elephants, monkeys, fish, hawks, and other species found in his vast empire. In 1519, conquistador Hernando Cortes visited a large menagerie held by the Aztec King Montezuma in Mexico, which was staffed by 300 keepers. The collection included exhibits featuring American animals as well as human dwarfs and slaves. As in many of today's exhibits, the animals were exhibited in barless, moated enclosures.

By the 1600s, foreign conquests, trade, and the spread of agriculture and industry into undeveloped lands brought tales of great beasts and occasionally living specimens to Western nations. Because collections were still mostly private, the demand for animals in traveling menageries that could be seen by the public grew.

The first modern zoos were European zoological collections like Tierpark Schoenbrunn in Austria, which opened in 1765, Menagerie du Jardin des Plantes in Paris, which opened in 1793, and the London Zoological Garden, which opened in 1828. Like modern zoos, they

were open to the public. Animal exhibits were surrounded by exotic plants in a gardenlike setting. These zoos/gardens (hence the term zoological garden) differed from earlier menageries, in that closely related species were exhibited near each other. In keeping with the scientific spirit of the age and the growth of Darwinism, they were established for scientific studies and education.

Exhibit techniques reflected what public attitudes towards animals, technology, space, and resources of the day would allow. Zoo managers and most visitors believed the animals to be in spacious enclosures that resembled, and even improved upon, their natural habitat. Compared with the cramped cages of the more familiar menageries, that was probably true. A landscaped garden surrounding the outside of the enclosure was viewed as representative of a tame jungle. Zoos were living museums.

In the United States, having a zoo in your town became as important as having a museum or art gallery. Many zoos' first animals, directors, curators, and experienced animal keepers were from circuses. The first true European-style zoo in the United States was the Philadelphia Zoo, opened in 1874, which was modeled after the London Zoological Garden. Animals were housed in permanent ornate buildings. The zoo was supported by a zoological society, and it was managed by a director knowledgeable about wildlife. Zoos also began to formally include scientific research as part of their mission. The National Zoo in Washington, D.C. was established in 1891 "for the advancement of science and the instruction and recreation of the people."

As more municipal zoos emerged, there was a competition among zoos to have as many different kinds of animals as possible represented. This is often compared to a stamp collection, because the emphasis was on a great variety of species. Often social animals were not exhibited in groups or pairs, so that the public would not be offended by witnessing breeding behavior. Without breeding in captivity, there was a need to replenish the supply of captive animals. Expeditions were organized to trap and transport wild animals to the zoo. Animal mortality during capture, transport, and at the zoo was high. Since little was known about wild animal care, many exhibits were small and barren, in the belief that this would minimize disease risk. Exhibits were typically barred cages for the safety of the visitors and the animals, and to allow visitors to see the animals as close as possible. Animal buildings were designed for the pleasure of the visitor, and included art such as fine sculpture or tile mosaics.

Around 1907, some zoos began to take advantage of the Hagenbeck Revolution. At his zoo in Hamburg, Germany, Carl Hagenbeck Tierpark, animal supplier Carl Hagenbeck designed concrete moats around exhibits which kept animals in, visitors out, and eliminated the need for bars. His exhibits were recreations of nature as he saw it during his world travels. Exhibit illusions such as a lion sharing space with antelope were created by a moat separating the two animals that was hidden from the visitor's view. The zoological garden had spread from the public walkways into the exhibits. Since Hagenbeck, many zoos have moved from prison-like cages to more naturalistic enclosures.

As the sciences of zoo biology, animal behavior, veterinary medicine, genetics, and animal nutrition grew in the 20th century, animal management improved,

more species bred in captivity, and emphasis was no longer on large collections of many species, but on fewer species exhibited in larger, more naturalistic enclosures. There were more mixed-species exhibits and exhibits with social groups of one species. Animals could be exhibited by themes like species relatedness, geographic zone, or habitat. Some zoos chose to focus on local or regional wildlife species. Some zoos, like the Durrell Wildlife Conservation Trust in the United Kingdom, maintain and breed only species that are endangered and can benefit from zoo and field research. New exhibit technologies, coupled with greater knowledge of animal behavior and husbandry, have led to a surge in immersion exhibits that allow visitors to enter the habitat by means of, for example, acrylic tunnels, safari vehicles, and boat rides. Some have even blurred the lines between zoo and aquarium by integrating terrestrial and aquatic exhibits.

