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Although the Editorials section is usually reserved for the editors and the Comment section is devoted to the views of other contributors, there is a slightly different arrangement in this issue. An editorial by Michael W. Fox is followed by a reply from Jim Mason, author of the Comment article entitled "The Politics of Animal Rights: Making the Human Connection," which appeared in our May/June 1981 issue. Because Mr. Mason’s piece is an invited response to Dr. Fox’s editorial, we felt that it would be most effective and truest to the goal of the Journal to promote dialogue if we presented them together. — Ed.

Animal Welfare, Rights and ‘Liberation’

Michael W. Fox

A distinction which is more than mere semantics needs to be made between certain philosophical and political trends in the humane movement. The historical basis of the movement is founded upon the morality of promoting kindness toward all creatures: reverence for all life. This approach has been strengthened by the integration of ecological, or eco-ethical principles and by the emerging interdisciplinary science of animal welfare. Furthermore, the movement has been enriched by the scholarship of moral philosophy, including the limited but useful concept of animal ‘rights.’

This concept is useful because it focuses attention upon animals’ interests (social, emotional, behavioral and other needs) instead of upon perceived cruelty and the wrongdoer. This latter moralistic approach, which at best, helps to clarify our moral obligations toward animals, at worst appears as a judgment against those who exploit animals. This puts people—farmers, scientists and others—on the defensive and fails to establish the common ground vital to the process of reform. Addressing our moral obligation to treat animals humanely and to cater to their basic needs, shifts the focus to where it should be: upon the animal.

Animal rights philosophy, properly articulated, can also help in this regard, but not when it is presented in an absolute or idealistic way. For example, while we have a moral obligation to treat all creatures humanely, and while it may be argued that they have a natural right to humane treatment, it should be made quite clear that not all rights are absolute. If it were, and society accepted it as such, then animal shelters would be swamped with surplus cats and dogs, and society could not afford to house and feed them for the rest of their lives. Similarly, the postulation of an absolute right not to be eaten is unrealistic and, at this time in history, counterproductive. Promoting vegetarianism on the sole basis that animals have a right not to be eaten will not aid communication with producers and others involved in the livestock industry, or with hunters and fishermen. (Also, animal suffering is sometimes unavoidable, but morally justified, in at least a few research studies which are of over-riding, direct benefit to both humans and nonhumans.)

Vegetarianism has nothing directly to do with how farm livestock are treated: look at the plight of livestock in vegetarian India for example. In many parts of the world, raising livestock is an essential part of ecologically sound food production. Global vegetarianism could be ecologically disastrous. The case for farm animal welfare is weakened and clouded when vegetarianism is brought in. However, used selectively, the injunctions not to eat meat (or to reduce one’s intake considerably) may be an effective strategy with considerable economic and ecological validity, especially in the United States.

I see the animal liberation front, with its abolitionist posture and idealistic distortion of animal rights philosophy (e.g., animals have a right not to be eaten) as a potentially counterproductive element in the animal welfare movement. Actions of confrontation such as raids on research laboratories, letting confined farm animals loose and ‘eco-guerilla’ tactics to stop hunters, sealers and whalers are effective in gaining public awareness and sympathy, but public ridicule will follow if such activities are not followed up with dialogue between opposing factions and the setting of realistic goals. Confrontation alone is usually the result of political frustration, but by itself, it can be anarchy.

The animal liberation front is, in many respects, not unlike the Victorian antivivisection movement. It has a definite role in the overall dynamics of social change and consciousness raising. But animal liberationists may be tarred with the same brush of anarchy as other extreme factions that are polarizing Western society today, such as the neo-Fascists, the ‘moral majority,’ disaffected labor and staunch pro-lifers. However, this is not necessarily the only fate for the movement. Henry Spira has demonstrated that carefully orchestrated militant action combined with cooperative ventures with the more moderate animal welfare organizations would still maintain contact with the establishment power centers can be very effective. It is unfortunate that animal ‘rights’ philosophy has become associated with the militant animal liberation forces because, as Mahatma Gandhi showed, the firm foundation provided by ethics and moral philosophy can give great strength to a social cause based on nonviolent civil disobedience. Also, the goals of the movement must be based in reality and should not concentrate on idealistic hopes that cannot be accomplished in a time frame reasonable for the human animal. Goals such as the abolition of the killing of animals or the use of animals in research are not attainable in the next decade although these ideals may some day come to fruition. There is a difference between unbridled idealism and practicality. The latter is more socially effective and hence, more expedient. The former often leads to militant enthusiasm, which is difficult to sustain without charismatic leaders and public demonstrations, and it may end in violence when enthusiasm is replaced with frustration caused by a more entrenched and less communicative opposition.

So let us keep our ‘isms,’ our personal beliefs and ideals, such as vegetarianism and antivivisectionism, in proper perspective, and get on with the business that concerns us all in the humane movement proper—namely, animal welfare and humane ethics.

A Reply to “Animal Welfare, Rights and ‘Liberation’” by M.W. Fox

Jim Mason

Michael Fox’s editorial correctly points out some of the advantages and disadvantages (and confusion) associated with the recent emergence of the concepts of animal rights and liberation. I agree with him that the concept of rights is, in some respects, an improvement over the traditional welfare/cruelty perspective. I do not, however, share his pessimism about animal liberation and his opinions about the value of that trend in our movement. I feel that this latter development in perspectives and in tactics provides a simple but better grounded basis for a progressive world view and environmental ethic.
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Though it is hardly mature, the rights approach already appears stale—merely the same old animal welfare approach in updated, trendy language. Indeed, most of our large animal welfare organizations have already adopted animal “rights” rhetoric, yet they have made no changes in outlook, policies or programs. The present state of the rights concept lends itself to this chameleonic behavior. Philosophers are unlikely ever to settle the arguments about whether “rights” exist at all and if they do, why they do. In this conceptual trap animals quite probably will not have it much better than under the traditional welfare/cruelty approach. Though it does, as Dr. Fox points out, offer some advantages, the rights concept is at bottom poorly understood at all levels of intellect and education; “rights” are soft, slippery and hard to define. When all is said and done, animals will achieve only those “rights” that we who own, use and manipulate them are willing to give.

That is why some of us press the radical, “idealistic” and, I suppose, somewhat frightening notion that animals should be “liberated” from the human economy. While the rest of society seems to be steadfast in its exploration of ways either to enslave or to exterminate animals, we demand (more and more vociferously) a sharp change in direction that would explore ways to relieve animals of and protect them from our scientific, technological and economic impact. Science and technology under the guidance of progressive morality rendered human slavery unjust and obsolete. Why stop there? As long as human society’s outlook toward and relationship with other animals carries the old residue of hierarchy, supremacy, mastery, servitude, property and economic “benefit,” animals will be neither safe nor free (free to move, to respond, to interact, to follow instinctive or learned behavior, to reproduce, to evolve and ultimately to live at all); no amount or kind of “rights” can really improve their lot. Slaves had a few insignificant “rights,” but none substantial enough to free them, nor to end the injustice and brutality inherent in the institution of slavery.

For the human animal, the path of animal liberation would offer benefits both cultural and spiritual (not to mention technological). We would no longer need to subjugate the beast, whether within or without. We could abandon the myths, rationalizations and defenses constructed to ease the anxious conscience of an animal-dependent, animal-exploitative society. We would then be in a position to end our fear, hostility and alienation toward animals and the living world so that we could know and live with them as well as with the animal within ourselves. Under a liberationist restructuring of human/animal perspectives and relations, we would be forced to see the natural world as it truly is in the purest scientific sense, without human-centered bias. Of course, we would have to drastically change our outlook, habits... our ways, but this is exactly what many recent thinkers are saying we must do if we are to avoid some sort of global disaster, whether by nuclear, chemical, social or one of the many other means so ready and available these days.

How radical, idealistic or “far out” one’s thoughts and actions are in this age depends on how bad one believes things to be and how strongly one yearns and struggles for a resolution in favor of an acceptable kind of survival. The general drift of events today tends to call for a radical response, even if that “polarizes” society. Somehow, the issue of survival must be made clear, and it must be acted upon.

Effects of Domestication on Cognition

Anyone who has seen sheepdog trials or watched the complicated dressage performed by various types of show horses, and then compared his or her impressions with those formed from observation of the consistent, relatively invariable and stereotypical behavior of a wild animal might well conclude that the domesticated animal, because of its ability to be trained, has superior ability to learn and hence greater intelligence. However, this view fails to make a distinction between the mechanism for acquiring the proper response to a cue and the mechanism for learning to solve problems.
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Domestication proceeds by artificial selection, “artificial” in the sense that human beings as well as environmental conditions exert control over which behavioral and anatomical features survive through successive generations. One obviously desirable trait to foster in domesticated animals is tractability; according to Dr. Frank, tractability was probably inadvertently selected for in the midst of selection for other traits in dogs because animals whose behavior was difficult to control would have been eliminated from the breeding pool. Dr. Frank relates tractability to two properties of the canine “information processing system”: responsiveness to a broad spectrum of stimuli, such as that used in human communication, and enough plasticity to allow behavior to be shaped and reinforced by the techniques of instrumental conditioning that are used in training.

In contrast to dogs, wolves tend to learn through observation, as in the case of a female wolf in Dr. Frank’s group that learned to open a door after watching a wolf-malament hybrid perform the task just once. Although the hybrid used his muzzle to unlatch the door, the wolf used her paws. Observational learning implies recognition of means/ends relationships; the observation of the substitution of a functionally equivalent behavior (using paws instead of muzzle) adds support to the notion that the animal “…understands the instrumental nature of the action he [in this case, she] observes.”

From an evolutionary point of view, one can ask the question: Why should observational learning be favored under natural selection and superseded by the
ability to learn by instrumental condi-
tioning under conditions of domesticata-
tion? Dr. Frank proposes that in a wild and potentially hazardous environment, selection would favor the ability to learn quickly the consequences of one's actions. However, in an environment defined largely by man, the human being becomes a kind of buffer, shielding the animal from the consequences of its mistakes. Thus survival becomes contingent on tractability, i.e., the ability to respond to a wide range of cues from humans although the response has no discernable functional connection with its result.

This answer is incomplete, as it does not account for the rigid, stereotype behavior that is seen alongside playfulness, curiosity and problem-solving in the wolf. To tie this loose end, Dr. Frank puts forth the idea of a dual or "duplex" information processing system in the wolf: one component is complex, flexible and inventive; the other responds with consistency to a narrow band of stimuli. This latter type of system would also have a function in a wild environment since in some circumstances (communication, defense of cubs and food, etc.) a correct first response would obviously be preferred over learning from one's mistakes. In the wolf it seems that with the appropriate cue, the instinctual system usually over-rides the cognitive one, which probably developed later in connection with the evolution of cooperative group hunting.

In the domestic dog, however, the two systems seem to have fused. For example, instinctual sucking and rooting disappear as such and become incorporated into more complex behavior patterns quite early in dogs, whereas it is possible to induce this basic nursing behavior in wolves well into adulthood. Similarly, barking takes a longer time to develop in the dog than in the wolf, and dog barks are more complex and differentiated than those of wolves. Selection for tractability could have achieved this fusion of cognitive and instinctual systems if it coexisted with the prolongation of other juvenile characteristics. Selection for neoteny in anatomy and physiology would then have carried it selection for arrestment of the ability to habit uninreinforced responses, which is associated with matura-
tion and is a prerequisite to both creative and stereotypical behavior.

Shrinking Habitat for Britain's Wildlife

Efforts aimed at protecting individual wildlife species rather than their habitats are proving to have devastating effects on Britain's wildlife populations. Except for those areas designated as SSSIs (Sites of Special Scientific Interest), which occupy less than 6% of the land, the majority of wildlife habitats is being destroyed. Various studies report such immense losses that it is feared less than one half of the land covered by natural vegetation will remain by the end of the century. Such is the view of Dr. David Goode, Assistant Chief scientist for the Nature Conservancy (NCC), the British government's own advisory board.

Writing in New Scientist (89:219-223, 1981), Dr. Goode indentifies three primary factors contributing to the problem: 1) intensification of agriculture, 2) production of commercial forests, and 3) urban development. Grassland and heathland have suffered average losses of 35% and 61% respectively from fertilization, liming and cultivation. The destruction of commercial forests, which replace the native broadleafed oak and ash trees with conifers, accounts for a 20% average loss of the deciduous woodlands. The destruction from urban development involves mainly farmland.

The NCC estimates that 30-50% of all ancient, semi-natural woodland has been lost since 1947, an amount roughly equivalent to that lost over the previous four centuries. One ecologist suggests that all remaining ancient woodland in Britain that does not receive special protection will disappear by the year 2025. The surging rate at which habitats are being destroyed means that concern for particular wildlife species is no longer the issue; the threat now is to a major proportion of all wildlife in Britain. Once the habitats are destroyed, the flora and fauna indigenous to them are lost as well.

A bill currently before Parliament seeks to change this scenario. Entitled the Wildlife and Countryside Bill, it includes provisions to strengthen the existing legislation protecting important wild-life habitats. The NCC has publicly announced, however, that the bill is too weak and has requested a further provision ensuring notification of the NCC prior to any changes which would be "detrimental to the scientific interest of any SSSI." The NCC considers the range of habitats represented by the SSSIs as the minimum necessary to support viable populations of most wildlife species found in Britain. Under the existing regulations, however, the SSSIs are not given full protection—they can be destroyed. The provision recommended by the NCC would strengthen that protection, and consultation in advance to proposed changes would enable the NCC to compensate farmers and foresters in return for protecting wildlife.

The bill, having survived eight hundred amendments and eight days of debate in its report stage in the House of Lords, is now proceeding to the House of Commons (New Scientist 89:726, 1981). During the report stage, an all-party amendment which would have given statutory protection to the SSSIs was defeated by the government, which instead accepted a proposal which would allow the government to advise landowners against damaging SSSIs. However, the choice to ignore this advice would carry no penalty. In addition, the owners of land with 40 SSSIs would be required to notify the NCC if they intended to develop these areas, in which case development would be postponed for twelve months during which the landowner and the NCC would confer on how the land should be managed. If both parties fail to reach an agreement, the NCC has the option to exercise its right of compulsary purchase. If the NCC does not purchase the land, the owner is free to proceed with development.

To Pea Or Nut To Pea

Two researchers at the University of Texas at Austin have devised a method for collecting urine samples from vervet monkeys that takes advantage of a behavioral tendency of the animals and avoids the problem of routine isolation of individuals from the social group for restraining and catheterization.

According to T.M. Kelley and C.A. Bramblett (Am J Primatol 1(1):95-97, 1981), "[C]aptive vervet monkeys readily urinate on an intruder if caging conditions allow them to position themselves overhead." Acting on this observation, Kelley and Bramblett proceeded to train 8 adult males, housed in an outdoor cage (26m x 14m x 4m) with 35 other monkeys of various ages and both sexes, to urinate into beakers while perching on a horizontal bar located 2 meters from the ground. The training regimen employed positive reinforcement with rewards of peanuts, the number of which varied according to how well the monkey performed the desired task (sit on perch; urinating from perch "in close proximity to the observer"; urinating from perch into a beaker). Monkeys were considered to be completely trained when they directed three consecutive 'clean hits' into the beakers. Commenting on the training procedures, the researchers noted: "Although only the 8 adult males were rewarded, several females and juveniles began to position themselves correctly and urinate, apparently from observational learning. In fact, the monkeys were a bit too keen on the new routine. Several of them started to urinate simultaneously, too rapidly for collection of individual samples. This problem was solved by making each subject wait until the observer was directly in front of him and
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In fact, the monkeys were a bit too keen on the new routine. Several of them started to urinate simultaneously, too rapidly for collection of individual samples. This problem was solved by making each subject wait until the observer was directly in front of him and

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then saying “Sit, (name of monkey)”, after which the monkey urinated. Another problem arose when high-ranking males lurked near urinating males of lower rank and snatched the peanut rewards from their rightful owners. The observers solved this problem by improving their timing in handing out the peanuts and also by waiting until the coast was clear of dominant animals.

Kelley and Bramblett estimate that training, if carried out on a daily basis, could be completed within 2 weeks to 2 months, depending on the relative reticence and precocity of the particular subject.

The advantages of this method are fourfold: if behavioral endocrinology is being studied, this procedure produces less distortion than prolonged isolation and restraint; the same members of a social group can be sampled several times over a period of days or even a month for an indefinite period without repeated venipuncture, restraint or catheterization; members of the group may show intensified behavioral differences through interactions stimulated by the sampling procedure, thus enabling researchers to obtain more accurate information on dominance, activity profiles and personalites; no additional staff or equipment are required.

Although the researchers expressed one reservation about their method, namely, its as yet unknown effect on the endocrinology of the group, they made a strong plea for their approach to be considered seriously as a “humane alternative to more traditional techniques.”

