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Alpo Bites Back

"Too Much of a Good Thing: Protein and a Dog's Diet" (April-June 1983) included two points to which we take strong exception. The article discussed information in "Stress and Your Dog", a pet owner information booklet published by the ALPO Center for Advanced Pet Study. This booklet, which has been praised by such groups as the American Institute of Stress and the Latham Foundation, describes the causes and signs of stress in dogs and what pet owners can do to minimize stress and its effects.

The first point in contention is the author's inference that the stress of a twenty-mile sled dog race cannot be related to the everyday stress experienced by household pets. In this, the author fails to recognize the cumulative nature of stress. We realize that an isolated incident such as being left alone may not evoke a response equal to that of a race, but add to it the other everyday stresses such as being placed in unfamiliar surroundings, meeting a hostile dog in the park, a trip to the veterinarian for an annual checkup, and one ends up with an accumulation of circumstances which in total may equal or exceed the stress of a big race.

The second point in your article questioned the value of increased dietary protein for stressed dogs. It was repeatedly stated that protein is mobilized during stress for the purpose of providing energy, only after carbohydrate stores are expended. It further suggested that increased carbohydrate might be more in order. Such does not agree with available facts as found in basic physiology textbooks.

Tissue protein is mobilized to provide amino acids for synthesis of glucose. This is an immediate response to the release of adrenocorticoid hormones. Continuous or repeated stimulation of the adrenal in response to stressors leads to continuous or repeated release of these hormones and eventual depletion of protein reserves. This can be prevented or slowed by feeding of a high protein, energy dense diet. The red blood cell response was used in the stress studies as a measure of the adequacy of protein reserves.

The article not only questions the need for added protein in meeting the demands of stress, it quotes Dr. Mark Morris, Jr. as stating that, "High protein dog food is not good for your dog." Such statements have long been made by Dr. Morris, but he has never presented anything more than opinion to back them up. The work of Bovee, which Dr. Morris so readily dismissed, showed that high protein diets were not detrimental to dogs with reduced renal mass and actually improved the function of the remnant kidneys in these dogs. The paper of Brenner, et al., so often quoted by Dr. Morris was not a report of original research, but a review of old literature covering research in rats and other species which admittedly by Dr. Brenner, if not by Dr. Morris, does not fit the dog.

The final point that I would like to make is one totally ignored by the article and one that could put the comments of Dr. Morris in a different light for many readers. Dr. Morris, head of Mark Morris Associates, is professionally related to a company, Hill's Pet Products, Inc., which manufactures a line of diets, Prescription Diets, the mainstay of which is a low protein diet purported to be, though never shown in controlled clinical trials, efficacious in the dietary management of acute or chronic renal failure, uralithiasis, hepatic disease, congestive heart failure, and endocrine imbalances. Included in Hill's company literature is the following statement: "Formulation, ingredients and product specifications of all Prescription Diet products by Mark Morris Associates..." Dr. Morris is entitled to his opinions, but the author should not interpret Dr. Morris' opinions as proven scientific fact without adequate research.

Allen Products Company has always met such charges with research to get at the facts. The work of Bovee was sponsored by a grant to the University of Pennsylvania by the ALPO Center for Advanced Pet Study. The materials for the booklet "Stress and Your Dog" came out of research headed by Dr. David Kronfeld and funded by a grant to the same university. Stress and kidney disease are only two of many areas that have been or now are being supported to increase our knowledge of diet and nutrition in relation to canine health and disease. We are proud of the contributions we have made and continue to make towards the welfare of animals.

Charles A. Banta, Ph.D.
Director, ALPO Center for Advanced Pet Study
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P.O. Box 2187
Allentown, PA 18101

Letters

The Agricide Treadmill and Farm Animal Welfare

Michael W. Fox

The "factory farming" of animals is, in essence, a product of what W.W. Cochrane in Farm Prices, Myth and Reality terms the "agricultural treadmill." As with the development and application of insecticides, the development of intensive confinement systems for raising livestock and poultry was not motivated by hunger or the threat of famine but by the treadmill effect of increasing capital rather than labor-intensive farming practices. J.H. Perkins observes, "Apples, corn (for feeding livestock) and cotton became the largest users of insecticides after 1950, and the context of their use on those crops provides an interesting demonstration that the protection of capital-intensive farming was the foundation for inventive and innovative activity in insect-control technology." In the face of year after year of food-surpluses from over-production, it is ironic that chemical crop farming and "factory" farming of animals should have evolved, but this is because of the treadmill effect of farmers competing to reduce production costs (and not, as agribusiness claims, to produce cheap and wholesome food for all). Perkins summarizes this phenomenon as follows:

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* Minneapolis, University of Minnesota Press, 1958.

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Preventive Medicine and the Politics of Disease

Michael W. Fox

Great strides are being made in biomedical research in the development of cures for cancer, much of which comes from research studies on animals and afflicted humans. As these successes are publicized (as on CBS national news, May 2–3, 1983), and the promise that all can­
cess will be eventually treatable, the 850,000 people who will be diagnosed as having cancer this year will certainly have some hope.

These successes justify, in the pub­lic’s eye, the continued and unrestricted exploitation of laboratory animals for hu­man benefit. Any questioning of the ethics of using laboratory animals in such re­search is perceived as being tantamount to ignoring human welfare and placing animals before people. The public has been conditioned to believe in biomedical science and technology as a kind of truth and trustingly does not question

the direction that biomedical research and development have taken. And if and when they do become ill, they have the hope and promise of a cure. And relief and gratitude if they are cured.

But is it not more of a mark of pro­
gress to be able to prevent cancer and other diseases than to possess only an armament of cures? Without preventive and health care maintenance programs, including the fixing on the health and eco­logical medicine, human suffering and sickness will only increase as our en­vironment, air, water, and food become even more contaminated with agricultu­ral and industrial chemicals.

Yet what options do we have, realis­tically, when advances in preventive medicine are in politicized limbo? This is because the U.S. Department of Agricul­ture, Environmental Protection Agency and other government departments are in a state of “bureaucratic gridlock” with allied industries responsible for food quality and environmental health, the two barley figures of health and maintenance. Furthermore, the kind of research that is funded by pharmaceuti­cal and medical biotechnology industries (for diagnosis as well as for treatment) is oriented primarily toward “treating disease as it comes” (venienti occurrere morbo) rather than its prevention, which is less profit­able.

The domain of disease prevention has been relegated to the Federal Govern­ment, while the vainglorious war against human sickness is the almost exclusive, legally protected monopoly of the A.M.A. — biomedial establishment. But when organi­cal and establishment medicine and research focus primarily upon inter­ventive treatment—oriented cures and garners public funds to find more cures, we are faced with something more in­sidious than profit motives and the polit­icized intetria of progressive preventive medicine. What we have is a hypnotic ideological fixation on a wholly mecha­nistic, interventive kind of medicine based upon an aggressive dominionistic attitude toward disease and toward life itself. This attitude extends also into our dealings with other nations and with the forces of nature: an adversary mentality prepared to fight, to self-righteously intervene or rescue, rather than through understand­ing and humility prevent the need for violent intervention. Until a change in attitude occurs, a paradigm shift in awareness, of mental and mental suffering, and environmental problems will exacerbate, as will the need for more medical and technological "fixes."

While there is no intent to deny that people who are sick should have the ben­efit of interventive and curative treatment, the grand illusion that new cures (in the absence of concerted disease—preventive programs) represents progress, must be shattered. Otherwise the quality of human life and of all life on this planet will continue to decline, becoming in­creasingly dependent upon interventive remedies and supports and upon the ex­ploitation of both animals and "models" of our diseased states. Medi­cal nemesis is inevitable, if, for political, economic and ideological reasons, society continues to ignore the importance of preventive medicine and the increasing­ly pathogenic state of the world in which we live. A first step, which our democra­cy once tried, but failed abysmally, would be for all proposed medical, biological, agricultural, chemical, and industrial ad­vances and innovations to be first evalu­ated by democratically constituted re­view boards and not by self-serving, ideo­logically fixed panels of specialists. Most decisions are made on the basis of corporate interest, and when not balanced with enlightened self-interest, as the his­torical record of industrial society attests, the good of society will not be served. Society attests, the good of society will not be served.

In the final analysis, life has mean­ing when it is loved, served, nurtured, and protected, and no meaning when it
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Yet what options do we have, realistically, when advances in preventive medicine are in politicized limbo? This is because the U.S. Department of Agriculture, Environmental Protection Agency and other government departments are in a state of "bureaucratic gridlock" with allied industries responsible for food quality and environmental health, the "convenience" of meat, the continuing overproduction and consumption of which contributes significantly to agricide and to even more animal suffering and depredation, as the treadmill forces farmers to adopt even more intensive and inhumane husbandry practices.

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News & Analysis

Agribusiness Chicken Myth Dispelled

It has been claimed by poultry scientists and producers that the modern hybrid birds that are kept in battery cages are especially adapted (genetically) to these conditions, so they don’t really suffer. Recent research does not support such claims however. Scientists B.O. Hughes and P. Dun (in the British Society for Veterinary Ethology Newsletter, No. 28, March 1983) carried out a small-scale trial comparing the production and behavior of hens in outside pens with hens in battery cages. The birds outside produced on average as many eggs as those inside but they ate more food. In addition, they supplemented their diet with up to 30 g. of grass/hen/day. Mortality was similar in the two systems. There was no evidence that modern hybrids are specifically adapted to either intensive or extensive systems. The behavioral observations suggest however that the full repertoire of foraging behavior is still present.

Tuna Fishing and Improved Monitoring of Dolphin Mortality

Nancy Lo of the National Marine Fisheries Service, P.O. Box 271, La Jolla, CA 92038, in a paper entitled “Sample size for estimating dolphin mortality associated with the tuna fishery” (J Wildlife Management 47:413-421, 1983), has developed an improved statistical method for more accurately determining dolphin losses. She summarizes her report:

‘Dolphin (Stenella spp., Delphinus delphis) mortality caused by U.S. tuna purse seiners in the eastern tropical Pacific has been monitored under a quota system since 1976. A stratified ratio estimator (kill-per-day) has been used to measure the kill rate during the year. Vessel trips are stratified by fishing time period. The mortality data from 1976 through 1978 suggests a sample-size procedure based on the coefficient of variation rather than on the absolute variance of kill data. The sample size for each stratum is computed according to the desired precision of the stratum estimates rather than by allocation of a yearly sample size. The probability that the estimated mortality exceeds the quota, when in fact the quota is higher than the true mortality, is computed. This sample-size procedure is recommended for data that have a standard deviation proportional to the mean and the situation where the estimate within stratum is as important as the overall estimate.'
is simply objectified, controlled, exploited or destroyed for purely selfish motives. The difference in attitude, as between reverence and domination, and between preventive and interventive medicine, reflects the dialectical tension and nature of our existence. We cannot be well without both complementary polarities being equal: reverence and domination, which we may indeed heal and redeem ourselves, and in the process restore our planet for the benefit of all life to come.

Journal Termination

It is with regret that we announce that this will be the last publication of the International Journal for the Study of Animal Problems. Increasing publication and other related costs have become prohibitive. The Institute's editorial staff wish to convey their gratitude to the editorial advisory board and to contributing authors & subscribers for their continued support and encouragement during the life of this Journal, which has done much to help establish a scientific and philosophical basis for the understanding and care of domesticated and wild animals.

In recognition of the continuing importance of science and philosophy to animal welfare, the Institute plans to publish an annual collection of original and review articles, provisionally titled: Annual Review of Animal Welfare, Science and Philosophy. Persons interested in contributing and subscribing to this new series should contact the editor Dr. Michael W. Fox, Institute for the Study of Animal Problems, 2100 L Street, N.W., Washington, D.C. 20037. It is anticipated that this new Annual will continue to provide the same kind of scholarly material for the humane and animal rights movement that the International Journal has done over the past four years, thus providing a stimulus for further advances in the science and philosophy of animal welfare.

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A Clear Mandate to Abolish Factory Farming

The British farm animal welfare reform magazine Ag (No. 71, May–June 1983) published the results of a National Opinion Poll that shows overwhelming public opposition to factory farming, ritual slaughter and export of live animals. The Poll was carried out by NOP Market Research Limited at the request of the General Election Co-ordinating Committee on Animal Protection (GECCAP). It shows clearly that the animal issues are vote-switching issues and with more concern expressed about farm animals than any other section of animal welfare.

The survey was based on a quota sample of 2,135 respondents in 107 constituencies across Great Britain. NOP was careful to sample a good “environmental mix”, to be representative of the
whole country in terms of voting—urban, rural, age, sex, etc. 

88% of the people questioned favoured the reform of factory farming conditions, with 48% strongly in favour of reform.

90% said that the law should be changed to give factory farm animals suffering undue freedom of movement to turn round, stretch their limbs and groom themselves. This would mean banning sow stalls and tie stalls as well as veal crates.

82% said that if battery cages continue to be used, the law should be changed to ensure that the battery hens can always stretch their wings.

Only 13% approved of battery cages and 72% of those against, thought they should be banned by law. This can be summarised: 40% want battery egg production banned; 15½% are against cages but don't necessarily want them banned; 13½% in favour of battery egg production; and 31% had no opinion. Of the 56% that are definitely opposed to battery cages, there was no significant difference between town and country dwellers (which, as Ag emphasizes, gives the answer to agribusiness' smear campaign that a ban on battery cages is only supported by ‘ignorant townies').

75% were in favour of a ban on the Live Export of farm animals. Only 14% were opposed to Parliament banning Live Exports, and once again there was little difference between town and country dwellers.

77% said that the ritual slaughter of farm animals should stop—with only 12% remaining in favour of the exemptions from the human slaughter laws at present granted to certain ethnic groups.

5% said that they would definitely change the party they vote for if another political party promised to introduce laws to give more protection to animals.

15% more said that they might switch their vote.

There is a clear indication here that the animal issue could be the deciding factor in many marginal seats. The young are seen to be more likely to change votes in this way especially the 18 to 24-year olds—11% said they would definitely do so.

Finally, 72% are opposed to the use of snare traps to trap wild animals and think snares should be banned.

Relief for Iguana Lizards

Land iguanas (Conolophus subcristatus) have been returned to their ancestral home on Isabella Island in the Galápagos. These lizards were threatened with extinction by feral dogs on the island and several adults were removed in 1976 for captive breeding at the Darwin station. The feral dogs responsible for the decline have now been eliminated from Cartago Bay where the lizards have been reintroduced. Of the 37 juvenile iguanas released there last year, most have taken up residence in old iguana burrows. If the dog eradication program on the island of Santa Cruz proves as successful as the Isabella program, iguanas will be released there also.

Dogs Endanger Wolves

James Hansen writing in New Scientist (March 3, 1983) describes how free-roaming and feral dogs in Italy are now competing with the few wolf packs that are still surviving in that country. It is estimated that fully wild feral dogs in Italy have exploded to about 80,000 animals, this number being fueled by a pool of some ten times as many stray and free-roaming dogs. The feral dogs apparently behave much as wolves do—running in packs of up to 20 or 30 members and being active mainly at night in order to avoid humans. They prey on larger herbivores such as deer, and domesticated animals such as cattle, horses, and particularly sheep. Competition and natural selection in the wild is favoring larger breeds and their hybrids, notably setters, German sheepdogs, mastiffs, and the larger hunting and herding breeds. Attacks on humans are rare because these genuine wild dogs are aversive to human presence. However, these large packs of feral dogs are now recognized as the most serious threat to the survival of the Italian wolf, since they compete for the same food sources. The problem is compounded by the fact that wolves and dogs are interbred. Wryly, author Hansen concludes that the Italian wolf, which is perilously close to extinction, may survive after all as a hybrid dog. It is estimated that approximately 25% of Italy's total dog population of around 3.5 million is made up of animals which are free-ranging, if not actually stray animals. Although the Italian government has not taken such stringent measures yet as endeavoring to depopulate the feral dog population, this action may soon be taken, not primarily to save wolves, but because of the omnipresent threat of rabies which is now moving towards Italy out of Eastern Europe. If the Italian government uses poison bait as a method to control the wild dog problem, then an even greater threat to wolves and other wildlife will be created.

DES in Veal

Confinement—raised, “fancy” or “milk-fed” veal gets more than milk and milk substitutes, according to USDA inspectors. The U.S. District Court Judge in Syracuse, New York, recently placed four veal producers in New York state under injunction because evidence was brought forward to show that they had been using the illegal carcinogenic growth hormone diethylstilbesterol (DES) in their calves and had marketed these calves for slaughter containing illegal residues of this synthetic hormone. Under the terms of the injunction, these four producers have been ordered not to use DES or to market DES—treated animals. Furthermore, they will have to pay for FDA and USDA residue testing of more than 1,000 animals currently on hand and will be unable to sell the calves for food if residues are found. This court action followed a nine-month investigation into the illegal purchase and use of DES by veal producers. This court action is the first involving veal producers and DES since the ban in 1979 on the use of this hormone, although widespread illegal use of DES in beef cattle was uncovered in 1980 where several thousand animals had to be impounded. There is an allegedly well-recognized blackmarket industry for DES implant pellets in the beef industry. As to how much DES contaminated veal had been sold and consumed prior to USDA’s intervention, no one knows.

The Welfare of Adult Pigs: The Effects of Five Housing Treatments on Behavior, Plasma Corticosteroids and Injuries

The effects of five housing treatments (tethers, pairs, and group indoors, a yard and a paddock) on the behavior, physiology (stress physiology and blood metabolites), health (injury status) and production (food eaten and oestrous expression) of 30 non-pregnant, adult female pigs were determined at regular intervals over 12 months. Pigs housed in pairs exhibited a chronic stress response; they had highest free corticosteroid levels “at rest”, a disrupted diurnal rhythm of plasma corticosteroids and a slower corticosteroid response to and recovery from transport. Behaviorally these pigs spent more time lying alone than pigs in other treatments, and there was a significant regression between lying alone behavior and free corticosteroid levels suggesting this behavior may be a useful indicator of welfare status. The group of six pigs housed indoors showed the consistently lowest total and free corticosteroid levels during the entire experiment, and also the least lying alone behavior; however these responses may have been influenced by their similar rearing and experimental environment. While the occurrence of inappropriate behaviors such as chewing, biting and excessive drinking was generally low, it was higher in pigs housed indoors particularly the tether and pair treatments, sug-
whole country in terms of voting—urban, rural, age, sex, etc. 88% of the people questioned favoured the reform of factory farming conditions, with 48% strongly in favour of reform.

90% said that the law should be changed to give factory farm animals sufficient freedom of movement to turn round, stretch their limbs and groom themselves. This would mean banning sow stalls and tie stalls as well as veal crates.

82% said that if battery cages continue to be used, the law should be changed to ensure that the battery hens can always stretch their wings.

Only 13.5% approved of battery cages and 72% of those against, thought they should be banned by law. This can be summarised: 40% want battery egg production banned; 15.5% are against cages but don’t necessarily want them banned; 13.5% in favour of battery egg production; and 37% had no opinion. Of the 56% that are definitely opposed to battery cages, there was no significant difference between town and country dwellers (which, as Ag emphasises, gives the answer to agribusiness' smear campaign that a ban on battery cages is only supported by ‘ignorant townies’).

75% were in favour of a ban on the Live Export of farm animals. Only 14% were opposed to Parliament banning Live Exports, and once again there was little difference between town and country dwellers.

77% said that the ritual slaughter of farm animals should stop—with only 12% remaining in favour of the exemptions from the human slaughter laws at present granted to certain ethnic groups.

9% said that they would definitely change the party they vote for if another political party promised to introduce laws to give more protection to animals.

15% more said that they might switch their vote.

There is a clear indication here that the animal issue could be the deciding factor in many marginal seats. The young are seen to be more likely to change votes in this way especially the 18 to 24-year olds—11% said they would definitely do so.

Finally, 72% are opposed to the use of snares to trap wild animals and think snares should be banned.

**Relief for Iguana Lizards**

Land iguanas (Conolophus subcristatus) have been returned to their ancestral home on Isabella Island in the Galápagos. These lizards were threatened with extinction by feral dogs on the island and several adults were removed in 1976 for captive breeding at the Darwin station. The feral dogs responsible for the decline have now been eliminated from Cartago Bay where the lizards have been reintroduced. Of the 37 juvenile iguanas released there last year, most have taken up residence in old iguana burrows. If the dog eradication program on the island of Santa Cruz proves as successful as the Isabella program, iguanas will be released there also.