With the recognition that many species of animals were threatened with extinction due to human activities, zoos have also become major centers of conservation and public education. Instead of a staff of mostly animal collection managers, modern zoos have added veterinary, nutrition, conservation and research, and education departments. A few animals are bred specifically for reintroduction to places where their numbers are few or they have disappeared completely. The New York Zoological Park is widely credited for rescuing the American bison in the early 1900s through captive breeding and reintroduction. Some zoos maintain their own offsite breeding and research centers. Many zoos have major field research programs. Professional zoo societies have emerged worldwide and have facilitated zoos' working with each other and partnering with conservation groups to address local and international wildlife issues.

Finally, concern about the wellbeing of animals in zoos, particularly since the 1980s, has resulted in increased oversight. This guidance includes self-regulation, requirements for accreditation in professional zoo organizations, and local, state, and national laws.

To the scholar, early zoos were living museums, places of scientific and artistic opportunity. To the visitor, they were urban retreats, gardens of novelty, entertainment, and education. Those roles have not changed, although emphasis is now on education and conservation. Zoos' continued popularity makes them ideal venues for these missions.

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Michael D. Kreger

ZOOS: ROLES

If animals have a right to freedom, zoos seem to infringe on that right, and therefore to be questionable on welfare grounds. Today's thousands of zoos, attracting millions of visitors worldwide, vary enormously from so-called roadside zoos, which are condemned outright by reputable ones, to zoological parks

whose animals, many of them in large, naturalistic, and/or behaviorally enriched enclosures, often give every indication of being in a state of wellbeing.

The question remains whether it is still misguided, as some feel, to maintain wild animals, how ever well cared for, outside their natural habitats, to which millions of years of evolution have adapted them. Zoos and their critics agree now that wild species must be protected, and reputable zoos now take very few animals, especially mammals, from the wild, though they need to do this occasionally for serious conservational reasons. If it is acceptable to keep domesticated animals, perhaps it is not wrong to keep what can only be relatively wild animals in zoos. Indeed, some of them could be argued to be slightly domesticated because of their individual adjustment to zoo conditions, or because of some perhaps unavoidable selective breeding. It is true that many domesticated animals, such as intensively reared hens and pigs, are kept in appalling conditions, but this is because of economic greed, not because they cannot be kept humanely. Zoo animals' captive environments can similarly be vastly improved by studying their behavioral requirements.

The degree to which animals show their natural behavior is a main criterion for judging their wellbeing or otherwise, as well as a guide to how their facilities may be improved. Other criteria include their degree of physical health, their readiness to breed, and the degree to which they show abnormal behavior such as the stereotyped weaving of some captive polar bears.

If animals in zoos are only relatively wild or even slightly domesticated, this makes keeping them more acceptable, but at the same time it casts doubt on zoos' claim to maintain truly wild animals, and on whether these animals or their descendants could successfully be reintroduced to the wild. This is one of many real problems for zoos, and some critics deny their ability to save animals who are wild in any meaningful sense. On the other hand, zoos now have elaborate conservational arrangements to help to maintain their animals' wildness, at least genetically. These include studbooks for many endangered species and computerized, linked animal records (part of ISIS, the International Species Information System, started thirty years ago) to assist in the management of zoo animals as members of total captive populations with minimal inbreeding and maximal genetic diversity, as in a wild population. Enlightened zoo conditions help to maintain behavioral wildness also. Successful reintroductions have already occurred, such as the reintroduction of the Arabian oryx. However, just how successful some reintroductions have been, for example, that of the golden lion tamarin, is arguable. Thus zoos' ability to save, or at least reintroduce, many wild species remains unproven. However, threats face many wild species, from the hunting of rhinos and tigers to the threats to almost all wild habitats from the exploding human population, and zoos can help considerably. Again, some critics see a concentration on captive breeding as a dangerous distraction from the primary conservational task of protecting actual wild habitats. But zoos see their captive breeding as merely complementing this, and some zoo scientists assist greatly in the protective management of actual wild populations. Many more zoos help to educate the public about threats to wild habitats. Zoos' conservational roles also bring their own moral problems, such as whether saving endangered species can

justify killing surplus animals, for example, nearly eighty hybrid orangutans in American zoos who are unsuitable for reintroductions.