Anesthetics for Draize: Follow-Up

Further experiments, however, indicate that a third anesthetic, tetracaine, increase eye irritation. In the initial tests, tetracaine was ruled out because of its delayed and inconsistent effects. However, when the dose was doubled in the follow-up experiment, tetracaine was judged to perform adequately as an anesthetic with the added benefit of not contributing to corneal irritation, except in the case where it was used with 5% acetic acid: Healing time was lengthened, but according to CPSC biologist Constance Hoiselman, the longer healing period “was not a great difference...” and when used with the other ingredients (5.5% sodium hydroxide, 70% ethanol and 10% liquid detergent), “the tetracaine came out in irritation response exactly the way the controls came out” (The Rose Sheet, FDC Reports 2(3):120, 1981).

The CPSC no longer conducts Draize tests on a routine basis. Proceeding from the belief that skin irritation is a predictor of eye irritation, it is asking manufacturers to label products as eye irritants if skin irritation tests on laboratory animals are positive. If the manufacturer refuses, the agency will begin Draize testing with a suitable ocular anesthetic in order to enforce the Federal Hazardous Substances Act labelling requirements.

Talking at Cross Purposes

In the last year or so, the Institute of Animal Physiology near Cambridge (UK) has been the target of much ire and abuse from animal liberation groups. The climax of the campaign was a demonstration outside the Institute coupled with a commando-type raid on the actual facilities. Those who broke in reported a number of horrific scenes and also claimed to have seen a two-headed goat and creatures that were half goat and half cow. These allegations, as well as others, are dismissed as nonsense in a recent article by Dr. B.A. Cross, Director of the Institute (Vet Rec 108:202-206, 1981). In so doing, he takes up the gauntlet thrown down by animal liberation supporters. In fact, he specifically states that “…the most malign effect of the recent campaign of antivivisection propaganda, together with the verbal and physical abuse of research workers associated therewith, has been that politicians, administrators and even scientists have been reluctant to speak their minds in public for fear of attracting hostility.”

Cross perhaps taking refuge in the knowledge that he has already attracted hostile attention, accuses avivisec tionists of spreading misinformation on animal research and adding to the forces of “restrictive utilitarianism,” a phrase which has come to describe the efforts by animal welfare groups and members of Parliament to restrict animal research only to that which leads directly to abolition of suffering or the prolonging of life in human beings and other animals.

Workshop on Humane Killing of Whales

In November 1980, a workshop sponsored by the International Whaling Commission (IWC) met in Cambridge, England to consider methods of improving techniques for killing whales. Comprised of experts from various fields including veterinary anesthetics, diving physiology, animal welfare and commercial whaling, the group reviewed the existing slaughter techniques with a view toward suggesting more humane methods. The workshop made several recommendations which were endorsed by the IWC. A summary of its report is presented below:

The group recognized that because of the stress imposed on the target animal by its selection, isolation and pursuit, a complete assessment of humanness in the whaling industry must include a review of capture techniques as well as slaughter methods. However, due to inadequate information on the ethology of whales, the group confined its discussion to those components of the operation dealing directly with inducement of unconsciousness and death.

The group formulated a working definition of “humane killing” as that which causes death without pain or distress to the animal. This is the idealistic goal, realistically, any humane killing method would aim to render an animal insensitive to pain as quickly as technically possible. The group endorsed the view that developing the means to achieve rapid and painless killing of whales would serve to increase the efficiency of the whaling operations and thus improve the quality of the meat obtained.

Therefore, a humane death for the whales would also serve the commercial interests of the whaling industry.

The group reviewed the most effective methods of rendering large mammals insensitive to pain and then considered the means of achieving this in whaling operations. The most rapid and practical route involves depression of the central nervous system or cerebral cortex. This can be achieved in several ways: shock from pressure waves or concussions; interference with blood supply to the brain; passage of electric current through the brain; chemical interference with neurological pathways (drugs); cervical dislocation or severing of the spinal cord. The animal can be killed immediately after becoming insensitive to pain (via the same mechanism), or some time later by another means.

Existing methods and new developments

Explosive harpoons — Used primarily in the slaughter of large whales. The whale is struck with the harpoon just behind the flipper at the horizontal midline. The flat-head grenade on the harpoon then explodes into 2 or 4 large pieces. The harpoon is meant to pierce the heart as the animal swims away. If the harpoon fails to penetrate a vital organ, the fragments of the grenade lacerate the blood vessels and cause hemorrhaging. In an Icelandic study, 4 out of 19 harpoons failed to explode, owing to either a defective harpoon or moisture spoiling the powder. To avoid this, several charges and detonators are reserved aboard the vessel. Japanese
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Anesthetics for Draize: Follow-Up

A preliminary study by the Consumer Product Safety Commission (CPSC) of local anesthetics for the Draize test revealed that proparacaine HCL and butacaine sulfate were effective although both preparations increased irritancy and lengthened healing times of the affected rabbit eye (Int J Stud Anim Prob 2(3):120, 1981).

Further experiments, however, indicate that a third anesthetic, tetracaine, increase eye irritation over the initial tests, tetracaine was ruled out because of its delayed and inconsistent effects. However, when the dose was doubled in the follow-up experiment, tetracaine was judged to perform adequately as an anesthetic with the added benefit of not contributing to corneal irritation, except in the case where it was used with 5% acetic acid: Healing time was lengthened, but according to CPSC biologist Constance Hoheisel, the longer healing period “was not a great difference,” and when used with the test ingredients (5.5% sodium hydroxide, 70% ethanol and 10% liquid detergent), “the tetracaine came out in irritation response exactly the way the controls came out” (The Rose Sheet, FDC Reports 2(17), 1981).

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Explosive harpoons— Used primarily in the slaughter of large whales. The whale is struck with the harpoon just behind the flipper at the horizontal midline. The flat-head grenade on the harpoon then explodes into 2 or 4 large pieces. The harpoon is meant to pierce the heart as the animal swims away. If the harpoon fails to penetrate a vital organ, the fragments of the grenade lacerate the blood vessels and cause hemorrhaging. In an Icelandic study, 4 out of 19 harpoons failed to explode, owing to either a defective harpoon or moisture spoiling the powder. To avoid this, several charges and detonators are reserved aboard the vessel.
whaling crews do not bring the charge and detonator on deck until immediately before firing.

Nonexplosive harpoons—Used in pelagic and small-type (minke) whaling. Cold, nonexplosive grenades are used in place of the explosive type as the latter would destroy too much meat. Again, the harpoon enters the animal behind the flipper, but in this case, death results not from hemorrhage, but from shock waves. In Japanese operations, an electric lance is used to kill the animal if death is not immediate (see below). In 1979, legislation was introduced in Norway requiring each small-type whaling vessel to use a large caliber rifle to kill the whale after it had been struck with the harpoon. Initial reports indicate that this method is successful. Efforts are being made to develop an explosive harpoon which could be used to kill minke whales rapidly. Apart from achieving rapid death, it is important to ensure the safety of the operators and cause minimal damage to the whale meat. Penthrite was selected over black powder as the preferred explosive, and harpoons containing penthrite are thought to have excellent potential for producing rapid and humane death. (The workshop also recommended that information on the failure of grenades to explode be obtained.)

Bomb lances—Used in bowhead whaling by Alaskan Eskimos. A bomb lance is fired at the whale to kill or disable it so that it can be killed by harpoon. If the whale is not harpooned, it may escape seriously injured.

Electrical methods—As previously mentioned, electric lances are used primarily in minke whaling to kill the whale if the first harpoon should fail. Electrodes are inserted on either side of the heart and shock is applied. Research into improving the design of the lances and the power supply continues. The Japanese are developing an electric harpoon that has its power source in the grenade. Electrocuton is also under consideration as a slaughtering method, but controlled studies must be undertaken to assess its effect on various parts of the body of aquatic, as opposed to terrestrial, mammals.

\[ \text{CO}_2 \text{ injection—This method has three advantages: death by embolism is rapid, and as it is not necessary to hit a vital organ, the effective target area is large; the injection of gas ensures that the whale will float when dead; the meat is not tainted as quickly as when air is injected for buoyancy, as \( \text{CO}_2 \) lowers the body temperature and does not support \( \text{CO}_2 \text{ injection are the possibility of freeze-burning of the meat due to a blocked cylinder and that processing of the meat must be immediate to prevent anaerobic bacterial decomposition.} \]

Explosive bullets—First used experimentally in 1973-74 by Japanese whalers, explosive bullets were found to be ineffective, as it was difficult to shoot accurately under field conditions. Their use was discontinued soon after the development of the electric lance. There is some evidence to suggest that the use of high-velocity bullets is effective; however, to achieve the most rapid death, the bullet must be fired first or simultaneously with the harpoon. Research into the use of high-velocity bullets should be pursued.

Drugs and poisons—Whalers have experimented with drugs since the 1830s, but most of those tested have proved to be too dangerous to handle. Neuroumous blocking agents such as strychnine, succinylcholine and curare are not recommended for use in the humane killing of whales. Anesthetizing drugs are acceptable if they meet the following criteria: no risk to personnel; effective when applied intramuscularly; leave no dangerous residues if whale products are to be consumed by humans or other animals; no threat to market from unfoundered numbers of tainted meat. No presently available drug satisfies all of these requirements. While the use of drugs is not currently recommended, controlled experiments on the effects of certain drugs should be undertaken.

Injection of compressed gas—This method is fraught with practical problems such as how to deliver the gas, how to construct a valve capable of rapidly releasing such a large volume of gas, and how to market the product. The use of an inert gas such as argon is a possible solution to the marketing problem. Even if the practicalities could be worked out, evidence exists from experiments with swine that death from multiple gas emboli is painful.

The group also discussed problems connected with aboriginal whaling and stranded whales. The methods used in aboriginal whaling are likely to involve slow death by bleeding. Improvements in the techniques used should be examined as a matter of urgency; this might best be done through the IWC ad hoc Working Group on Management Principles for Subsistence Whaling, which convenes in July 1981. For stranded whales, killing was deemed the most humane alternative. For smaller cetaceans (up to 25 ft), shooting with a high caliber rifle is the preferred method. If the animal is shot through the blowhole in a line toward the anterior insertion of the flipper, the bullet will pass through the brain. (A large caliber handgun can be used for dolphins and porpoises.) Drugs are also acceptable. In smaller cetaceans, the blood vessels in the flukes are sufficiently visible to locate the central vessel and inject a suitable enlazing agent. In larger animals that are more difficult to shoot, injection of a drug such as etorphine hydrochloride is potentially the most humane method. Care should be taken that the drug used does not have the potential to harm other animals that may scavenge the carcass of the whale.

The Strange Case of Jensen-Salsbery

According to U.S. federal regulation CFR §228(a)(4), annual reports must be filed by research facilities to the U.S. Department of Agriculture’s Animal and Plant Health Inspection Service (USDA-APHIS), indicating the number of animals used in actual research and testing. The reporting form is organized by species of animal covered by the Animal Welfare Act and types of experiment, which fall into three categories: experiments or tests involving no pain or distress (Category B); those involving pain or distress with the administration of appropriate anesthetics, analgesics or tranquilizers (Category C); those involving...
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The group also discussed problems connected with aboriginal whaling and small-type whales. The methods used in aboriginal whaling are likely to involve slow death by bleeding. Improvements in the techniques used should be examined as a matter of urgency; this might best be done through the IWC ad hoc Working Group on Management Principles for Subsistence Whaling, which convenes in July 1981. For stranded whales, killing was deemed the most humane alternative. For smaller cetaceans (up to 25 ft), shooting with a high caliber rifle is the preferred method. If the animal is not shot through the blowhole or in the brain, the bullet will pass through the brain. Care should be taken that the drug used does not have the potential to harm other animals that may scavenge the carcass of the whale.

The Royal Society for the Prevention of Cruelty to Animals (RSPCA) has launched a nationwide publicity campaign on pet-owner responsibility, with an emphasis on neutering animals to help reduce a population that is "out of control," in the words of Janet Fookes, MP, chairwoman of the RSPCA.

The campaign literature features slogans such as "Is it your dog's sex life that stops you getting him neutered? Or is it yours?"; "As long as pets are bought like toys, they'll be treated like toys" and "Why should a society's rejection of animals have to kill 160,000 every year?" The campaign is designed to educate as well as to awaken, as evidenced by the information leaflets on the health and welfare of companion animals being made available.

An editorial in the Veterinary Record (108:16:343, 1981) praises the RSPCA's initiative, but adds a cautionary note about the "hard core" of irresponsible pet-owners. Measures taken by charities and by the veterinary profession to reach the pet-owning population will probably not suffice because of the unresponsiveness of this hard core; therefore, legislation may be necessary. In the meantime, the UK government could begin to create a climate in which responsibility for pets had more meaning by raising the fees for dog licenses to a "reasonable level." However, the government shows no such inclination at present.

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pain or distress without the administration of any pain-relieving drugs (Category D). Routine procedures involving momentary pain or no pain, such as injections, tattooing and blood sampling, do not need to be reported.

Jensen-Salsbury Laboratories (Division of Burroughs Wellcome, 2000 South 11th St., Kansas City, Kansas 61013) filed 1979 annual reports from its three animal research facilities: the Biological Control Department, the Biological Research Department and the Biological Production Department. Of the three reports, only Mr. J.A. McKeown, Production Manager, two had been altered so that the numbers entered in Category D (pain—no drugs) appeared in Category C (pain and drugs). The numbers in Column D were left with “X” marks through them.

In addition, the numbers reported were unusually large: 16,412 for the Biological Research Department and 2,120 for the Biological Production Department.

When informed of the discrepancy, Mr. McKeown stated that he had not changed the numbers and had not been told by the USDA of any alterations. The USDA, responding to further enquiries, provided the following information:

In late 1979 or early 1980, Dr. Robert Whiting, then USDA-APHIS Chief Staff Veterinarian, contacted his area office in Kansas to inquire about the Jensen-Salsbury reports.

After consulting with that office, Dr. Whiting relisted the numbers from Column D in Column C. He justified the action by referring to information he obtained from attachments to the reports, which are required to describe experiments or tests involving pain without administration of pain-relieving drugs. In this case, the descriptions were of “challenge testing,” i.e., injection of a vaccine or bacterin into a group of animals followed by injection of a selected disease agent to determine if the animals have been immunized. (A control group receives the virus or bacteria, but not the vaccine or bacterin.)

Dr. Whiting reasoned that because the tests involved injections, which are considered under the regulations to be routine procedures, there was no need to report them. He added that he felt the research facilities had misinterpreted or were unaware of this exemption. Dr. Whiting maintained that these particular inoculations cause, at the most, only minor and temporary pain although he did concede that the infections induced in the animals are serious as well as in these animals that might receive an ineffective vaccine or bacterin, could cause considerable pain.

The disease agents used in the Jensen-Salsbury challenge tests were Leptospira, rabies virus and anaerobic bacteria. According to Mr. McKeown, who stressed that he was not a doctor of veterinary medicine, infection with Leptospira impairs kidney function: “...the animals die of renal shutdown.” In the rabies challenge test, some of the animals die of untreated rabies. As a disease agent, rabies is known to be painful in humans. Infection with anaerobic bacteria, as listed in the report's explanation, results in gas-gangrene and tetanus. The attachments to the reports note specifically that in each instance, no pain-relieving drugs were administered. Mr. McKeown assumed that infections which cause pain and distress in untreated humans cause similar pain and distress in untreated laboratory animals. Therefore, to comply with regulations, Jensen-Salsbury listed the animals in Column D.

The change made by Dr. Whiting resulted in the incorrect classification of 18,532 of the total of 22,551 animals reported in Table 5 for the state of Kansas. “Animals to which pain-relieving drugs were administered to avoid pain or distress” in the official report of USDA-APHIS on animal welfare enforcement for fiscal 1979 to the President of the Senate and the Speaker of the House of Representatives.

It would seem that if an alteration were to be made, the choice, based on both Mr. McKeown's evaluation and Dr. Whiting's stated reasons, would have been omission and listing in Category B (no pain). It is puzzling why listing in Category C (pain and drugs) would have been an option at all, as clearly no pain-relieving drugs were administered at any time. Further confusion arises from the fact that the figures from Jensen-Salsbury's third report (Biological Control Department) were not reclassified although the procedures described were either similar or identical to those outlined by the other departments.

As mentioned, the questions raised were about the proper procedures for a government agency's altering a state annual report (Should the research facility be informed of changes made by USDA?), whether two other serious questions emerge: Are the regulations stated so ambiguously that such conflicting interpretations are possible? Is the exemption clause, which excludes the reporting of routine procedures, intended to include those procedures involving a routine activity but also going beyond, say, a simple injection? For while challenge testing does employ injection, and while the injection itself involves only minor, transitory pain to the animal, the infection produced may result in extreme distress.