**Dogs Endanger Wolves**

James Hansen writing in New Scientist (March 3, 1983) describes how free-roaming and feral dogs in Italy are now competing with the few wolf packs that are still surviving in that country. It is estimated that fully wild feral dogs in Italy have exploded to about 50,000 animals, this number being fueled by a pool of some ten times as many stray and free-roaming dogs. The feral dogs apparently behave much as the wolf packs do, running in packs of up to 20 or 30 members and being active mainly at night in order to avoid humans. They prey on larger herbivores such as deer, and domesticated animals such as cattle, horses, and particularly sheep. Competition and natural selection in the wild is favoring larger breeds and their hybrids, notably setters, German shepherds, mastiffs, and the larger hunting and herding breeds. Attacks on humans are rare because these genuine wild dogs are averse to human presence. However, these large packs of feral dogs are now recognized as the most serious threat to the survival of the Italian wolf, since they compete for the same food sources. The problem is compounded by the fact that wolves and dogs are not interbreed. Wryly, author Hansen concludes that the Italian wolf, which is perilously close to extinction, may survive after all as a hybrid dog. It is estimated that approximately 25% of Italy’s total dog population of around 3.5 million is made up of animals which are free-ranging, if not actually stray animals. Although the Italian government has not taken such stringent measures yet as endeavoring to depopulate the feral dog population, this action may soon be taken, not primarily to save wolves, but because of the omnipresent threat of rabies which is now moving towards Italy out of Eastern Europe. If the Italian government uses poison bait as a method to control the wild dog problem, then an even greater threat to wolves and other wildlife will be created.

**DES in Veal**

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A comparison of the two most contrasting environments (tethers and paddock treatments) showed no clear welfare advantage to housing dry, adult pigs in a more extensive (natural) environment. Jim thinks that even with the best ventilation systems the air in the barn is humid.

Swollen joints are also fairly common, but most of the problems with the older calves come from accidents. The health of the calves in their later stages was much less trouble than in their first few weeks. At the end of his involvement in raising veal calves, disease was still a major problem. The mortality rate for his last group of calves was 45 percent. He took 30 calves he thought were going to die out of their crates and put them outside where they were fed on grass and hay. These calves became considerably more healthy than they had been. Those calves who had not previously stood up voluntarily while still in confinement stalls were now standing up on their own. Many of the calves became playful and would chase or otherwise interact with Jim’s cat and dog. Of the 30 only one calf died.

It was a personal decision for Jim Pittenger to stop raising veal calves with more than one factor acting upon that decision. Part of the reason he quit had to do with animals’ rights. He feels that the present system of raising veal calves is too hard on the animals and that it is not an ideal system in which to raise them. The neighboring farms were family operations, the people were old-time farmers using time-tested methods, the animals were well cared for and as a result they had low mortality rates. Jim saw that his neighbors had a lot of personal pride in their farms and their animals, which he doesn’t feel is possible in raising veal calves. He gradually became more and more demoralized, partly due to the high mortality rates experienced in raising calves for veal. Jim feels that although veal is a delicious product, it is somewhat of a human gimmick, especially white veal, and is not in the best interest of the animals. He feels that the system presently being used for producing veal can be improved and indeed has to be improved. Other reasons for Jim getting out of the business included boredom and the desire to make a career change.

At one point Jim tried switching to a pen raising system with automatic feeders, but it didn’t work out, mainly because the feeding system didn’t work, and he was forced to go back to the narrow crate system. At the time he was trying this new system he had not heard of the straw yard system employed by Quantock veal in the United Kingdom and felt that if he had, he could have benefited greatly from their knowledge and experience. Before he got started he traveled to a few states trying to find the optimal system. He found there was little choice and feels that nobody was doing any better than he had done. After finding out about the straw yard system through this interview he wished he had gone to Europe in search of a model. He was pleased to hear of the great success of this system in the U.K. and, if he was still in the business, he said he would reduce the number of calves he raised and would become active in developing a straw yard system.

The observation that Jim made was that those calves he singled out as his favorites and so had relationships with seemed to be happier than the rest of the calves. It seems that those animals who were allowed outside freedom, a proper diet, personable human contact, who were in some way treated with normality, were the healthiest and the happiest. Jim believes that the psyche or spirit of the animals is overlooked. He thinks that people get caught in cycles and are not aware of what they are doing. “I rationalized what I was doing. You need to stand back to say, ‘I am doing this. What are my alternatives?’” If Jim was ever to go back to animal farming his first choice would be to raise sheep or cattle; his last choice would be to raise veal calves, and then, only in straw yards or group-pens.

Sherry Showell ISAP Intern

Research into Bizarre Alternatives

Authors K. Shamuzzaman and M.F. Haard, affiliated with the Department of Biochemistry, Memorial University of Newfoundland, St. Johns, Newfoundland, write in The Journal of Food Science (Vol. 48, p. 179-182, 1983) that a crude preparation of gastric proteases from harp seals was found to coagulate milk over a wider pH range than porcine pepsin, which is commonly used in the manufacture of cheese. These authors prepared cheddar cheese with seal gastric proteases and found that this gave significantly higher “sensory scores” than cheese made with calf rennet. The authors conclude their paper by stating that “the total annual catch of pups and adult harp seals in Newfoundland is about 91,000, taking an average of the data for the years 1976-1979. By following a modified extraction method, the estimated total yield of coagulant from the seal’s stomachs would be sufficient to clot about 31 million liters of milk. Such serendipitous use of a by-product of the seal industry, while on the surface seems exemplary in terms of its innovativeness and efficiency, can surely only lead to further justification for continued slaughter of seals in Canada if the Canadian cheese industry becomes dependent upon seals for their cheese production.”

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A comparison of the two most contrasting environments (tethers and paddock treatments) showed no clear welfare advantage to housing dry, adult pigs in a more extensive (natural) environment. Ironically this study, reported in the agribusiness weekly Feedstuffs was entitiled, Study shows sows fare same when housed inside, outside! (Feedstuffs, May 9, 1983.)

Barrett, J.L., Cronin, G.M., Winfield, C.G. and Dewar, A.M. Animal Research Institute Australia

Reflections of an Ex-Veal Farmer

Jim Pittenger raised veal calves for five years, from 1970 to 1975. He stumbled into the business, as he believes many do, after seeing an advertisement by Agway Inc. for milk-fed veal. He started out with 10 calves and when that went well increased to 100. He eventually enlarged his operation to handle 200 calves at a time. All the calves were approximately the same age and he tried to get two-and-one-half groups through to slaughter each year. By the end of his business 600 calves per year were going to slaughter.

It is during the first month that the health of the calves is the most precarious. At this stage there is a high incidence of illness and a lot of money is spent on medications. It is also during this period that the mortality rate is highest. On a good operation the highest mortality rate would be between 10 and 15 percent. As a personal goal Jim Pittenger tried to keep his mortality rate below 5 percent.

By the sixth week the calves' health usually stabilizes and the raising of the veal becomes mainly a feeding operation. Their health is good considering their situation. If they were being raised outside they would be harder. As it is they still have little resistance to diseases, they bruise easily which has caused some deaths, and they always seem short of breath as if they had lung congestion. Jim thinks that even with the best ventilation systems the air in the barns is humid. Swollen joints is also fairly common, but most of the problems with the older calves come from accidents. The health of the calves in their later stages was much less trouble than in their first few weeks.

At the end of his involvement in raising veal calves, disease was still a major problem. The mortality rate for his last group of calves was 45 percent. He took 30 calves he thought were going to die out of their crates and put them outside where they were fed on grass and hay. These calves became considerably more healthy than they had been. Those calves who had not previously stood up voluntarily while still in confinement stalls were now standing up on their own. Many of the calves became playful and would chase or otherwise interact with Jim's cat and dog. Of the 30 only one calf died.

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animals may actually bias certain research conclusions, especially in toxicity studies and in research investigations of such multifactor diseases as atherosclerosis. More recently social stress has been implicated in the development of atherosclerosis in monkeys.

J. R. Kaplan writing in Science (Vol. 220, 1983, p. 733-735), reported that socially stressed adult male cynomolgus monkeys fed a low fat, low cholesterol diet developed more extensive coronary, artery atherosclerosis than unstressed monkeys. The stress was induced by periodically altering group memberships by redistributing animals among three groups. The monkeys were redistributed once every 12 weeks in the first year of the study and once every four weeks in the following nine months. Reorganization of groups was selected as a means of inducing stress because previous reports have indicated that introduction of strangers fosters a high degree of social instability in macaques monkeys. The results of this study suggest that psychosocial factors may influence the development of atherosclerosis. These two scientific reports illustrate a new dimension in biomedical research which has been called behavioral medicine, through which a greater understanding of the emotional and social factors involved in human disease and disease prevention may be more fully understood. Furthermore, such studies provide insights into the importance of social and emotional factors in the development of disease in animals such that researchers and others can no longer ignore the fact that animals are likely to suffer emotionally as well as physically, in ways more similar to us than we might otherwise wish to believe.
A Psychic Dog?

For nearly 30 hours, a search party combed the rugged cliffs on the island of Minorca for a missing three-year-old boy in the spring of 1983. The search party abandoned its search and the leader of the party, Mayor Jose Tadeo, returned to his home two miles away where his four-year-old Irish setter, Harpo, who had not been with his master during the search, would not let him rest. Constantly whining, the dog scratched at the door until it was opened. The dog led the way to where the boy had disappeared and suddenly stopped barking and wagging his tail on the edge of a small crevice hidden by thick undergrowth. Search parties had three times passed within feet of this crevice but had not seen anything. The Mayor smashed his way through the undergrowth and found the little boy whose name was Oscar lying there semi-conscious. How did the dog, which had been two miles away at the time of the search, sense where to find the boy? Reported in the Sunday Express, April 24, 1983.

Comment

A Survey of Animal Behavior-Related Research and Teaching Activities in North American Agricultural and Veterinary Medical Colleges

W.R. Stricklin

A letter questionnaire was used to survey animal behavior-related research and teaching efforts in U.S.A. and Canadian university animal sciences departments (agriculture) and veterinary medical colleges. The objectives of the eleven questions of the survey were to identify behavior workers and to determine the current and planned levels of emphasis on research and teaching activities in domestic animal behavior. During 1981, questionnaires were mailed to 162 deans and chairmen, and 102 were answered and returned. Twenty-three persons were identified as having research appointments that had some responsibilities in animal behavior. Twenty-two respondents reported that they offer an undergraduate course in animal behavior, ten of which were colleges of veterinary medicine. The behavior course was required for graduation by six of the veterinary medical colleges, but only two animal sciences departments taught a required course in animal behavior. Seventeen graduate programs in behavior were identified. Plans to increase the amount of effort in areas related to animal behavior were reported on 32 of the returned questionnaires.

Introduction

Abraham Lincoln once said, “If we could first know where we are and where we are tending, we could better judge what to do and how to do it.” This paper reports efforts to determine the current status of animal behavior teaching and research activities in U.S.A. and Canadian agricultural and veterinary medical colleges. It is suggested that this information will be helpful to persons who make decisions about the future of the discipline of animal behavior in agriculture and veterinary medicine.
Methods

During 1981, a questionnaire was mailed to 133 chairs of departments that deal with animal agriculture and 29 deans of colleges of veterinary medicine of North American (Canadian and U.S.A.) universities. Eleven questions were presented with the objective of identifying personnel working in animal behavior and determining present and planned activities in domestic animal behavior, especially farm or agricultural animals. The questions are listed in Table 1. Additional information, such as names of workers and number of lectures, was requested for each question.

The animal sciences department from the largest agricultural university of each state was identified (Anonymous, 1980). These were primarily land-grant universities and therefore have federally supported research programs (Arnold, 1971). In general, these 50 selected animal sciences departments have larger student enrollments and more faculty than do other agricultural schools in the U.S.A. An additional 17 poultry science, 11 dairy science, and 12 veterinary science departments were identified within these 50 universities. The disciplines relating to poultry, dairy, and veterinary science (primarily health) are typically part of the animal sciences department, and when the collegial organization has a separate department for one or more of these areas, the faculty tend to have primarily research appointments.

An additional 36 animal science programs in Canada and the U.S.A. that offer a bachelor of science degree or higher were identified from “The College Blue Book” (Anonymous, 1981). These programs included 15 smaller land-grant universities, branch campuses of land-grant universities, private colleges, and state or provincially supported universities. Some of these programs are larger in number of students and faculty than the smaller animal sciences programs of the 50 land-grant universities, but in general, these are smaller departments that focus on undergraduate teaching and not research activity. Additionally, six major Canadian animal sciences departments with graduate programs were identified, and 29 veterinary medical colleges were surveyed, three of which were Canadian. Approximately six of the veterinary medical schools were started within the last 5 to 7 years and some were still developing new programs and hiring new faculty at the time this survey was conducted.

Survey Response and Results

A total of 102, or 63 percent, of the questionnaires was completed and returned. Results of the returned forms are summarized in Table 2. Twenty-three personnel were identified as having teaching or research activities specifically in animal behavior, and 99 persons were identified whose work included some involvement with animal behavior. A preliminary list of these persons including names, addresses, and areas of interest was published in the North American Applied Animal Ethology Newsletter (Friend, 1981).

In most cases, it appeared that the chair or dean passed the questionnaire on to a person who had interests or work related to behavior who then answered and returned the form. The responses were probably more indicative of the total amount of farm animal behavior interest and activity in North American universities than a representative sample of the 162 departments. Based on my knowledge of behavior programs, it appeared that departments with behavior programs tended to reply, and those without programs tended not to reply. An exception may have been veterinary colleges which are organized with several departments, and thus, the questionnaire may have not reached all appropriate departments.

Aspey and Christenson (1982) prepared a listing of graduate programs in animal behavior for the Animal Behavior Society. They identified ten graduate programs from departments in agricultural and veterinary medical colleges, and the current survey identified those ten programs and seven others. It was not possible to accurately assess the total number of students currently in graduate studies related to animal behavior. However, partial listings identified over 60 graduate projects which included domestic animal behavior in some way.

There was some tendency for relatively greater emphasis on behavior in Canadian animal sciences programs than in U.S.A. animal sciences programs. There was also considerable emphasis on behavior in veterinary medical colleges with six programs having required courses in animal behavior. The smaller colleges tended to cover animal behavior in introductory or management courses rather than in courses specifically on animal behavior.

This survey was an underestimate of the total number of researchers in North America. For example, researchers with the U.S. Department of Agriculture and the Canadian Department of Agriculture research centers were not included in the survey. However, Curtis and McGlone (1982) determined the status of farm animal behavior research in North America using journal reviews, computer data bank searches, and letter communications with identified researchers. Alexander (1982) reported that of the first 200 articles of Applied Animal Ethology, 53 articles were by U.S.A. workers and 16 from Canadian workers.

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<table>
<thead>
<tr>
<th>Category</th>
<th>Questionnaires Sent No.</th>
<th>Returned No.</th>
<th>Percent</th>
<th>Question number</th>
<th>Primary Work (no.)</th>
<th>Secondary Work (no.)</th>
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Some Preliminary Thoughts on 
Permitting Animals to Sue in 
Contract and Tort

Henry Cohen

Henry Cohen is Legislative Attorney for Congressional Research Service, Library of Congress. The views expressed herein do not necessarily represent those of the Congressional Research Service or the Library of Congress.

Animal protection statutes are of course extremely valuable, and they might be made even more so if they were formulated to give private rights of action to their beneficiaries—the animals themselves. But what I would like to explore here is the idea of extending common law rights of action to animals. Admittedly, permitting animals to sue in contract and tort now seems fanciful, but my hope is that this article will provide an initial step toward bringing it about.

The right to sue in contract would seem not especially useful, since animals generally lack the mental capacity to contract. However, the concept of quasi contract might be invoked on behalf of animals who were injured as a result of justified reliance on another's acts. An example might be a pet animal or a zoo animal that was abandoned after having lost its ability to survive on its own, or that was abandoned in a locale where survival on its own was impossible. The monkeys who were taught to use sign language and who were recently threatened with becoming the subjects of laboratory experiments also might have had a cause of action under this theory.

Actions in tort, however, present more significant possibilities, and the situations that might give rise to tort actions for animals seem much more analogous to those that give rise to tort actions for humans. They may, in fact, be identical. Suppose a man is crossing the street and is hit by a motorist and suffers a broken leg. He can sue in tort for compensation for his medical bills, his pain and suffering, and any loss of income that results from the injury. Now suppose the same man had been walking his dog and had suffered the same accident, and, in addition, his dog had suffered a broken leg. Under present law, the man could recover veterinary expenses and any loss of income that resulted from the dog's injury (assuming the dog did not receive television commercials or the like). But there could be no recovery for the dog's pain and suffering, even though the dog's pain and suffering might have been equal to or greater than the man's. Yet, as Peter Singer showed in Animal Liberation, there is no relevant difference between humans and animals that would justify considering the pain of one more important than the pain of the other. Incidentally, measuring a dog's pain and suffering would seem only slightly more difficult than measuring a man's.

Tort actions might also have valuable potential because they could lead to the questioning of conventional practices such as hunting, factory farming, and animal experimentation. Animal cruelty statutes are rarely invoked against these practices because the state's attorney must be willing to prosecute, and because criminal laws are narrowly construed. But any victim of a tort can set the wheels of justice in motion. Suppose someone, without justification, shoots your pet. If animals could sue in tort you could bring an action on behalf of your pet for his pain and suffering. Now suppose a hunter, without justification (apart from "sport") shoots a wild animal, and an animal rights activist sues on the animal's behalf for its pain and suffering. If the court attempted to rule in favor of your pet but not in favor of the wild animal, it would be faced with having to distinguish the two cases, and might realize that, from the points of view of the animals, the cases are indistinguishable. And, since the animals would be the plaintiffs, it would be their points of view that mattered.

A final issue that must be raised is the type of remedies that should be awarded in common law actions by animals. It would be appropriate in some cases, and the species of the plaintiff would raise no conceptual problems. In cases in which monetary damages were appropriate, however, a problem would arise from the fact that animals have little use for money. A pet animal's damages could be put in trust and spent for the animal's benefit, but, unless trust expenditures were for items that the owner would not supply anyway, the damages in effect would accrue to the owners. However, spending the recovery on luxuries would not solve the problem because most animals have little need of material luxuries, and most such items (diamond studded collars, for example) are really for the owner's benefit.

Furthermore, animals should be able to recover for wrongful death as well as for personal injury, and dead animals certainly would have no use for money. The concept of estates for animals is a can of worms that will not be opened on this occasion. One possible way to handle monetary damages might be to have them paid to the state; awards would then still have a deterrent, though not a compensatory purpose. I would favor, however, the use of damages to fund animal rights groups working for the benefit of the injured animal's species or class (e.g., zoo animals), or to fund environmental groups working for the benefit of the injured animal's habitat.

Permitting animals to sue in contract and tort would not only remedy specific injustices and provide a source of funding for animal rights groups; it might also contribute toward a change of consciousness, consisting in part of a recognition that animals' interests deserve equal consideration with humans'. As Christo­pher Stone wrote in Should Trees Have Standing?—Toward Legal Rights for Natural Objects, 45 Southern California Law Review 450, 453 (1972), "[t]hroughout legal history, each successive extension of rights to some new entity has been...a bit unthink­able." I hope that this article will at least make the question of common law rights to animals less unthink­able.

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Humane Ethics and Animal Rights

M.W. Fox

The humane ethic of treating animals with compassion has been the principal tenet of the animal welfare movement for many decades. It is based upon the Judeo-Christian doctrine of benevolence to all God's creatures and upon the moral virtue of kindness, inhumanity being regarded as a social evil and a sign of bad character.

This ethic, however valid, is limited because it would seem to accept any form of animal exploitation if it is done humanely. Would an explosive harpoon or instant-kill trap make the slaughter of whales and fur-bearing mammals morally acceptable? Within the narrow tenet of being kind and not cruel toward animals, the answer would be yes.

While the primary goal of the animal welfare movement is to eliminate suffering in moral reasoning, species that are exploited by humans, this goal, although exemplary, is narrow sighted. Notwithstanding the practical difficulties of proving animal suffering, especially psychological, suffering could conceivably be eliminated, as in confined farm animals, through the use of tranquillizers, or even brain surgery. A goose being made to eat compulsively, following selective partial destruction or stimulation of its brain to cause hyper trophy of its liver for the liver paté trade, may not suffer. But it is being harmed. Likewise, to selective breed a farm animal, like a broiler chicken, that eats to excess and its rate of growth jeopardizes its health, or to raise a zoo or laboratory animal in a highly restricted environment, may not cause overt suffering, since the animals do “adapt.” But they are being harmed, since such treatments can increase their susceptibility to stress and disease. In the parlance of animal rights philosophy, their rights are being violated, regardless of whether or not suffering occurs or can be scientifically proven.