Serious zoos are in many ways allies of all those who care about animals as individuals and about their survival as species. Apart from their conservational captive breeding, zoos constitute a kind of powerhouse of ordinary people's fondness and concern for animals. Though zoo critics tend to see zoos as demonstrations of domination over nonhumans, many of the millions who visit zoos probably do it because of animals' appeal to them. These people are potentially a huge body of support for conservation and animal protection. A first step here is the introduction of legislation to regulate zoos, which already exists in Britain and some other European Union countries. In Britain also, detailed welfare and conservational requirements are laid down in the Secretary of State's Standards of Modern Zoo Practice. In the United States, zoos are licensed and inspected by the U.S. Department of Agriculture and other agencies.

See also Enrichment and Wellbeing for Zoo Animals

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Stephen St.C. Bostock

ZOOS: WELFARE CONCERNS

In recent years there has been a great deal of discussion about the welfare of animals raised for food, used in research, and confined in zoos. This has led to discussion of what welfare consists of, attempts at behavioral enrichment, and debate about whether adequate levels of animal welfare can ever be secured in zoos, laboratories, and slaughterhouses.

In addition to these concerns about welfare, another critique has developed that appeals to a wide range of animal interests. Some critics have argued that the fact that animals may suffer in zoos and laboratories is only part of what makes these facilities unjust. To use a common but controversial analogy, what was wrong with American slavery was not only that slaves suffered, but that slavery systematically violated virtually every significant interest of those who were legally defined as slaves. Similarly, what is wrong with zoos, in this view, is not only that they cause animal suffering, but that they violate a range of interests that

are central to the lives of many animals. Just as happy slaves do not justify slavery, so behaviorally enriched animals do not justify zoos.

This second critique can only have moral force among people who already believe that animals have significant moral standing. Once this is granted, zoos become morally suspect, since virtually all creatures with significant moral standing have an interest in directing their own lives. If animals are to be confined in zoos, then the moral claim in favor of respecting this interest will have to be overcome.

Some, such as Tom Regan, argue that this moral claim cannot be overcome. Humans and many nonhumans enjoy an equal moral status that manifests in rights. Fundamental rights, in his view, can almost never be infringed. Since zoos violate the rights of many animals, they are thus morally indefensible.

Others, such as Dale Jamieson, believe that this presumption can in principle be overcome, if there are weighty enough reasons for keeping animals in captivity. In recent years, education and conservation have been invoked most frequently in attempts to justify zoos.

While an appeal to education may carry some weight, it is alarming that there is so little empirical evidence about what zoos actually achieve in their educational efforts. Anecdotes are available, but reliable data are hard to come by. But even if we grant that zoos are successful in educating the public in some positive way, given the technological resources (webcams, virtual reality, etc.) that are now coming online, it is far from clear that holding animals in captivity is necessary for delivering positive educational results.

Conservation is the justification most often appealed to by scientists in the zoo

A rhinoceros sleeps against a barred window in an impoverished cage in a zoo. (Dreamstime.com)

community. There are variations on the theme. Some want to use zoos as bases for captive breeding and reintroduction. Others want to use the economic and political power of zoos to protect habitat. Still others would be satisfied if zoos could be constituted as genetic libraries for animals that no longer exist in viable populations. Sometimes it seems that conservation is so highly valued that any activity directed toward this end is thereby considered justified.

Despite the rhetoric, most zoos have no habitat conservation programs, and among those that do, it is rare when more than one to two percent of the budget is spent on them. Reintroduction has been a mixed success. Benjamin Beck, formerly Chair of the American Zoo and Aquarium Association's Reintroduction Advisory Group, rather understates his conclusion when he writes, ". . . we must acknowledge frankly at this point that there is not overwhelming evidence that reintroduction is successful." David Hancocks, who directed zoos in both the United States and Australia, writes that "[t]here is a commonly held misconception that zoos are not only saving wild animals from extinction but also reintroducing them to their wild habitats."

