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The Use of Nonhuman Animals in Research*

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Dr. Buyukmihci discusses the use of nonhuman animals in biomedical research and gives examples of how animals are used in research. He advocates abolishing this practice.

A number of years ago, in another country, scientists took a group of people and subjected them to the following experiment against their will. Each person's abdominal cavity was injected with ethanol. Thirty minutes later, the subjects were anesthetized and their extremities immersed into a freezing (-18°C) solution of fifty percent ethylene glycol for six minutes and then thawed at room temperature. The individuals were allowed to awaken from the anesthetic and were observed for fourteen days. During this time, some died; the remaining survivors were killed fourteen days later. From this study, the scientists concluded that ethanol has significant adverse effects on tissue perfusion and mortality associated with severe frostbite.

I presume you were outraged as you read the summary of this study. No, it was not an example of what went on during the Holocaust. Suppose I disclosed to you that the study was not done many years ago in another country, rather it was done just a few years ago in this country? Would your sense of moral indignation be different? Suppose I told you that the study was actually conducted in the precise manner described, but on mice instead of humans? Would this assuage your conscience with respect to the behavior of the scientists?

For about eleven out of the sixteen years of my professional career, I used various nonhuman animals in biomedical research or vivisection. The types of animals included dogs, cats, mice, monkeys, and hamsters. My work was aimed at understanding various ocular diseases and the anatomy of the eye. I received several grants from the National Institutes of Health,

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1. Barillo, Spillert, LoVerme & Lazaro, *Detrimental Effects of Ethanol on Murine Frostbite*, 50 AM. SURGEON 649 (1984) [hereinafter Barillo].

all as principal investigator, and published numerous scientific papers. If you had asked me during the early part of my career whether it was appropriate to use nonhuman animals in biomedical research, teaching, and testing, I would have said yes. I believed, as most of my colleagues do, that the importance of my work outweighed the effects on the animals. I had not, however, carefully explored the ethical considerations of this value judgment.²

After studying the issue carefully, I concluded that all arguments in favor of using and killing animals in research are rationalizations, not legitimate justifications. The arguments are fundamentally flawed morally, ethically, and scientifically. The major defense put forth by my colleagues is that humans or other animals derive benefits from this research: an "end-justifies-the-means" argument. However, only experimentation on the human animal can provide results that can accurately be applied to the human condition; there is no such thing as a "model" of a human being.

My colleagues are quick to state, and rightfully so, that certain things cannot be done to humans because it would be unethical. The frostbite example I gave at the outset would be an example. Why is it considered ethical in the case of other animals? No one has ever put forth a valid, defensible argument demonstrating that nonhuman animals are not deserving of serious moral concern. The only reason we can do what we do to nonhuman animals is because we have the power to dominate them. We tacitly act on the morally unconscionable principle that might makes right.

It is often said that nonhuman animals used and killed in research are protected by review committees and laws, and therefore that makes it acceptable. A moment's reflection, however, should make one realize that the review committees are inconsequential. Can you imagine a human use committee that would approve of subjecting the participants to unnecessary surgery, or killing them at the end of a study? No animal, human or nonhuman, would knowingly submit to experimental manipulations, even if they were not painful, if they knew that death was the end point. A basic ethical tenet of research involving humans—informed consent—is not something that can apply to nonhuman animals. Even if a person who is an animal advocate is on such a committee, the control of the vote is made up of people who, in some way, have a vested interest in having the projects done.

2. The major scholarly works on this subject are P. SINGER, *ANIMAL LIBERATION: A NEW ETHICS FOR OUR TREATMENT OF ANIMALS* (1975); *ANIMAL RIGHTS AND HUMAN OBLIGATIONS* (T. Regan & P. Singer eds. 1976); B. ROLLIN, *ANIMAL RIGHTS AND HUMAN MORALITY* (1981); P. SINGER, *IN DEFENSE OF ANIMALS* (1985); T. REGAN, *THE CASE FOR ANIMAL RIGHTS* (1983).