**Seabird Mortality: Biology and Politics**

In the 1970s, the netting of thousands of porpoises by the American tuna fishery attracted publicity to the problem of marine mammal mortality in commercial fishing operations. More recently, concern over the incidental take of sea turtles in shrimp trawls in the southeastern U.S. has resulted in negotiations between the industry and conservationists to modify the gear, timing and location of shrimp operations except for a core of specialists. The conservation and animal welfare communities have for several decades been neglecting another problem that in sheer numbers may be far more serious—the incidental mortality of seabirds due to commercial fishing.

Seabird mortality in fishing nets became significant with the advent of offshore salmon gillnet fishing, by the Danish in the North Atlantic and the Japanese in the North Pacific (King et al., 1979). The Danish offshore operation ended in 1975, after only one decade. The Japanese gillnet fishery, begun in 1952, now comprises both a land-based fleet of independent vessels, and a high-seas mothership fleet (four processing ships and 172 catcherboats) that operates in the U.S. fishery conservation zone (FCZ). For Japan to continue its fishing operations in U.S. waters, it must obtain a permit allowing for the incidental killing of marine mammals, particularly porpoises. Although the focus of the deliberation has been on marine
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--Mark Solomon

EEC Says No Ban on Battery Cages

Early last year, we reported on the intentions of the European Economic Community (EEC) to investigate existing methods of egg production with a view toward banning the battery cage (Int J Stud Anim Prob 11(2):79, 1980). The EEC investigation had been urged by the Federal Republic of Germany’s Minister of Agriculture following a 1979 decision by a superior court in that country which made the battery farming of hens illegal on the grounds that it constituted cruelty. Pressure from both the animal welfare lobby and the poultry farmers in Germany prompted the EEC’s attempt to standardize production methods among its member states.

The EEC Council adopted a resolution on 22 July 1980 recognizing the risk of excessive suffering by hens kept in battery cages and emphasizing the need for common minimum standards for the welfare of battery hens throughout the Community. However, the Council then agreed to continue its studies on the welfare of battery-caged poultry and on possible alternative husbandry systems. Adoption of rules governing welfare standards is projected for November 1981.

Seabird Mortality: Biology and Politics

In the 1970s, the netting of thousands of porpoises by the American tuna fishery attracted publicity to the problem of marine mammal mortality in commercial fishing operations. More recently, concern over the incidental take of sea turtles in shrimp trawls in the southeastern U.S. has resulted in negotiations between the industry and conservationists to modify the gear, timing and location of shrimp fishing operations except for a core of specialists. The conservation and animal welfare communities have for several decades been negotiating another problem that in sheer numbers may be far more serious—the incidental mortality of seabirds due to commercial fishing.

Seabird mortality in fishing nets became significant with the advent of offshore salmon gillnet fishing, by the Danish in the North Atlantic and the Japanese in the North Pacific (King et al., 1979). The Danish offshore operation ended in 1975, after only one decade. The Japanese gillnet fishery, begun in 1952, now comprises both a land-based fleet of independent vessels, and a high-seas mothership fleet (four processing ships and 172 catcherboats) that operates in the U.S. fishery protection zone (FCZ). For Japan to continue its fishing operations in U.S. waters, it must obtain a permit allowing for the incidental killing of marine mammals, particularly porpoises. Although the focus of the deliberation has been on marine...
mammals, the long overshadowed problem of seabird mortality has also become a point of contention.

It was not until 1974 that biologists were first able to obtain some estimates of the impact of the Japanese salmon fishery operation on pelagic bird populations. These early figures were based on reports rather than commercial, gear, and on broad geographic averages. A more recent study (Ainley et al., in press) indicates that the size of the kill is considerably higher than previously reported, concluding that about 10 million birds have been killed in Japanese gillnets since 1952, with an average of 400,000 to 1.4 million annually.

Although gillnetting is a passive method (unlike seining or trawling), the size and configuration of the nets allow both marine mammals and seabirds to become entangled and drown. A single commercial net is 15 kilometers long, nets are set vertically from the surface to a depth of 6-8 meters, about 5 miles apart. Although there is no evidence that the marine mammals are attracted to the nets, the fish caught in the net apparently do attract a number of bird species. The foraging behavior of a particular species therefore influences the likelihood of its becoming entangled in the nets. Ainley et al. reported that 16 species of birds became entangled in the nets, either while diving after fish or while scavenging from the nets.

Experimentation with different sizes of mesh further revealed that the category including commercial mesh size had a statistically higher catch rate than all other categories. Two other factors influenced the catch rate: 1) productivity of the water, which determined the density of seabirds, and 2) distance from the Aleutians, which determined the number of birds from breeding colonies on the islands. Ainley et al. observed that the highest number of birds became entangled in nets within 50-75 nautical miles from shore.

The numbers of birds killed annually are staggering, yet the effect on seabird populations is debatable. One significant point is that the species caught have extremely low reproductive rates, each female laying a single egg. Although some species, notably the shearwaters, which migrate from the southern hemisphere, are caught in large numbers (27% of all birds caught in King et al.'s 1979 study), the catch represents a small percentage of their total population. Other species, especially alcids and puffins (like birds), appear to be caught more selectively, and the incidental take may be a substantial proportion of their population. King (1981) estimates that for Tufted Puffins, Horned Puffins, and Thick-Billed Murres, the incidental mortality alone accounts for 11.6, 44.0 and 21.4% respectively of the young produced in the Aleutian colonies. The salmon fishery is currently operating at an all-time low for economic reasons, but the actual impact on populations from the 25 years during which the fishery was expanded and the geographic range expanded remains unclear. It is worth noting, however, that the Atlantic fishery, with a total salmon catch of about 1% of that of the Japanese fishery (King et al., 1979), was responsible for significant population declines during its 10-year existence.

Biologists are concerned that the lack of research on and monitoring of seabirds will enable incidental take to go unchecked, possible with serious consequences for a number of breeding populations. They have therefore requested that conditions be attached to any permit granted to the Japanese, requiring observer coverage, population studies, and research on technical modifications to reduce incidental mortality of seabirds as well as marine mammals. However, the issue is clouded by politics: Does the incidental take of seabirds constitute a violation of the international treaties protecting migratory birds? Which U.S. agency (the Commerce Department, which has jurisdiction over marine animals and fishing operations, or the Interior Department, which has jurisdiction over seabirds) has regulatory authority in this case? Will too many conditions create political tension between the U.S. and Japan, possibly resulting in Japanese withdrawal outside the FCZ, thus precluding any monitoring of incidental take of marine mammals or birds?

The probability is slim that any meaningful steps toward a resolution will be taken. Although the Solicitor's Office at Interior issued an opinion that the incidental take of seabirds in U.S. waters does indeed constitute a violation of the migratory bird treaties, it also concluded that under the terms of the treaties, U.S. territorial waters extended only three miles seaward. Interior's authority to enforce the treaties is therefore irrelevant, as most of the taking of seabirds occurs farther out at sea. The Commerce Department has refrained from denying outright its authority to impose conditions regarding seabirds on its permit to the Japanese; to have done so may have risked a lawsuit by conservationists challenging Commerce's claim of no jurisdiction, a lawsuit that might well have been successful. With negotiations rushing to a close before the onset of the 1981 fishing season, it appears that Commerce has taken an easy out. By attaching a series of weak recommendations to the Japanese permit, it will try to evade both a legal skirmish with conservationists and political pressure stemming from the imposition of overly restrictive conditions.

Few biologists believe that the fishery poses a real threat to the survival of marine mammal and bird species (although certain populations may be in jeopardy), at least during the next three years for which the Japanese have been authorized to operate in U.S. waters. But the controversy underscores some important aspects of wildlife conservation in this country: In cases where explicit statutory responsibility does not exist, certain “problem” species tend to become political footballs. Until precise data are available clearly indicating that a species is being threatened, the existing evidence is likely to be ignored, especially when economic and political pressure can be applied. The attitude of the Japanese industry and the American government toward any serious biological ramifications is that that bridge will be crossed when they come to it. By that time, irreversible damage may have been done to seabird populations.

-Natasha Atkins

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Animal Regulation Studies— Abstracts

Buffalo Production and Regulation in Thailand— Agriculture in Thailand is largely dependent on animal power for farm operations. Mechanized farming is very limited in extent and distribution. The small size of the farm holdings and their large number are characteristics shared by many countries in Southeast Asia. The Swamp buffalo is the main source of animal power on the small farms and has traditionally been found in all conditions and feed resources of Thailand. It is hard to replace the buffalo on the small farms by other economic sources of power.

Buffalo production in the country has, however, suffered long neglect. The projection of population figures for the year 2000 shows that besides the animals that would be needed for farm operations, 1.2 million head of buffaloes and cattle will be required annually to meet the needs of domestic meat consumption. In addition, more animals would be wanted to feed the expanding livestock export trade.

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Plasma progesterone level has been found to be a reliable guide to the detection of heat and pregnancy as early as the third week. The advantages of transporting horses facing away from the direction of travel were demonstrated in two independent studies of over 500 horses. As a result of changes in the positioning of the horses, loading methods, tethering, stall size, light, ventilation, and axle placement of the conveyance, transit stress was minimized. — S. E. Cregier (Anim Regul Stud 3: 223-227, 1981).

Polypeepers and Stress in Laying Hens in Cages and Pens — The effects of polypeepers (spectacles) on plasma corticosteroid concentrations were determined in White Leghorn hens in cages and on litter and crossbred hens in cages. Poly­peepers had no significant effect on mean corticosteroid concentration in hens in cages and unstrressed hens on litter. Hens on litter which had been fitted with polypeepers were stressed by chasing and showed a positive adrenal response; this may have been due to the visual limitations imposed by polypeepers. — J. L. Barnett and B. E. Bartlett (Anim Regul Stud 3: 229-235, 1981).


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Plasma progesterone level has been found to be a reliable guide to the detection of heat and pregnancy as early as the third week. Strategies for development of the buffalo at the small farm level are discussed. The scope for increasing buffalo production for beef on small farms is explained. The feasibility of cooperative buffalo ranching for beef production by the small farmers is discussed.

Buffalo production for beef should be exploited in Thailand. However, this will require suitable improvements to the existing regulations governing slaughter and production of meat, and the pricing and marketing systems together with the introduction of a grading system for beef which meets international standards.

Regulation of buffalo production in Thailand for increased milk production has a place in the context of a developing rural economy and needs consideration as a long range objective. — M. Kamonpatana (Anim Regul Stud 3:181-190, 1981).

Bovine Tuberculosis in Cattle in Great Britain I: Eradication of the Disease from Cattle and the Role of the Badger as a Source of Mycobacterium Bovis for Cattle — The eradication of bovine tuberculosis from cattle in Great Britain is described and the role of the badger (Meles meles) as a source of M. bovis infection for cattle is discussed. The control measures adopted when a link between badgers and M. bovis infection in cattle is established are outlined and the effectiveness of such measures is assessed. — H.T. Evans and H.V. Thompson (Anim Regul Stud 3:191-216, 1981). Ed. Note: The role of the badger in the spread of bovine tuberculosis in Great Britain is currently the subject of considerable controversy. For other points of view, see, e.g. Nature (290(5803):183-184, 1981) and The Beast (No. 8:1-3 and No. 9: 8-9, 1981).

Muslim Attitudes to the Slaughter of Food Animals — Consumption of food of animal origin is freely permitted in Islam, and a large number of terrestrial and aquatic food animals is permitted, but swine, carrion and blood are prohibited. Slaughter, which is achieved by incision of the soft tissues of the neck, including the large blood vessels, can be performed by persons of either sex who are in possession of their mental faculties. Permitted animals slaughtered by Christians, Jews and Sabians are also lawful as food.

Particular emphasis is laid on avoidance of unnecessary suffering of animals before and during slaughter, especially on the sharpness of the knife used for this purpose.

The writer believes that modification of the method of slaughter is possible if it makes it really more humane and does not infringe the basic concepts. — M. Abdussalam (Anim Regul Stud 3:217-222, 1981).

Alleviating Road Transit Stress on Horses — The advantages of transporting horses facing away from the direction of travel were demonstrated in two independent studies of over 500 horses. As a result of changes in the positioning of the horses, loading methods, tethering, stall size, light, ventilation, and axle placement of the conveyance, transit stress was minimized. — S.E. Cregier (Anim Regul Stud 3:223-227, 1981).

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History of the Humane Movement and Prospects for the 80s

Robert A. Brown

It was in 1836 that the oldest humane society currently in existence, the Royal Society for the Prevention of Cruelty to Animals, was founded in London. Many others were formed during the nineteenth century, such as the organization I now represent, which was founded in Chicago in 1899. Above all else, there is one distinguishing feature of this period for me: the movement had what is known in Germany—Arthur Schopenhauer and Richard Wagner. In France—Victor Hugo. In England—just about the entire intelligentsia: the poets Blake, Shelley, Browning, and Tennyson; the novelists Charles Dickens, Robert Louis Stevenson, Lewis Carroll, and Thomas Hardy; in the arts John Ruskin. In 1891 Henry Salt formed the Humanitarian League, including no lesser a figure than George Bernard Shaw. In the United States—Henry Thoreau, Walt Whitman, Mark Twain, and the Beechers—Henry Ward and his sister Harriet Beecher Stowe. These were not simply individuals outraged by certain excesses of their time such as bull baiting, the rat pit, and the bearing rein, an orthopedic nightmare which forced a horse's neck into a painful but supposedly spirited posture. Rather these were individuals who espoused what have been thought of in recent years as the humane societies enjoyed support from individuals of wealth, influence, and brains. Let me give some examples:

Victoria herself was a patron of that first SPCA before her accession. The first exponent of humane legislation in Parliament was “Humanity Martin,” whose dominions in Galway encompassed 200,000 acres. From his front door to his gatehouse he had to drive thirty miles. Here in Chicago, The Anti-Cruelty Society was formed by the wife of one of the city’s most illustrious figures, Theodore Thomas. But my point about clout may be better made with examples of the brains behind the movement.

In Eastern Europe we find Leo Tolstoy, an outspoken champion of animals. In Germany—Arthur Schopenhauer and Richard Wagner. In France—Vctor Hugo. In England—just about the entire intelligentsia: the poets Blake, Shelley, Browning, and Tennyson; the novelists Charles Dickens, Robert Louis Stevenson, Lewis Carroll, and Thomas Hardy; in the arts John Ruskin. In 1891 Henry Salt formed the Humanitarian League, including no lesser a figure than George Bernard Shaw. In the United States—Henry Thoreau, Walt Whitman, Mark Twain, and the Beechers—Henry Ward and his sister Harriet Beecher Stowe. These were not simply individuals outraged by certain excesses of their time such as bull baiting, the rat pit, and the bearing rein, an orthopedic nightmare which forced a horse’s neck into a painful but supposedly spirited posture. Rather these were individuals who espoused what have been thought of in recent years as the two radical fringes of humanitarianism, namely, vegetarianism and antivivisection. The question that immediately comes to mind is, “What on earth happened?” for, since the first World War, the pejorative “little old lady in tennis shoes” does often apply. Why ethical movements flourish and wane can be a matter of speculation only, but I offer mine here.

Let us look at what those intellectual giants of the nineteenth century were saying about animals. Tolstoy wrote,

“And there are the ideas of the future, of which some are already approaching realization and are obliging people to change their way of life and to struggle against the former ways: such ideas in our world as those of freeing the labourers, of giving equality to women, of ceasing to use flesh food, and so on (Giehl, 1979).

Mr. Brown is Executive Director of The Anti-Cruelty Society, 157 West Grand Ave., Chicago, IL 60610. This paper is the edited version of a text prepared for and presented at a Conference on Medicine, Animals and Man, University of Illinois at the Medical Center, Chicago, Illinois, 21 May 1980. The conference was co-sponsored by the Humanistic Studies Department of the University of Illinois and The Anti-Cruelty Society.

R.A. Brown

Comment

Similar quotations can be found in the writings of the others named (Freshel, 1933).

Unlike the stereotype who supposedly pampers poodles while conspecifics starve, these animal rights advocates had broad human concerns. Mark Twain wrote the short story, A Dog's Tale, one of the most maudlin of antivivisection tracts, but he also pleaded for civil rights with his depiction of the innate sensitivity of Huck to the runaway slave, Jim, in Huckleberry Finn.

Lest the user of laboratory animals gain comfort from the notion that none of these figures were biologists, I should mention that both discoverers of the great unifying principle of biology, Darwin and Wallace, deplored sacrificing animals on the surgical table. Wallace advocated total abolition of vivisection (Freshel, 1933), and Darwin found the practice so odious the thought of it kept him awake at night (Hume, 1972).