Animal suffering, therefore, is only one aspect of animal exploitation and abuse. Recognizing this, and the fact that the elimination of animal suffering is an extremely limited horizon, the humane movement has greatly expanded its vision and goals by incorporating animal rights philosophy and ecological principles into its educational, legislative, and political activities.

A deeper understanding of what animals do, and say, and why, will not only enhance our enjoyment of them as companions or as natural creations for observation and appreciation contemplation; it will also improve the care they receive under humane stewardship and under the dominion of animal researchers, farmers, and others whose livelihoods depend upon the exploitation of animals for the benefit of society. Furthermore, this "animal connection" of understanding is the basis for informed empathy, as distinct from a purely Cartesian, utilitarian anthropomorphic, or aesthetic attitude, which leads us inevitably toward what Albert Schweitzer called “a reverence for all life.” Once this animal connection of understanding and reverence is established, the societal recognition of the intrinsic worth of animals, and of their rights, will mean a fundamental change in our attitude toward the animal kingdom which will improve our stewardship of planet earth and the lives of all creatures under our dominion. The following synopsis of animal rights philosophy, it relates to the treatment and exploitation of domesticated and wild animals, shows where ethical guidelines and ecological considerations are needed beyond the limited framework of animal suffering per se.

Economic and other social justifications of animal exploitation, particularly the raising of animals for human consumption and their use in biomedical research, should stand the test of moral, as well as utilitarian justification, with reference to the ethics of humane animal exploitation and their intrinsic worth or "rights" which may be articulated as follows:

Animals have an intrinsic nature and interests (needs, wants, etc.) of their own, their rationality or purposiveness, and have intrinsic worth independent of the extrinsic values we may project or impose upon them. These interests may be construed as their rights or entitlement;

Their physical, emotional and social needs constitute their intrinsic nature, or "animalness" (which has an evolutionary and genetic basis), which entitle them to just treatment and moral concern;

In recognizing that animals have intrinsic worth and interests independent of their extrinsic worth to us, we are ethically enjoined to treat them compassionately. Thus, when they are under our care or stewardship, we are morally and legally, to be bound to respect their rights;

Respecting the rights of animals means avoiding unnecessary or unjustifiable death, physical or psychological suffering, or deprivation or frustration of their basic physical, emotional and social needs;

Such rights are relative and not absolute (i.e., presumptive). For example, a domestic animal’s desire to be free may have to be inhibited for its own good and for the good of society. However, it would be a violation of such an animal’s rights (amounting to cruel and unnecessary privation) to keep it continually restrained in a small cage or on a short chain;

To argue that animals have rights is based on more than philosophical presumption or moral conscience. It is based upon the ecological evidence that they are, as we, an integral part of the biophysical earth community and also upon the physiological and psychological affinities that many animal species have with us. That we are dominant over them and in control or superior to them are not valid reasons for denying animals equal and fair consideration. The honest reasons for denying them such consideration, and not according them rights are primarily economic, and also that their exploitation gives us pleasure, and that their interests at times conflict with ours, as over-competition for resources. An understanding of the intrinsic nature of animals leads to an appreciation of their intrinsic worth and thus ultimately to according them rights;

The rights of animals should be given equal consideration with the rights of human beings, but it is important to recognize that this does not necessarily imply equal treatment nor that the interests of the animal are accorded the same weight or value as essential human interests;

This provides the ethical basis for determining when the killing or harming of an animate object causing it to suffer (or to be deprived of certain basic needs) is morally justifiable;

In making such ethical determinations, we as moral agents must consider the animal’s intrinsic nature and its rights, and reason informs us that animals are legitimate objects of our concern;

Thus, the killing of an animal may be ethically acceptable only when there are no reasonable alternatives, as when the animal is: (a) incurably ill and is-ex-
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Thus, the killing of an animal may be ethically acceptable only when there are no reasonable alternatives, as when the animal is: (a) incurably ill and is ex-
A major aspect of animal rights philosophy which has been seriously overlooked, because of the instant polarization of this issue into animal versus human rights, is that animals of the same species, or of the same degree of sentience, should be treated with the same degree of humanness (since they can all suffer similarly). There are no moral or ethical grounds for considering otherwise, and there is certainly no scientific reason why they should be treated differently. The only reasons why similar animals are treated differently are primarily economic.

In sum, the intrinsic nature of an animal is the basis for rights, from which the above ethical codes may be deduced. Nonhuman beings should be as much a part of our community of moral concern as humans. They are an inseparable part of the ecological community of our planet. The ethical codes are both practical and essential, originating from the highest tenets of humane, compassionate and responsible conduct. They bespeak a reverence for life, cast within the framework of ecologically sound and selfless planetary stewardship, upon which our survival depends and through which the quality and diversity of all life on earth may be protected and enhanced for the "greater good":

While the "greater good" cannot be easily defined for all conditions or circumstances, the concept is framed within the Kantian formulation that no man must be the means to the ends of another. The Talmudic statement: "Whosoever saves a single life is as if he had saved the whole world; whosoever destroys a single life is as if he had destroyed the whole world" is also relevant to resolving the ethical dilemma where the rights and sanctity of the individual must be sacrificed for the "greater good". This is distinct from some lesser (e.g., ideological or economic) good, for the benefit of all, rather than for the benefit of a select, more powerful few;

The lack of regard and concern for the intrinsic nature, worth and "rights" of animals is a metaphor for the lack of empathy, care, knowledge, respect and responsibility that humans have for their own kind, be they of the same or opposite sex, of a different race, socioeconomic class, political, religious, or other belief or value system;

It has been argued that since only humans can act as moral agents, it is only they and not animals who can have rights. However, to possess rights, one need not be an active moral agent, as in the case of infants and comatose patients. It is logical that since rights constitute a social recognition of other's interests, to deny animals recognition of their rights is to deny the evidence that they, like we, have certain interests, needs, and behavioral requirements. Since we are moral agents, capable of rational, responsible and compassionate action, it is clearly irrational anthropocentrism to deny other sentient creatures their rights, recognition of which makes us more fully human by broadening and enriching the scope and awareness of our moral community.

The ultimate tragedy, apart from irreversible environmental destruction and extinction of species, is not human and animal suffering so much as the collective atrophy of the human spirit that permits the unethical exploitation and subjugation of animals and humans alike, in the name of economic necessity, political expedience and other inhumane rationalizations. Social, political and other reforms, although often well intended, as exemplified by the philosophy, actions and aspirations of animal and human rights groups, will make little progress until it is realized that social transformation is possible only when each individual has become spiritually enlightened to act responsibly and has regained the ability to empathize, to have compassionate understanding and respect for the intrinsic worth of other beings, animal and human alike.

References for Further Reading
A major aspect of animal rights philosophy which has been seriously overlooked, because of the instant polarization of this issue into animal versus human rights, is that animals of the same species, or of the same degree of sentience, should be treated with the same degree of humaneness (since they can all suffer similarly). There are no moral or ethical grounds for considering otherwise, and there is certainly no scientific reason why they should be treated differently. The only reasons why similar animals are treated differently are primarily economic.

In sum, the intrinsic nature of an animal is the basis for rights, from which the above ethical codes may be deduced. Nonhuman beings should be as much a part of our community of moral concern as humans. They are an inseparable part of the ecological community of our planet. The ethical codes are both cultural and practical, originating from the highest tenets of humane, compassionate and responsible conduct. They bespeak a reverence for life, cast within the framework of ecologically sound and unselfish stewardship, upon which our survival depends and through which the quality and diversity of all life on earth may be protected and enhanced for the "greater good":

While the "greater good" cannot be easily defined for all conditions or circumstances, the concept is framed within the Kantian formulation that no man must be the means to the ends of another. The Talmudic statement: "Whosoever saves a single life is as if he had saved the whole world; whosoever destroys a single life is as if he had destroyed the whole world" is also relevant to resolving the ethical dilemma where the rights and sanctity of the individual must be sacrificed for the "greater good," as distinct from some lesser (e.g., ideological or economic) good, for the benefit of all, rather than for the benefit of a select, more powerful few.

The lack of regard and concern for the intrinsic nature, worth and "rights" of animals is a metaphor for the lack of empathy, care, knowledge, respect and responsibility that humans have for their own kind, be they of the same or opposite sex, of a different race, socio-economic class, political, religious or other belief or value system.

It has been argued that since only humans can act as moral agents, it is only they and not animals who can have rights. However, to possess rights, one need not be an active moral agent, as in the case of infants and comatose patients. It is logical that since rights constitute a social recognition of other's interests, to deny animals recognition of their rights is to deny the evidence that they, like we, have certain interests, needs, and behavioral requirements. Since we are moral agents, capable of rational, responsible and compassionate action, it is clearly irrational anthropocentrism to deny other sentient creatures their rights, recognition of which makes us more fully human by broadening and enriching the scope and awareness of our moral community.

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The Potential Role of Local Ethical Committees in the Moderation of Experiments on Animals in Britain

D.P. Britt

Scientists working with laboratory animals in Britain are made aware forcibly that a serious ethical dilemma surrounds the use of animals in experiments. Certain vociferous sections of the community press the issue on the attention of the general public and media sources tend to propagate views expressed by the most extreme parties, while neglecting coverage of mature, rational opinion. It is, perhaps no bad thing for the scientific community to be frequently reminded to take a responsible attitude to the use of animals but recent overt, even illegal, activity on the part of extremist animal protectionists has encouraged a regrettable polarisation of viewpoints with the scientific community to be frequently reminded to take a responsible attitude to the use of animals but recent overt, even illegal, activity on the part of extremist animal protectionists has encouraged a regrettable polarisation of viewpoints with some scientific institutions seeking to withdraw still further from public scrutiny and accountability.

What is the Basis of "the Ethical Dilemma"?

On the one hand is the view that scientists should have complete freedom in what they do with animals; on the other that all experiments involving animals should be abolished. The first view treats laboratory animals like any other tool used by the scientists in pursuit of new knowledge or insights. The other subscribes rights and privileges to even the lowliest of experimental animals at least equivalent to those enjoyed by (or meant to be enjoyed by) humans. In between is room for many shades of opinion and the majority of the British public who think at all about such matters would hold views somewhere within this centre field (Fig. 1).

Because "experiments" cover feeding trials and simple observational studies where, arguably, little or no suffering occurs, the concern of the public at large is directed chiefly at experiments in which animals are clearly exposed to pain or distress. In general, the more obvious and severe the suffering, the greater is public disquiet, tempered to some extent by the aims of the experimenter.

The number of scientists in Britain who hold the extreme view that they should enjoy carte blanche in the use of animals is probably small. Moreover, there is a growing awareness that good science depends on avoidance of unnecessarily stressful experiments and on maintaining the highest standards of animal care.

The rival extreme view is held by a small but volatile minority.

For holders of either of these extreme views the ethical dilemma does not really exist. Animal experimentation is either totally wrong, or always justifiable. Although untroubled by pangs of conscience both groups are frustrated in the realisation of their ideals. Patently, experiments with animals are proceeding (more than 4 million animals are used annually in Britain alone) and again in Britain as is widely known, scientists do not have complete freedom; they are subject to Government legislation and have to work within laws administered by the Home Office.

The legislation imposes certain restraints. Experimenter must:

(i) be licensed (implies competency);
(ii) be certificated for use of particular procedures/species (implies competency);
(iii) work only on approved, prescribed premises;
(iv) keep records and submit annual returns to the Home Office; and
(v) be subject to inspection by H.O. inspectors.

Is the legislation adequate? Those opposed to animal experiments believe not. A growing number of concerned scientists also recognize the inadequacies in practice. Proposals shortly to be debated in Parliament promise more comprehensive and tighter control of animal usage but better laws and more policing can only improve the situation marginally. For real progress what is required is a shift in attitude so that ethical considerations come to weigh equally with other factors in experimental design and implementation. Dr. S. Vine (1977) formerly Chief Animal Inspector in the Home Office, has stated that the one area in which the inspectorate and the Secretary of State cannot make decisions is in ethical matters. In one sense, indeed, existing legislation acts against good ethical concern, since having received the stamp of approval in the form of a license and appropriate certificates the experimenter may feel that as long as he does not contravene the law he is absolved from further consideration of the ethics of his actions. And in the last analysis what an individual experimenter does not do is very largely his own decision.

It is at this point that some people feel that a carefully formulated ethical code should intervene to aid decision making. This code would supersede individual views and, ideally, reflect the attitudes of the public at large — attitudes which may, of course, change with time.

The points of ethical concern which must be taken into account in any projected work with animals can be summarized in 4 questions:

(i) Is infliction of pain and/or stress justified?
(ii) If yes, how much can be inflicted? (Can it be measured?)
(iii) What is the basis for justification?
(iv) Who decides?

Measurement of pain or stress (in question (iii)) is not strictly an ethical matter but it is a serious practical problem which must be addressed if ethical advice is to be effective.
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The Swedish Experience of Ethical Committees

It was consideration of questions like those above that led a group of scientists at the University of Uppsala in Sweden to conceive the idea of a peer review body comprising scientists and others to evaluate proposals involving experimental animals before they were implemented, from the point of view of possible ethical objections.

As a result of the pilot scheme launched in Uppsala in 1976, legislation to make such committees mandatory was passed by the Swedish Parliament only three years later. Thoughts along similar lines in Britain are much influenced by the Swedish scheme.

A significant early step was agreement on a system of categorising experiments in terms of the pain or stress to which animals are likely to be exposed and deciding at what level intervention by the ethical committee should occur. The categories are listed below (Table 1).

Experiences to date show that more than 70% of projects involve experiments in categories I and II which are exempt from ethical scrutiny. This is important in revealing to the public that a large majority of experiments inflict minimal suffering and in reducing the committee's work to manageable levels.

Members of the committees are research workers from relevant scientific disciplines, animal/laboratory technicians or laymen—equal numbers of each. Total membership is large (minimum of 15 persons) but each project is examined by a group of only three members, one from each category.

When presenting a project for ethical scrutiny, the proposer prepares a document for the committee with knowledge of his area of work and the scientist appoints the other two members on a rotational basis. They meet together in the proposer's laboratory to discuss the project. Certain criteria of evaluation have to be satisfied but the keynote to success of the scheme seems to be the informality of the process, with the three-member committee offering advice on modifications to the protocol (if they feel this is desirable) without censure. Table II shows the sort of questions which the committee asks.

A similar scheme is now in operation in at least one Australian University (Ross, 1981) and a somewhat different version of peer review is presently mandatory in Canadian institutions. However, there are serious objections to peer review as a measure of control, neatly summarised by M.W. Fox, Director of the Institute for the Study of Animal Problems, Washington, D.C. "Accountability is supposedly upheld via the peer review system for research grant awards and approval, but unfortunately this system is inadequate for many reasons notably (a) professional etiquette (one does not criticize one's peers or superiors, especially since they may some day be reviewing your own research proposals) (b) supposed societal value of performing a given experiment is compounded and confounded by other values which in no way justify animal sacrifice or suffering. These include academic status, tenure, scientific recognition, additional income and prestige for the university or research institution; and (c) the value of adding further knowledge to a particular discipline (no one wants their speciality or life's endeavors de-valued or discredited). This is very different from valuing such knowledge in terms of benefiting society" (Fox, 1981).

It is hard for individuals and even groups from a single institution to ignore the "other values" to which Fox alludes. Probably the true worth of ethical review bodies will only accrue when they reflect a wide spectrum of public opinion in their membership, but this is particularly contentious and it is doubtful if the scientific community in Britain is ready as yet to agree to such major intervention.

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Ethical Committees in British Institutions

In 1980, the universities for Animal Welfare circularised twenty leading research institutions in Britain to sound out attitudes to the idea of local ethical committees (LECs) being promoted in future Government legislation on laboratory animal welfare. The five questions asked (reproduced here by permission of the Director of UFAW) appear in Table 3 below. Answers from the 16 respondents were almost uniformly unfavourable to the idea. In particular, not one answered question (iv) affirmatively.

In spite of this coolness on the part of the scientific community, a number of influential bodies have accepted the potential value of LECs and it remains possible that future Government legislation will favour their adoption.

There appears to have been no determined action to establish such bodies in British universities but a group of scientists in Liverpool has become established with the aim of heightening the
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5 Questions:

Do you have a formal scientific planning/research committee?
Do you have any internal committee with similar function to LEC?
Do you think LECs have a role to play in the planning/control of scientific investigations?
Do you think LECs should improve the welfare of animals kept for scientific purposes?
Can you see any scientific/administrative, etc. objections to LECs?

TABLE 3 Ethical Committees—UFAW Questionnaire, 1980

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Sentient Spiders?

Some animals including lizards, crabs, spiders, and insects when caught or injured by a predator will shed a tail or limb in order to escape.

It has been reported by Thomas Eisner and Scott Camazine of Cornell University in the June Proceedings of the National Academy of Sciences (no. 11) that some spiders can also detach a limb after being stung by a venomous insect such as a phymatid, honeybee, or wasp. The orb-weaving spider from the genus Argloloe as well as spiders from three other families are capable of shedding a limb as a defense against poisonous venom. When a spider has been bitten its response of shedding the affected limb occurs within seconds, before the venom can reach the body. Common house spiders do not have this ability.

Spiders are highly sensitive to the venom components serotonin, histamine, phospholipase A2, and melittin and it is these components that induce the spider to detach a limb. It is also known that these same components cause pain in humans. It is not known whether the neurological basis for detecting these venoms is similar in both spiders and humans.

The autotomous capability of animals is considered to be a reflex, however, because the same components that cause pain in humans cause spiders to separate themselves from a limb could imply that these animals feel pain or pleasure. One question that can be raised as a result of these findings then is whether or not the spiders detach their limbs consciously, perhaps as a response to pain.

At the 1980 Great Ape Infertility Workshop, we concluded that “physical and social environments must be improved if not optimized if great apes are to reproduce satisfactorily…” In 1982, the trend toward improvement continues and there are some promising signs that reproduction has been enhanced as predicted. The problem of designing and evaluating captive environments which will facilitate interaction, reproduction, appropriate parenting, and socialization is well within the scope of Environmental Psychology. I intend to illustrate the promise of this applied research field in the remarks that follow.

The intellectual roots of this work may be traced to three individuals: Robert M. Yerkes, Heini Hediger, and Robert Sommer. Early in his distinguished career, Yerkes acknowledged the importance of the physical environment. In his 1925 publication Almost Human he wrote:

If...we were asked to sum up...the essentials of success in keeping and breeding the higher primates, we should emphasize the following points: freedom, or reasonably spacious quarters; fresh air and sunshine, preferably coupled with marked variations in temperature; cleanliness of surroundings as well as the body; clean and carefully prepared food in proper variety and quantity; a sufficient and regular supply of pure water; congenial species companionship and intelligent and sympathetic human companionship; and, finally, adequate resources and opportunity both in company and in isolation for work and play.

Fifty years later, it appears that great ape management practices have finally begun to reflect this sage advice.

Similarly, Heini Hediger (1950) long ago recognized that captive environments could be enriched. In his own words:

Naturalness in the treatment of wild animals does not consist...of a pedantic imitation of one model section of nature. It means that a substitute must be found suitable for animals, taking into account the new conditions of life in captivity. Naturalness, in the sense of a biologically correct type of space, is not the result of an attempt at imitation, but of an adequate transposition of natural conditions.
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More recently, the work of Robert Sommer has been a rich source of ideas and insight. His book *Tight Spaces* (1974) especially influenced my own thinking. Differentiating between “hard” and “soft” environments, Sommer observed that the behavior of people could be profoundly influenced by such design features. I have argued elsewhere that this dimension of habitat is a variable of some significance in captive animal behavior. I have been further guided by Sommer’s classic declaration that:

*If living creatures cannot be left in their original habitat, the least that can be done is to place them in natural and responsive surroundings—natural so that their character is not warped, and responsive so that their individuality and creativity are firmly respected.*

The literature of Environmental Psychology (hereafter EP) complements nicely the views of these three men. Indeed, the extant data can be uniquely applied, since in EP the research on humankind can be applied to animal welfare issues. This irony is akin to Harlow’s (1979) view that:

*one should never study problems in monkeys that cannot be solved in man.*

A well-known text in EP written by Bell, Fisher and Loomis (1978) defined the field as follows:

**Environmental psychology is the study of the interrelationship between behavior and the built and natural environment.**

This definition can be effectively utilized in studies of both human and animal behavior. The relevance of EP to great ape behavior is relatively easy to demonstrate.