There is no meaningful legal protection for nonhuman animals used in research, something that should be intuitively obvious when one considers that essentially all animals are killed at the end of a project. The one law that addresses the use of animals in research is the Animal Welfare Act.³ The Act dictates from where animals can be obtained, how they are to be cared for during shipment and housing, what size cages can be used, and so on. Yet even these minimal provisions are not granted to the majority of animals used in research.⁴ Perhaps the most troublesome aspect of the Act is that it stops at the laboratory door. It is not allowed to interfere with the design or performance of research.⁵ The latest amendments to the Act in 1985 contain the same exception.⁶

Numerous contemporary examples of research projects involve pain and suffering, including the induction of various conditions such as cancer,⁷ radiation exposure,⁸ gastrointestinal ulcers,⁹ and inflammation of the eye.¹⁰ Other experiments involve: poisoning in toxicologic studies,¹¹

3. Animal Welfare Act, Pub. L. No. 94-279, 90 Stat. 417 (1976) (codified as amended at 7 U.S.C. §§ 2131-2157 (1988)).

4. The Act defines an "animal" as:

any live or dead dog, cat, monkey (nonhuman primate mammal), guinea pig, hamster, rabbit, or such other warmblooded animal, as the Secretary may determine is being used . . . for research, testing, experimentation, or exhibition purposes, as a pet; but . . . excludes horses not used for research purposes and other farm animals, such as, but not limited to livestock and poultry, used . . . as food, or fiber, or . . . for improving animal nutrition, breeding, management, or production efficiency

Id. § 2132(g). Birds, reptiles, amphibians, and invertebrates are *not* included in this definition.

5. *Id.* § 2143(6)-(8).

6. Pub. L. No. 99-198, § 1752(b), 99 Stat. 1646 (1985) (codified as amended at 7 U.S.C. §§ 2131-2157 (1988)).

7. Benfield, Shors, Hammond, Paladugu, Cohen, Jensen, Fu, Pak & Teplitz, *A Clinically Relevant Canine Lung Cancer Model*, 32 ANNALS THORACIC SURGERY 592 (1981) (mongrel dogs and closely bred beagles were given carcinogens or radioactive material; early mortality from multiple nonneoplastic causes was variable); Cohen, Shors, Okita, Matsumura, Jensen & Benfield, *Morphologic Aspects of Experimental Canine Bronchial Carcinogen Exposure*, 14 EUR. J. CANCER 401 (1978) (dogs were given benzo(a)pyrene, N-methyl-N-nitrosourea or both; some were also given azathioprine and prednisolone to immunosuppress them; thirty-one of the fifty-four dogs died from various causes, but none of the dogs developed tumors); Cross, Palmer, Filipy, Dagle & Stuart, *Carcinogenic Effects of Radon Daughters, Uranium Ore Dust and Cigarette Smoke in Beagle Dogs*, 42 HEALTH PHYSICS 33 (1982).

8. Dagle, Bristline, Lebel & Watters, *Plutonium-Induced Wounds in Beagles*, 47 HEALTH PHYSICS 73 (1984).

9. Vincent, Pare, Prenatt & Glavin, *Aggression, Body Temperature, and Stress Ulcer*, 32 PHYSIOLOGY & BEHAV. 265 (1984) [hereinafter Vincent] (rats were food deprived for up to 24 hours, then restrained and placed in a refrigerator for three hours; one group was able to bite a brush that was passed by them; this group developed fewer gastric ulcers).

10. Lass, Campbell, Rose, Foster & Dohlman, *Medroxyprogesterone on Corneal Ulceration: Its Effects After Alkali Burns on Rabbits*, 99 ARCHIVES OPHTHALMOLOGY 673 (1981).

11. Seale, Johnson, Carney & Rennert, *Interstrain Variation in Acute Toxic Response to Caffeine Among Inbred Mice*, 20 PHARMACOLOGY, BIOCHEMISTRY & BEHAV. 567 (1984) (caffeine was given to mice that were forced to swim in a large beaker of water; they appeared to die of respiratory arrest prior to submersion of their heads).

extreme heat¹² or cold,¹³ burning or subjection to other fire-related injury with soldering irons or other apparatus,¹⁴ prolonged sleep deprivation,¹⁵ inescapable and severe electrical shock,¹⁶ and fighting, sometimes to the death, in order to study aggression.¹⁷ Pain relief is not mandatory; in fact, it is routinely withheld, either because it would interfere with the results of the experiments, or because the scientists said they could not determine that the animal was in pain. Even though the Animal Welfare Act is largely ineffectual, it is disheartening that my colleagues in the biomedical community have consistently and vigorously fought it and all amendments to it.