Rights for any powerless sentient being were unrecognized in the nineteenth century. In 1800 there were two hundred different capital crimes in England! Slavery prevailed through much of the world during much of the century. The compassionate reformer must have lived in a state of exasperation. But then the lot of the oppressed started to change, at least on a de jure basis. Slavery was abolished. The labor movement gained strength. Eventually, even women could vote! In a meat-eating society, with human suffering diminishing from physiological and immunological studies of animals in laboratories, it seems to me small wonder that the animals' cause got lost in the twentieth century rush for rights for laborers, non-whites, and women.

Before we leave the period prior to the first World War, I would like to relate some early trends that may provide clues to the present renaissance of humanitarianism and relate a few anecdotes to dispel any implication in the foregoing that nineteenth century animal advocates (or their opponents) were always wise.

The stimulus for the birth of humane societies here and abroad was the overloading and abuse of the horse. Except for such as oxen on the farm and a few dog carts, the horse carried or pulled all passenger vehicles and all the products of nineteenth century agriculture and commerce. In the 1860s, Henry Bergh, founder of New York's American Society for the Prevention of Cruelty to Animals, in top hat and opera cape, used to seize the whip from cruel teamsters and beat them furiously. However, even though the horse was the stimulus for the movement, the activities of the new organizations were often directed elsewhere because reform in treatment of horses was perceived as a bad target. The economy would collapse without horsepower, and besides, it seemed unjust to punish the working-man teamster for carrying out the orders of his employer. In England animal fighting, baiting, and blood sports were the early legislative targets.

The antivivisection movement gained initial strength from Frances Power Cobbe, described as follows by E.S. Turner, ..."writer and social worker, who came from a family with five archbishops to its credit..." in 1862 she had been ridiculed for advocating university degrees for women... Although accused of being ready to sacrifice any number of men, women, and children to save a few rabbits from in-convenience... she thought the lady of fashion who handed over her child to servants while she lavished her affection on a spaniel was about as odious a specimen of humanity as might easily be found." In contrast we have Dr. Anna Kingsford, who "with passionate energy invoked the wrath of God upon (Claude Bernard)... with the intent to smite him to destruction" (Turner, 1965). Eureka, it worked! Within a few
History of the Humane Movement and Prospects for the 80s

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It was in 1836 that the oldest humane society currently in existence, the Royal Society for the Prevention of Cruelty to Animals, was founded in London. Many others were formed during the nineteenth century, such as the organization I now represent, which was founded in Chicago in 1899. Above all else, there is one distinguishing feature of this period for me: the movement had what is known in Chicago as clout. In marked contrast to the years following the first World War, humane societies enjoyed support from individuals of wealth, influence, and brains. Let me give some examples:

Victoria herself was a patron of that first SPCA before her accession. The first exponent of humane legislation in Parliament was "Humanity Martin," whose dominions in Galway encompassed 200,000 acres. From his front door to his gatehouse he had to drive thirty miles. Here in Chicago, The Anti-Cruelty Society was formed by the wife of one of the city's most illustrious figures, Theodore Thomas. But my point about clout may be better made with examples of the brains behind the movement.


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weeks the arch demon of vivisection was dead, and Dr. Kingsford turned her new found powers on Louis Pasteur, who had to spend some time on the Riviera to recuperate.

The side of science was also ill-represented. One professor claimed that "vivisection was necessary to proclaim the independence of science against interference by clerics and moralists". Dr. Emmanuel Klein, author of the *Handbook of the Physiological Laboratory*, admitted openly in testimony that he disregarded entirely the suffering of the animal in performing a painful experiment. Claude Bernard made good press: "A physiologist is no ordinary man. He is a learned man, a man possessed and absorbed by a scientific idea. He does not hear the animal's cry of pain. He is blind to the blood that flows..." In a poetic moment Bernard described the science of life as "a superb salon resplendent with light, which could be attained only by way of a long and ghastly kitchen" (Turner, 1965). Lewis (1979), renowned author of moral essays and novels: "Once the old Christian idea of the total difference in kind between man and beast has been abandoned, then no argument for experiments on animals can be found which is not also an argument for experiments on inferior men. If we cut up beasts simply because they cannot prevent us and because we are backing our side in the struggle for existence, it is only logical to cut up imbeciles, criminals, enemies, or capitalists for the same reasons."

The problem is, such voices were not listened to. Between the wars and since, what was once called "vivisection" became known as "biomedical research" and it grew from the use of thousands to tens of millions of animal subjects. But the movement retained its greatest strength of all, extraordinarily broad grass roots support. Fund raising for humane societies proved different from that of other charities. The Physiological Laboratory, which by today's standards seems merely a contradiction in terms. For the most part the Antivivisection Societies, despite substantial financial disagreements, ended up with meager programs consisting of the distribution of tracts to their own members. As I have already hinted, the humane movement was less distinguished through much of the post World War I period. One highlight, though, was Henry Bergh's founding of the first agency to combat child abuse. The automobile caused stray dogs and cats to replace horses as the rallying point for most humane societies. Numerous "Dogs' Homes" were established in Britain. In the U.S. many shelters accepted municipal and county contracts to round up unleashed pets. In my opinion this form of financing proved a disaster. It allowed the humane public because these animals were transported to distant and disagreeable pounds where few survived. One of the most widespread concerns was humane slaughter, which by today's standards seems merely a contradiction in terms. For the most part the Antivivisection Societies, despite substantial financial resources, ended up with meager programs consisting of the distribution of tracts to their own members. There were, however, important voices to be heard. Here is a quote from C.S. Lewis (1979), renowned author of moral essays and allegorical novels: "Thanks to such as these, the UK Parliament passed the Cruelty to Animals Act of 1876. But immediately there were regrets: one MP called it an insult to the medical profession, Miss Cobbé felt it was a measure that would protect vivisectors. Recently Turner (1965) summed up the dilemma well: "It is still true that not a single prosecution for cruelty has been brought by the Home Office under the 1876 Act. Humanitarian and skeptic alike join in wondering whether any other Act in history has been so scrupulously observed."

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Coming now to the present, we find vigorous rejuvenation underway in humane thinking. Much of this is coming from persons new to the movement but with a previous concern for the rights and suffering of others. In intellectual circles rights for blacks and women are no longer a matter for debate. Animals provide a focal point for lively discourse.

The most important recent event was the publication in 1975 of Animal Liberation (New York Review, New York, NY) by Utilitarian philosopher, Peter Singer. This book has had enormous impact because it is sound philosophically, and it is a forceful call to arms for the general reader on the subjects of factory farming and research animals. I should also mention my friend and colleague Henry Spira, a self-educated merchant seaman with a background in union reform and civil rights. This modern day David has brought the methods of social activism to humane reform. As a result certain experiments were actually stopped in the Colliathian research establishments. You are probably aware of a case at The American Museum of Natural History in New York: the observation of copulatory behavior in cats after surgical denervation of the senses and the penis and after creating lesions in the brain (Wade, 1976). Spira's investigation and the resulting public outcry caused 121 Congressmen to ask the National Institutes of Health (the funding source) for an explanation and ultimately forced NIH to revise its guidelines for animal care (NIH, 1978).

Less well-known is the fact that Spira caused Amnesty International to stop conducting experiments on electric shock torture using pigs as models for human prisoners (Spira, 1978). The objective was to determine if painful shocks could be given without leaving telltale scars. Spira's successful argument pointed out that no matter what the outcome of the study, it would not help prisoners. If torture could be done in this way without scars, then this knowledge would encourage the practice. If scars were produced, then other methods would be employed and prisoners would thus be executed. While such practical considerations might curtail serendipitous findings in science in general, they seem particularly relevant to many of us if the experimental plan causes suffering to another sentient being.

Many old and new humane societies are caught up in the current rebirth of humanitarianism. Several American societies have new and more vigorous directors. The Humane Society of the United States established the Institute for the Study of Laboratory Animal Sciences. For the user of laboratory animals I foresee good news and bad news. First the bad. The current extent of the use of laboratory animals—at least 75 million per year in the United States, perhaps 200 million per
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While Tolstoy appended animal abuse to a list of human wrongs, Nobel Prize winner Isaac Bashevis Singer speaks directly of animal rights problems and refers back to human problems: "There is only one little step from killing animals to creating gas chambers at the Hitler and concentration camps at Stalin—all such deeds are done in the name of 'social justice.' There will be no justice as long as man will stand with a knife or with a gun and destroy those who are weaker than he is" (Giehl, 1979).

Now for the future, my personal view of the 80s, particularly as they relate to the laboratory animal sciences. For the user of laboratory animals I foresee good news and bad news. First the bad. The current extent of the use of laboratory animals—at least 75 million per year in the United States, perhaps 200 million per
year world wide, the numbers growing fast, and many procedures involving intense suffering—necessitates that the new breed of rational humanitarian will be far more concerned about what goes on in laboratories than, for instance, in the Canadian Harp Seal hunt which has claimed the lives this year of 180,000 pups by a relatively quick death.

One can argue that lab animals are small game for humane reform as compared to the three and one-half billion chickens raised by American agribusiness each year under conditions not unlike Dante’s Inferno. But like direct attacks on horsepower a century ago, this extraordinarily cheap means of animal protein production may not be a vulnerable target in the coming decade. Furthermore, laboratory animal scientists themselves are no longer unified in their conviction that theirs is the ultimate tool.

The following is from the meeting last December of the International Program for the Evaluation of Short-Term Tests for Carcinogenicity:

"The major impetus for the development of the present study is that traditional methods for identifying carcinogens by using chronic animal studies cannot satisfy our need for rapid identification and control of carcinogens. I think we all agree on that point. We also realize that need for rapid identification and control of carcinogens cannot be met with rodent studies. These rodent studies, because of various resource limitations, cannot be carried out on a large enough scale to identify all carcinogenic chemicals in the environment within a reasonable period of time" (NIH, 1979).

The modern day counterpart of Claude Bernard may be Harry F. Harlow, whose studies on maternal deprivation and solitary confinement with resulting psychoses in primates have continued for decades. Says Dr. Tony Pfeiffer, now at Chicago’s Field Museum of Natural History, “We know that a group-living animal, as shown by field study, is in pain when isolated from its kind. Harlow received a lot of press attention, but one has only to observe that the most unified social bond in the mammalian kingdom is the mother-infant bond, and its importance for normal growth and development is abundantly clear. Earl Count noted this in the fifties. Jane Goodall made the case as strongly as Harlow for the mother-infant bond when she observed chimpanzee infants orphaned by contact with a human-induced polio epidemic. She was able, moreover, to document how other group members, most interestingly blood relatives, helped or failed to help these infants” (NAS, 1977).

The bad news for laboratory animal scientists is that laboratory animal use looks like a good target for a significant reduction in present animal suffering. And, while we may be amused at the arrogant statements of Claude Bernard and other nineteenth century physiologists, they have their present counterparts. When the American Museum protest erupted, its Director, Dr. Thomas D. Nicholson, said: “If anything has distinguished this museum it has been its freedom to study whatever it chooses without regard to its demonstrable practical value. We intend to maintain that tradition” (New York Times, 16 February 1976).

Many scientists state in various ways the thought that dogs and cats in their colonies are better cared for than in some homes, and exotic animal subjects are better off than in the wild. Benign experimental procedures are relatively uncommon, and this argument is about as valid as defending slavery on the grounds that there are advantages to a civilized diet.

Harlow, like Bernard, makes great press. In explaining how he creates a depressed state in monkeys, he says, “Subsequently an improved total social isolation apparatus was created with true cunning and connivance by Rowland, and this became and remains our standard total social isolation chamber. Rowland’s apparatus was designed so that monkeys could be raised from birth onward without seeing any other animal or part of any other animal except the experimenter’s hands and arms which assisted the neonate up a feeding ramp during the first fifteen days of life... Exploration and even simple play were nonexistent. Torn by fear and anxiety, aggression was obliterated in these monkeys, and even the simple pleasure of onanism was curtailed. They sat huddled in the corners or against the walls of the room” (Harlow et al., 1971). Once in Pittsburgh he told a reporter, “The only thing I care about is whether the monkeys will turn out a property I can publish. I don’t have any love for them. Never have. I really don’t like animals. I despise rats. I hate dogs. How can you like monkeys!” (Pittsburgh Press, 27 October 1974). I can only hope Harlow enjoys his experiments less than he enjoyed making outrageous statements as President of the American Psychological Association, Editor of Journal of Comparative and Physiological Psychology, and George Cary Comstock Research Professor at the University of Wisconsin.

By this time we think we may all need some good news for laboratory animal science. First of all, it is becoming clear that the most objectionable experiments result from ineffectual governmentmandated safety testing and unnecessary industry-promoted product testing, areas far removed from the forefront of science. Also the behavioral experiments alluded to apparently account for a significant number of the painful experiments reported to the USDA (Diner, 1979). Would Harlow’s chambers of horror be missed?

Spira’s question to Amnesty International, ‘How will the prisoners benefit when the results are in?’, applies to other experiments and could save millions of research dollars for worthwhile studies.

While I am obviously a biased observer, I can see enormous advantages in scientific discovery from adoption of a humane orientation. Laboratory animals are turned to on a kind of knee-jerk basis. Considering the success of this approach in the past, this is not surprising. But real breakthroughs in science come from persons who have a new, outside-of-the-establishment perspective: Charles Darwin, the theologian student; Francis Crick, the crystallographer. I feel strongly that biology and medicine can benefit from turning away from a rote compulsion for repeating everything on laboratory animals.

The International Program for Evaluation of Short-Term Tests for Carcinogenicity now employs thirty-five different assay systems of which the well-known Ames test is only one. Some of these tests can be read in only twelve hours (Devoret, 1979). Here is a gold mine for improved public health, but scientists continue to worry about false negatives and false positives. If you join the humane bandwagon, however, and really want to make these tests work, it doesn’t take much imagination to see that false negatives could be drastically reduced by use of test batteries and that there may be no such thing as a false positive. Let me explain this last notion, since it may be new. A positive to the Ames test, for instance, is a substance which causes a significant mutagenic effect in a special strain of Salmonella typhimurium cultured with live microsomes. The positive is called “false” if the test substance is believed to be noncarcinogenic in animals. But we really want to be able to spread, via supermarket shelves, chemicals that cause mutations in colon
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bacteria? Personally, I don't see the need to contract a traveller's sickness without the privilege of buying an airline ticket. This attitude toward so-called false positives should certainly apply to components of unessential products. Clarification and adoption of this notion could save millions of laboratory animals annually and improve public health. It could also reduce new product development costs for industry, as the only reason that DuPont might continue with a false positive for floor wax is the fear that Dow is doing so.

The behavioral sciences might benefit as well. In a stainless steel environment we eliminate variables such as weather changes, distracting odors, contact with other animals. But as you compile a list like this it is evident that what is really eliminated is a normal environment. Do we really care how animals behave in a state of partial sensory deprivation? Isn’t this state a new variable? The new variable that is purposely introduced more often than not is the painful electric shock. It is well suited to experimental use because it can be quantified in terms of intensity (how many milliamps) and duration (how many tenths of a second). It also has the benefit of giving rise to a new industry—the manufacture of Skinner boxes, shuttleboxes, and Pavlovian slings and myriad electronic accoutrements. Let's look at one of the procedures carried out with this new technology: At the University of Minnesota, Dorworth and Overmeier (1977) published “On 'Learned Helplessness': The Therapeutic Effects of Electro-Convulsive Shock.” The paper reads: “The question posed by the present experiment was whether ECS (electro-convulsive shock) administered to dogs showing maximal learned helplessness would be effective in allaying the behavioral impairment.” Nineteen dogs were placed in a hammock which “had holes in it through which the dog’s legs were extended and were secured... 8 x 8 cm brass electrodes could be attached to the hind-feet for the delivery of inescapable, uncontrollable electric shocks.” I could continue to quote the paper in detail, but let's be as brief as possible, so we can go on to less disturbing matters. “Sixty-four unsignalled, uncontrollable, inescapable electric shocks were delivered through the hindfoot electrodes... shocks were scheduled totally independent of behavior... session length was 105 minutes.” The dogs were then tested in a shuttlebox. “Ten of the preshocked dogs never escaped (from the electrified side of the shuttlebox), showing maximum helplessness.” Half of these were subject to ECS “every ten to fourteen hours until a total of six treatments had been given.” Later the five treated dogs and the five controls were retested in the shuttlebox.

Can this study of a different disorder in a different species possibly tell us more about electro-convulsive shock therapy than a careful follow-up on some of the thousands of humans who have and have not received this treatment for depression?

Turning now to medicine, why isn't epidemiology enough in many cases? An extreme example is provided by the case of cigarette smoking, where the industry position is that not only is epidemiology not enough but legions of smoking primates and beagles in government-sponsored studies are not enough either. According to the tobacco industry, what are really needed are their own animal tests. And, of course, if they don't turn out right, one can always say that animal tests don't necessarily apply to man! Similar considerations apply to the current saccharine controversy (Smith, 1980).