Consider the design feature of comfort. The man-made environment is typically hard, barren, and inflexible. This is in contrast to the softer, more malleable features which are characteristic of the natural habitat. Of equal importance is the influence of the animal’s living environment on human perceptions and attitudes. The appearance of the environment and its adverse effects on the occupants’ behavior lends credence to the view that animals are brutish and vulgar. Poor exhibition techniques may stimulate derisive abuse and are likely to reinforce attitudes of human superiority and indifference.

In marked contrast, a naturalistic presentation promises to inculcate positive attitudes and engender respect and appreciation, if not outright reverence for wildlife and the wilderness itself. Regrettably, I am aware of no data which conclusively support this assertion. I am anxious to put it to the empirical test. A previous trend in design permitted plants only on the periphery of environments. Bold new designs call for plants within.

*Hediger (1950) has furthermore argued that plants serve multiple functions in nature for food, support, comfort, and as signalposts, playthings, tools, building materials, cover, and camouflage. The role of plant foods as an occupational device is illustrated by the work of McGrew (1974) who noted that some hard-shelled fruits may require prolonged processing, thereby engaging the animals in a kind of work. As Thornton (1970) has similarly argued:*

*Since feeding is such a major activity in the lives of primates, feeding behavior is a dominant aspect of their biology—a large part of their natural history...It may greatly influence social behavior...*  

Hediger also suggested that the contours and features of nature are rounded and diverse, not angular and unchanging. At the San Francisco Zoo’s new “Gorilla World” and at Seattle’s innovative Woodland Park Zoo, these principles have been successfully employed.

Recent innovations at Seattle include a flexible chain seating bench combined with browse to increase comfort.

At Apenheul in Appeldoorn, the Netherlands, the planted environment is both vertically challenging and spacious. The designer, Wim Mager (unpublished ms.) described this 5 acre island as an “unconventional” design which facilitates group behavior and activity.

Since the “personalities” and locomotor adaptations of the respective taxa vary somewhat, some dimensions of the physical environment may be more applicable to one taxon than another. A vertical composition seems particularly appropriate for an arboreal primate such as the orangutan. A unique design solution has been constructed at the Phoenix Zoo in Arizona.

Other design variables may be briefly mentioned. The presentation of browse stimulates manipulation and nest-building, and may even modify such unsavory behaviors as coprophagy and regurgitation/reingestion. Appropriate cover provides opportunities for play, escape, and privacy. Movable and especially hollow objects, such as empty oil drums and beer kegs, enhance displays as other behavioral scientists such as Van Hooff (1973) and McGinnis and Kraemer (1977) have shown.

In a paper soon to be published in the new journal *Zoo Biology*, Susan Fisher Wilson demonstrates that movable objects are associated with greater activity. The presence of such objects must therefore be regarded as beneficial to the psychological well-being of apes. Although many examples of innovative design and behavioral enrichment can be cited, it must be acknowledged that experimental studies of design effects have been few and far between. Recently, in collaboration with Elizabeth Watts and her students at Tulane University, I carried out a pretest-post test study on environmental change. The former environments for both gorillas and orangutans were inappropriate and barren. The new design called for a larger, moated, complex and naturalistic environment which was carefully tested by the consultants.

The presentation was enhanced and new behaviors emerged. Effects on aggression and social interaction were clearly demonstrated. We have recently conducted similar evaluations at the Kansas City and Topeka Zoos respectively.

The physical environment can also be successfully manipulated in rehabilitation projects. At the Bastrop Chimpanzee Facility in Texas, honey-pots (first suggested by Jane Goodall) are periodically deployed to combat boredom. Successful introductions and socialization of previously restricted animals take place in social groups amid relatively spacious and complex surroundings.

The amount of space is important but as Hediger asserted, even more crucial is the quality, form, and nature of the surfaces exposed to animals. The manipulation of these variables in both experimental and applied settings is a problem within the domain of Environmental Psychology.

Recently, Betsy O’Donoghue (1982) reported that the introduction of an unfamiliar female stimulated sexual behavior in a previously lethargic male orangutan who had for many years failed to breed with his cagemate. Enhanced space has been suggested as a stimulus to breeding in captive gorillas at the Yerkes Primate Center (cf. Nadler, 1982) and at the San Francisco Zoo (Kitchener, personal communication). Intuitively, changing social and physical environments promote reproductive behavior. The data to support this contention are slowly accumulating.

Of course, environmental change should not be absolute; opportunities for continuing novelty ought to be a
More recently, the work of Robert Sommer has been a rich source of ideas and insight. His book *Tight Spaces* (1974) especially influenced my own thinking. Differentiating between “hard” and “soft” environments, Sommer observed that the behavior of people could be profoundly influenced by such design features. I have argued elsewhere that this dimension of habitat is a variable of some significance in captive animal behavior. I have been further guided by Sommer’s classic declaration that:

> If living creatures cannot be left in their original habitat, the least that can be done is to place them in natural and responsive surroundings—natural so that their character is not warped, and responsive so that their individuality and creativity are firmly respected.

The literature of Environmental Psychology (hereafter EP) complements nicely the views of these three men. Indeed, the extant data can be uniquely applied, since in EP the research on human kind can be applied to animal welfare issues. This irony is akin to Harlow’s (1979) view that:

> one should never study problems in monkeys that cannot be solved in man.

A well-known text in EP written by Bell, Fisher and Loomis (1978) defined the field as follows:

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"Almost any novel, moving, changing or intense stimulus is apt to enhance physiological arousal level and overt responsiveness for a time; but then — assuming the stimulus is innocuous — its effect steadily diminishes with repeated presentations, as if each stimulus in turn must lose its charge and become assimilated into the indifferent standard.

Some infertility in humankind appears to derive from the influence of "psychological" variables. Our understanding of such events is poor. It is not altogether unlikely that similar factors may be at least partially to blame for the reproductive problems of our closest living relatives, the great apes. As physical and social opportunities are enhanced, captive great ape reproduction should be similarly affected.

In quoting his mythical character, the chimpanzee "Pano," William Conway (1978) recently remarked that "a laboratory might be a nice place to visit, but I wouldn't want to breed there." This accurately portrays one of our most difficult problems. Although laboratories are inherently more restrictive in character than zoological gardens, it is possible to soften and render complex the most difficult of environments. Constraints of time and money, if not human inertia, are the typical obstacles to such progress.

It is useful at this point to apply the definition of health which has been suggested by the World Health Organization. As stated in their constitution: "Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity." By the scope of this definition, healthy apes are those that are active, sociable, busy, and reproducitively successful. Environmental Psychology is a tool for achieving these ends.

There is much work to do as we extend the boundaries of Environmental Psychology into the domain of animal behavior. The great apes represent a unique test case, and it is with them that the potential applications may be most usefully applied.

References

Prostaglandin F2α
Induced Nest Building Behavior in the Non-Pregnant Sow, and Some Welfare Considerations

Judith K. Blackshaw

Dr. Blackshaw is with the Department of Animal Production, University of Queensland, St. Lucia, Brisbane, Australia.

Nest building behavior, induced with intramuscular injections of prostaglandin F2α (PGF2α), was studied in non-pregnant sows. Acute effects, which included salivation, scratching, vomiting, defaecation and ataxia, were also recorded. Sows (Large White x Landrace) were housed in two different environments: six sows in bare pens and six sows in pens provided with bedding material. In all cases except one (bare pen) nest building sequences of differing intensities were recorded. Welfare suggestions include the provision of nesting boxes for sows in pens provided with bedding material. In all cases except one (bare pen) nest building sequences of differing intensities were recorded. Welfare suggestions include the provision of nesting boxes for sows in pens provided with bedding material.

Introduction

Nests are important to the sow ready to farrow. Feral pigs show a reduction in movement in about one month prior to farrowing and tend to restrict their activities around the farrowing nest (Kurz and Marchinton, 1972). These nests are shallow pits made by sows and are lined with bedding material (Hanson and Karstad, 1959; Kurz and Marchinton, 1972), to provide shelter for the sow and her new born pigs. The nests of the Australian feral pigs reported by Pullar (1950) were...
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large (6–8 ft in diameter) and well camouflaged, consisting of interlaced branches, fern fronds and grass.

Domestic pigs will attempt to build a nest with whatever material is available but concrete floors and farrowing crates prevent much of the nest building behavior, although many of the motor elements are still present (Signoret, Baldwin, Fraser and Hajef, 1975).

Nest Building Behavior

Several phases of nest building can be distinguished in the wild pig after she has selected a suitable place (Frädrich, 1974). With her snout she digs a hollow about the same length as her body. She then collects dry grass, leaves and small sticks to line the nest. This material is evenly distributed over the hollow by rooting and moving in a circle. Leaves and grass lying outside the nest are brought in by pawing with the front legs. These actions may be repeated several times so that the completed nest is of several layers and may become one meter high. As the sow uses the heap it becomes flatter and assumes a round or oval form.

In domestic pigs, Jones (1966), described efforts to begin preparing a nest during the 24 hours before parturition. During the 6 hours before parturition nest building activity increased and the sow made vigorous pawing movements of each foreleg working alternately. This appeared to distribute the bedding to the animal’s liking. Often the sow would move the bedding from one position to another. Periods of nest building alternated with quiet intervals until 60 to 15 minutes before the birth of the first pig, when the sow lay quietly on their sides.

The use of progestin (PG) F2a for induction of farrowing in the sow is used in intensive piggy management (Diehl and Day, 1974), and it is known that PGF2α causes an immediate increase in prolactin levels in the sow (Taverne et al., 1978/79). Maternal behavior patterns (such as nest building and retrieval of young) in young virgin rats have been induced by the administration of prolactin (Riddle et al., 1935). Preliminary work showed that PGF2α injections induced nest building behavior in non-pregnant sows (Blackshaw and Smith, 1982). Boars also responded to PGF2α by displaying elements of copulatory behavior but with no signs of nest building behavior (Blackshaw, J. and Blackshaw, A., 1982).

The present study was undertaken to study in detail the acute behavioral effects of PGF2α on the non-pregnant sow and the resulting nest building behavior. Welfare implications were also considered for the housing of sows in a bare environment or in an area supplied with bedding material.

Materials and Methods

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Materials and Methods

The non-pregnant sows (Large White x Landrace) were in two groups. One group of sows (6) were housed in the intensive, 55 sow, Specific Pathogen Free piggery at the Veterinary Science Farm, University of Queensland, Australia, in bare pens (2.0 m x 1.5 m). The other group of sows (6) was penned (3.5 m x 1.4 m) at the University’s Large Animal Clinic, and supplied with straw or shredded paper. All floor surfaces were concrete.

Each sow was injected intramuscularly with PGF2a (Lutalyse, Upjohn) using 10 mg/100 kg, on four occasions following a control injection (buffer and solvent) one hour before. Injections were made during lactation (1–2 days before weaning) the post-weaning oestrus, the subsequent luteal phase (11–13 days post oestrus) and the second oestrus (21 days). Observations were recorded for 45 minutes after both control and test injections. Acute effects and nest building activity were recorded in detail.

Results

Prostaglandin F2a caused behavioral changes in both groups of non-pregnant sows, which were not observed after control injections. The acute effects included salivation, chewing movements, scratching with a hind leg, rubbing on the wire pen side, vomiting, defaecation and ataxia.

Nest building behavior included snout rubbing on the floor, straw or paper gathering if available, pawing and walking in circles. The acute and nest building behaviors are defined in Table 1.

The onset of the acute behaviors after PGF2a injection was between 1–15 minutes. Table 2 shows the frequency of acute behaviors in both groups of sows and also the time of onset after PGF2a injection. All sows in both groups salivated and made chewing movements; they also scratched with their back legs, rubbed against the pen wire, defaecated and displayed ataxia. Vomiting was restricted to 2 pigs in the piggery and 5 in the clinic.

Nest building behavior was induced in all 6 sows provided with bedding material, and in 5 sows in the piggery. This behavior began 19–38 minutes after injection.

A complete nest building sequence of a sow in a bare environment included: a) walking around the pen, b) vigorously snout rubbing on the floor in a confined area, c) pawing with front legs in that area, d) circling again and snout rubbing, e) lying down on one side in that area.

**TABLE 1 Definitions of Acute and Nest Building Behaviors After Prostaglandin F2a Injection into Non-pregnant Sows.**

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute</td>
<td></td>
</tr>
<tr>
<td>Salivation</td>
<td>Saliva drips from mouth.</td>
</tr>
<tr>
<td>Chewing movement</td>
<td>Pig opens and shuts mouth 2–4 times. May or may not be accompanied by salivation.</td>
</tr>
<tr>
<td>Scratch</td>
<td>Pig uses either back leg to reach its side and/or belly area.</td>
</tr>
<tr>
<td>Rub</td>
<td>Pig stands beside wire of pen and rubs side, face or rum area up and down.</td>
</tr>
<tr>
<td>Ataxia</td>
<td>Pig becomes very staggery in the back legs.</td>
</tr>
<tr>
<td>Nest Building</td>
<td></td>
</tr>
<tr>
<td>Snout rubbing</td>
<td>The top of the snout is rubbed against the floor as though pushing straw into a pile. If straw is provided the snout is used to make a pile. It is distinct from floor feeding where the bottom lip is extended and used to gather food from the floor.</td>
</tr>
<tr>
<td>Straw or paper collecting</td>
<td>Pig may collect bedding in its mouth and carry it to a desired place.</td>
</tr>
<tr>
<td>Paving</td>
<td>The front legs are used alternately in a rapid up and down movement along the floor in front of the pig (2 to many times &gt; 10).</td>
</tr>
<tr>
<td>Circling</td>
<td>The pig walks in a circle in the nesting area which may be bare or contain a straw or paper nest.</td>
</tr>
<tr>
<td>Nest building</td>
<td>The complete activity includes snout rubbing, pawing, straw collecting, circling. Some pigs may not show all these elements.</td>
</tr>
</tbody>
</table>
These activities were performed for 1-10 minutes, but not all pigs showed all nest building behaviors after each injection. Snout rubbing and pawing occurred in 70 percent of the observations and imitate the nest building phases described by Fradrich (1974).

Pigs in the environment provided with bedding material showed similar behavior except they collected the material in their mouths or pushed it together with their snouts, to make a nest. One pig consistently made a very large nest 0.5 m x 1.5 m and 15-20 cm high. Another pig although supplied with nesting material with which it played, made an "imaginary" nest like the pigs in the bare environment.

Another feature of the nest building behavior was its intensity (Table 3). This is a subjective measurement which was recorded during observation. Very active snout rubbing and pawing was scored as intense (3); less active, as medium (2); and in cases where the behavior was performed once, this was recorded as weak (1).

From Table 3 it is seen that 3 of the 5 sows showing nest building activities in the bare environment and 5 of the 6 sows in the environment with bedding, showed intense behavior during lactation (post weaning). Two of the 5 nest building sows in the bare environment showed intense behavior during the second oestrus, and 4 of the 6 sows provided with bedding showed similar behavior. Table 3 also indicates the individual differences in nest building behavior of non-pregnant sows.

**Discussion**

This study shows nest building activity can be induced by PGF2α injection in non-pregnant sows housed in bare pens or supplied with bedding material. In both environments nest building behavior was similar, and followed the pattern of behavior seen in wild pigs (Fradrich, 1974) and in domestic pigs preparing a nest during the 24 hours before parturition (Jones, 1966).

There is a growing awareness of animal welfare as it affects pig production. Emphasis is placed on the provision of an environment which will satisfy the behavioral needs of intensively housed pigs. Farrowing crates without bedding may seem unsuitable for sows but this study suggests that sows will carry out nest building sequences even without bedding material. It is interesting that one sow in the pen provided with bedding material did not use the material but built an "imaginary" nest, while performing the nest building sequences.

The main requirement which can be suggested for sows just before parturition is that they have enough space to perform the various nest building behaviors. During lactation, prolactin plays an important role, and levels of plasma prolactin are elevated at the beginning of an oestrous cycle and towards the end (Hughes and Varley, 1980). The added prolactin release caused by PGF2α adminis-
TABLE 2 Acute Behavioral Responses of Sows After PGF2α (10 mg/100 kg) Injection. Each of the Sows in the Two Groups Was Tested on 4 Occasions over 21 Days.

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Clinic environment</th>
<th>Piggy environment</th>
<th>Onset after PGF2α (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salivation</td>
<td>24 (6)*</td>
<td>24 (6)</td>
<td>1 — 8</td>
</tr>
<tr>
<td>Chewing</td>
<td>24 (6)</td>
<td>24 (6)</td>
<td>1 — 8</td>
</tr>
<tr>
<td>Scratching</td>
<td>24 (6)</td>
<td>24 (6)</td>
<td>3 — 9</td>
</tr>
<tr>
<td>Rubbing</td>
<td>24 (6)</td>
<td>24 (6)</td>
<td>3 — 5</td>
</tr>
<tr>
<td>Vomiting</td>
<td>20 (5)</td>
<td>8 (2)</td>
<td>4 — 6</td>
</tr>
<tr>
<td>Defaecation</td>
<td>24 (6)</td>
<td>24 (6)</td>
<td>2 — 14</td>
</tr>
<tr>
<td>Ataxia</td>
<td>24 (6)</td>
<td>24 (6)</td>
<td>2 — 7</td>
</tr>
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</table>

*Number of pigs showing behavior

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tration may be responsible for the differences in nest building intensity over the oestrous cycle.

The acute effects of PGF2α on the sow also raise the question of its suitability as a drug to induce farrowing. It is easy to ignore these effects if the end result is achieved. If the welfare of the animal is considered seriously it is important to look at all aspects of drug therapy.

References


Animals Rights—Animal Souls?

Veterinarian L.T. Keenan of Pomona, New York, writing in the Journal of the American Veterinary Medical Association (Vol. 183, July 1, 1983, p. 10) states that he is “tired of being an ‘animal doctor.’ I want to become a ‘real doctor.’ This can only be achieved if animals are believed to have souls and the same basic rights as our fellow human beings. Only then can I justify to clients large money outlays for reconstructions, repairs, or treatment modalities. It would help my professional status if an Animal Bill of Rights were to be proposed and eventually made into the law of the land....The sooner this is accomplished, the better it will be for me, my fellow veterinarians, and our fellow animals.”

Biological Control of Aleutian Island Arctic Fox: A Preliminary Strategy

Edward W. West and Robert L. Rudd

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Intentional introduction of exotic animals can normally be expected to yield unanticipated biological consequences. Single-purpose introductions frequently result in ecological catastrophe. Islands are particularly vulnerable to such assault. Arctic foxes (Alopex lagopus), released for the purpose of fur farming on the Aleutian Islands formerly devoid of land predators, have significantly altered nesting avifaunal diversity, abundance and productivity. A program for restoring the historic distribution and abundance of critically affected bird species is described. In a long-term study biological control methods are proposed to test the hypothesis that introduced sterile red foxes (Vulpes fulva), apparently a competitively superior species, will markedly reduce or extirpate resident Arctic foxes.

Introduction

Attitudes toward population control of introduced mammals range from regarding them equal or superior to native forms to irrational hostility toward an introduced species. Most introductions can be viewed as detrimental in some aspect (Roots, 1976). Although population reductions (and the extreme form—eradication) may be generally regarded as beneficial, controversy inevitably accompanies the methodologies by which reductions are attempted (Hutchins et al., 1982). Trapping, shooting, exclusion, and poisoning are the traditional methods used in mammalian population control. Novel, often species-specific, methods such as biological control have been introduced into insect and weed control practices but have rarely attempted in mammal control. One of us has extensively reviewed the many aspects of pest population reduction (Rudd, 1964). The present article describes an example of attempts at eradication of a predatory mammal population in the Aleutian Islands by specific biological means.

The target species is the Arctic fox, Alopex lagopus. Displacement by biological and behavioral means subserves our methods and purposes. The specific method is generally known as the sterile male technique. Detailed ecological information is vital to biological control of this sensitive character. Especially important is the fact that fox populations to be controlled are only those on small islands (West et al., 1982). Throughout our work is the background attitude that humane and scientific considerations can be effectively combined, as well described by Kellert (1982).

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island ecosystems can be easily upset by the introduction of foreign organisms. Island species, isolated from complex mainland ecosystems, evolve to form relatively simple communities. These systems generally lack sufficient natural controls to respond effectively to competition or predation by introduced species. Without strong checks on their growth, non-island species increase rapidly. This population growth invariably occurs at the expense of many forms of endemic fauna.