Whatever the role of captive breeding and reintroduction in species preservation, an inconsistency arises when it is enlisted as a justification for zoos. Zoos are places where people come to see animals. They are places to take children on Sunday afternoons. They are urban amenities like football and baseball teams, part of what makes a city big league. Increasingly, zoos are even the sites of rock concerts and fundraisers. However, the best institutions for captive breeding and reintroduction would not play these roles. They would remove animals from excessive contact with people, give them relatively large ranges, and prepare them for reintroduction in ways that zoo visitors might find shocking, for example by developing their competence as predators. What the importance of captive breeding and reintroduction justifies, if anything, is not the existing system of zoos, but a different kind of institution entirely, one that protects animals from people rather than putting them on display. Thus, whatever the power of the appeal to conservation, the present zoo system seems to be unjustified.

Arguments whose conclusions diverge from what people want to believe are not always greeted with enthusiasm. Yet, in 1994, the citizens of Vancouver, Canada voted to close the Stanley Park Zoo, and San Francisco, Chicago, Detroit, Philadelphia, and the Bronx Zoo in New York City have all agreed to stop exhibiting elephants. However, since most zoos will continue to exist for the foreseeable future, we should ensure that the highest standards of welfare are maintained.

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Dale Jamieson

Chronology of Historical Events in Animal Rights and Animal Welfare

Below is a brief chronology of some historical events in the United States, unless otherwise indicated, related to the use of animals and to animal rights and animal welfare. "UK" stands for the United Kingdom.

Globally, there is a lot of ongoing legislation concerning animal protection. Details about the federal Animal Welfare Act can be found at http://www.nal.usda.gov/awic/legislat/usdaleg1.htm. A general search on Google for "history animal protection" will lead to numerous web sites on legislation in specific countries and for specific species. The Animal Welfare Information Center (AWIC) Newsletter updates information in its "Congress in Action" section (see also http://awic.nal.usda.gov/nal_display/index.php?info_center=3&tax_level=1).

For more information, see the first edition of the *Encyclopedia of Animal Rights and Animal Welfare* (Greenwood Publishing Group, 1998) and also Michigan State University College of Law: Animal Legal & Historical Web Center (www.animallaw.info); Animal Law Review (http://www.lclark.edu/org/animalaw/); National Center for Animal Law (http://www.lclark.edu/org/ncal/); Society for Animal Protective Legislation (http://www.saplonline.org/); A Chronology of Key Events in the Scientific Use of Chimpanzees in the United States (http://www.releasechimps.org/pdfs/chronology-of-key-events.pdf); the National Association for Biomedical Research: Animal Law Section (http://www.nabr.org/AnimalLaw/contactUs.htm); http://worldanimal.net/const-leaflet.htm for a global summary of animal protection legislation; the website for the Animal Welfare Institute (http://www.awionline.org/legislation/index.htm; http://capwiz.com/compassionindex/issues/bills; http://www.awionline.org/links.html); and the website for the Animal Welfare Information Center (http://awic.nal.usda.gov/nal_display/index.php?info_center=3&tax_level=1).

A summary of regulations on the use of animals in research in European countries can be found at http://arbs.biblioteca.unesp.br/viewissue.php in the essay by Annamaria Passantino titled "Application of the 3Rs Principles for Animals Used for Experiments at the Beginning of the 21st Century."

A summary of species used in research can be found at http://www.hsus.org/animals_in_research/species_used_in_research/ and A Timeline of Progress for Farm Animals can be found at http://www.americanhumane.org/site/PageServer?pagename=pa_farm_animals_timeline.