Now for some more good news. I have found the humane public a reasonable lot; Anna Kingsfords are not that common. There is a high occurrence of euthanasia in large urban shelters, but we enjoy wide support not because euthanasia has been eliminated but because we are successful in reducing it. A little progress by scientists may be very deeply appreciated.

A final bit of good news. The new breed of humanitarian may not want government regulation that only means more paperwork. This goes back to the dilemma of the British Cruelty to Animals Act of 1876. It is not at all clear that the Act has helped animals at all; learned helplessness is widely induced in Britain too (Evans, 1979). The American counterpart, the Federal Animal Welfare Act, enforced by a national task force of regulatory veterinarians, produced in its first ten years a total of $600 in fines, none against research establishments (Brown, 1977). During the last two years, the U.S. Department of Agriculture finally decided to issue cease and desist orders to three research institutions among the many that haven't bothered to send in the required annual reports (Diner, 1978). Cease and desist, that is, from not sending in reports. What the new breed of humanitarian wants is to work with scientists to develop alternatives to the use of animals.

What I am trying to suggest is that real progress, which can only be measured in declining use of animals, may come primarily from a new attitude on the part of scientists, an attitude that regards the animals not as models but as feeling beings whose desire for life counts for something. With such an attitudinal change animal use could plummet. This may not be entirely far-fetched. At a conference on the ethics of the use of animals in research (Bates College, Lewiston, Maine, March 1980), Dr. Emmanuel Bernstein reported that J.B. Overmeier, co-author of the study in which ‘unsignalled, uncontrollable, inescapable electric shots’ were delivered to the hindfeet of dogs, is the owner of two pet cats! He also has been a member of the American Psychological Association's Committee on Precautions and Standards in Animal Experimentation. Furthermore, I learned that when asked if he owned a pet dog he replied that he is away from home too long during the day (presumably getting through all the regimens of ‘marked intensity’), and he believes it would be unfair to leave a dog alone for so long.

The point is that most scientists are not cruel. Cruelty implies deliberate infliction of suffering of sadistic enjoyment. Scientists seem to have been conditioned by their training and the history of their discipline to disregard the suffering of their animal subjects. They may have a blind spot not unlike the one the ASPCA had with respect to fox hunting. I believe that science could benefit from a change to a humanitarian perspective during the 1980s.

References

Evans, J. (1979) Interview with Dr. Alice Heim, Animals’ Defender, July/August, 1979.
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A final bit of good news. The new breed of humanitarian may not want government regulation that only means more paperwork. This goes back to the dilemma of the British Cruelty to Animals Act of 1876. It is not at all clear that the Act has helped animals at all; learned helplessness is widely induced in Britain too (Evans, 1979). The American counterpart, the Federal Animal Welfare Act, enforced by a national task force of regulatory veterinarians, produced in its first ten years a total of $600 in fines, none against research establishments (Brown, 1977). During the last two years, the U.S. Department of Agriculture finally decided to issue cease and desist orders to three research institutions among the many that haven't bothered to send in the required annual reports (Diner, 1978). Cease and desist, that is, from not sending in reports. What the new breed of humanitarian wants is to work with scientists to develop alternatives to the use of animals.

What I am trying to suggest is that real progress, which can only be measured in declining use of animals, may come primarily from a new attitude on the part of scientists, an attitude that regards the animals not as models but as feeling beings whose desire for life counts for something. With such an attitudinal change animal use could plummet. This may not be entirely far-fetched. At a conference on the ethics of the use of animals in research (Bates College, Lewiston, Maine, March 1980), Dr. Emmanual Bernstein reported that J.B. Overmeier, co-author of the study in which "unsignalled, uncontrollable, inescapable electric shocks' were delivered to the hindfeet of dogs, is the owner of two pet cats! He also has been a member of the American Psychological Association's Committee on Precautions and Standards in Animal Experimentation. Furthermore, I learned that when asked if he owned a pet dog he replied that he is away from home too long during the day (presumably getting through all the regimens of "marked intensity"), and he believes it would be unfair to leave a dog alone for so long.

The point is that most scientists are not cruel. Cruelty implies deliberate infliction of suffering of sadistic enjoyment. Scientists seem to have been conditioned by their training and the history of their discipline to disregard the suffering of their animal subjects. They may have a blind spot not unlike the one the RSPCA had with respect to fox hunting. I believe that science could benefit from a change to a humanitarian perspective during the 1980s.

References

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R.A. Brown Comment

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Biomedical Research and Animal Welfare: Traditional Viewpoints and Future Directions
Franklin M. Loew

It has been twenty years since C.P. Snow first presented the concept of "The Two Cultures"; referring to the "culture" of scientists and the "culture" of literary intellectuals (mainly writers), Snow said (1969):

...constantly I felt I was moving among two groups — comparable in intelligence, identical in race, not grossly different in social origin, earning about the same incomes, who had almost ceased to communicate at all, who in intellectual, moral and psychological climate had so little in common...

In some ways, "Two Cultures" goes far to characterize the current state of affairs surrounding those whose scientific endeavors involve the use of animals and those who oppose such use. On the other hand, Snow carefully drew attention to the errors of simply dividing people or ideas into two groups ("Two is a very dangerous number."); and it is indeed an oversimplification to do so in this discussion.

The Use of Animals in Research

Scientists began to employ the study of animals in the fields of physiology and medicine in a major way in the middle of the 19th century. Claude Bernard, the French physiologist, not only led this movement, but wrote about his perception of the issues in his Experimental Medicine (Bernard, 1927):

Have we the right to make experiments on animals and vivisect them? As for me, I think we have this right, wholly and absolutely. It would be strange indeed if we recognized man's right to make use of animals in every walk of life, for domestic service, for food, and then forbade him to make use of them in his own instruction in one of the sciences most useful to humanity. No hesitation is possible; the science of life can be established only through experiment, and we can save living beings from death only after sacrificing others. Experiments must be made either on man or on animals. Now I think that physicians already make too many dangerous experiments on man, before carefully studying them on animals. I do not admit that it is moral to experiment, if it is immoral, then, to make an experiment on man when it is dangerous to him, even though the result may be useful to others, it is essentially moral to make experiments on an animal, even though painful and dangerous to him, if they may be useful to man. (Emphasis added).

Dr. Loew is Director of the Division of Comparative Medicine, The Johns Hopkins University School of Medicine, Baltimore, MD 21205. This paper is modified from a presentation given at the Eleventh Annual Laboratory Animal Medicine Conference, "Ethical Issues Related to the Use of Research Animals," University of Cincinnati College of Medicine, Cincinnati, Ohio, 27-28 April, 1979.
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This utilitarian argument succinctly states the general view of present-day society and most of its scientists. Note that in Bernard's opinion it was science itself which depended on experiments on animals. Louis Pasteur, Bernard's contemporary, studied animal species ranging from silkworms to sheep, but in his studies of rabies in dogs we catch a glimpse of the conflict between animal studies and his personal attitudes (Duclaux, 1920). Pasteur's colleague Roux, wrote:

...Pasteur, who had been obliged to sacrifice so many animals in the course of his beneficent studies, felt a veritable repugnance toward vivisection. He was present without too much squeamishness at simple operations such as a subcutaneous inoculation, and yet, if the animal cried a little, Pasteur immediately felt pity and lavished on the victim consolation and encouragement which would have been comical if it had not been touching. The thought that the skull of a dog was to be perforated was disagreeable to him; he desired intensely that the experiment should be made, but he dreaded to see it undertaken. I performed it one day in his absence; the next day, when I told him that the intracranial inoculation presented no difficulty, he was moved with pity for the dog: 'Poor beast! His brain is without doubt wounded. He must be paralyzed.' Without replying, I went below to look for the animal and had him brought into the laboratory. Pasteur did not love dogs; but when he saw this one full of life, ferreting curiously about everywhere, he showed the greatest satisfaction and straightway lavished upon him the kindest words. He felt an infinite liking for this dog which had so well endured trepanning, and thus had put to flight for the future all his scruples against it.

While these two anecdotes from Bernard and Pasteur clearly do not describe the objectives of science, they do illustrate that scientists a century ago did at least have the same mixture of attitudes that exist today among scientists who believe that science in some part depends on the study of animals.

The Art of Scientific Investigation by W.I.B. Beveridge (1950), Cambridge University's distinguished veterinary pathologist, has been standard reading for graduate students for nearly 30 years. In it, Beveridge observes:

Science as we know it today may be said to date from the introduction of the experimental method during the Renaissance. Nevertheless, important as experimentation is in many branches of science, it is not appropriate to all types of research. It is not used, for instance, in descriptive biology, observational ecology or in most forms of clinical research in medicine. However, investigations of this latter type make use of many of the same principles. The main difference is that hypotheses are tested by the collection of information from phenomena which occur naturally instead of those that are made to take place under experimental conditions.

It is against the background of these differences in approach that individual scientists try to make personal decisions as to the type of research they do. But in a sense, the decision whether to utilize animals is as much a function of the type or nature of the knowledge gained or needed as it is of personal choice. The popular American educator, John Holt (1970), wrote in his book, What Do I Do on Monday?

This might be a good place to say, by the way, that the scientist or mathematician or thinker very rarely goes out collecting information or evidence just to see what turns up, but not caring what turns up. This is not what his "objectivity"—such as he has—consists of. He goes out there looking for something. The scientist is not indifferent. His objectivity consists of this, that when the evidence begins to show him that his hunch was no good, that what he was looking for is not there, he thinks, "So be it," and starts looking for or thinking about something else. He does not lie to himself or others about what the evidence is telling him.

Thus even the best scientists may find their use of animals more dependent upon what it is they study than their own preferences.

Another scientific concern is the so-called numerical basis of testing hypotheses. A criticism of animal use in research is that seemingly vast numbers of animals are used when small numbers might suffice. Many scientists are guided in this by Lord Kelvin's hoary dictum, "When you can measure what you are speaking about and can express it in numbers you know something about it, but when you cannot measure it, when you cannot express it in numbers your knowledge is of a meager kind."

The outgrowth of this has been, in the medical and biological sciences, a reliance on statistical tests. I have neither the time nor the competence to address this aspect of science except to observe that if animals are to be studied at all, scientists believe that enough of them need to be studied to draw valid conclusions.

Today, the catch-phrase is the study of what are known as animal models. In a recent workshop sponsored by the Institute of Laboratory Animal Resources, the following definition of an animal model was offered (Wessler, 1976):

...a living organism with an inherited, naturally acquired, or induced pathological process that in one or more respects closely resembles the same phenomenon occurring in man. Animal models, in this sense, never provide final answers but offer only approximations, for no single animal model can ever duplicate a disease in man. Thus, animal models should not be expected to be ideal, nor to be universally suited to all foreseeable uses. On the other hand, for a model to be a good one, it must provide a new insight, have relevance to a particular problem and respond predictably.

My only argument with this is that animal models are also used in the study of diseases or phenomena in other animal species, as well as in man. I apologize for using so many quotations, but the methods of scientific research can often be best inferred from what scientists have done or written.

Animal Welfare Societies

Among the hundreds of local, regional, national, and international organizations concerned with animal welfare, objectives vary widely. Some are oriented toward all issues affecting one particular type of animal, such as primates, cats, whales, or wild horses. Others are concerned with single issues involving several species: vivisection, trapping, sealing or bullfighting. And many are involved with all issues and several species.
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Just as it is difficult to determine who speaks for science, no one person or organization can speak for all animal welfare organizations. Some of these organizations oppose all animal use in scientific research, but surprisingly few fall into this category. In my opinion, there can be no reconciliation between these organizations and biomedical research interests: They must beg to differ.

I view the positions of the remaining majority of humane organizations as being along the following lines: Where animal studies can be justified by appropriate and controlled means, and where personnel and facilities genuinely appropriate to the proper conduct of such studies exist, and where the minimum number of animals can be legally acquired and most beneficially cared for, then such studies should go forward until scientifically acceptable nonanimal alternatives are available. In my opinion, this goal is shared by many scientists as well as nonscientists. Conflicts still arise in this middle ground, of course, mainly because of difficulties in defining words like "appropriate," "minimum," and "scientifically acceptable."

Two persons involved in establishing animal welfare organizations in the United States at about the same time Bernard and Pasteur were working in France were Henry Bergh and George T. Angell. Bergh established the New York-based American Society for the Prevention of Cruelty to Animals, while Angell was instrumental in establishing the Massachusetts Society for the Prevention of Cruelty to Animals, whose Angell Memorial Hospital now bears his name. Angell (1884) was involved in many of the leading issues of his day, including pure food and drug laws, working conditions, and, of course, protection of animals. His views were, in my opinion, remarkably advanced. In 1891 in the magazine Our Dumb Animals, Angell wrote:

Our antivivisection friends have now been at work in Europe some twenty years, and in America some ten. What have they accomplished? In Continental Europe there has been an enormous increase of vivisection, and, so far as we can learn, not a single case ever prevented. In America the same. In England where some laws have been enacted, an enormous increase of vivisection.

When, in our good city of Boston, it is impossible, by the payment of $1000, to obtain evidence to prove a single case of the docking which is still practised (though, we are glad to say, not by our best citizens), how can humane societies expect to stop medical students, instructed to believe they are acting in the interests of medical progress, from performing vivisections!—or obtain any practical limitations of them unless they can win the approval and assistance of the best men of the medical profession?

And is there not great danger that in anathematizing the professors and teachers of our medical schools, and the men who largely lead that profession, they may arouse antagonisms which will do more harm than good?

It is not possible that our antivivisection friends, in their zeal to prevent suffering, have already aroused antagonisms which have tended to produce rather than repress the enormous increase of this practice?

The world's history shows that very little can be gained by denouncing those who, without criminal intent, differ with us in view of right. Is there not a better way? We think there is. We believe there are lots of good and humane men in the medical profession who, if convinced, will go as far as any one to prevent unnecessary cruelty.

Conclusions

The positions of most animal welfare organizations and biomedical research organizations with respect to the use of animals are more similar than many would have us believe. If scientists will make an effort to discern among the many humane societies and join one or more whose stance they find near their own, and if humane organizations will accept such people and their knowledge into their decision-making processes, much can be accomplished. Until the fabric of American society is prepared to recognize or award (as the case may be) animal rights, the enlightened middle ground must prevail. I am reminded of a newspaper column by Ellen Goodman (1978) in the Boston Globe:

...people who are moderate politically are usually moderate psychologically. If they harbor a questionable true belief, it is in the power of reason. They are the interpreters and conciliators of the world, the people who project into the lives and minds of others. Their ability to see the other side of the story leaves them more vulnerable, even more confused.

Moderates tend to define their politics in terms of daily realities rather than abstract ideals. So when you pit an extremist against a moderate, you have a debate between an immovable force and a malleable object.

It's the true believers who persist against odds. But it's the others who often decide, as one put it, that 'trying to reason with irrational people is in itself irrational,' and they quit.

Maybe, though, instead of early retirement or medical leave they should just take a lesson in the immoderate pursuit of moderation. What we need now are some good, solid, dyed-in-the-wool moderates—sensible people with iron bladders.

I would like to conclude by proposing the establishment of what might be called a "Third Force" in dealing with issues related to the use of animals in research. There are hundreds of veterinarians who have acquired by training and experience special knowledge in the care of animals in the laboratory. Nearly 300 of them have subjected themselves to additional competency examinations by the American College of Laboratory Animal Medicine. These people are the ones who must deal daily with issues we have been discussing at this conference.

I know from personal experience that there is a community of interest between most of them and most animal welfare organizations. If these veterinarians and their scientist-colleagues whose research involves animal use could more regularly listen to and participate in animal welfare discussions like this one, a new era can begin.

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References


Singer, P. (1973) *Animal Rights*. Animal Liberation, by Peter Singer (New Review, 1975) have sparked another wave of these views and have inspired a spate of college courses, articles in both academic and popular periodicals and radio and television programs on the subject of animal rights. We are reaching the public now with better analyses and better ways of explaining why humans should stop abusing and using other species.

Still, there are early warning signs of cause for concern. The now trendy label “Animal Rights” is being slapped over some of the same old animal welfare campaigns — old wine in new bottles, so to speak. Also, some animal rights advocates may be trampled in the rush to get media coverage, and the survivors may be “had” by media outlets which because of time or space limitations and constraints on content imposed by advertisers, characteristically deal with only the most sensational, superficial or harmless aspects of any subject. In both cases we face a danger that the full meaning and implications of the case for animal rights/liberation will be lost in the shuffle and be assigned some stereotyped image that has no relevance to its substance. If that happens, we go back into the closet of political irrelevance with other crank causes for another umpteen dozen years. In the meantime, animals will still suffer and more species will become extinct.

To head off these developments, I suggest that our movement emphasize the human connection, but that I mean a real connection through personal and political action and not merely one of argument. One way to make this connection is to identify the forces and institutions under human control that perpetuate exploitation of animals; the other is to identify how animal-hating and -exploitative habits affect people.