On the Aleutian Islands in Alaska (Fig. 1) Arctic foxes (Alopex lagopus, Fig. 2), introduced for purposes of fur farming, have eliminated many breeding populations of marine bird species and threaten the total extinction of a race of Canada Goose (Branta canadensis leucopareia). In an effort to restore island ecosystems to their natural state, research has been conducted in cooperation with the U.S. Fish and Wildlife Service to develop an arctic fox management program using biological control techniques. Sterile red foxes, (Vulpes fulva, Fig. 3), a competitively superior species in sympatric mainland habitats, will be ultimately introduced on a target island (Kagalaska). Studies on ecology and population dynamics of interactions between the two species will provide an empirical test of the potential for complete competitive exclusion of the arctic fox by red foxes.

History

Foxes were first introduced to the Aleutian Islands in 1886 by the Russian-American Company for the purpose of establishing fur “ranches” (Ashbrook and Walker, 1925). Pairs of foxes were transported to many islands and left to breed and multiply. After several years the surplus was trapped off. Islands were frequently selected on the basis of bird abundance, a natural food source. By 1925, foxes had been introduced to 77 islands. By 1936 over 25,600 pelts had been taken from the Archipelago (Jones and Byrd, 1979). The economic depression after 1929, destroyed the market for wild furs (Chesemore, 1975). With the onset of World War II, fur farming was virtually eliminated in Alaska. The foxes remained and without frequent harvest their numbers increased. Many endemic bird populations were markedly reduced or eliminated.

The full impact of fox introductions was first assessed in 1936. Murie (1959) conducted a two-year faunal survey of 22 islands along the chain. His findings showed significant reductions in bird species diversity, distribution and productivity. These changes, he concluded, were primarily due to fox predation. Large colonies of ancient murrelets (Synthliboramphus antiquus) and Cassin’s auklets (Ptychoramphus aleuticus) vanished from Sakal Islands. Storm petrels (Oceanodroma sp) were entirely eliminated from Salt and Illak islands. Cassin’s auklets went extinct on Keegaloo and Adugak Islands. Whiskered auklets (Aethia pygmea) were also eliminated from the Near Islands.

Recent bird surveys of other Alaskan Islands document a continued and more widespread reduction in bird populations by the foxes (Stephenson, 1970; Bailey, 1978; Bailey and Faust, 1980, 1981). Crested auklets (Aethia cristatelata) and parakeet auklets (Cyclorrhynchos psitta- cula) are still heavily preyed upon by fox on St. Lawrence Island. Horned puffs (Fratercula corniculata) and tufted puffs (Lunda cirrhata) are also taken in high numbers. On Big Koniuji Island, Moe (1977) determined that 6 adult and 7 juvenile fox killed 763 crested auklets and 95 horned puffs over a three-month period. On a recent survey of the Alaska Peninsula, which have, or have had foxes, no nocturnal seabirds were found (Bailey, 1978). The most significant, and current­ly most pressing, ecological concern is the near total extinction of the Aleutian Canada goose (Branta canadensis leucopareia). It has vanished from its former extensive nesting range in the Aleutians except for a small population on Buldir Island (Jones and Byrd, 1979).

Early Management Programs

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FIGURE 1 Aleutian Islands in Alaska

FIGURE 2 Arctic fox (Alopex lagopus)
followed the standard control method of broadcasting lethal baits on selected islands (Springer et al., 1978). This technique freed only one island (Amchitka) of foxes. In 1972, an executive ban on chemical control agents (primarily compound 1080) limited control activities to trapping, shooting and the use of M-44's "coyote getters" (gas-propelled cyanide guns). These techniques were comparatively slow, expensive and extremely difficult to support logistically. Clearly, a more expedient, more humane, and target-specific program is required to achieve the management objective of removing foxes.

**Biological Control**

Biological control is a management program that uses natural controls to regulate the population density of a pest species. Zoogeographic patterns and field observations of arctic-red fox interactions suggest that the red fox naturally controls the numbers of arctic fox locally by competitive exclusion and predation. Competition occurs when two species vie for the same resource in limited supply. Interaction between species reduces the fitness and the population size of the weaker species. This process can occur in one or both of two ways (Piranka, 1974). The first, termed interference competition, occurs by direct physical interaction, such as aggressive encounters. In this instance an excessive amount of time and energy is required for competition or its avoidance, so that the amount remaining for self-maintenance and reproduction drops below survival level. The second process, termed exploitation competition, occurs when one species monopolizes a limiting and essential resource (e.g., food or denning sites) thereby making its use unavailable to its competitor. The extent to which competition will occur will be propor-

**Field Research**

Validation of the hypothesis that red fox are effectively displacing the arctic will be obtained if, after introduction, there is a marked displacement of arctic fox from prime denning and foraging sites and a sharp decline in arctic fox numbers. Baseline data on arctic fox density, home range, denning and foraging patterns have been gathered on Kagarla Island (Fig. 1) and are presented elsewhere (West et al., 1982). Foxes have been trapped in large box traps, ear-tagged and fitted with collars bearing radio transmitters. Tracking results show that resident foxes den and forage almost exclusively along the coast. Analysis of scat composition shows that fox diet is comprised largely of beach amphipods and birds, although fish are taken during salmon runs. Recaputre data provide an index to density.

In the future sterilized red fox, collected in the eastern Aleutian Islands, will be introduced to the island. Groups of pairs will be released in selected bays and coves. From an analysis of similarities in food and density requirements (West et al., 1982) it is estimated that these introductions will minimally require an approximate 1:2 red to arctic fox ratio and noticeably increase the fox population of the island. Available food and den sites will then be subject to intense interspecific competition.

**Discussion**

The success of a biological control program of this nature depends greatly upon the intensity of competition immediately following introduction of the red fox. Island habitats provide optimal conditions for maximizing the factors in several ways. Islands are confined areas; emigration to escape competitive inter-
followed the standard control method of broadcasting lethal baits on selected islands (Springer et al., 1978). This technique freed only one island (Amchitka) of foxes. In 1972, an executive ban on chemical control agents (primarily compound 1080) limited control activities to trapping, shooting and the use of M-44’s “coyote getters” (gas-propelled cyanide guns). These techniques were comparatively slow, expensive and extremely difficult to support logistically. Clearly, a more expedient, more humane, and target-specific program is required to achieve the management objective of removing foxes.

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Research on the dynamics of sympatric populations of arctic and red fox suggest that both types of competition occur. In Russia, Skrobov (1960) and Chirkova (1968) noted that red fox replace arctic fox wherever their ranges overlap. On Hardangervidda, Norway, Oestbye et al. (1978) found that the red fox occupied 50% of the dens originally dug by arctic foxes. Similar exclusions have been recorded by Marsh (1938) in Manitoba, Canada.

Recent comparative analysis of the social dynamics, territoriality and population structure of arctic and red fox by use of radiotelemetry in Great Britain and in Iceland showed marked similarities between the two species (Hersteinson & MacDonald, 1982). These similarities suggest that complete direct competition between the two species underlies present allopatric distribution.

Red fox are also known to prey upon arctic fox. Alaska trappers consider red foxes to be one of the primary predators of arctic fox (Chesemore, 1975). Marsh (1938) found that red foxes often attacked and killed trapped arctic foxes. Fur farmers noted that if arctic and red fox were placed on the same island the arctic fox was soon exterminated. Recent behavioral observations of interactions between captive arctic and red foxes show that red fox pairs dominated the use of enclosures and forced arctic foxes to use less preferred denning and feeding areas (Rudzinski et al., 1982).

Available biological evidence strongly suggests the hypothesis that red foxes will eliminate arctic fox when introduced on the same island. It is therefore very likely that a management program using the red fox as a control agent would be successful. It would also be comparatively rapid, economical and environmentally safe.

**Field Research**

Validation of the hypothesis that red fox are effectively displacing the arctic will be obtained if, after introduction, there is a marked displacement of arctic fox from prime denning and foraging sites and a sharp decline in arctic fox numbers. Baseline data on arctic fox density, home range, denning and foraging patterns have been gathered on Kagalaska Island (Fig. 1) and are presented elsewhere (West et al., 1982). Foxes have been trapped in large box traps, ear-tagged and fitted with collars bearing radio transmitters. Tracking results show that resident foxes den and forage almost exclusively along the coast. Analysis of scat composition shows that fox diet is comprised largely of beach amphipods and birds, although fish are taken during salmon runs. Recaputure data provide an index to density. In the future sterilized red fox, collected in the eastern Aleutian Islands, will be introduced to the island. Groups of pairs will be released in selected bays and coves. From an analysis of similarities in food and density requirements (West et al., 1982) it is estimated that these introductions will minimally require an approximate 1:2 ratio of arctic fox to ensure successful competition between the two species underlies present allopatric distribution.
actions is not possible. In addition, because of the relatively small size of the islands, the carrying capacity and equilibrium density for foxes is rapidly attained. Arctic fox numbers are assumed to be at saturation density. Fluctuations in population density are primarily density dependent. Increasing the density of foxes will immediately maximize competitive pressure. The highly seasonal nature of the Aleutian Island environment also favors concentration and focusing of competitive impact. Breeding birds provide ample food for the foxes during the spring and summer. During the winter, however, most birds migrate. The foxes are then forced to subsist on beach amphipods and carrion (Murie, 1959; this study). These food items have limited food value and the foxes are nutritionally stressed.

Optimally, red fox introductions should be made during midsummer to minimize the predatory impact on nesting birds, and to allow sufficient time for the foxes to acclimate to the island before winter sets in. Introduction of foxes from the eastern Aleutian Islands would minimize the acclimation period. To minimize intraspecific competition between the red foxes, introductions should be made at several localities around the islands, and at periodic intervals to allow adequate time for dispersal. All introductions should be made within one season to maximize interspecific competition.

Red fox displacement of arctic foxes away from prime feeding areas will cause a multifaceted reduction in arctic fox numbers. As arctic fox are forced into already saturated areas, starvation will occur in addition to secondary causes of mortality induced by physiological stress. Fecundity could be expected to drop due to reabsorption of embryos and poorer kit survival. Under conditions of stress foxes are also known to cannibalize mates, young and littermates (MacPherson, 1969; Chesemore, 1975; Fox, 1975). These factors acting in concert will provide a system of natural control that is species-specific and avoids the often haphazard methods of trapping, shooting and poisoning. The management system proposed exploits naturally occurring processes that are precise and enduring. They easily and logically apply to islands in the Aleutian chain and may also be modified for other species of insular introduced mammals (cf., Barnett and Rudd, 1983).

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Attitudes Toward Animals in Greco-Roman Antiquity

Liliane Bodson

Both wild and domesticated animals had a direct and wide-ranging role in the life of the ancient Greeks and Romans. The bond between humans and animals which first originated in the economic needs went far beyond strictly practical matters. It did influence and enrich the Classical culture in its major aspects from literature and arts to philosophy and ethics. It also induced people to analyze the main implications of their relationship with “subhuman” creatures. The present paper aims to survey the range of the attitudes they developed about animals. It also examines to what extent they were concerned with the problems related to animal welfare and rights, and how they coped with them.

When one considers the importance of the involvement of animals in the life of the ancient Greeks and Romans, one is bound to wonder how the latter treated those subhuman creatures of which they required so much for their physical and metaphysical needs (Keller, 1909–1913; Toynbee, 1973). Did they care for them and to what extent? Did they have any definite ideas on the subject of animal welfare and animal rights? Did they by any chance become such a sensitive and controversial issue (Magel, 1981; Rollin, 1982)?

The relationship between man and animal is directly affected by the cultural and intellectual environment of the societies and civilizations in which it is rooted. Since it has taken an increasing importance in the last few decades (due to the current economic, scientific, and moral evolution), we run the risk, as always when investigating an ancient tradition on matters of present interest, of being anachronistic. A few preliminary remarks are therefore needed in order to define the sources to be taken into consideration, their limits and prospects.

Although the amount of materials lost over the ages should not be underestimated, the remaining evidence, either direct or indirect, clearly shows the evolution of the mentalities throughout the antiquity. They are scattered over two millennia or so: from the Creto-Mycenaean era (2nd mill. B.C.) down to the first centuries of the Roman empire. Some of them, especially those recording the attitudes which were privately adopted towards the animals are concentrated in the Greek and Roman texts of the first three centuries A.D., at the time when people reconsidered the philosophical and ethical theories previously elaborated in ancient anthropology, broadened the debate, and focused on the human-animal bond more systematically then ever before. Yet, the data that they brought up to illustrate the often diverging positions go back to events and episodes which took place earlier, sometimes several centuries before the time when they were definitively written down and preserved. This late emergence does not detract from their importance. Far from being mere anecdotes, colorful but of restricted meaning, they complete the direct and scarcer evidence and confirm that the problems arising from the daily relationship between man and animal were never despised nor played down at any period.

Quite the reverse, they were paid attention to not only by philosophers and moralists, but also by a wider public, by the State authorities, and by those who were concerned in the first place: animal owners, breeders, and kind by Zeus, while the wild animals—fish, birds, mammals—deprived as they are of the logos (both intelligence and language) that makes man’s superiority, “teared each other to pieces in a merciless struggle” (Works and Days, 274–280). Hesiod also praised the ploughing ox, suggested how the farmer should select it, but said nothing even allusively on its welfare (ibid., 405, 436–441). One might, however, admit that the farmer, considering his own and personal interest, at least would care for his “first servant” and grant it the minimal comfort to keep it in good health.

A few decades later, Pythagoras and his followers dealing among other metaphysical concerns with life after death developed the theory of metempsychosis. They believed in the human soul’s transmigration to the other living creatures, including the animals, and therefore they taught their contemporaries not to harm them, whether they were wild or domestic. They relied upon a more or less exclusive vegetarian diet depending on the range of animal species involved in the transmigration process (Hausleiter, 1935). The theory of soul transmigration was later to be taken up by Plato who distinguished a double nature in man’s soul: for its better part, divine and shared with the gods (logistikion: the rational element), and, for the other, related to the animals through the thymoeides (the spirited element) and epithymetikon (the appetitive element). (See Plato, Republic, IV. 439 E–440 E.) Man could only fulfill himself by giving his reason command over the ir
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rational forces of his soul. Aristotle who correlated the rational and sensitive parts of the soul initiated an important program of research in animal psychology. After him, Theophrastus could argue on the physical and mental similarities between man and animal. He concluded to their kinship, since he agreed on the fact that "if they are differences of degree, there are no really qualitative distinctions with regard to the sense perception" (Gompertz, 1955; Gill, 1969; Dierauer, 1976). Such views and similar ones proposed by the founders of natural history were connected with the arguments already expressed or alluded to earlier in the tradition, e.g. by Empedocles, and destined to undergo further developments, that the animals are superior in some ways to human beings. The ancient theoreticians of the human-animal relationship also kept alive the polemics generated by the Stoics' ideas on the hierarchy of all beings and their concept of man's superiority correlated with his theoretically absolute dominion over the animal. Epicureans, Cynics, and later Skeptics, neo-Pythagoreans, each of them with their own arguments and purposes (Lorenz, 1974; Dierauer, 1977) vigorously contested such theories and the consequences they involved for the status of animals since the beasts were said to exist only for man's use and advantage. Underlining the animals' irrationality, the Stoics denied any of the abilities indispensable for their being granted recognition of any rights, either natural or legal, and therefore denied them the protection of law and justice. One of the most comprehensive accounts of those controversies is Verhagen's (1975) with a good synthesis of the main factors at issue is given by Plutarch's treatises, especially those entitled The Cleverness of Animals, Beasts Are Rational, and The Eating of Flesh. Yet, the most open-minded among the ancient philosophers and moralists never brought the question of animal rights beyond the speculative level and individual applications. There is no clue of their discussions being influential enough even at some local scale to stir up the radical changes that the mis-handling of animals, such as in the games organized by authorities in the Roman empire (see below), would have justified. It is known that in Thessaly the storks and in Argolid the grass snakes were protected by the local laws. The basic reason for such regulation was man's advantage: those animals were regarded to be more effective than any other at keeping respectively vipers and small rodents under control. In Athens, an old law mentioned by Plato in his ideal code (Laws, IX, 873 E) stated that "if any animal of burden or any other animal murdered anyone—except if they did it when taking part in a public competition—the relatives should prosecute the slayer for murder, and so many of the land-stewards as were appointed by the relatives should decide the case, and the convicted beast they should kill and cast beyond the borders of the country." No consideration of the private right or the civil responsibility of the animal's owner is to be found here. Such a law, anthropocentric as it is, is based on the archaic notion of the blood stain to be resolved in the ritual destruction and expulsion of the culprit, either an animal or even a simple object, as shown by the Laws, IX, 873 E-874 A (Gernet, 1917). No ancient legislation favoring the mistreated animal with comparable measures has been found so far. Yet some evidence of court condemnation for abuses of animals occurs in the tradition. Plutarch (The Eating of Flesh, I: 7) mentioned the circumstances of a preserved animal fleeing his ram when it was still alive. Pliny the Elder (Natural History, VIII. 180) pointed out the case of a Roman citizen "who was indicted for having killed an ox. He was convicted by the public court and sent into exile as though he was killed in his farm-labourer." Such episodes are commanded by the empathy for the animals in the sense defined by Fox (1980) and the sentences are passed by referring to the penalty for any attempt upon man's life and physical integrity. The contexts in which the episodes are mentioned suggest that the "moral conscience" of the public was hurt by the unmotivated slaughter of and other acts of cruelty towards animals, considered them as intolerable, and sought to curb them by requiring exiles, fines, public rep­rimands, etc., for the author of the gesture assimilated to a crime. The available evidence, however, shows that such reactions, widely praised by those who emphasized the animal's right of being fairly treated, remained occasional. They even seem to have been exceptional enough to be underlined and remembered as guidelines by those who recorded them. More often than from the laws and official regulations the reactions to animal mistreatment came from the so-called popular wisdom as is expressed in old proverbs. "There are Erinyes (i.e., deities of vengeance) even for dogs", the Greeks used to say meaning thereby that every living being however great or small in the scale of hierarchy would be in the end avenged by the immanent justice. In the meantime, this deeply-rooted belief did not prevent the public from reacting and even overreacting against animal abuse: the killer of a talking raven famous and much appreciated in Rome in the 1st cent. 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The Impact of Religion

Both wild and domestic animals fulfilled countless functions in the Greek and Roman religions, mythologies, and symbols in which they occurred as omen bearers, messengers, and attributes (Hopf, 1888; Pollard, 1977; Bodson, 1976). That privileged relationship with the supranatural world and the sacred forces included in it was intensively perceived and revered, even in the later periods when religion became more formalistic. This played a part in the process which won the animals the moral right of being treated equitably, as the major cult celebration in honor of every god either of first or of second rank included the sacrifice of domestic animals. The slaughter of the victim was one of the main points at issue. Hunting the wild and ferocious animals was always justified as an improvement of the living conditions and as the best training in bravery, courage, and stamina for the youngster keen on becoming a responsible citizen and a good soldier. But even then the rule was not to slaughter the newly-born offspring of at least the undangerous species and to leave them to the goddess Artemis, protectress of both the hunter and the game (Xenophon, Cynegeticus, 5.14). The problem was quite different with the domestic species, especially sheep, goats, and cattle, the slaughter of which inspired a full range of rules and devices to justify a compulsory but feared action perceived as an attack on the life of man's first and faithful servants (Pollard, 1979). Required by cultural, political, and social reasons (Vernant, 1981), animal sacrifice was not carried out without a carefully designed ceremonial which aimed at counterbalancing the potential danger of shedding blood of innocent victims (Yerkes, 1981). Buried in that sense, the ancients could praise the Scythians otherwise despised as barbarians or the minorities such as the Pythagorician sect, the latter as "milk drinkers", the former as vegetarians. Such diets, although out of reach for the majority, appealed to man because it reminded them somehow of the mythical Golden Age when man and animal were believed to live together in full harmony (Guthrie, 1957). Moreover, in Greece and in Rome, the cult observance could also be fulfilled on certain occasions with
rational forces of his soul. Aristotle who correlated the rational and sensitive parts of the soul initiated an important program of research in animal psychology. After him, Theophrastus could argue on the physical and mental similarities between man and animal. He concluded to their kinship, since he agreed on the fact that “if they are differences of degree, there are no really qualitative distinctions with regard to the sense perception” (Gomperz, 1955; Gill, 1969; Dierauer, 1979). Various and similar ones preserved by the founders of natural history were connected with the arguments already expressed or alluded to earlier in the tradition, e.g. by Empedocles, and destined to undergo further developments, that the animals are superior in some ways to human beings. The ancient theoreticians of the human-animal relationship also kept alive the polemics generated by the Stoics’ ideas on the hierarchy of all beings and their concept of man’s superiority correlated with his theoretically absolute dominion over the animal. Epicureans, Cynics, and later Skeptics, Neo-Platonists, each of them with their own arguments and purposes (Lorenz, 1974; Dierauer, 1977) vigorously contested such theories and the consequences they involved for the status of animals since the beasts were said to exist only for man’s use and advantage. Underlining the animals’ irrationality, the Stoics denied any of the abilities indispensable for their being granted recognition of any rights, either natural or legal, and therefore denied them the protection of law and justice. One of the most comprehensive accounts of those controversies is Yerkes’ (1952) study. In a good synthesis of the main factors at issue is given by Plutarch’s treatises, especially those entitled The Cleverness of Animals, Beasts Are Rational, and The Eating of Flesh. Yet, the most open-minded among the ancient philosophers and moralists never brought the question of animal rights beyond the speculative level and individual applications. There is no clue of their discussions being influential enough even at some local scale to stir up the radical changes that the mishandling of animals, such as in the games organized by authorities in the Roman empire (see below), would have justified.