1822 Ill-Treatment of Cattle Act

1822 Martin's Anticruelty Act (UK)

1824 Society for the Prevention of Cruelty to Animals (SPCA) (UK) founded

1826 Bill to Prevent the Cruel and Improper Treatment of Dogs

1832 Warburton Anatomy Act (UK)

1840 SPCA becomes the Royal Society for the Prevention of Cruelty to Animals (RSPCA) with patronage of Queen Victoria (UK)

1866 American Society for the Prevention of Cruelty of Animals (ASPCA) founded

1868 Massachusetts Society for the Prevention of Cruelty to Animals (MSPCA) founded

1875 Victoria Street Society for the Protection of Animals from Vivisection (UK) founded

1876 Cruelty to Animals Act (UK)

1877 American Humane Association founded

1883 American Anti-Vivisection Society founded

1889 American Humane Education Society (AHES) founded

1891 The Humanitarian League founded

1895 New England Anti-Vivisection Society founded

1898 British Union for the Abolition of Vivisection (UK)

1906 Animal Defence and Anti-Vivisection Society (UK) founded

1911 Protection of Animals Act (England, UK)

1912 Protection of Animals Act (Scotland, UK)

1925 The Performing Animals (Regulations) Act (UK)

1926 University of London Animal Welfare Society founded (name changed to Universities Federation for Animal Welfare [UFAW] in 1938) (UK)

1929 Victoria Street Society for the Protection of Animals from Vivisection changes its name to National Anti-Vivisection Society (UK)

1946 National Society for Medical Research founded

1948 Morris Animal Foundation founded

1949 The Docking and Nicking of Animals Act

1950 Animal Protection Law (covers farm animals and bans battery cages) (Denmark)

1951 Animal Welfare Institute founded

1952 Institute for Animal Laboratory Resources founded

1954 Humane Society for the Unite States (HSUS) founded

1954 The Protection of Animals (Anaesthetics) Act (UK)

1955 Society for Animal Protective Legislation founded

1957 Friends of Animals founded

1958 Humane Slaughter Act

1959 Beauty without Cruelty (UK) founded

1959 Wild Horses Act

1959 Catholic Society for Animal Welfare (now International Society for Animal Rights) founded

1960 The Abandonment of Animals Act (UK)

1961 Lawson-Tait Trust (UK) founded

1962 Bald and Golden Eagle Protection Act

1962 The Animals (Cruel Poisons) Act (UK)

1963 British Hunt Saboteurs Association (UK) Act

1965 Brambell Report on Farm Animal Welfare (UK)

1965 Littlewood Report (UK, a discussion of alternatives to the use of animals)

1965 American Association for Accreditation of Laboratory Animal Care founded

1966 Laboratory Animal Welfare Act

1967 Fund for Animals (UK) founded

1967 Farm Animal Welfare Advisory Committee (UK) founded

1968 Animal Protection Institute founded

1969 Council of Europe Convention on Animals in Transport

1969 International Fund for Animal Welfare (IFAW) founded

1969 Endangered Species Act

1969 Fund for the Replacement of Animals in Medical Experiments (FRAME) (UK) founded

1969 International Association against Painful Experiments on Animals (UK) founded

1970 Laboratory Animal Welfare Act broadened and renamed Animal Welfare Act; legislation extended to include all warm-blooded animals (including pet and exhibition trades)

1970 Dr. Hadwen Trust for Humane Research (UK) founded

1971 Greenpeace (now International) founded

1971 Wild Free-roaming Horse and Burro Act

1971 Law requiring approval of new buildings for animal protection (Sweden)

1972 American Zoo and Aquarium Association accreditation standards and code of professional ethics

1972 Marine Mammal Protection Act

1972 Animal Protection Act (Germany)

1973 International Primate Protection League founded

1973 National Antivivisection Society founded

1973 Endangered Species Act

1973 Convention on International Trade in Endangered Species (CITES) of wild fauna and flora (international) is signed by 167 countries

1976 Animal Rights International founded by Henry Spira

1976 Animal Welfare Act broadened to cover, among other things, transportation and prohibitions against dog fighting and cockfighting

1976 Horse Protection Act

1976 Fur Seal Act

1976 Protest at American Museum of Natural History (Henry Spira)

1976 The Dangerous Wild Animals Act (UK)

1977 First International Conference on the Rights of Animals, Trinity College, Cambridge, England (organized by Andrew Linzey and Richard Ryder)