In the first part of the effort, we are up against a consortium of industries and institutions that thrive on consumer demand for meat, milk, eggs, leather, drugs, medicines and a host of nonproducts from animals such as companionship, entertainment and biological data. The demand comes from a society with deeply rooted, long-held habits of using animals for food, work, sports and other purposes. It is a self-sustaining cycle: Industry profits, and in the case of nonprofit institutions, contributions are plowed back into research and development programs that reinforce the habits and bolster demand. Society might be willing to make changes, but the industries and institutions which it put in business tend to resist them. We will have to determine how to break these cycles if we want to advance the cause of animal rights/liberation. To do that, we will have to extend the sweep of our movement. Our promotion of vegetarian and vegan diets and our campaigns against specific abuses do not run far and deep enough to produce the necessary social, economic and technological changes.

This brings us to the second part of the human connection. We need to locate our case on the map of human concerns so that it can be perceived and understood as relevant to other social and ethical causes. It has already been done on paper, but the movement as such does not follow through with the action behind its rhetoric. Singer’s case for animal liberation begins with the position that discrimination based on race or gender is immoral and goes on to state that “speciesism”, a related form of discrimination, is likewise immoral. One would expect that every animal rights/liberation advocate would then necessarily embrace this basic position. To be sure, many animal activists oppose racism and sexism, but more, it seems, out of coincidence than from animal liberation convictions. Sadly, I keep coming across advocates of animal rights who either ignore or verbally attack the messages of (what should be) our companion movements against racism, sexism and other forms of discrimination among our own species. This strikes me as worse than a lapse in adhering to animal liberation principles. It is misanthropy and misogyny, that is, forms of speciesism — the very prejudice we claim to oppose. Moreover, since we are a political movement (if we are not, then what are we doing?), we ought to know better than to antagonize parallel, perhaps potentially supportive movements. If our moral principles against prejudicial attitudes and practices really mean anything to us, should we not have the personal conviction to act politically to further those principles? And if we as individuals do that, should not our movement as a whole follow through with political action? Without such commitment, we will be not only hypocrites but failures.

This is where our movement is most lacking. Our failure to speak, act and live according to our own basic principles isolates us from the rest of progressive politics; it makes us appear irrelevant (“kooky”), and it contributes to the perception that our case is academic rather than political.


The following article was originally run in our last issue (May/June 1981). However, our failure to pick up a production error in time resulted in the article being printed with several sections bizarrely transposed. We offer our apologies once more to our readers and especially to the author and present the article in its proper order below. — Editors

**The Politics of Animal Rights: Making the Human Connection**

**Jim Mason**

Animal Rights is in the air, so much so that the term borders on becoming a buzzword and the cause itself the latest form of radical chic. Although Lewis Gompertz, Henry S. Salt and others put forth radically different views on attitudes and relations toward other animals more than a century ago, the publication in 1972 of essays by Brigid Brophy, Richard Ryder and others in the book, *Animals, Men and Morals* (London: Gollancz, 1971; New York: Taplinger, 1972) and the more popular book, *Animal Liberation*, by Peter Singer (New York Review, 1975) have sparked another wave of these views and have inspired a spate of college courses, articles in both academic and popular periodicals and radio and television programs on the subject of animal rights. We are reaching the public now with better analyses and better ways of explaining why humans should stop abusing and using other species.

Still, there are early warning signs of cause for concern. The now trendy label “Animal Rights” is being slapped over some of the same old animal welfare campaigns — old wine in new bottles, so to speak. Also, some animal rights advocates may be trampled in the rush to get media coverage, and the survivors may be “had” by media outlets which because of time or space limitations and constraints on content imposed by advertisers, characteristically deal with only the most sensational, superficial or harmless aspects of any subject. In both cases we face a danger that the full meaning and implications of the case for animal rights/liberation will be lost in the shuffle and be assigned some stereotyped image that has no relevance to its substance. If that happens, we go back into the closet of political irrelevance with other crank causes for another umpteen dozen years. In the meantime, animals will still suffer and more species will become extinct.

To head off these developments, I suggest that our movement emphasize the human connection, but that I mean a real connection through personal and political action and not merely one of argument. One way to make this connection is to identify the forces and institutions under human control that perpetuate exploitation of animals; the other is to identify how animal-hating and -exploitative habits affect people.

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The idea of extending our movement has been all too quietly discussed among animal rights/liberation advocates over the past few years. A friend wrote recently urging me to remind others that “the struggle for animal rights is a revolutionary movement aimed not merely at gaining protection for other creatures, but at a basic restructuring of institutions in our society.” Now this may sound too daring, too up­setting and too subversive for some people among the ranks of our movement. But then these people should not profess to want to bring an end to abuse and exploitation of animals. They should continue to function as most churches do, collecting money from the guilty, preaching platitudes and carrying on programs that are more palliative than curative.

Our movement must take stock of the cultural milieu in which we work. We are immersed in cultural attitudes and habits formed during several thousand years of a human economy based on the subjugation and exploitation of animals. We began this process some 10,000 years ago when we first brought animals under our dominion and control — ostensibly for our own benefit. In doing so, we invented oppression. We soon learned to apply the new invention to less powerful members of our own species — women, children or “outsiders” — and slavery was born. In her important book, Woman’s Creation (Garden City, New Jersey: Anchor Press, 1979) feminist writer Elisabeth Fisher traces the archaeological evidence that shows how early animal-keeping societies (our cultural ancestors) gradually began to treat women like another kind of livestock, as instruments to be controlled or sacrificed. She documents how dramatic changes in these societies’ perspectives on nature and sex roles are associated with war, slavery, prostitution and class oppression. Although the whole book is must reading, a few words from Fisher communicate just how relevant her findings are to our movement:

“...The continuum between animals and people is felt by many. Small wonder then that the keeping and raising of animals had wide-ranging effects on the customs, art, and psyche of human society.

“...Now humans violated animals by making them their slaves. In taking in and feeding them, humans first made friends with animals and then killed them. To do so, they had to kill some sensitivity in themselves. When they began manipulating the reproduction of animals, they were even more personally involved in practices which led to cruelty, guilt and subsequent numbness. The keeping of animals would seem to have set a model for the enslavement of humans, in particular the large-scale exploitation of women captives for breeding and labor, which is a salient feature of the developing civilizations.”

Other feminist writers see the connection between animal exploitation and human oppression, and more than a few advocate ethical vegetarianism along with feminism. In her book, The Violent Sex (Guerneville, California: Bluestocking Books, 1978) Laurel Holliday writes:

“Peter Singer has presented the case [for vegetarianism] with the utmost philosophical clarity... My purpose here is not to recruit vegetarians so much as to make the point once again that the root of the problem is in our blithely taking power over the lives and deaths of other creatures whose suf­fering is in no way necessary for our survival. If we so easily take the lives of animals who are only a few evolutionary steps removed from us, what is to prevent us from doing the same to humans who are physically very different from us — of a different color, or speaking an unintelligible language, or “primitive” in their customs?” (emphasis in original)

In the introduction to their excellent vegetarian cookbook, The Political Palate (Bridgeport, Connecticut: Sanguinaria Publishing, 1980) the women of The Bloodroot Collective explain the reasons for their diet:

“Our food is vegetarian because we are feminists. We are opposed to the exploitation, domination, and destruction which come from factory-farming and the hunter with the gun. We oppose the keeping and killing of animals for the pleasure of the palate just as we oppose men controlling abortion or sterilization. We won’t be part of the torture and killing of animals.”

In their search to understand the roots of their own oppression, these feminists see the significant relationship between animal subjugation and human social relations — a relationship that our movement would do well to better illuminate. They note well how once animal subjugation, exploitation and the hatreds that go with them come to be legitimized in a culture they can be directed elsewhere. Indeed, the severest degrees of hatred and oppression of Blacks, Jews, Orientals and other “races” are still rationalized on the grounds that these humans are “just animals” and not entitled to moral consideration.

Although I have not yet made an exhaustive study, I believe that there is evidence that hatred, debasement and the other attitudes that made subjugation of animals emotionally comfortable to humans are interwoven among the historical roots of racism and misogyny. Ancient attitudes toward apes, for example, offer a revealing index to our attitudes about our own species in relation to other animals. Because the ape so resembled humans, it was the object of much neurotic hostility. To the Greeks and Romans, the ape was turpissima bestia (most vile beast), a hideous pretender to human status. In the early Christian era, the pejorative epithet “ape” was applied to all enemies of Christ and the ape became a figura diabola (representation of the devil) in art and literature. By the Middle Ages, apes symbolized humans in a state of degeneracy: laughable, contemptible and a reminder that we neglect “the spiritual aspect of our nature and unreasonably abandon ourselves to the sins of the flesh; in short, if we let our animal impulses get the better of us, we will sink to the level of ape...” (H.W. Janson, Apes and Ape Lore in the Middle Ages and the Renaissance, London University Press, 1952). It took little thinking to extend this perspective to human differences, and sure enough, apes in art of the period are associated with Eve, the “fall of man,” the victory of sensuality over Christian discipline, and feminine qualities in general “Bestial,” “oversexed” apes represented the “wantonness” and perhaps the “natural inferiority” of women.

Possessing this cultural outlook, Europeans of the 16th century were introduced to the anthropoid apes and to West African peoples at the same time and in the same place. As Winthrop D. Jordan states in his classic study on the historical origins of racism in the United States, The White Man’s Burden (Oxford University Press, 1974):
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Possessing this cultural outlook, Europeans of the 16th century were introduced to the anthropoid apes and to West African peoples at the same time and in the same place. As Winthrop D. Jordan states in his classic study on the historical origins of racism in the United States, *The White Man’s Burden* (Oxford University Press, 1974):
"Given this tradition and the coincidence of contact, it was virtually inevitable that Englishmen should discern similarity between the man-like beasts and the 'beast-like' men of Africa. A few commentators went so far as to suggest that Negroes had sprung from the generation of ape-kind or that apes were themselves the offspring of Negroes and some unknown African beast... By forging a sexual link between Negroes and apes, Englishmen were able to give vent to their feelings that Negroes were a lewd, lascivious, and wanton people."

Jordan lays out how undertones of sexuality run throughout English accounts of West Africa and how the likening of Africans to beasts indicated the fear and loathing of the animal within humans. In the conclusion to his work, Jordan argues that racism based on hatred of animals served not only to legitimize in the Christian mind the enslavement of another people, but that the racist subjugation of African people offered peace of mind that the beast in humans was under control:

"...in a variety of ways the white man translated his 'worst' into his 'best.' Raw sexual aggression became retention of purity and brutal domination became faithful maintenance of civilized restraints. These translations, so necessary to the white man's peace of mind, were achieved at devastating cost to another people.... In fearfully hoping to escape the animal within himself the white man debased the Negro, surely, but at the same time he debased himself."

From this cursory foray into the literature on the historical roots of sexism and racism, I am convinced that there is much, much more weight to our perspectives about animals in the human economy, we must also employ history and science (anthropology, archaeology) to discover the ways in which our perspectives about ourselves, other animals and the natural world bear detrimentally on other social problems, especially on racism and sexism. In the process, I am certain that we will establish connections that will combine all progressive struggles against prejudice and oppression. This human connection to the cause for animal rights/liberation, if strengthened, would enhance our political effectiveness and accelerate progress toward a society unhampered by these lies and historical mistakes.

Euthanasia of Day-Old Male Chicks in the Poultry Industry

Walter Jaksh

Humane killing of animals implies a painless death (euthanasia). This depends on the rapidity with which unconsciousness is achieved and the maintenance of this state until death occurs. Euthanasia methods for day-old chicks must also be economical and should not interfere with the use of the carcasses for animal food or fertilizer. Manual decapitation or dislocation of the neck are the best available manual methods of euthanasia. For larger numbers of birds, the literature recommends homogenization in a crusher. In the author's own experiments, the destruction of day-old chicks was most effectively carried out by poisoning with carbon dioxide (CO₂). A simple gas chamber was constructed, which is now commercially available, into which boxes of chicks were placed. The chamber has the capability to euthanize approximately, 8,000 chicks within 2-3 hours at minimal cost.

Introduction

With the development of modern hybrid breeds, the poultry industry has produced flocks with distinctive genetic performances. The laying flocks, bred for maximum productivity, utilize all their energy for producing eggs, with a minimal amount of weight gain. The males of the laying flocks, with the exception of those few used to fertilize the hen, are of little use. Because of their genetic make-up, it is economically unfeasible to fatten them up for meat production. As a result, millions of newly hatched male chicks are destroyed each year. Although most industrialized countries have regulations for the slaughter of livestock, these concern mainly food animals, and as such govern the techniques of stunning and bleeding, and ensure hygienic preparation of the meat. Since there is no consumption of the day-old chickens and thus no public health consideration, little attention has been given to this procedure. In fact, there are no known regulations which exist specifically for the euthanasia of these birds.

The first scientific report in the German literature on the methods of euthanizing male chicks did not appear until 1969, when Gerriets (1969) investigated euthanasia by gas poisoning and manual techniques. Poisoning with carbon dioxide and nitrogen, homogenization in a crusher, and manual blows are at present considered the most effective and efficient methods.

All other publications on the euthanasia of poultry up to 1973 dealt only with the adult fowl or single birds. In 1973, Mitterlehner and Jaksh presented a preliminary report of their research on the euthanasia of day-old male chicks. This was followed by their publication of reports on the development of mass euthanasia of chicks by carbon dioxide poisoning (Jaksh and Mitterlehner, 1979). Hilbrich (1976, 1977) also published the results of experiments using crushers, and in 1976, mention of the problem was first made in a textbook (Siegmann, 1976). This paper will discuss and evaluate the various methods used for mass euthanasia of male chicks with regard to the existing literature and the author's own research.

Dr. J. Mason

Comment
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the adult fowl or single birds. In 1973, Mitterlehner and Jaksch presented a 
preliminary report of their research on the euthanasia of day-old male chicks. This 
was followed by their publication of reports on the development of mass euthanasia 
of chicks by carbon dioxide poisoning (Jaksch and Mitterlehner, 1979). Hilbrich 
(1976, 1977) also published the results of experiments using crushers, and in 1976, 
mention of the problem was first made in a textbook (Siegmann, 1976).

This paper will discuss and evaluate the various methods used for mass eu-
thanasia of male chicks with regard to the existing literature and the author’s own 
research.

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Killing Methods for Chicks

Methods currently in use may be divided into four groups:

1) Mechanical — manual dislocation of the neck or decapitation; large scale homogenization.
2) Oxygen withdrawal — suffocation or drowning.
3) Carbon dioxide or nitrogen gassing.
4) Electrocution.

Mechanical methods

(i) Manual
Decapitation is effected by using sharp scissors or for large animals, a sharp, heavy chopper. An assistant should hold the bird by its legs, wings, and breast, placing the head and neck sideways on a block with the bird facing away from the operator. After decapitation, one can observe movements of the body for 44-75 seconds after unconsciousness and death (Jaksch, 1980).

Decapitation, while esthetically unpleasant, is not objectionable from the medical and humane points of view, as death is virtually instantaneous.

The spinal cord of small birds and chicks can also be cut without using an instrument (cervical dislocation). The bird is held with the left hand and the neck taken between the thumb and forefinger knuckle of that hand. The thumb and the forefinger knuckle of the right hand are applied to the neck, close to those of the left hand. Using a hard grip with both hands and a sharp twist (UFAW, 1967) the joint between the head and neck areas is dislocated, and death occurs immediately as a result of destruction of the medulla. This method is used in some small hatcheries in continental Europe, and if performed correctly, is rapid and humane.

Stunning may be performed by striking the head smartly against a hard object. To ensure death, a second blow should follow. This method is only reliable when perfectly performed; otherwise birds may regain consciousness some time later with severe brain injury. This is more of a problem when large numbers of birds are being killed. After stunning, the throat should be cut on a diagonal, as near to the head as possible.

Decapitation, which usually results in a spray of blood, seems to be the preferred mechanical method of euthanasia for chicks. German animal protective legislation also recognizes the head-strike (stunning) and cervical dislocation as acceptable methods if correctly performed.

Manual methods are not widely used in hatcheries, probably for several reasons. They are labor-intensive and may therefore prove uneconomical (although the author has witnessed one operator killing approximately 1,000 chicks per hour).

They are esthetically displeasing to the layman and emotionally stressful for the operator. Furthermore, it is likely that a social stigma attaches to personnel who euthanize animals in such a manner (Owens et al., 1981). These factors, combined with the possibility of slow and consequently inhumane handling and execution, seem to outweigh the advantages of these methods.

(ii) Homogenization

Homogenization of chicks in a crusher has the advantage of being able to kill large numbers of birds in a short time without any handling by individuals. Several authors have recommended this technique with the proviso that the equipment be properly designed to ensure rapid and humane death (Gerriets, 1969; Fiedler, 1976; Gylstorff, 1976; Siegmann, Woernle, personal communications).