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bloodless offerings made of flowers, vegetables, fruits, etc., along with periodical abstinence of meat. Such was the case at some festivals celebrated for the Greek goddess Demeter (lat. Ceres) which spread all over the ancient world the sacred ritual of being issued at Eleusis and requiring the worshipper “to honour his parents, to bring fruit offerings to the gods, not to injure any living creature.”

**Individual and Collective Attitudes Towards Animal Welfare & Rights**

As seen above, the idea of the natural and moral rights of animals to be fairly treated was largely shared and spread out under philosophical and religious influences. From its very beginning, the Greek literature included significant evidence of pity, compassion, and reverence paid to the animals (Lilia, 1974). Some have got worldwide fame: Argos, the dog faithfully awaiting his master Odysseus during his 20-year long absence (Odyssey, 17. 290–327); the horses of the Trojan hero Pandaros who preferred to leave them at home lest they should be deprived of the proper care in all the uncertainties of the battlefield of Troy (Iliad, 5. 201–203). Those examples fit very well with the large amount of Homeric similes focusing on the understanding of the animals and showing the reader that the extension of empathy to animals at the early stage of the Greek civilization implied a better knowledge for the behavior and psychology (Rahn, 1950–1954; 1967). From then down to the Roman period, there is a wealth of evidence on how many among the ancient people experienced and admired the ability of the animals to learn, progress, and react, how much they felt susceptible for the animals’ dependants and concerned to exert their domination over them by ensuring their welfare. The main and first reason for doing so was their conviction that the animals had the moral rights to be: (1) well treated during their lives including their old age when they are not able to work any more; (2) honored and praised for the courage and bravery that the best of them put in carrying out their duties; and finally (3) granted the right to die peacefully and to have their mortal remains removed with dignity. Breeders and farmers who trained to pay close attention to the health of the animals they raised and employed, to protect them from bad weather conditions, to provide them with appropriate and sufficient fodder, to spare them any unnecessary hardship (Columella, On Agriculture, VI–IX passim). At first, such a policy could seem to be planned for no better purpose than the profit of the animal’s owner. Indeed, the advantage of the owner should not be disregarded, but this does not exclude unselfish reasons linked up with the irreplaceable experience of the daily relationship and contacts taking place in the common undertaking of the farm work (Gorteman, 1957). The animals were recognized as sensitive creatures serving man generously and faithfully. They were at his mercy, he had the duty of elementary justice and equity towards them, if for no other reason because he had been granted more intelligence than they. The argument of man’s logos which could, as seen above, be brought up to set up his superiority on the other animals and to assert his right to use and abuse them was then put forward to justify his duty of humaneness towards them. Quite often, the attitude of animals was inspired by heartfelt reasons as much as philosophical ones. According to Xenophon (Economics, 5. 20), Socrates used to recommend prayers for farm animals: cattle, horses, and sheep. Indeed, shepherds, cattle raisers, donkey owners, etc., concerned with their beasts prayed the gods to bless their herds and to keep them in good health. The prayer formulas, the rites performed on such occasions, and the monuments erected once the prayer had been fulfilled are identical with those they used when praying for themselves and for their children (Bodson, 1980). Moreover, many people in Greece and in Rome took steps to have themselves represented with their animals—oxen, dogs, goats, birds, etc.—on the tombstones to be erected after their death (Galletteri, 1922; Herrlinger, 1930). It is not unreasonable to conclude from the abundant evidence supplied by excavations that those who wished their animals to benefit by their piety and to continue to share their companionship even after death were motivated by a deep and sincere empathy for them. In that general context, they did not have to refer to religion, philosophy, or laws to criticize and protest against those who mistreated their serving animals: the farmer who harassed his cow just after calving (Bianor, Palatine Anthology, X. 101); the bathhouse keeper who forced his donkey to work without rest (Plutarch, On Love of Wealth, 5); Cato the Elder who was heartless to the point of selling his horse after campaigning with him for months (Plutarch, Life of Cato major, 5. 7). Similar reactions occurred against those who unscrupulously abused their pets or tame animals: Alcibiades cutting his dog’s tail to divert the Athenians’ attention from his way of handling public affairs (Plutarch, Life of Alcibiades, 9), the killer of the talking raven mentioned above, or the local authorities of Hippona secretly killing the dol­phin which they considered a great dis­turber of public peace because it attracted thousands of people eager to watch its frolics from the beach (Pliny the Younger, Letters, 9. 33).

While reminding their readers of those abuses and their consequences in order to prevent them in the future, the authors also wished to point out the occasions when the animals had been properly treated as a positive way to encourage humanitarianism towards animals. Xenophon, Pericles’ father, was remembered among other things because he had ordered a memorial for his dog which had died from exhaustion while trying to swim behind the boat on which he was being evacuated from Athens before the Persian invasion of 490 B.C. (Plutarch, Life of Themistocles, 10. 9–10). The Athenians extended the application of the law designed to grant the athletes public honors to some famous animals distinguished for their services. Such were a mule which had worked tirelessly as a draft animal in the building of the Parthenon (Aristotle, History of Animals, VI, 24), and a watchdog which had stopped a sacrilegious burglar (Plutarch, The Cleverness of Animals, 13). Many private citizens were keen to have their favorite pets portrayed by painters or sculptors and celebrated by poets while the animals were still alive or after their deaths as a last tribute (Galletteri, 1922). Herrlinger (1930) as Carson (1972) pointed out, this was also a means to flaunt one’s wealth and social status. But when it came from ordinary citizens for ordinary dogs, birds, or cicadas, etc., or from a Roman emperor like Hadrian who wished to compose the epitaph for his horse (Aymard, 1951), sincere attachment rather than selfish ostentation was probably their true motive.

Yet, for all the sympathy they displayed towards animals, the ancient Greeks and Romans could not always refrain from cruelty and mistreatment. The Greeks, especially the Athenians, did enjoy quite a peculiar kind of cruelty towards exotic animals. It was often called “nautia” (to paint the eyes of an animal or a rock, 1965), the latter being justified as a national celebration since a couple of fighting roosters was believed to have inspired the Athenian resistance to the Persian invaders in the early 5th century B.C. (Aelian, On Animals, II. 38). There is however nothing in those shows to compare with what was to become the common entertainment under the Roman empire. Besides the pacific exhibitions and parades of exotic animals, people in Rome and in the more remote provinces as well enjoyed the bloody games of the arena in which thousands of wild animals...
bloodless offerings made of flowers, vegetables, fruits, etc., along with periodical abstinence of meat. Such was the case at some festivals celebrated for the Greek goddess Demeter (lat. Ceres) which spread all over the ancient world the sacred ritual of issuing at Eleusis and requiring the worshipper “to honour his parents, to bring fruit offerings to the gods, not to injure any living creature.”

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were slaughtered at the price of irretrievable damage to the African, Asian, and European fauna (Loisel, 1912, Jennison, 1937, Toynbee, 1973). Even though such games, yet on a lower scale, were originally part of funeral rites, by the turn of the 1st century B.C., they no longer had any reference to a cult or religious purpose. They were sometimes presented as a useful device of the emperors aiming at clearing some parts of the Empire from wild and dangerous mammals in order to enlarge the areas available to human settlement. Yet, they were primarily a political and social phenomenon in which the goals of sport hunting, once defined by Xenophon (see above) were perverted (Auguet, 1970). Contrasting with the literary evidence and the rich diversity of sensitive depictions of animals either common or rare, the sadistic barbarity of those mass slaughtering reveals one of the outstanding paradoxes of the Roman people. While being so much alive to the interest and beauty of the animal kingdom, they took pleasure in gazing at the sufferings and agonizing death of its most impressive species. Cicero’s, Seneca’s, Plutarch’s voices were among the very few which were raised in protest against those hideous practices. They condemned them—unsuccessfully. As for the onlookers, the first and last public protest recorded in the ancient tradition occurred in 55 B.C. during the great show given by Pompey which turned into the killing of about twenty elephants (Scullard, 1974).

Conclusion

Unlike Judaism with the Bible (Rim­bach, 1982), the Classical antiquity never disposed of a single and sacred book used as a standard of reference. The evidence to be taken into consideration is therefore less homogeneous but it includes a somehow larger range of data both concrete and theoretical. First of all, they show all the possible attitudes from cruelty to humanitarianism which once prevailed at different degrees in the relationship between man and animal. Those behaviors originated in all kinds of motives and intentions involving religion, ethics, and psychological factors which were sometimes quite elusive when they were rooted in the special fascination or in the aversion the animal species generated in man’s mind.

Investigating the ancient religion and philosophy essentially, Lorenz (1974) came to the conclusion that (p. 240) “...tauchte nun im vierten Jahrhundert für uns greifbar bei Xenokrates and Theophrast, der Gedanke auf, dass die Tötung von zahmen und mit dem Menschen lebenden Tieren ein Unrecht darstelle.” Enlarged to the day-after-day experiences of the relationship with animals, the evidence confirms a real empathy towards animals long before the 4th century B.C. Personal and individual feelings of right or wrong in dealing with the animals by standards of humaneness were first designed to rule the relationship between human beings, and then extended to subhuman creatures. Those standards were active from the beginning of human-animal relationships, even though they were not always fully asserted. They brought about a sharper and more generous attention to animal welfare. On that general and empirical background, the impulse given by Aristotle and the Perspectaculum in school to the study of the animal developed a new approach, at both scientific and psychological levels, of the animal nature, of its differences and similarities with the human nature, and of the place of the animal in the hierarchy of living beings. Then, many philosophers and moralists stressed and pleaded for the idea that man could make no better use of his logos towards the animals than by granting them the natural and moral right to be fairly treated and by adapting his behavior to that principle. They argued sometimes fiercely against those who contested that right. They cam­ paigned for the animal defense by writing, lecturing on the matter, and by teaching the children to respect the animals (see Bion quoted by Plutarch, The Clev­erness of Animals, 7), since they thought it to be more effective to prevent rather than to begin the onlookers, Plutarch echoing the relentless debates of his time on animal nature emphasized the ever present and paradoxical difficulty to reconcile man’s interest and claims with the animal rights to welfare and humanitarian protection or, in other words, to reach the challenging ideal of a harmonious relationship between man and animal. While noticing the cases of empathy he observed towards the domestic animals and pets and underlining the consequences for their welfare, he had to mention the abuses and mistreatments inflicted especially on the wild animals in the Roman empire on a scale broader than ever before.

The paradox still exists, and the challenge as well.

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The Care of Pets Within Child Abusing Families

Elizabeth Deviney, Jeffery Dickert, and Randall Lockwood

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The treatment of animals was surveyed in 53 families in which child abuse had occurred. Patterns of pet ownership, attitudes towards pets and quality of veterinary care did not differ greatly from comparable data from the general public. However, abuse of pets by a family member had taken place in 60 percent of the families. The families in which animal abuse was indicated tended to have younger pets, lower levels of veterinary care and more conflicts over care than non-abusive families in the study. There were several parallels between the treatment of pets and the treatment of animals with child-abusing families, suggesting that animal abuse may be a potential indicator of other family problems. These findings also suggest that it may be helpful to review the role of pets in these families as part of the therapeutic process.

The belief that one’s treatment of animals is closely associated with the treatment of fellow humans has a long history. Several philosophers have suggested this connection, even without accepting the concept of intrinsic rights of animals. In the thirteenth century Saint Thomas Aquinas, in Summa Contra Gentiles, followed his defense of exploitation of animals with the observation that:

"...if any passages of Holy Writ seem to forbid us to be cruel to dumb animals, for instance to kill a bird with its young, this is... to remove man's thoughts from being cruel to other men, and lest through being cruel to other animals one becomes cruel to human beings..." (Regan and Singer, 1976, p. 59).

Immanuel Kant echoed these same sentiments 500 years later, suggesting that the only justification for kindness to animals was that it encouraged humane feelings towards mankind. In his essay on "Duties to Animals and Spirits" he wrote:

"...Our duties towards animals are merely indirect duties towards humanity. Animal nature has analogies to human nature, and by doing our duties to animals in respect of manifestations of human nature, we indirectly do our duties to humanity." (Regan and Singer, 1976, p. 122).

In "Metaphysical Principles of the Doctrine of Virtue" he came to a similar conclusion regarding cruelty to animals:

"...cruelty to animals is contrary to man's duty to himself, because it deadens in him the feeling of sympathy for their sufferings, and thus a natural tendency that is very useful to morality in relation to other human beings is weakened." (Regan and Singer, 1976, p. 125).
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Writers sympathetic to the notion of animal rights have also proposed an association between kindness and cruelty to animal and man. Schopenhauer, in critique of Kant, proposed that:

"Boundless compassion for all living beings is the firmest and surest guarantee of pure moral conduct, and needs no casuistry. Whoever is inspired by it will assuredly injure no one, will wrong no one, and will encroach on no one's rights...The moral incentive advanced by me as the genuine is further confirmed by the fact that the animals are also taken under its protection." (Regan and Singer, 1976, pp. 125–126).

The simplest statement of this belief is Albert Schweitzer's comment that

"the ethics of reverence for life makes no distinction between higher and lower, more precious and less precious lives" (1965, p. 47).

There have been few attempts to systematically study the relationship between the treatment of animals and humans by specific individuals. Mead (1964) found evidence that, in a variety of cultures, torturing or killing of animals by a child may precede more violent acts by that individual as an adult. Several studies have focused on the frequent association between criminal violence in adulthood and persistent enuresis, fire-setting and other aggressive behavior against people which may persist into adulthood. Hutton (1981) indicated that violence against pets may be an indicator of other forms of family violence. Hutton (1981) suggested that physical abuse of a child may result in the child abusing animals and exhibiting other aggressive behavior against people which may persist into adulthood. Fucini (1978) indicated that violence against pets may be an indicator of other forms of family violence. Hutton (1981) reported that of 23 families in a British community known to the RSPCA for reasons of animal abuse or neglect, 82 percent were known to local social service agencies and were described by these agencies as having "children at risk" or signs of neglect and physical violence. Beck (1981, p. 232) specifically suggests that:

"animal abuse has long been overlooked as an indicator, monitor, and even precursor to the antisocial behaviors people inflict on each other, including child abuse and neglect, spouse beating, rape, and homicide."

The present study was undertaken in an attempt to determine the extent to which pets are included in the patterns of abuse and neglect seen in abusive families. We see this as a first step in clarifying the role that pets play within the home of these families and in identifying possible ways of using information about the human/animal bond in the understanding and treatment of family violence.

Method

The sample consisted of fifty-three families involved with the New Jersey Division of Youth and Family Services for reasons of child abuse as defined by New Jersey Statute 9:6-1 of the Protective Custody Law. Under this law, an abused or neglected child is defined as any child under 18 years of age:

"whose parent or guardian inflicts or allows to be inflicted upon the child physical injury through other than accidental means which results, or potentially could result, in a substantial risk of death, a serious or prolonged disfigurement, or impairment or loss of function of any bodily organ;"

"whose physical, mental or emotional condition has been impaired because of the failure of his or her parent or guardian to provide adequate food, clothing, shelter, education, medical or surgical care;"

"against whom a sex act has been committed by a person responsible for his or her care or by someone else permitted to commit such an act by the person responsible for the child's care; or"

"who has been wilfully abandoned by his or her parent or guardian."

The sample was chosen from a pool of 200 such families on the basis of pet-ownership and availability for the study. A comprehensive interview schedule containing 55 questions was developed in consultation with several humane societies and experts on animal care. Questions dealt with demographic variables, pet care and attitudes toward pets, as well as general information on pets owned by the family over the last 10 years. A staff member of the Family Enrichment Program interviewed one adult or teenager in each household. The interviews took place in the family's homes. In each case they were conducted by a staff member currently working with the family who had observed interactions with pets at first hand. This approach allowed us to detect discrepancies between how the families stated they treated their pets and the actual treatment observed.

Description of the Sample

The average age of adult respondents to the interview was 33.25 years. Three respondents were between 12 and 14. The families in this sample had an average of 2.7 children under the age of 18, with a mean age of 8.2 years.

The pattern of pet ownership in this sample was similar to that described in a variety of surveys of pet-owners (Table 1). The number of dogs owned by dog-owners was somewhat higher than in other studies (Table 2), but was within the typical range. The majority of interviewees reported a positive attitude toward their pets. Sixty-seven percent reported that they had pets for companionship while 17 percent said that the main purpose was protection. Eighty-one percent indicated that they would feel sad or hurt if they lost or had to give up their pets. Three people specifically stated that they would feel like they had lost a child if anything happened to their pets and two mentioned that they would kill anyone who would try to harm their animals. The remaining 19 percent said they would be unconcerned or even happy if anything happened to their pets.

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Most people spoke favorably of their pet’s personality and behavior, using such descriptions as “happy”, “loving”, “friendly” and “playful”. Only 9 percent used adjectives such as “nasty” or “nervous”. One client, who admitted to brutally beating his cat regularly, described the animal as “very affectionate and cute and very playful”.

In 36 percent of the families the children were described as having a “good”, “loving” or “playful” relationship with pets in the family. In 26 percent of the families the children were reported to hit, kick, pester or annoy a pet. Six percent of the interviewees indicated that the children ignored or neglected the pets.

Care of Pets

Responses to questions on feeding, exercise and basic care did not differ noticeably from acceptable standards, but the socially acceptable replies were generally obvious. These questions yielded contradictions between the client’s replies and the case workers’ observations in 17 percent of the sample. For example:

“Mrs. C. said she gave the two dogs water three to four times daily. However, the animals never had food or water available to them (during the interviewer’s visits) even on the hottest summer days.”

Most people reported that they fed their animals commercial food one or two times a day and 90 percent indicated that water was continuously available or was given at least daily. There were a few unusual responses such as “he does not take water often—once a month” and “I give him water whenever he pants.”

Table 3 gives the proportion of pet-owners who reportedly made use of veterinarians in our sample and in stratified samples in a variety of U.S. communities. The use of veterinary services among dog owners fell below the lowest rate reported for the general population. Use of such services among cat owners did not differ noticeably from that reported elsewhere. Use of veterinary services is closely associated with occupation and family income (Dorn, 1970; Franti et al., 1980). Within the population from which our sample was drawn, 21 percent are non-working, 37 percent are laborers and 14 percent service workers. Thus lower use of veterinary services may be explained by the tendency toward lower socio-economic status in our study group and among families with child abuse in general.

Fifty percent of the dog owners in our sample reported that their animals had been vaccinated. This is not inconsistent with the report that 60 percent had seen a veterinarian. However, 81 percent of the cat owners reported that their animals had been vaccinated, despite the fact that only two-thirds had reportedly been to veterinarians. This difference may be explained by the fact that several owners reportedly made use of free vaccination programs in some areas.

The reported incidence of spayed female dogs in our sample (27 percent) is slightly lower than the 32–36 percent rates reported in three separate demographic studies (Griffiths and Brenner, 1977; Heussner et al., 1978; Franti et al., 1980). The proportion of neutered cats owned by people in our sample (16 percent) was half the 33–34 percent value reported in those surveys.

Incidence of Animal Abuse

We defined animal abuse according to criteria stated by Leavitt (1978). Meeting one of these was sufficient for classifying a family as exhibiting animal abuse. The criteria were:

1. Observably or reported pain or suffering due to inflicted pain beyond forms of discipline commonly accepted in our society.
2. Causing the death of an animal in an inhumane manner.
3. Abandoning an animal in an environment which is not natural to it or in which it is incapable of surviving.
4. Failing to provide care as indicated by poor sanitary conditions, lack of proper nutrition, lack of shelter or inhumane confinement.