1978 Humane Slaughter Act broadened

1978 Animal Legal Defense Fund founded

1978 Swiss Animal Welfare Act

1979 Association for Biomedical Research (founded as Research Animal Alliance) founded

1979 Coalition to Abolish the Draize Test founded by Henry Spira

1979 First European Conference on Farm Animal Welfare, the Netherlands

1979 Packwood-Magnuson Amendment to the International Fishery Conservation Act

1980 People for the Ethical Treatment of Animals (PETA) founded

1980 Psychologists for the Ethical Treatment of Animals (PsyETA) founded

1981 Association of Veterinarians for Animal Rights (AVAR) founded

1981 Johns Hopkins Center for Alternatives to Animal Testing founded

1981 Silver Spring monkeys case, which led to the 1985 revision of the federal Laboratory Animal Welfare Act

1981 The Zoo Licensing Act (UK)

1981 Foundation for Biomedical Research founded

1982 Marine Mammal Protection Act reauthorized

1982 World Women for Animal Rights/Empowerment Vegetarian Activist Collective founded

1983 In Defense of Animals founded

1984 Humane Farming Association founded

1984 Performing Animal Welfare Society founded

1984 Break-in, Head Injury Clinical Research Laboratory, University of Pennsylvania

1985 Improved Standards for Laboratory Animals Act (an amendment of the Animal Welfare Act) to include requirements for psychological enrichment for non human primates. It mandates minimal cage size (for chimpanzees: 5 x 5 x 7 feet).

1985 Head Injury Clinical Research Laboratory closed

1985 National Association for Biomedical Research founded (merger of National Society for Medical Research, Association for Biomedical Research, and Foundation for Biomedical Research)

1985 Jews for Animal Rights founded

1986 Farm Animal Reform Movement (FARM) founded

1986 Animal Welfare Information Center founded

1986 European Directive Regarding the Protection of Vertebrate Animals Used for Experimental and Other Scientific Purposes (Council of Europe)

1988 Swedish Animal Welfare Act

1989 Veal Calf Protection Bill hearings (U.S. Congress)

1990 Veal Crate Ban (UK)

1990 Pet Theft Act, amendment to the Animal Welfare Act

1990 Rutgers Animal Rights Law Center founded

1991 The Ark Trust, Inc., founded

1991 Americans for Medical Progress founded

1991 European Union Regulation against Leghold Traps

1992 Czechoslovakian Law against Cruelty on Animals (first welfare legislation in former Communist countries)

1992 Wild Bird Conservation Act

1992 International Dolphin Conservation Act

1992 Driftnet Fishery Conservation Act

1992 Protection of Animal Facilities Act

1992 Animal Enterprise Protection Act

1993 National Health Revitalization Act

1993 First World Congress on Alternatives and Animals in the Life Sciences held in Baltimore, Maryland

1993 European Centre for the Validation of Alternative Methods (ECVAM)

1995 Second World Congress on Alternatives and Animals in the Life Sciences, Utrecht, Netherlands

1996 House of Representatives holds a hearing on the Society Animal Protection Legislation (SAPL)-supported Pet Safety and Protection Act

1996 The Pet Protection Act is considered

1997 Dolphin Protection Consumer Information Act makes it a violation of the Federal Trade Commission Act for any producer, importer, exporter, distributor, or seller of any tuna product that is exported from or offered for sale in the United States to include on the label of that product the term "dolphin safe" or any other term or symbol that falsely claims or suggests that the tuna contained in the product were harvested using a method of fishing that is not harmful to dolphins if the product was obtained by tuna harvesting

1998 Multinational Species Conservation Fund was created to carry out the African Elephant Conservation Act, the Asian Elephant Conservation Act, and the Rhinoceros and Tiger Conservation Act

1999 New legislation bans the creation, sale, and possession with intent to sell, of animal crushing or stomping films

1999 Depiction of Animal Cruelty: This statute makes it a crime knowingly to create, sell, or possess any visual or audio depiction of animal cruelty with the intention of placing that depiction in interstate or foreign commerce for commercial gain. It provides an exception for "any depiction that has serious religious, political, scientific, educational, journalistic, historical, or artistic value."