The National Institutes of Health's *Guide for the Care and Use of Laboratory Animals* is the avowed bible of the research institutions. My colleagues sometimes state that the *Guide* insures the "humane" treatment of animals in research. However, as with the Animal Welfare Act, the *Guide* states explicitly that it is not meant to interfere with the design or

12. Li, Meyer, Mak & Hahn, *Heat-Induced Protection of Mice Against Thermal Death*, 43 *CANCER RES.* 5758 (1983) (mice were anesthetized and placed in heated water (about 108 °F) for as long as forty-five minutes, then allowed to recover from the anesthesia; many mice died during or within the seven days after treatment, but investigators did not find specific cause of death).

13. Barillo, *supra* note 1; Vincent, *supra* note 9.

14. Alarie, Stock, Matijak-Schaper & Birky, *Toxicity of Smoke During Chair Smoldering Tests and Small Scale Tests Using the Same Materials*, 3 *FUNDAMENTAL & APPLIED TOXICOLOGY* 619 (1983) (mice exposed to the smoke created when polyurethane or polyester filled chairs were smoldering suffered intense irritation, especially of the respiratory tract, and death over a variable period of time); Ossoff, Duncavage, Eisenman & Karlan, *Comparison of Tracheal Damage from Laser-Ignited Endotracheal Tube Fires*, 92 *ANNALS OTOTOLOGY, RHINOLOGY AND LARYNGOLOGY* 333 (1983).

15. Rechtschaffen, Gilliland, Bergmann & Winter, *Physiological Correlates of Prolonged Sleep Deprivation in Rats*, 221 *SCIENCE* 182 (1983) (rats deprived of sleep suffered severe pathology and death).

16. Dess, Linwick, Patterson, Overmier & Levine, *Immediate and Proactive Effects of Controllability and Predictability on Plasma Cortisol Responses to Shocks in Dogs*, 97 *BEHAVIORAL NEUROSCIENCE* 1005 (1983) (dogs in slings were shocked through electrodes in foot pads to see what lack of control over the shocks did to their behavior).

17. Bammer & Eichelman, *Ethanol Effects on Shock-Induced Fighting and Muricide in Rats*, 9 *AGGRESSIVE BEHAV.* 175 (1983) (ethanol was given to rats to see if it affected electric shock-induced fighting, or the killing of mice; investigators admitted that it was not known which types of aggression in animals were useful models for aggression in humans). See also Blanchard, Kleinschmidt, Flannelly & Blanchard, *Fear and Aggression in the Rat*, 10 *AGGRESSIVE BEHAV.* 309 (1984); Emley & Hutchinson, *Effects of Phencyclidine on Aggressive Behavior in Squirrel Monkeys*, 18 *PHARMACOLOGY, BIOCHEMISTRY & BEHAV.* 163 (1983); Flannelly, Blanchard, Muraoka & Flannelly, *Copulation Increases Offensive Attack in Male Rats*, 29 *PHYSIOLOGY & BEHAV.* 381 (1982); Miczek, Winslow & DeBold, *Heightened Aggressive Behavior by Animals Interacting with Alcohol-Treated Conspecifics: Studies with Mice, Rats and Squirrel Monkeys*, 20 *PHARMACOLOGY, BIOCHEMISTRY & BEHAV.* 349 (1984); Potegal, Blau, Black & Glusman, *Effects of Castration of Male Golden Hamsters on Their Aggression Toward a Restrained Target*, 29 *BEHAVIORAL & NEURAL BIOLOGY* 315 (1980); Viken & Knutson, *The Effects of Negative Reinforcement for Irritable Aggression on Resident-Intruder Behavior*, 8 *AGGRESSIVE BEHAV.* 371 (1982); Yoshimura & Miczek, *Separate Neural Sites for d-Amphetamine Suppression of Mouse Killing and Feeding Behavior in Rats*, 9 *AGGRESSIVE BEHAV.* 353 (1983).

performance of research, and there are no restrictions on what can be done to nonhuman animals. The *Guide* also states that the use of analgesics, anesthetics, or tranquilizers is not necessary if the researcher deems that such use would interfere with the experiment. I believe that groups promoting the use and killing of animals in research routinely mislead the public about this. For example, in a brochure entitled "Health Research to Benefit People & Animals," the California Biomedical Research Association states: "Procedures *require* the use of anesthesia and medication to suppress pain and suffering."¹⁸ This is absolutely untrue, and it attempts to lull the public into thinking that animals used in research do not suffer.