Twenty-five percent of the interviewees affirmed that they or a member of their household had injured their pets at some time. In an additional 38 percent of the families the case worker observed animal abuse or neglect first hand which was either underreported or not reported in the interview.

Thirty-four percent of the interviewees gave indications that some of the pets they had previously owned had been either abused or neglected. This was inferred from reports of the manner in which pets had died, were lost, or disposed of. For example:

“Cat was shot by husband.”

“Husband dropped off dog in the woods.”

“Dog was let loose on the highway.”

Kicking or punching small animals was the mildest treatment to be considered abuse in this survey. Other abusive actions included hitting the pet with a hard object (excluding sticks or newspaper), throwing hard objects at the pet or other acts that clearly endangered the animal’s life.

In all, 60 percent of the families (N = 32) were identified as having had at least one family member who had met at least one of the criteria for abuse to a family pet. Thirty-six percent met the first criterion (pain and suffering), 6 percent met the second (inhumane death), 13 percent met the third (abandoning) and 25 percent met the fourth (neglect). Twenty percent of the families met two or more of the criteria. In the majority of

TABLE 3 Proportion of Pet-Owners Utilizing Veterinary Services

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cases falling into categories 1 and 2, one or both parents were the major source of abuse to the animals. In only 14 percent of these cases were the children the sole abusers of animals. Of 31 cases in which the identity of the abused animal was clear, 18 (58 percent) involved dogs, 10 (32 percent) involved cats, 1 (3 percent) involved both dogs and cats and 2 (6 percent) involved birds.

The interviewers commented favorably on the treatment and care of pets in only 5 of the 53 families (9 percent). Specific comments included:

"Takes obvious pride in her horse, she is a responsible owner."

"Pets are compassionately cared for."

"(The cat) is a very loved pet of this household. He gets more than adequate care and is the source of great amusement to the family."

Comparison of Pet-Abusers With Non-Abusers

Interview responses and field reports for the 32 families in which animal abuse had been reported were compared with those of the remaining 21 families in which no animal abuse had been indicated. There were no significant differences between these groups with respect to pet ownership and reasons given for owning pets. There were no differences in the use of positive adjectives in descriptions of the pets' personality.

The abusive and non-abusive groups showed differences with respect to their pets (Table 4). In general the abusive group had more younger pets and fewer pets over 2 years of age than their non-abusive counterparts or the general population. However, due to the small sample size these differences were not statistically significant. A high proportion of young animals in a population usually indicates high mortality and rapid turnover. This suggests that the abusive group did not have their pets for as long as the non-abusive group. The number of families that reported having pets that were lost, hit by a car, or ran away was not significantly different for the abusive and non-abusive groups.

We hypothesized that conflict over the care of a pet might be related to the incidence of animal abuse. There was evidence of disagreement over the feeding of pets. Forty-four percent of the abusive group and only 16 percent of the non-abusive group reported that the person who was supposed to feed the animal and the person who actually fed the pet were different ($x^2 = 4.19, df = 1, p < .05$). Viewed another way, 82 percent of those cases in which there was conflict over the feeding of the pet involved families in which animal abuse was reported.

Among dog and cat owners in the abusive group, 45 percent reported that they had never taken the animal to a veterinarian, compared to 29 percent in the non-abusive group. This difference was in the expected direction but was not statistically significant ($x^2 = 1.14, df = 1, p < .2$). In the non-abusive group, 88 percent reported that their dog or cat had received vaccinations compared to only 61 percent in the abusive group. As indicated earlier, these figures may represent exaggerations in a socially acceptable direction but the difference is significant ($x^2 = 3.86, df = 1, p < .05$).

The two groups did not differ with respect to the proportion of dogs or cats that were spayed (all $p > .5$).

Some incidents of animal abuse may be due to an inability to control the animal. Twenty-two percent of the abusive group perceived their pets as not being well-behaved, compared to 6 percent in the non-abusive group. Although this difference was not significant ($x^2 = 2.3, df = 1, p > .1$), it suggests that pets that are abused tend to be or become behavior problems. It is possible that the abusive group had pets that were more aggressive or more difficult to control. This is supported by the fact that 69 percent of the families with animal abuse reported that a family pet had injured a person, compared to only 6 percent of the families in the non-abusive group ($x^2 = 4.4, df = 1, p < .05$).

The abusive group differed from the non-abusive group with respect to the forms of discipline they employed with the pet (which was not used as a criterion to differentiate the two groups). Physical means (spanking with stick, hands or newspaper) were reportedly used by 88 percent of the non-abusive owners ($x^2 = 5.33, df = 1, p < .05$).

**Comparisons of Form of Pet and Child Abuse**

All of the families were involved with the Division of Youth and Family Services for reason of child abuse. It was possible to determine the form of abuse in 48 of the 53 cases. In 40 percent ($N = 19$) the children were physically abused. In 10 percent ($N = 5$) there was sexual abuse and in 58 percent ($N = 28$) the children were in a neglectful home situation. In 4 percent of the cases ($N = 2$) there was risk of abuse due to psychiatric illness. In our sample of pet-owning child-abusers, 88 percent of the families in which physical abuse took place also had animals that were abused. In those cases where physical abuse of children was not present, animal abuse was seen in only 34 percent ($x^2 = 12.07, df = 1, p < .001$). Neither sexual abuse of children nor neglect differentiated the animal abuse from animal non-abuse groups.

**Conclusions and Implications for Further Research**

The families in this survey had all shown some impairment of their capacity to provide care for children. A large proportion also showed a breakdown in their capacity to care for pets. This finding lends empirical support to the belief that a battered pet may be a sign that other types of violence are occurring in the family (Fucini, 1978). It also lends...
cases falling into categories 1 and 2, one or both parents were the major source of abuse to the animals. In only 14 percent of these cases were the children the sole abusers of animals. Of 31 cases in which the identity of the abused animal was clear, 18 (58 percent) involved dogs, 10 (32 percent) involved cats, and 3 (13 percent) involved both dogs and cats and 2 (6 percent) involved birds.

The interviewers commented favorably on the treatment and care of pets in only 5 of the 53 families (9 percent). Specific comments included:

"Takes obvious pride in her horse, she is a responsible owner."

"Pets are compassionately cared for."

"(The cat) is a very loved pet of this household. He gets more than adequate care and is the source of great amusement to the family."

Comparison of Pet-Abusers With Non-Abusers

Interview responses and field reports for the 32 families in which animal abuse had been reported were compared with those of the remaining 21 families in which no animal abuse had been indicated. There were no significant differences between these groups with respect to pet ownership and reasons given for owning pets. There were no differences in the use of positive adjectives in descriptions of the pets' personalities.

The abusive and non-abusive groups showed differences with respect to their pets (Table 4). In general the abusive group had more younger pets and fewer pets over 2 years of age than their non-abusive counterparts or the general population. Due to the small sample size these differences were not statistically significant. A high proportion of young animals in a population usually indicates high mortality and rapid turnover. This suggests that the abusive group did not have their pets for as long as the non-abusive group. The number of families that reported having pets that were lost, hit by a car, or ran away was not significantly different for the abusive and non-abusive groups.

We hypothesized that conflict over the care of a pet might be related to the incidence of animal abuse. There was evidence of disagreement over the feeding of pets. Forty-four percent of the abusive group and only 16 percent of the non-abusive group reported that the person who was supposed to feed the animal and the person who actually fed the pet were different ($x^2 = 4.19, df = 1, p < .05)$. Viewed another way, 82 percent of those cases in which there was conflict over the feeding of the pet involved families in which animal abuse was reported.

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considerable weight to the warning offered by Van Leeuwen (1981, p. 182):

“It would be sad... if in analogy to child abuse there persisted a reluctance to recognize the existence of animal abuse among the so-called accidental injuries brought to the veterinarian’s attention. Greater awareness of animal abuse may lead veterinarians to initiate mental health intervention for the abusing family in addition to treating the animal.”

The relationship between animal abuse and child abuse is not a simple one. As with child abuse, most cases of mistreatment involved either long-term neglect or relatively few instances of clearly detectable harm (Cohen and Sussman, 1975). Repeated injury was not usually indicated. Abusers of animals and children alike often report deep affection for their victims, but we also found that 50 percent of the animal abusers with more than one pet tended to split them into “good” and “bad” pets, a theme that is common in cases of child abuse (Wasserman, 1967). Only 13 percent of the non-abusive group made such a distinction.

There are several parallels between the possible origins of violence to animals and to children. Some family violence may be seen in terms of “scapegoating” of an innocent and powerless victim by a recipient of violence. This behavior may be a factor in several of the instances of animal abuse and neglect. Additional problems with both children and animals may come from unfamiliarity with effective ways of using reinforcement to achieve desired changes in behavior. Finally, family conflicts over responsibility for basic care of both children and animals may generate additional tensions that lead to abusive behaviors.

For reasons of confidentiality, we were unable to assess the relationship between particular patterns of child abuse and animal abuse in the families in this survey. We are currently conducting an intensive analysis of the involvement of pets in the family dynamics in a small number of families in which child abuse has occurred.

Even in families with child abuse, many members express great love and concern for animals. With a better understanding of the role of pets within these families it should be possible to integrate the family’s feelings and actions toward their pets into the therapeutic process as a tool for understanding both the healthy and unhealthy processes that are taking place. Ultimately the objective of those who work to prevent child abuse is the same as that of those who seek to prevent mistreatment of animals — to foster an ethic which appreciates the sensitivity of all life.

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There are several parallels between the possible origins of violence to animals and to children. Some family violence may be seen in terms of "scape-goating" of an innocent and powerless victim by a recipient of violence. This could explain the involvement of children in animal abuse in 37 percent of the households in which pet abuse was reported. Another common theme in disturbed families is "triangling" in which aggression is directed against one family member indirectly through actions against a third (Minuchin, 1974). Since many family members have close bonds to pets, these animals can become the targets of abuse intended to hurt a person. This pattern has been reported by Robin et al. (1981) who found that a high proportion of delinquent adolescents had owned pets to which they were closely attached but which had been killed by a parent or guardian.

Child abuse may also originate, in part, from a lack of familiarity with the needs of children or unrealistic expectations about their abilities. This was clearly a factor in several of the instances of animal abuse and neglect. Additional problems with both children and animals may come from unfamiliarity with effective ways of using reinforcement to achieve desired changes in behavior. Finally, family conflicts over responsibility for basic care of both children and animals may generate additional tensions that lead to abusive behaviors.

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Ethologic and Economic Examination of Aviary Housing for Commercial Laying Flocks

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Introduction

In 1972, studies about different housing systems for poultry were carried out. The housing systems are: free range, deep litter, sloped wire and cages. These studies have increased our knowledge about behavior, health, diseases and egg production (Brunner and Fölsch, 1977; Fölsch, et al., 1977; Huber and Fölsch, 1978; Fölsch and Stahel, 1979; Fölsch, 1980; Fölsch and Vestergaard, 1981).

The result of our work shows that appropriate housing is necessary for intensively kept hens and that the housing has to correspond to the vital needs and the nature of the animals.

This is important for two reasons: a) the innate needs of the birds must be satisfied; b) for the proper development of the animal and successful egg production.

The housing facilities should allow the following functional cycles without restrictions:

- **Social organization:** the structuring of a group or unit of animals.
- **Locomotion:** walking, running, flittering, flying.
- **Feeding behavior:** search for food and water, food and water pecking, ground scratching, scraping.
- **Comfort behavior:** plumage care, stretching, dust bathing.
- **Resting behavior:** standing, sleeping.
- **Sexual behavior:** egg laying, nest building behavior.

Each one of these functional cycles requires its own area in the hen house. The hen house has to be arranged in order to accommodate the needs of the animals.

The management of the hen house should be easy and efficient. A clearly arranged house is an agreeable place to work.

The technical components in aviary housing are: feedtroughs, water nipples, dropping pits, perches, nests, and deep litter areas.

In the Cantonal Agricultural School of Zürich (Strickhof), we built a small experimental aviary hen coop for fifty animals in 1978/79.

In 1979 it was also possible to change an old hen house with deep litter into an aviary system. This system belongs to the experimental farm "Weinigen" of an animal food factory (Klingentalmüle AG). Like the rest of this enterprise, the aviary is run according to economic principles.
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his house has been occupied by a thousand hens. (Hisex white, ten hens per m² or three hens per m³.) By the end of 1981, another aviary house was completed on the same farm and stocked with 2,000 animals to serve as breeders.

According to our concept (Fölsch, 1982), the ethological question is: Can a proper aviary system be achieved by dividing the room into different horizontal levels and by installing mobile elements such as feeders and conveyor belts in the nests?

Specific Questions and Procedure of the Experiment

1) Does a single animal move around in the whole hen house or only in one part of it?

2) What are the animals doing during the daytime phase using natural and artificial light, what is their position, and, how many are active?

Method

To analyze the first question, fifty animals were marked with red and white number tags. The sections of the hen house were designated with big letters. The observers then noted which tagged animals were in which field, what position they occupied, and what activities they were engaged in. To address the second question, the observations were done within a limited part of the house which represented a cross section. The observers, following a fixed timetable, watched the marked positions (feeders, perches, etc.) in the cross section and counted the number of animals and recorded their activities. One observer watched the floor and the nest area. A second observer stood on the dropping pit.

The observations were recorded on forms which were prepared beforehand. Dependent upon the number of positions in the nest area, floor area, or dropping pit, it was possible to observe the same position twice or three times per house (multi-moment technique of observation).

It was necessary to observe the nests more closely during the egg laying period, as well as the floor area during dust bathing time, and the food places during feeding time.

Moreover, control was exercised over all the places where the eggs were laid. The eggs were collected by hand and the number of eggs in the nests, the floor, and on the dropping pit were counted.

Further information was obtained regarding the physiological conditions of the animals: any changes of the feet, cloaca, and plumage evident upon examination.

Analysis of this information yielded results concerning the behavior of a flock in a certain hen house. According to this study, each aviary hen house was unique in its complexity. Since most aviary hen houses will be conversions, a great variety in the interior design is expected in aviary housing.

In spring 1980, the first observations of the small experimental flock, as well as the commercial laying flock, were made. Our method has been useful so far.

Results

1) The observation of the marked animals showed that they made use of the whole room according to their needs. All the marked animals moved around during the observation period (eight-hour period). The entire length of the house, the perches on the different levels, and the nests were frequented. The hens spread out equally over the whole hen house. So far, the arrangement seems to be correct according to the hens’ needs. Few negative social interactions occurred. Cannibalism and hysteria did not occur.

2) The method shows whether or not the design of the hen house is useful and corresponding to the behavioral needs of the animals. Such design includes: the deep litter area, the kind and number of nests, arrangement of the different perches, structure of the dropping pit, the working frequency of the conveyor belts, and the illumination of the hen house.

After a laying period of 14 months, the animals seemed to be in good health. The external appearance was judged to be good and the number of sick or dead animals was low (Table 1).

Egg production and food consumption of commercially run aviary flocks

<table>
<thead>
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D.W. Fölsch, et al. — Aviary Housing for Commercial Laying Flocks  Original Article

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FIGURE 2 Plan of Swiss Aviary System for Breeders/Parent Stock

Since December, 1979, this house has been occupied by a thousand hens. (Hisex white, ten hens per m$^2$ or three hens per m$^3$.) By the end of 1981, another aviary house was completed on the same farm and stocked with 2,000 animals to serve as breeders.

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Certain conditions were improved upon in an effort to upgrade the hen house. For example, after the first cycle, windows were installed to allow for more daylight. Small curtains were placed in front of the nests in order to provide the hens with a dark, quiet area for laying. This addition was also found to help reduce the number of dirty or broken eggs.

A heat exchanger should be installed to improve the climate in the hen house. The investigators also wanted to judge the economic situation, the manageability of an aviary housing system: Work situation

- Animals kept in aviary housing are easy to survey.
- The keeper can walk through it and catch sick animals without difficulties.
- It is possible to mechanize daily duties like feeding, watering, and egg collection. Droppings can also be removed of mechanically.

Economic situation

According to our experience and to newer estimates (1982), one has to reckon about thirty dollars of construction costs per bird for a newly built aviary house. This price can be reduced by 15 to 20% if the caretaker or farmer does part of the construction himself. All these statements are valid for Switzerland only. The construction of a hen house with cages costs the same amount, whereas 20% of the implemental funds can be used to finance the buildings. The installation of an aviary will become even cheaper, if a building is already in existence. Furthermore, the price can be lowered by 50% depending on how much work the caretaker is willing to do himself.

The input of work per animal and egg depends on the extent of mechanization. This input is lower than in the conventional deep litter system, but higher than in conventional houses with cages.

The food consumption of the hens per egg is slightly higher than in cages.

Summary

Intensively kept hens must have appropriate housing facilities. This conclusion is the result of studies which were done utilizing different housing systems and different numbers of animals per unit of area.

In 1979, the construction of aviary houses was started. The characteristic components of the aviary housing system are: deep litter area for scraping, nests, perches on different levels with access to the feeders and waterers, the influence of daylight and the outdoor climate.

The method of observation, reporting and interpretation was developed. All the hens utilized the depth and length of the hen house, the perches, the nests, and the deep litter areas. The state of health and production were considered to be good.

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Review of Literature on Use of T-61 as an Euthanasic Agent

Laura Dalia Barocio

Veterinarian Barocio is a research fellow of the Institute for the Study of Animal Problems, Washington, DC. Her present address is The Animal Medical Center, 510 East 62nd Street, New York, NY 10021.

Introduction

Euthanasia means, according to its Greek root, an “easy death” (17) and is, by definition, the act of inducing death without pain (19). To a Doctor of Veterinary Medicine, trained in the healing art, the idea of euthanizing is not pleasant. However, millions of unwanted dogs and cats are brought to the public and private animal shelters annually, and the most humane disposition of these animals is to give them a “good death.”

This entails an enormous ethical responsibility and the moral injunction that the method of killing be humane (epically and psychologically). Therefore, there is an obligation, as a final ethical responsibility and demonstration of respect for the life that is to be terminated, to utilize the best available method of euthanasia: to induce a gentle and painless death without causing suffering (21).

The tools of evaluating the degree of distress in animals being killed include electroencephalography (EEG), electrocardiography (ECG), and measurement of blood pressure and respiration. Sound clinical and behavioral observations should also not be abandoned in the evaluation process (21).

There are many methods which may be employed to reach the same end results, but the ideal method should satisfy several criteria (20):

1. It should be painless;
2. It should cause unconsciousness instantaneously and death within minutes;
3. It should not cause undue anxiety, alarm, fear, panic, behavior, struggling, vocalization, muscle spasms or clinical signs of automatic activation (e.g., convulsions) before unconsciousness;
4. It should always cause death when properly used;
5. It should be safe for the properly trained person to use;
6. It should be easy for the properly trained person to use;
7. It should not be a drug subject to abuse in human beings;
8. It should be aesthetically unobjectionable. (This criterion depends on who the observers are);
9. It should be practical to use for the particular type of animal to be killed;
10. It should not create a problem of sanitation or environmental contamination.
11. It should not cause tissue changes which will alter postmortem examination or chemical tests; and
12. It should be economical.

The objective of this paper is to review the literature on the use of T-61* as an euthanasic agent and to determine to what extent it meets the above criteria.

Early Use of T-61

The use of T-61 solution for killing small animals was first reported in West Germany by Fikmeier in 1962 (5) and for killing large animals by Kuepper in 1964 (10). Fikmeier concluded after killing 350 dogs and 300 cats that the material was very suitable for euthanasia. Its use in private practice has spread in some countries. In Italy, under the trade name “Tanax,” this material is being widely used to kill unwanted animals in municipal animal pounds (21). In the United States, its clinical use in small animals was first reported by Quin in 1963 (16).

The Agent

T-61 is an injectable nonbarbiturate solution that consists of a mixture of three agents (3). Each milliliter contains:

1. 200 mg of N-[2-(m-methoxyphenyl)-3-ethyl-butyl-1]gamma-hydroxybutyramide, having a strong narcotic effect on the central nervous system, where it also paralyzes the brain centers controlling respiration;
2. 50 mg of 4,4-methylene-bis(cyclohexyl)-trimethyl-ammomion iodide, which exerts a paralytic action on striated muscle and rapidly induces circulatory collapse (curariform-like action)*;
3. 5 mg of tetracaine hydrochloride, which is a local anesthetic added to reduce painful tissue reactions at the site of injection, with 0.6 ml of dimethylformamide in distilled water.