Hilbrich and von Mickwitz (1977) used a special-feed homogenizing mill running at 5,000 or more revolutions per minute which could handle over 1,000 chicks every two minutes. The author found that at lower revolutions per minute (1,420 or 2,810), the results were not satisfactory. Even after twenty seconds, there were only partly damaged animals with whole skulls. Therefore, these speeds should be used for anesthetized chicks only. In all cases, it is essential that the crusher be equipped with a funnel through which chicks are dropped one at a time (Fiedler, 1976, Hilbrich, 1976). The produced mash can then be used as animal feed or manure, or it can be deep frozen. Death occurs virtually within one second. The method is safe for personnel. It is quick and costs are minimal, disregarding the initial cost of purchasing the equipment. Only esthetic considerations remain to bar the use of this method, although the sensibilities of personnel should be taken into account; they should not override considerations of humaneness and efficiency.

Oxygen withdrawal

Decompression is a highly controversial killing method. It is argued that decompression due to low ambient air pressure leads to a painless, rapid descent into unconsciousness and death. Decompression has been used on a wide scale in the U.S. for killing dogs and cats, but the known resistance to the effects of hypoxia in young animals (and many of the animals killed are puppies and kittens) has thrown the method into serious question. However, without further research, the physiological responses of dogs and cats cannot be reliably extrapolated to chicks.

Decompression is practiced widely in the poultry industry of the German Democratic Republic, and is recommended as a rapid and safe method (Heider, 1972). In the author's research, it was found that the reduction of air pressure within ten seconds to 8.0 kPA (60mm Hg) induced dyspnea (labored breathing) in the chicks. After twenty seconds, the birds fell over onto their sides and later onto their backs. Just before death, which occurred within 40-80 seconds, a foamy discharge appeared on the beak, indicating lung edema. Time of onset of unconsciousness was uncertain.

Decompression equipment is very expensive, but the operating costs are minimal. The equipment is complex and requires careful attention by properly trained and skilled operators.

Suffocation of chicks in sacks or firm containers is also practiced in hatcheries. Although hatcheries have claimed that densely packed chicks die within two to three minutes, the author has found chicks at the top of a sack still breathing after 1½ hours, which suggests that death is caused not only by oxygen starvation, but also by mechanical hindrance to breathing caused by the birds being squeezed so tightly together.

Large numbers of chicks are killed in hatcheries by drowning in special cages or nets. This is a highly unsatisfactory method due to the prolonged killing time (90-120 seconds in our experiments) and the high probability that some of the chicks will die by suffocation as a result of being crowded together. Boiling water reduces the killing time but does not alleviate the crowding problem.

In summary, all currently available methods involving oxygen withdrawal are unacceptable in varying degrees. Drowning is probably the most objectionable, and has been categorically rejected by UFAW (1968) as a method of euthanasia.

Gassing

(i) Chloroform, nitrogen and carbon monoxide

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the same manner as for dogs and cats, i.e., by introduction of the gas into a closed chamber (UFAW, 1968; Carding and Fox, 1978). However, in practice, this method is often misused because of the large numbers of animals involved. Chicks are collected in sacks, sprayed with chloroform, and placed in closed chambers. Depriving the birds of air makes it difficult for the volatile chloroform to produce a vapor. The high concentration of liquid chloroform irritates skin and mucus membranes, and most of the birds suffocate before the chloroform can take effect.

For dogs and cats a concentration of 1.5-2.0% of chloroform vapor in air is sufficient to produce anesthesia and death. For large numbers of chicks, exposure must last longer; the birds should remain in the gas chamber for at least 15 minutes, as shorter exposure may result in deep anesthesia only (UFAW, 1968; Eckloff, 1963; Fiedler, 1976).

Unfortunately, the proper use of chloroform is time-consuming and expensive. Additional disadvantages include the volatility of the gaseous substances, the danger to the operators from chronic inhalation of chloroform fumes, and the unsuitability of the killed chicks for use as feed.

Nitrogen was first used to kill mink (Vinter, 1957) and later to kill other animals, including ducks (Fitch et al., 1974). In high concentrations, nitrogen produces unconsciousness through hypoxia by displacing oxygen in the air. UFAW has not yet approved this method, as hypoxia and respiratory paralysis may be distressing and often unavoidable prior to unconsciousness. Gerriets (1969) has had disappointing results with a mixture of nitrogen and carbon dioxide: The chicks waked up to 3 minutes to die and demonstrated intense excitation during that period.

Exhaust fumes from car engines are the most usual source of carbon monoxide as a killing agent. In 2% concentration, this gas causes rapid death through anemic anoxia leading to respiratory paralysis and unconsciousness. Death occurs painlessly and without apparent discomfort at 70-80% concentration in the blood (Lumb and Jones, 1973). Although carbon monoxide is nonflammable, nonexplosive and odorless, the gasoline engine generator produces impurities (carbon particles, oxides and oxygenates) which may be irritating to the chicks. Furthermore, failure to cool the gas sufficiently may result in the chicks suffering pain from the hot air. This can be avoided by passing the gas through a large water chamber which cools it and removes some of the impurities. Pure carbon monoxide is available in cylinders, but can be prohibitively expensive. According to Gylstorff (1976) both carbon monoxide and chloroform are more dangerous than carbon dioxide, as repeated prolonged exposure to these substances can have toxic effects on humans.

iii Carbon dioxide

Nonflammable, nonexplosive, odorless, colorless carbon dioxide (CO₂) is a preferred agent for euthanasia of chicks in poultry-producing countries. Recommended by UFAW for euthanasia of small animals, CO₂ inhalation causes little or no distress to the birds, works reasonably fast, and suppresses nervous activity (UFAW, 1978). Experiments on the effects of CO₂ as a killing agent have been confined mainly to dogs, cats and small laboratory animals (American Veterinary Medical Association, 1972). Inhalation of low concentrations of CO₂ increases the threshold of pain, while higher concentrations (30%-+) depress the central nervous system, leading to unconsciousness followed by respiratory arrest and death. In dogs, 70% is the approximate optimum concentration at which the animals collapse after 20 seconds and die after 5 minutes with almost no hyperpnea (rapid breathing). It is generally believed that because the gas is odorless and colorless, the animal cannot detect it and therefore the depressive effect occurs without preliminary fear or excitement, as long as enough oxygen is provided until onset of unconsciousness. However, Carding and Fox (1978) state that the use of CO₂ has not been satisfactorily adapted for euthanasia of dogs and cats and recommend its use only as an alternative to intravenous injection of barbiturates in wild or fearful cats.

Poultry must be evaluated separately due to their special air-sac respiratory system, which influences gas concentration and duration of fumigation. Experiments with CO₂ to produce anesthesia prior to slaughter have been performed on chickens by Kotula et al. (1957, 1961) and Scott (1967), and on turkeys by Drewniak et al. (1955).

CO₂ anesthetization of slaughter poultry requires 33-36% concentration for chickens and 70% for turkeys; fumigation times are 75 and 15 seconds, respectively. Day-old chicks, however, are relatively resistant to carbon dioxide since respiration begins during embryonic development, resulting in CO₂ concentrations of up to 14% in the egg before hatching. Thus CO₂ concentrations must be especially high for this age group.

Kaltofen and Houben (1973) reported that chicks become unconscious within 10-15 seconds after being submerged in carbon dioxide; they appeared to have no fear, jumped once or twice, and then collapsed, opening their beaks. In contrast, Hilbrich and von Mickwitz (1977) observed considerable movement until death occurred. Dyspnea and jumping lasted up to 45 seconds, and movements were observed after 10-30 seconds. In an open system, chicks died after 3-5 minutes and then recovered after 4 minutes. In a closed system (a bag filled with CO₂), the chicks died after two minutes. In the author's experiments using a closed system, chicks showed dyspnea after 10 seconds and grew quiet after 20-30 seconds, resting on their sides and showing occasional eye movement. Only one bird continued to move (for 20 seconds) 40 seconds after the experiment commenced. These results corroborate the findings of Cooper (1967) and Kaltofen and Houben (1973), but the author agrees with Hilbrich and von Mickwitz that gassing should last at least 5 minutes to ensure the chicks' death.

It cannot be concluded on the basis of the observed excitation that the chicks experience pain or distress. The same movements often occur after decapitation. Fiedler (1976) attributes most of these movements to hypoxemia in the breathing center, which occurs after the onset of unconsciousness.

Because carbon dioxide has a high density, it can be administered either in an open or closed system.

Open system: CO₂ gassing in an open system involves placing the animals in an open container or chamber with a gas lake on the floor. UFAW (1967) recommends a lidless chamber of 100x1.33cm (3x4 ft) square dimension and 150cm (4 ft, 6 in) in height. The birds are placed in a polypropylene crate with a grid floor, and lowered into the gas-filled chamber. To displace any air pockets present between the body and the feathers, the crate should be moved up and down a distance of 15-30cm. Anesthesia is produced within 30-45 seconds, accompanied by a small amount of wing-flapping. After two minutes, more carbon dioxide should be introduced to replace the gas already inhaled. To ensure that all birds are killed before the crate is removed, it is necessary to allow 5 minutes to escape from the time the crate enters the chamber.

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euthanasia of the birds in the first crate and the second and subsequent crates. Birds in the first crate required 25 seconds for euthanasia compared to 3 minutes for the second. After nine introductions, the concentration of the carbon dioxide had been reduced to only 50%. With each subsequent gassing, it is therefore recommended that the open containers be refilled. Further, the period of exposure should be less than 5 minutes. After gassing the crates should be carefully checked to ensure that all birds have been killed.

A modification of this technique is the use of polyethylene bags in which small numbers of chicks are placed and CO₂ then introduced. A rubber band placed at the neck of the bag prevents the gas from escaping. Because carbon dioxide euthanasia in open systems is not always reliable and requires constant refilling (more expense), carbon dioxide euthanasia in a closed system is preferred.

Closed system: The method most used is similar to the modified technique described above. The chicks are placed in air-tight sacks or containers and the gas is introduced afterward. While UFAW recommends only a small number of chicks for the modified technique, this method allows for more chicks, filling the sack to the neck. As has been noted, the chicks require enough air to become unconscious without distress. After the onset of unconsciousness, the gas concentration can be increased to ensure that the birds are killed.

In the first group of experiments, sacks of 1m height and 35cm diameter were filled (within 4-10 minutes) with 650-1,560 chicks. Without introduction of the gas, one third of the chicks at the lower end of the sack were killed after 15 minutes. Of the remaining chicks, some were damaged in various ways, while those in the uppermost layers were still alive and had sustained no damage. When this experiment was repeated with introduction of the gas after filling, those chicks in the upper layers were immobilized by the gas, but not all were killed. Those in the lower layers were killed and/or damaged. In the last of these experiments, the sack was filled with 1,560 chicks within 10 minutes and no additional gas was introduced. Upon filling the sack, the chicks in the lower half of the sack showed no movement; 15-25 minutes later the chicks in the upper layers were still alive. Upon introduction of carbon dioxide, it was again found that the gas did not reach the bottom of the sack.

In other trials using smaller numbers of chicks, as some hatcheries do, similar results were obtained.

As a result of these experiments, the author concludes that because a large number of birds die by suffocation before the carbon dioxide is introduced, this method is unsatisfactory for proper euthanasia in modern poultry production. Experiments have been conducted, however, with the aim of modifying this technique to accommodate large numbers of birds. Kaltoten and Houben (1973) devised an air-tight sack containing a funnel and a valve which closed the opening after each bird was passed through the funnel. The sack has a capacity of 1,200 chicks, and the carbon dioxide is introduced through a tube which extends from a cylinder to the bottom of the sack. Initially a large amount of CO₂ is introduced with smaller amounts added later. When the sack is filled with gas, CO₂ is supplied for two more minutes, then the sack is closed. Generally, the chicks are unconscious within 10-15 seconds after entering the sack. Death occurs within five minutes. The sack must be adjusted to a sloping position to prevent the chicks from falling to the bottom (Fiedler, 1976). If too large a number of chicks is used, death occurs too quickly (by suffocation). If too small a number is used (50), the time required to render them unconscious is increased.

Gas chambers: The author has constructed simple gas chambers in which the chicks are placed in small boxes such as those used in transport (Figs. 1 and 2). The boxes are placed on different floors with ample air space to avoid compression, hindrance of movement, and suffocation. After filling the chambers and closing the air-tight doors, the gas is introduced.

On the basis of the author’s work, an Austrian manufacturer (R. Schopper, A-2213 Schottwien, Austria) has constructed a modified chamber. Built from rust-free sheet-steel, the chamber is constructed to accommodate the transport boxes. Each box has four compartments which are normally filled with 25 chickens each. For euthanasia purposes, twice this number is used, i.e., about 200 chickens per box. The chamber can hold 6 boxes, or 1,600 chickens. The gas tube is so constructed that there is a pipe over each compartment of a given box, allowing for direct introduction of the gas. On the top of the chamber there is an opening to allow air to escape while the CO₂ is being supplied. The pipes are designed to introduce a small amount of CO₂ into the compartment to mix with air so that the chick may breathe without distress while becoming unconscious. After rendering the chick unconscious, a high concentration of the gas is added which kills the chick. The introduction of the gas requires 3 minutes, after which the chamber is closed for 15-30 minutes before the sacks are opened to remove the dead birds.

Figure 1 Chamber and apparatus for carbon monoxide euthanasia.
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Gas chambers: The author has constructed simple gas chambers in which the chicks are placed in small boxes such as those used in transport (Figs. 1 and 2). The boxes are placed on different floors with ample air space to avoid compression, hindrance of movement, and suffocation. After filling the chambers and closing the air-tight doors, the gas is introduced.

On the basis of the author’s work, an Austrian manufacturer (R. Schropper, A-2641 Schottwien, Austria) has constructed a modified chamber. Built from rust-free sheet-steel, the chamber is constructed to accommodate the transport boxes. Each box has four compartments which are normally filled with 25 chickens each. For euthanasia purposes, twice this number is used, i.e., about 200 chickens per box. The chamber can hold 8 boxes, or 1,600 chickens. The gas tube is so constructed that there is a pipe over each compartment of a given box, allowing for direct introduction of the gas. On the top of the chamber there is an opening to allow air to escape while the CO₂ is being supplied. The pipes are designed to introduce a small amount of CO₂ into the compartment to mix with air so that the chick may breathe without distress while becoming unconscious. After rendering the chick unconscious, a high concentration of the gas is added which kills the chick. The introduction of the gas requires 3 minutes, after which the chamber is closed for 15-30
Electrocution

Electrocution has been used widely since 1920 but most methods are considered unsatisfactory and cause pain to the animal.

The procedure involves inducing unconsciousness in the animal by passing a current directly through the brain. Following the animals’ display of the classic electroplectic fit, a second and lethal current is passed through the body to produce death from ventricular fibrillation and circulatory failure. Electrocution can be an efficient method of euthanasia for dogs if the sophisticated apparatus is used correctly and the operator recognizes the electroplectic fit (Carding and Fox, 1978).

Experiments with the electrocution of poultry have been performed by Richards and Sykes (1964, 1967), who used stunning electrodes to produce unconsciousness. Immediately following, an automatic knife opened the veins and arteries of the neck to complete the slaughter process. This particular method was found to be time-consuming and sometimes ineffective.

Most processing equipment has apparatus that passes the current through the head via a waterbath. Scott (personal communication) claims that with this method the typical electroplectic fit is produced, thereby rendering the animal unconscious. However, Müller (personal communication) and Fricker (1974) have found that such currents may produce only a painful fibrillation or muscle spasm and leave the animal fully conscious for some time before death. This has been observed in dogs. In euthanasia, as opposed to slaughter, it is unnecessary to bleed the animal. Therefore, simultaneous initiation of unconsciousness and death would be acceptable.

Figure 2 Chicks in transport boxes inside chamber.
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Experiments involving electrocuton of poultry have only been conducted on slaughter birds and not on day-old chicks. In actual practice, electrocuton is not used on poultry for technical reasons (Fiedler, 1976; Heider, 1972).

Evaluation of Different Methods

A method for euthanasia of day-old chickens which could be recommended by the veterinary medical profession and welfare organizations should satisfy the following criteria:

- Speed
- Reliability of inducing unconsciousness and death
- Painlessness (or to satisfy European legislation, as painless as possible)
- Ease of application
- Economy, i.e., cost of equipment, installation and labor
- Safety (for the personnel and environment)
- Preservation of the dead chicks for further use (as animal food or manure)
- Esthetics (no disturbing effect on personnel or observers)

None of the methods reviewed fulfill all these criteria perfectly. Many methods, when practiced on a large scale, can cause pain to the animal. While euthanasia by decapitation is the preferred method, it is not cost-effective, as an operator can kill no more than 1,000 birds per hour. Further, it may be esthetically disturbing to personnel and laymen.