Although not all research is as drastic as some of the examples I have given, other issues make it problematical. For example, almost all animals used in research eventually are killed, even if it is not necessary for the goals of the project. The animals usually live under conditions that are marginal at best and that cause extreme privation at worst. The emphasis is on sanitation and ease of care. Usually only the animals' immediate and absolute needs are met—food, water, and shelter; their social, behavioral, and psychological needs are rarely met. This is most apparent in the way primates are housed: small, barren, steel cages, essentially in social isolation. This privation is not only detrimental to the animals, it has tremendous confounding effects on the data that come from experiments on the animals, which numerous published scientific studies have proven.¹⁹

Those who defend the use and killing of animals in research state that the animals are treated "humanely." However, to be humane is to have sympathy for another, to have mercy, to be tender and kind. Regardless of how one feels about the propriety of using nonhuman animals in research, the use of the word humane in this context is inappropriate, regardless of whether the experiments involve pain or suffering. The next time someone claims that animals used in research are treated "humanely," ask if he or she would consider it "humane" to treat humans in the same way. Bear in mind that there is only one definition of the word humane: it is not one way for humans and another way for other animals.

When my colleagues do admit that animals used in research suffer, they try to justify the suffering by pointing out that humans are suffering, too.

18. CALIFORNIA BIOMEDICAL RESEARCH ASSOCIATION, HEALTH RESEARCH TO BENEFIT PEOPLE AND ANIMALS (n.d.) (emphasis added).

19. For example, in a study on rabbits involving a diet that would cause atherosclerosis, half the animals were housed and cared for per standard regulations. The other half were socialized to the investigators, which included gentle handling on a daily basis. When the animals were killed, those who were socialized had over sixty percent fewer plaques in their major vessels. Studies of this type suggest that the data in the scientific literature in general may be highly suspect. Nerem, Levesque & Cornhill, *Social Environment as a Factor in Diet-Induced Atherosclerosis*, 208 *SCIENCE* 1475 (1980).

It is strongly intimated, if not explicitly stated, that concern for nonhuman animals *a priori* indicates a lack of concern for humans. But this is absurd: the animal rights movement is one of compassion for all creatures, human and nonhuman. My colleagues try to reduce the issue to an "us or them" scenario. It sometimes seems as if they want to punish other animals for our ills. It is not the nonhuman animals' fault that we, too, are subject to the vicissitudes of life. Why do we feel that because we suffer, others must pay a price? The harming and killing of animals in the name of human progress clearly seems to be an expression of unconscionable selfishness on our part. Many of the things to which we subject animals, such as the smoking of tobacco, or alcoholism and other drug addictions, are purely human ills and can be prevented. Moreover, it seems almost perverse to cut funds for mental health or drug addiction programs and then spend millions of dollars every year doing psychological research or drug addiction studies on nonhuman animals. What kind of a moral statement are we making to the persons who presently are afflicted with these conditions and cannot get help because of lack of funds or facilities?

I do not think there is any question that subjecting other animals to the types of things we do in the name of science is unethical and immoral. Is biomedical research using animals necessary for human health and safety? No, it is a choice we make. The human species has had no difficulties maintaining itself. Although the use of nonhuman animals has been associated with our understanding of certain phenomena, it does not follow that this use was necessary or must continue. There is no proof that the advances associated with the use of nonhuman animals could not have come about without them. Furthermore, most advances, in terms of increasing the longevity and quality of our lives, have not come about through the use of nonhuman animals. The greatest benefits have come from adequate nourishment and proper sanitation. In addition, many of the great medical advances such as penicillin, the X-ray, and others came from work that did not initially involve nonhuman animals. For my colleagues to state that virtually every medical discovery has depended on the use of animals or could not have been discovered without their use simply is not true and ignores the recorded history of these discoveries. Perhaps the most ignorant and unscientific statement I have ever heard is that discontinuing the use of animals in research would cause science to come to a halt. This ignores or denies the numerous discoveries that were based purely on clinical observations of human and veterinary patients. Many discoveries and developments were made by studies on researchers themselves.²⁰

20. L. ALTMAN, WHO GOES FIRST? (1987).

When contemplating or discussing the issue of nonhuman animals used in research, it is important to bear in mind that animals are not “things,” they are living beings who have feelings and want to live just as much as you or I do. They are not here for us. To paraphrase Tom Regan, “They are not our tasters; we are not their kings.”²¹ They have interests and value independent of those we may give them. And, they have just as much right to share this world and to experience the phenomenon we call life.

21. T. REGAN, *THE STRUGGLE FOR ANIMAL RIGHTS* (1987) (paraphrasing a chapter title).