1999 The New Zealand Animal Welfare Act becomes law. Great apes are banned from use in research, testing, or teaching.

2000 The United States passes the Chimpanzee Health Improvement, Maintenance, and Protection (CHIMP) Act. The CHIMP Act provides for the retirement and lifetime care of chimpanzees not in active protocols, prohibits euthanasia and breeding, but allows for them to be recalled back into research

2000 The Great Ape Conservation Act establishes a $5 million conservation fund to assist in global projects to conserve great ape populations.

2000 New legislation requires the immediate termination of the Department of Defense practice of euthanizing military working dogs at the end of their useful working life, and facilitates the adoption of retired military working dogs.

2000 The Dog and Cat Protection Act of 2000 makes it unlawful to import into or export from the United States any dog or cat fur product, or to engage in the commerce of any dog or cat fur product.

2000 ICCVAM Authorization Act of 2000 provides that the Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM) shall among other things review and evaluate new or revised or alternative test methods; the ICCVAM was established by the Director of the National Institute of Environmental Health Sciences.

2002 Senate passes the Bear Protection Act; the bill eliminates the incentive to kill bears for their gallbladders by making it illegal to sell, import, or export the internal organs of a bear, as well as products containing bear parts.

2002 Farm Bill includes a Resolution dictating that the Humane Methods of Slaughter Act of 1958 should be fully enforced, preventing the needless suffering of animals; it also requires the Secretary of Agriculture to track violations of the Act and report results to Congress.

2002 Rhinoceros and Tiger Conservation Act, African Elephant Conservation Act, and Asian Elephant Conservation act are all reauthorized.

2002 Four new laws are enacted, and cruelty to animals is now a felony in 37 states.

2002 Sweden bans the use of great apes in biomedical research including a ban on the lesser apes, gibbons, and siamangs.

2003 The Captive Wildlife Safety Act prohibits the interstate transport of exotic big cats for private ownership as pets.

2004 The Marine Turtle Conservation Act states that its purpose is to assist in the conservation of marine turtles and the nesting habits of marine turtles in foreign countries by supporting and providing financial resources for projects to conserve the nesting habitats, conserve marine turtles in those habitats, and address other threats to the survival of marine turtles.

2005 The House of Representatives passes an amendment to stop the use of taxpayers' dollars to fund horse slaughterhouse inspection, effectively banning horse slaughter for one fiscal year if passed.

2006 The Supreme Court of India bans breeding of animals in zoos.

2006 Germany bans imported seal products from the country.

2006 Arizona and Michigan pass animal protection laws in their respective states. Arizona prohibits confining calves in veal crates and confining breeding pigs

in gestation crates. Michigan rejected a proposal that would have permitted a target-shooting season on the mourning dove, the state's official bird of peace, a protected species there since 1905.

2008 Colorado bans the veal crate and the gestation crate.

2008 The Spanish Parliament extends rights to great apes.

2008 The U.S. House of Representatives passes a bill to halt the interstate primate pet trade.

2008 Bullfighting is banned by the mayor in the Portuguese town of Viana do Castel.

2008 Proposition 2 passed in California. This law phases out some of the most restrictive confinement systems used by factory farms—gestation crates for breeding pigs, veal crates for calves, and battery cages for egg-laying hens—affecting 20 million farm animals in the state by simply granting them space to stand up, stretch their limbs, turn around, and lie down comfortably. (http://www.farmsanctuary.org/mediacenter/2008/pr_prop2_victory.html)

2009 On March 14, U.S. Department of Agriculture Secretary Tom Vilsack amended federal meat inspection regulations to completely ban the slaughter of downer cows, those cattle that become non-ambulatory disabled after passing initial inspection.

Resources on Animal Rights and Animal Welfare

SEARCHING THE LITERATURE ONLINE

Information on both animal welfare and animal rights is abundant. Accessing the Internet and typing a few words in a Google search box retrieves more results than there is time to read. Refining a search in order to retrieve fewer but more relevant results requires consideration of both how and where to search.