Other mechanical methods such as damaging the medulla or skull by head-striking are equally unpleasant, with the added danger of negligence. Thus, the author does not recommend these methods.

The use of crushers seems to be acceptable if certain technical criteria are fulfilled (number and position of knives, speed of revolution, etc.) and the chicks are placed one by one into the machine. Homogenization is, however, esthetically unpleasant to personnel and laymen.

Euthanasia by carbon dioxide gassing is advantageous in that it produces rapid anesthesia which leads to death. This can be effected, however, only if certain technical requirements are satisfied, such as a minimal time of exposure. The UFAW modified technique described earlier would not be suitable for practice, as only small numbers of chicks can be used. The technique of Kaltofen and Houben (1974) is also suitable only for small groups of chicks.

Fumigation in closed systems where the transport crates are simply put into a gas chamber is recommended by the author as an economical, quick, and “fail-safe” method for large-scale euthanasia of chicks.

References


Animal Welfare Science Essay Competition

Deadline: December 31, 1981

Two $500 Prizes

Competition Rules:

- All enrolled veterinary students in the U.S. (including those who have graduated within six months of the deadline) are eligible to compete.

- The two best essays, selected by a panel of judges comprised of veterinarians, philosophers, ethicists and other relevant scientists, will be awarded a cash prize of $500 and a Certificate of Appreciation. Judging criteria will include quality of writing, the accuracy of the supporting data and the extent to which opposing viewpoints have been taken into consideration and/or refuted.

- Essays should be between 4,000-5,000 words in length and may be based on literature and analyses, data gathering projects or personal viewpoints. All essays should be thoroughly documented with appropriate citations and references using the JAVMA format.

- The winners will be welcome to submit their essays to the International Journal for the Study of Animal Problems for consideration of publication.

- Copyright of the winning entries will be transferred to the Institute for the Study of Animal Problems as a condition of receiving the award. The author’s rights will be reserved.

- Candidates who are in doubt about the suitability of proposed topics are invited to contact Dr. Michael W. Fox for advice. Examples of subjects from which essays (either broader or more specific) may be selected include:

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  - Ethics
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MEETING REPORT

Laboratory Animal Research for the 80s

In the contemporary book, Slaughter of the Innocent, the bad guys are medical researchers. The book cover describes the "senseless bloody torture of millions of animals in laboratories all over the world."

The 1975 book, Animal Liberation by Peter Singer, reflected and popularized a more sophisticated animal welfare movement by setting down a philosophical basis for opposing animal research.

Animal rights proponents are divided in their tolerance of animal medical research, but they are stirring a controversy that is being debated in national journals, addressed by full-page magazine advertising and translated into federal legislative proposals.

The topic brought together more than 200 Midwest medical researchers and related professionals February 12, 1981 for a seminar on "Laboratory Animal Research for the 80s" at the Medical College of Wisconsin (MCW) in Milwaukee. A panel of four veterinary care professionals agreed that communication between investigators and the public was essential to promote an understanding of animals in medical research.

"There’s no reason not to tell people what’s going on behind closed doors," said Steele F. Mattingly, DVM, of Harlan-Sprague Dawley, a commercial vendor of research animals in Madison. "They're interested in knowing what you're doing."

"I think it's time for scientists...to state the case, not animal care professionals," noted Franklin M. Loew, DVM, PhD, director of comparative medicine at Johns Hopkins University (Baltimore, MD).

“Only the investigator can respond to people outside who are saying ‘Do you really need these animals?’ The laboratory animal veterinarian doesn’t have the credibility the investigator does,” added Robert A. Whitney Jr., DVM, chief of the Veterinary Resources Branch of the National Institutes of Health (NIH). MCW Dean and Academic Vice President Edward J. Lennon, MD, noted that a joint committee is now being formed by MCW and area institutions to develop channels of communication with the community. “An ongoing debate,” he added, “is not simply proselytizing our point of view. I don’t think you can be an effective communicator without listening.”

The animal welfare message has had impact on the national level. Congressional bill HR 556 would divert 30-50% of federal money allotted for animal research into developing alternative experiments.

NIH guidelines, which must be followed to qualify for NIH grants, include provisions calling for “consideration of the well-being of animals” and stating that statistical analysis, mathematical models or in vitro techniques “would be used when possible” to augment or replace laboratory animals.

Experiments using tissue culture, computer simulation, microbiological models and human experimentation are other alternatives to animal research, according to Dr. Loew, who said there is evidence that alternatives are being used. Between 1968 and 1978 the use of animals in U.S. research dropped 30-50% depending on the type of animal, according to National Academy of Sciences statistics. (For comment on these statistics, see Book Reviews — Ed.)

At the U.S. Center for Disease Control (CDC), animals are being used less for research because of goals and objectives, economics and availability, according to John H. Richardson, DVM, director of the Office of Biosafety at CDC. The number of rhesus monkeys used there for kidney donor models has been halved without decreasing the quality of the program, he noted.

Putting animal research into perspective, Dr. Loew cited statistics showing that each year about 13.5 million dogs are killed in U.S. shelters. In 1978, according to NAS figures, 183,000 dogs were used in U.S. medical research.

The seminar was arranged by Glenda W. Bowne, director of the Oscar F. Peterson Animal Resource Center at MCW, and sponsored by the American Association for Laboratory Animal Science (AALAS) Southern Wisconsin, Marquette University Department of Biological Sciences, Mount Sinai Medical Center, Veterans Administration Medical Center Wood and MCW. (This report appeared originally in MCW World 3(3), 1981.)

FORTHCOMING MEETINGS


Wildlife Disease Association (Australian Section): Fourth International Wildlife Diseases Conference, August 24-28, 1981, Sydney, Australia. Contact Dr. E.P. Finnie, Program Chairman, Toranga Park Zoo, Mosman, NSW 2088, Australia, or Dr. M.E. Fowler, Dept. of Medicine, School of Veterinary Medicine, University of California at Davis, Davis, CA 95616, USA.


British Veterinary Association: Annual Congress, September 17-20, 1981, Exeter University. Contact BVA, 7 Mansfield St., London W1M 0AT, UK.


International Conference on the Human/Companion Animal Bond: October 5-7, 1981, Philadelphia, PA. Sponsored by the University of Pennsylvania Center for the Interaction of Science and Society and the Delta Group of the Latham Foundation. Contact the Center (above), School of Veterinary Medicine, University of Pennsylvania, 3800 Spruce St., Philadelphia, PA 19104.


American Association for the Advancement of Science: Annual Meeting, January 3-8, 1982, Washington, DC. Contact AAAS Meetings Office, 1776 Massachusetts Ave., NW, Washington, DC 20036.

Zoological Society of Philadelphia and the Institute for Cancer Research: Symposium on Animal Counterparts of Human Disease, With Particular Reference...
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ANNOUNCEMENTS
Jorio Rustichelli Award
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Handbook for Animal Welfare Organization Vets
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PCAP Starts Magazine in U.K.
PCAP International (Protection and Conservation of Animals and Plantlife) is now producing a magazine, “Horizon”, sponsored by a London business and Liverpool printing firm. Subscriptions are free to PCAP members and 30p for nonmembers. PCAP membership rates for 1981 are: £2 — waged; £1 — unwaged; 50p — pensioners and under 16s. Contact Daniel Lindsay, 29 Broughton Dr., Gras­
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Book News

THE ECOLOGY AND CONSERVA­
TION OF LARGE AFRICAN ANIMALS
by S.K. Eltringham (Macmillan, London, UK, 1979, £9.00) The market for books on African wildlife seems inexhaustible, judging from their regularity of appearance. Eltringham’s book falls outside of most of the usual categories, however, and deserves special notice. The author tells us that it is meant to be a textbook for undergraduates studying biology, but for reasons given below, it is unlike­
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An immediate problem is that the book is mistitled; it should be called something like “The Natural History of Big Game in British East Africa.” The au­
thor readily discloses some of his biases, but this makes them no less restricting. Ecology may be a much abused term nowadays, but it is not a crutch to present a book as an ecological textbook and then fail to mention optimal foraging, evolutionarily stable strategies, food­
chains, or energy budgets. Similarly, the 40 or so pages devoted to conservation are of the most elementary nature. Most regrettable is the fixation on works in English on Kenya, Tanzania and Uganda (with a secondary focus on South Africa). The findings of French-speaking field workers, as published in Terre et la Vie or Mammalia, are ignored altogether.

Instead, the book’s strengths are in its well-integrated and wide-ranging treatment of our present knowledge of ungulates and large carnivores. These re­
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ty of the evidence. A statement (p. 117) that nonterritorial male antelopes are voluntarily celibate and not prevented from mating by territorial males sounds dubious, but no data are given. The peculiar behavior of ‘stotting’ in which a fleeing antelope punctuates its flight

with high, stiff bounds is well described, but it is dismissed as a waste of time on p. 188 and then cited as a good example of a mutual warning signal on p. 104.

The author also has the habit of pre­
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Such incompleteness may confuse rather than enlighten students.

The book is strongest on descrip­
tion and weakest on theory. For exam­
ple, the practical chapter on techniques of wildlife research is fascinating, e.g.,
artificially marked antelopes are more prone to be taken by predators than are unmarked ones, so this bias must be taken into account in studies of popula­tion dynamics. However, key concepts such as reciprocal altruism, female choice, kin selection, etc. are not re­
ferred to. Particularly disappointing are the repeated assertions that things can be explained by group selection or by “for-the-good-of-the-species” argu­ments. No matter how often the old saw is repeated that predators and prey are somehow engaged in a collaborative ex­
ercise whereby the former benefitingly serves the latter by maintaining the quality of its breeding stock (p. 168), it is just not true. Natural selection, in these forms at least, acts on genes carried by individuals and not on groups. Indi­
vidual predators are engaged in a life-or-death competition with their fellows to best the prey, an assertion (Dawkins and Krebs, 1979). Similarly, although so­
cial hierarchies are said to bring order to other mammalian societies through self­
imposed inhibition (p. 51), these can be shown empirically to result from the most critical competition between mem­

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However, this knowledge is not al­ ways clearly presented. Sometimes the sources are scrupulously cited, as with Schaller’s (1972) exemplary study of lions in the Serengeti. At other times, no source is mentioned, and the reader is left to wonder at the quality and quanti­ ty of the evidence. A statement (p. 117) that nonterritorial male antelopes are voluntarily celibate and not prevented from mating by territorial males sounds dubious, but no data are given. The peculiar behavior of ‘stotting’ in which a fleeing antelope punctuates its flight with high, stiff bounds is well described, but it is dismissed as a waste of time on p. 188 and then cited as a good example of a mutual warning signal on p. 194.

The author also has the habit of pre­ senting a finding but not going on to ex­ plain its significance, which is especially frustrating in a textbook. For example, we are told that a hare­ leading zebra stallion resists attempts by both to abduct his daughters, but not why this occurs. Large body size in males of poly­ gynous species is said to be advan­ tageous, but we are not told why. Coopera­ tive hunting by lions is judged to be like­ ly, but no criterion is given to establish this. Aerial counts of large mammals tend toward overestimation, while the reverse is true for smaller species, but we are not told why. Such incompleteness may confuse rather than enlighten students.

The book is strongest on descrip­ tion and weakest on theory. For exam­ ple, the practical chapter on techniques of wildlife research is fascinating, e.g., artificially marked antelopes are more prone to be taken by predators than are unmarked ones, so this bias must be taken into account in studies of popula­ tion dynamics. However, key concepts such as reciprocal altruism, female choice, kin selection, etc. are not re­ ferred to. Particularly disappointing are the repeated assertions that things can be explained by group selection or by “for-the-good-of-the-species” argu­ ments. No matter how often the old saw is repeated that predators and prey are somehow engaged in a collaborative ex­ ercise whereby the former benefitently serves the latter by maintaining the quality of its breeding stock (p. 168), it is just not true. Natural selection, in these forms at least, acts on genes carried by individuals and not on groups. In­ dividual predators are engaged in a life­ or-death competition with their fellows to best the prey, and why, and why not? (Dawkins and Krebs, 1979). Similarly, although so­ cial hierarchies are said to bring order to other mammalian societies through self­ imposed inhibition (p. 51), these can be shown empirically to result from the most critical competition between mem­
bers of a group for vital resources (Cauthreaux, 1976). The author explains marked seasonal breeding in terms of a population ensuring its continued. Apart from the unlikely image evoked of collective decision-making by thousands of wildebeests, the phenomenon can be explained more simply in terms of Darwinian selection acting on individuals. The reiteration of outmoded concepts of adaptation is especially unfortunate to Dorst and Dandelot (1970). This review has perhaps sounded well. Klopfer, eds., (p. 202) explains nothing, whereas to buy it as a companion volume to its members by to Schaller, G.B. (1972) The Serengeti Lion. A Study of Predator-Prey Relations. University of Chicago Press, Chicago, IL.

NATIONAL SURVEY OF LABORATORY ANIMAL FACILITIES AND RESOURCES (Institute of Laboratory Animal Resources, National Academy of Sciences, Washington, DC, 1980) is the report of a survey of the use of animals by U.S. biomedical research institutions during fiscal year 1978. The primary emphasis was on nonprofit organizations although data was also collected from commercial laboratories to allow comparison with a similar survey conducted ten years earlier.

The data suggest that the number of animals acquired annually by nonprofit organizations has declined. In 1968, the ILAR survey reported the acquisition of 33.5 million animals, compared to 20 million in 1978. This represents a forty percent decrease if the figures are strictly comparable. On the other hand, animals are being kept for longer periods of time and fewer animals originate from an institution's own breeding program. This probably reflects the increasing need for genetically defined stock.

The survey shows that of the $2.2 billion reportedly spent by nonprofit organizations on biomedical research, $800 million (or 35%) was spent on research involving the use of some laboratory animals. This is lower than the proportion (44%) spent on animal research in 1968. The survey's chairman, Dr. Max Lang, speculates that the lower proportion spent on laboratory animal research in 1978, as well as the smaller number of animals acquired, may be due to increased development and use of in vitro procedures (Lab Animal 9(5):23-26, 1980). The survey also reports that per diem rates for animal care vary widely from facility to facility, and that there is little or no relationship between per diem rates and the percentage of cost recovery. The report notes that "...it could not be determined whether this reflected operational efficiency or inadequate cost-accounting."

While the report is of interest and it does provide some indication of trends of animal use, the reader must be very careful in accepting the figures at face value. For example, the nonprofit organizations which responded to the questionnaire reported a total use of 8.8 million animals, and an expenditure of $2.2 billion dollars on biomedical research. However, Dr. Arthur Upton, former Director of the National Cancer Institute, in testimony to Congress, reported that NCI programs used 6.5 million rodents in 1978. (NCI's total budget at that time was approximately $1 billion). In addition, laboratory animal breeders estimate that the total annual market in the U.S. for laboratory mice and rats is, at the present time, somewhere around 40-45 million and 10-15 million respectively. Using these figures, or extrapolating from the stated NCI annual demand, the current annual use of laboratory animals is likely to be far closer to 80 million than 20 million. The proportion of research funds spent on projects using animals is similarly suspect, as NIH's own in-house survey could only identify approximately $700-800 million (out of a total budget of $3.5 billion) as being allocated to nonanimal research. If the United States is following the same trend as that seen in British figures on research animals used, then the annual demand probably has stabilized over the past few years and may even be declining. However, the decline is highly unlikely to be anywhere close to 40% and the actual totals reported are, to my mind, completely unrealistic.—A.N. Rowan

References
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This review has perhaps sounded more negative than it was meant to be. The book contains a wealth of information, and any person about to set out on a game-viewing holiday to Africa would do well to buy it as a companion volume to Dorst and Dandelot (1970). Similarly, anyone who works in safari parks or zoological gardens, or frequents the same, will find practical knowledge on diet, social organization, patterns of activity, etc. which will benefit the animals in their care as well as enrich their work or leisure.

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References


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BOOKS RECEIVED


LOVE AND ANGER: AN ORGANIZING HANDBOOK, J. Davis (Animal Rights Network, Box 5234, Westport, CT 06881, 1981, $2.95).


HANDBOOK FOR THE ANIMAL LICENSE HOLDER, H.V. Wyatt, ed. (Institute of Biology, 41 Queens Gate, London SW7 5HU, UK, 1980).

REPORT OF THE PANEL OF ENQUIRY INTO SHOOTING AND ANGLING (1976-1979), Lord Medway, Chairman (c/o RSPCA, Causeway, Horsham, Sussex, RH12 1HG, UK, 1980 £1/$2.50).


IN DEFENCE OF LIVING THINGS, C. Townsend ( Wentworth Books, Sydney, Australia, 1980).
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Productivity as a Measure of Farm Animal Welfare—We are interested in the question of how the economies of scale which govern modern intensive systems of animal farming affect evaluation of the individual animal's welfare. In addition, does individual productivity reflect individual welfare?

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