The search terms used directly affect retrieved results, no matter where one searches. For example, searching by each of the following six terms individually—*euthanasia, endpoint, slaughter, sacrifice, kill,* or *death*—will produce six lists with very different results. A search using the term vivisection and another using the terms animal research will also retrieve two sets of unique results. This is because Google does not interpret what is meant by a term; rather, it searches literally, letter by letter. Therefore, the term must be used in the search in order to identify any sites using that same term; consider your search terms carefully.

The source of the site, the citation, or the information retrieved in the search results are further essential considerations. Searchers should review who has posted the resource, and evaluate their qualifications and level of expertise. GoogleScholar is one way to limit a search to the scholarly literature, such as peer-reviewed papers, theses, books, abstracts, and articles from academic publishers, societies, and universities. The Advanced Search option is particularly useful in narrowing a search to results that are precise and authoritative.

The free databases published by the U.S. government, PubMed (published by the U.S. National Library of Medicine), http://www.ncbi.nlm.nih.gov/pubmed/, and Agricola (published by the National Agricultural Library), http://agricola.nal.usda.gov/, allow users to access research publications in the medical and agricultural fields, respectively. Academic and research institutions and libraries subscribe to proprietary databases, such as PsycInfo and Web of Science, which offer additional avenues to search for and locate useful and reliable information.

Finally, the general resources listed in "Books, Essays, and Organizations" below, as well as the "Further Resources" sections at the ends of the entries in the encyclopedia, provide valuable tools to identify and obtain information of interest.

Resources for Searching Animal Rights Literature

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GENERAL ONLINE AND PRINT PUBLICATIONS

This list of general sources will provide excellent references for a wide variety of issues centering on animal rights and animal welfare. For extensive references, please see the list of sources accompanying each essay in this encyclopedia, the web sites that are included in the list of contributors, and the following web sites and publications.

Web Sites

- Animal Ethics. A Philosophical Discussion of the Moral Status of Nonhuman Animals. http://animalethics.blogspot.com/. A blog spot that lists organizations and books, and provides blogs and discussion on animal rights and welfare.
- Animal People Online. http://www.animalpeoplenews.org/. An online news source for information about animal protection worldwide.
- Animal Welfare Institute. http://www.awionline.org/pubs/online.html; Lists Animal Welfare Institute online publications.
- Center for Environmental Philosophy. University of North Texas. http://www.cep.unt.edu/iseebooks.html. Selected Environmental Ethics Books.
- GEARI. Group for the Education of Animal Related Issues. http://www.geari.org/animal-rights-organizations.html. Provides a list of animal rights organizations.
- Google.com. Books on Animal Ethics. http://www.google.com/products?client=safari&rls=en&q=books+on+animal+ethics&ie=UTF-8&oe=UTF-8&um=1&sa=X&oi=product_result_group&resnum=4&ct=title; Provides a list of books on animal ethics, which link to commercial book ordering Web sites.
- Green People. http://www.greenpeople.org/animalrights.htm. Includes updated information about animal rights organizations in the United States, Canada, and other countries.
- Speak Out for Species at the University of Georgia: http://www.uga.edu/sos/organizations.html. Features a list of animal rights organizations.

- U.S. Department of Agriculture. National Agriculture Library. Animal Welfare Information Center. http://www.nal.usda.gov/awic/pubs/bulletin.shtml; Provides access to online information sources available through the U.S. National Agriculture Library, including all government-funded reports and databases. Searchable access points include research animals; farm animals; zoo, circus, and marine animals; companion animals; government and professional resources; alternatives; literature searching and databases; pain and distress; and "humane endpoints and euthanasia."
- WordPress.com. http://wordpress.com/tag/animal-protection-organizations/. "Blogs about Animal Protection Organizations."
- World Animal Net. http://www.worldanimal.net/. World Animal Net is the world's largest network of animal protection societies with consultative status at the UN.
- Yahoo. Directory. Animal Rights Organizations. http://dir.yahoo.com/Science/Biology/Zoology/Animals__Insects__and_Pets/Animal_Rights/Organizations/. Lists more than 100 organizations.

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