The manufacturers (3) recommend that, in dogs the injection should preferably be given intravenously. Intrapulmonary or intracardiac injections may be given where the intravenous injection is impractical, as in very small dogs and cats, or in a comatose animal with depressed vascular function. With the intrapulmonary route, care should be taken not to displace the lung tissue and inject into the pleural cavity. In cats the intrapulmonary route is considered by the manufacturers to be the most practicable method (3). Intramuscular or subcutaneous injections are contraindicated. T-61 is exclusively intended for the humane euthanasia of dogs, cats, mink, horses, laboratory animals (such as rats, mice, guinea pigs and rabbits), and birds such as pigeons and parakeets (3).

Two-thirds (2/3) of the total dose should be administered without interruption at the moderate rate of 1 ml each 5 seconds. The remaining one-third (1/3) may be administered rapidly. The correct injection technique is essential to effect euthanasia without excitation or pain because, when given too rapidly, transient anxiety and struggling may occur before unconsciousness (3).

The manufacturers (3) recommend that one should never overdose an animal with T-61, as this may lead to overexcitement and/or convulsions.

Effect on the Body

Euthanasia results from central nervous system depression, hypoxia and circulatory collapse. The AVMA Panel on Euthanasia (19) describes the drug as acting via a direct depression of the cerebral cortex, subcortical structures, vital centers and heart muscle. The ultimate cause of death is hypoxia and respiration ceases due to depression of vital centers and muscle paralysis.

A comparative study of T-61 and pentobarbital* indicated that either agent induced euthanasia smoothly and without undesirable reactions when properly administered (12, 13). The dogs given pentobarbital received a total dose of 57.1 mg/kg of body weight continuously at a rate of 1.2 ml/second. The dogs given T-61 received two-thirds of the total dose (0.3 mg/kg of body weight) at a rate of 0.2 ml/second with the last one-third given at 1.2 ml/second.

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*Note from Barocio: The curare-like drug is included to control seizures which may be caused by the narcotic component. According to one company’s veterinary representative, it assures that “if the animal were to regain consciousness, it would die away from respiratory arrest,” i.e., suffocation (21).

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Review of Literature on Use of T-61 as an Euthanasic Agent

Laura Dalia Barocio
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The manufacturers (3) recommend that, in dogs the injection should preferably be given intravenously. Intrapulmonary or intracardiac injections may be given where the intravenous injection is not readily accessible. The injection may be given either through the jugular or posterior auricular veins or into the alveoli of the lungs. The intrapulmonary route should be administered without causing fear, panic, or anxiety.

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* Sodium Pentobarbital: USP 1294 mg/ml.
a normal awake pattern to one of low frequency and increased amplitude for approximately 5 seconds followed quickly by electrical silence. The pentobarbital-treated dogs required 12 seconds longer for the occurrence of electrical silence. It was obvious that agents, alterations in electrocardiograph developed immediately and arterial pressure dropped to zero. However, three pentobarbital-treated dogs resumed an effective cardiac output and respiration. Analysis of the respiratory response from the start of injection until initial arrest indicated no significant difference between the two agents. Results of this study indicated that painless death is produced by pentobarbital or T-61 (12, 13, 19).

Dehner, cited by Quin (16), has stated: “For dogs, intravenous application of T-61 is the method of choice. The lethal effect frequently occurs even during the injection, otherwise, directly after this procedure. The animal collapses, muscular tonus dies away, and breathing stops. In the predominant number of cases, the animals die with no reaction of any kind, without resistant movements, outcrying, or shortness of breath. In rare instances where resitant movements occur, they persist only a few seconds. Ordinarily cardiac activity continues for a few seconds after breathing has stopped but rarely for as much as a minute.”

Comparison of T-61 With Pentobarbital According to Criteria for the Ideal Method

As stated earlier, the ideal method for euthanizing animals should satisfy the following criteria:

1. It should be painless.

The manufacturers have added tetracaine hydrochloride, a local anesthetic, to T-61 solution to reduce painful tissue reactions at the site of injection. Wills (23) has found that injecting T-61 intravenously in the rear-leg of small cats is very effective and painless (“about 100%”). However, McMurry (15) objects to the use of T-61 as an agent for euthanizing animals because of apparent severe pain upon injection. He states that tetracaine does not eliminate pain. When given intravenously as pentobarbital in contractions, there was obvious pain in 25 to 35% of the dogs euthanized (approximately 500) using T-61. He found that many of the dogs whine and/or howl. He also declares that if any of the material is injected perivascular, which can occur when encountering a highly excited animal, especially when injected by inexperienced personnel, the evidence of pain is very obvious.

Fox (7, 8), has likewise declared that even with the addition of the local anesthetic ingredient, pain reactions can be marked in some animals and may cause considerable excitement and distress.

2. It should cause unconsciousness instantaneously and death within minutes.

An appropriate technique for evaluating unconsciousness is electroencephalography (EEG). Up to 1974, there appeared to be no reported work giving EEG data from test cases of T-61 euthanasia. However, Rowsell investigated the use of T-61 for euthanasia in a rat and determined that the EEG became isoelectric (flat) within 4 seconds (21).

In 1978, Lumb (12) conducted EEG measurements in 21 dogs which indicated that T-61 rapidly (within 5 seconds) induced an isoelectric state indicating unconsciousness. These two studies, on one rat and 21 dogs, do not constitute sufficient proof that T-61 is effective in producing instantaneous unconsciousness in dogs, cats, horses, mink, laboratory animals and birds (as the manufacturers claim).

There is much conflicting anecdotal evidence on the efficacy of T-61. Wills (23) reported that intravenous injections of T-61 into the rear-leg of small cats is...very effective because complete unconsciousness occurs in 2 to 4 seconds and brain death in 10 to 20 seconds, whereas heart and motor functions cease in 20 to 30 seconds.” However, no specialized apparatus to measure time of unconsciousness, brain death and heart and motor functions was used.

The Executive Director of the Animal Shelter in Alexandria, Virginia (4), objects to the use of T-61 for euthanasia under any circumstances because of the pain factor which, as reported by McMurry (15), affected one-quarter of the dogs that he euthanized with T-61 (according to the procedure recommended by the manufacturers).

3. It should not cause undue anxiety, alarm, fear, panic, behavior, struggling, vocalization, muscle spasms or clinical signs of activation (e.g. convulsions) before unconsciousness.

Stonehouse (22) says that studies have shown that T-61 given intravenously, does not produce any initial curariform or muscle relaxant action before central nervous system depression occurs. Nevertheless, there are doubts. Baker (1) reports that T-61 was withdrawn in England because animals euthanized with this product exhibited distress, pain and convulsions prior to death. Baker noted that the “induction stage, anesthetic stage and respiratory paralysis do not occur in that order and animals tend to get respiratory paralysis prior to complete anesthesia.”

McMurry (15) also objects to the use of T-61 as an euthanizing agent because respiration does not always cease immediately and the heart continues to beat for several minutes following the recommended lethal dose.

There are also doubts about whether the paralyzing effects of the curare-like compound in T-61 occur before unconsciousness sets in. Like many curariform drugs, it may cause transient muscular tremors (depolarization) prior to unconsciousness (21), but it is not known how distressing this may be to animals (8, 15).

In contrast, the use of intravenous sodium pentobarbital has been shown to cause unconsciousness within the first seconds of injection, without any signs of distress or pain, or convulsions and howling (19).

There are also doubts about using T-61 by intracardiac or intrapulmonary routes, as recommended by the manufacturers (3), because of possible adverse reactions. For example, in the intrapulmonary route fluids in the lungs may cause significant distress and coughing prior to unconsciousness, and the intracardiac route is painful since the pericardium can be very sensitive to the needle (7).

With respect to the intraperitoneal route, the manufacturers recommend its use in mink but this is contraindicated. Uptake by this route is extremely slow and seizures may occur. In one study (16), three cats were given T-61 by intraperitoneal injection. They suffered spasms, excitement, a reflex bowel movement and dyspnea for 3 to 13 minutes before complete collapse.

Fogle (6) has noted in a letter that some veterinarians have stopped the use of T-61 because they felt it was not as humane as barbiturate intravenously. He declared that its main attraction was that it eliminated the “last gasp” that occurs with some dogs when they are euthanized with a barbiturate. This is hardly a suitable justification for an euthanizing agent.

In the study by Lumb (12), comparing T-61 and sodium pentobarbital for euthanasia, he notes that: “In most respects the effects of the two agents were similar; however, 3 of 12 dogs given pentobarbital resumed respiration and cardiac function. None of the 9 dogs given T-61 evidenced signs of recovery.” He then argues that (13): “On a comparative basis T-61 is superior to double-strength pentobarbital, in that the latter

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However, Reilly (18) states that Lumb used a dose of pentobarbital sodium which was close to the minimum lethal dosage, which is no reason, to imply as Lumb did, that T-61 is superior to sodium pentobarbital. Furthermore, the pentobarbital solution was far weaker (130 mg/ml). Reilly argues that this is the reason why some of the dogs resumed cardiac function and respiration.

4. It should always cause death when properly used.

There are numerous agents that can cause death, but in the case of T-61, "it is a lethal drug that causes death but not necessarily euthanasia" (15).

5. It should be safe for the properly trained person to use.

The drug is marketed as a vial which reduces any possibility of human ingestion. However, if T-61 is inadvertently taken orally by humans it will be absorbed very slowly and the onset effect will be delayed. Therefore, there should be enough time after inadvertent swallowing to remove the drug from the stomach, thereby preventing serious poisoning (9).

If small amounts of T-61 inadvertently get into a wound or under the skin of a person injecting it to a struggling animal, there is no danger of toxicity (9). However, Fogle (6) reported that in England, in the early 70's, there was a flurry of correspondence to the Veterinary Record concerning possible dangers to the operator in the use of the drug because of its curare-like effect. However, the indications are that it is as safe, or safer, than many other euthanasic agents.

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Fogle (6) declared in a letter that injecting T-61 intravenously in the rear-leg of small cats "is easy to learn, requiring only small degree of medical knowledge." But intravenous injections are not easy, even for properly trained persons. In addition, cats are hard to handle, which will make it more difficult to find a vein in the rear-leg. An advantage of sodium pentobarbital over T-61 for cats is that it can be given intraperitoneally; T-61 cannot. Also, cerebral excitement may occur if this drug is not injected according to the manufacturer's instructions (3) ("give the first two-thirds at a smooth rate of 1 ml per 5 seconds and then the rest rapidly"). Therefore, this compound will not be easy to administer and even experienced personnel can be expected to make mistakes, especially with nervous, struggling animals.

As stated before, no euthanizing drug should ever be given intratracheally because of its inhumaneness, but in such cases where it is required to give T-61 via the intracardiac route, it is necessary that the administrator be experienced and 100% confident of entering the heart every time (21).

Injection of sodium pentobarbital is easier than T-61 because it can be administered by several routes and the injection rate is not a critical factor.

7. It should not be a drug subject to abuse in human beings.

T-61 is not classified as a restricted drug by the Bureau of Veterinary Medicine of the Food and Drug Administration of the U.S. (11). However, its use is only permitted under veterinary supervision. By contrast, sodium pentobarbital is a schedule II drug and its use is closely regulated (11).

8. It should be aesthetically unobjectionable. (This criterion depends on who the observers are.)

When circumstances require the pet's owner to be present during the procedure, one must assure a smooth, rapid, and obviously painless euthanasia. According to reports, T-61 administration can be accomplished by agitation, anxiety and spasmodic body movements. So-
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9. It should be practical to use for the particular type of animal to be killed.

A certain proportion of the animals that are turned into shelters are in very poor condition. They may be injured, moribund or diseased. Under these circumstances T-61 cannot be used because the absorption and uptake of the compound may be delayed. Death is protracted with distressing convulsions and prematurity paralysis before narcotic unconsciousness can occur (7, 21). Therefore, T-61 is not an appropriate agent for euthanasia of these cases.

10. It should not create a problem of sanitation or environmental contamination.

T-61 and sodium pentobarbital do not have these kinds of problems; however, these two agents should not be injected into food animals designated for human or animal consumption.

11. It should not cause tissue changes which will alter postmortem examination or chemical tests.

When T-61 is given at larger than recommended doses, pulmonary edema and other tissue lesions may be produced (19).

12. It should be economical.

In comparison with sodium pentobarbital, T-61 is a relatively expensive agent according to the information in Table 1.

Conclusion

The available evidence indicates that there are many questions about T-61 as a satisfactory euthanasia agent. The only controlled study of animal EEG’s after T-61 administration indicated that this compound could produce rapid unconsciousness. However, the drug was administered via an indwelling catheter, hardly the type of condition to be found in a shelter euthanizing 10 to 20 thousand animals a year. Furthermore, the investigator compared the T-61 results with the results of a weak and marginally lethal dose of sodium pentobarbital.

### Table 1: Comparative Costs of T-61 and Sodium Pentobarbital

<table>
<thead>
<tr>
<th>Product</th>
<th>Class*</th>
<th>Unit Price (1 bottle)</th>
<th>Approx. Price (per 250 ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-61</td>
<td>Not schedule</td>
<td>$13.60</td>
<td>$60.00</td>
</tr>
<tr>
<td>Fatal-Plus-a</td>
<td>C-II</td>
<td>$55.00</td>
<td>$55.00</td>
</tr>
<tr>
<td>Euthanasia-b</td>
<td>C-II</td>
<td>$7.40</td>
<td>$18.50</td>
</tr>
<tr>
<td>Beuthanasia-D-f</td>
<td>C-III</td>
<td>$22.50</td>
<td>$56.25</td>
</tr>
</tbody>
</table>


c. Burns-Biotec Laboratories, Inc., Omaha, NE. Each milliliter contains: 390 mg of sodium pentobarbital, 50 mg of phenytoin sodium, 10% of ethyl alcohol, 18% of propylene glycol, 0.003686 mg of rhodamine B (coloring) and 2% of benzyl alcohol (preservative).

*Classification of a restricted drug by the Bureau of Veterinary Medicine of the Food and Drug Administration of the U.S. (11).

**These prices were obtained from the manufacturers.
The study was, thus, hardly a fair test. Anecdotal evidence indicates that, in practice, T-61 euthanasia can be associated with many problems. In addition, it has to be injected intravenously in a carefully controlled manner to achieve optimal results. It is totally unrealistic to expect that routine euthanasia in a busy shelter will be able to keep to such a precise protocol which has only a small margin for error.

At present, T-61 cannot be recommended for routine practice when the most reliable and apparently cheaper, alternative of sodium pentobarbitone can be used. At best, T-61 should be used only as an emergency backup when the supplies of barbiturates have run out, and its use restricted to healthy animals in a carefully controlled manner to protect and defend the rights of animals by enacting humane and environmentally sound legislation.

Whereas, The State of California has in the past led the country in passing legislation which recognizes the principles of animal rights; and

Whereas, From childhood man should be taught to observe, understand, and respect animal life which is linked to respect for mankind; and

Whereas, To advance our civilization we must become aware of the rights of all animals; now, therefore, be it

Resolved by the Senate of the State of California, the Assembly thereof concurring, That the Legislature of the State of California should take effective measures to protect and defend the rights of animals by enacting humane and environmentally sound legislation.

H.R. 3170: A Bill for Farm Animals

Thanks to a bill introduced by Rep. James Howard (D-NJ), intensive farming practices could get a close look from a Congressional Commission.

On May 26, 1983, Rep. Howard introduced his improved version of the Mottl bill from last Congress. The new bill was immediately referred to two House committees—a major strategic improvement over the fate of the Mottl bill, which was referred to only one, the House Agriculture Committee. The Howard bill has again been referred to the Agricultural Committee, except this time the bill has also been given joint referral to the Health Subcommittee on the House Energy and Commerce Committee. Joint referral means that either Committee could initiate hearings without having to wait for the other’s timetable.

For the first time in the history of the U.S. Congress, there could be a Commission to look at intensive methods of livestock and poultry husbandry.

Although Rep. Howard admits to being more interested in the “consumer end than the farmer end,” H.R. 3170 would establish a commission to study “intensive farm animal husbandry.” Howard claims the suffering of the animals is shocking and that the effects of eating food produced through intensive confinement is alarming. According to the most recent research, human beings are exposed to health risks from antibiotics, as well as growth hormones such as DES and appetite stimulants such as arsenic, which are given to farm animals to boost profits and productivity.

The Howard Commission would set in motion a well-balanced, hard look at modern intensive farming practices which is long overdue. Along with the consumer health issue, environmental issues would be examined, as well as the economic impacts of intensive vs. alternative husbandry practices for the farmer, producer, and consumer.
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In a carefully controlled manner to keep to such a precise protocol which is totally unrealistic to expect that routine euthanasia can be as successful as T-61.

References

Legislation & Regulation

Legislative Recognition of Animal Rights

There have been several inquiries about legislation in California which recognizes that animals have rights. The state of California’s resolution on this matter is here reprinted in its entirety.

Senate Concurrent Resolution No. 8

Resolution Chapter 99

Senate Concurrent Resolution No. 8 — Relative to animal rights. [Filed with Secretary of State September 18, 1979.]

LEGISLATIVE COUNSEL’S DIGEST

SCR 8, Roberts: Animal rights. This measure states that the Legislature should take effective measures to protect and defend the rights of animals by enacting humane and environmentally sound legislation.

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British Government Issues: Revised Welfare Codes for Pigs and Cattle

On May 3, 1983, the Ministry of Agriculture published two new codes of welfare for pigs and cattle. These included recommendations that alternative systems to the use of stall systems for keeping gilts and sows should be adopted and that cattle should at all times have sufficient room to lie down. These codes which were revised by the Farm Animal Welfare Council, some 12 years after their last issue, include advice on welfare aspects related to farm buildings and housing, ventilation, temperature, and lighting, fire and other emergency precautions, feed and water requirements, and general husbandry practices for cattle and pigs, with additional recommendations for raising pigs outdoors and indoors.

The question of keeping pigs in stalls is raised in this latter section in the codes. It is stated that the keeping of sows and gilts in stalls with or without tethers raises serious welfare problems (see also report by Barnett, et al., under Issues: Analysis), and that alternative systems, such as straw yards, yard-and-cubicles or kennels, “in which animals’ behavioral and exercise needs can be more fully met,” are strongly recommended.

In Section 35 of the codes for cattle, a similar recommendation that will require a change in certain farming practices, if it is to be adopted, is suggested: namely, that all cattle, whether in pens or tethered, should at all times “have sufficient freedom of sideways movement to be able to groom themselves without difficulty and sufficient room to lie down and freely stretch their limbs and to rise.” Consideration should be given to the adoption of appropriate loose-housing systems and is therefore recommended.

Apparently, the government is taking a strong position that these and 119 other recommendations contained in the two new codes are not to be seen simply as advisory. Mrs. Peggy Fenner, Parliamentary Secretary for Agriculture, in making these recommendations public in London stated that they had behind them the authority of government and Parliament observing that “whilst a failure to comply with them is not itself illegal, such a failure can be taken into account by the courts if a livestock keeper is charged with causing unnecessary pain or unnecessary distress to farm livestock. Moreover, the Farm Animal Welfare Council (FAWC) is now considering whether the time is ripe for any of the provisions of these codes to be translated into binding regulations.”

Codes of practice on the care of farm animals and horses during their transport on roll-on-roll-off ferries and codes of practice for the transport by air of cattle, sheep, pigs, and horses, have been published also by the Ministry of Agriculture Fisheries and Food, and copies of these can be obtained from the Ministry of Agriculture Fisheries and Food, Government Building, Hook Rie South, Tolworth Surbiton, Surry, KT6 2NF, England.

Laws to Protect Circus and Performing Animals

WSPA also provides some relevant information pertaining to the protection of animals in Germany and Switzerland where the use of methods whereby the animals are afflicted with pain, suffering, or injury for training purposes, is prohibited. They go on to note: “In Sweden, where until recently exemptions to the ban on performing animals used to include sea lions and elephants, these two animals have now been added to the list of forbidden animals. In Denmark, all circus performances with animals are forbidden. In England, the Performing Animals (Regulation) Act of 1925 deals mainly with the licensing of trainers who are not required to specify how or with what apparatus their animals are trained. It further safeguards circuses from spot checks by local authorities and police. This would automatically include animal welfare organizations. Information from the Captive Animal Protection Society, 17 Raphael Road, Hove, East Sussex, BN3 5QP. Yet the number of local authorities in England which ban circuses from their land has risen to 52, including 11 London Boroughs.

In France, the International League for Animal Rights (ILAR, 21 rue Jacob, 75006 Paris) maintains that Decrets 77-1296/25 of November 1977 for the establishments under discussion are not complied with. None of the local authorities (Prefectures) have taken steps against these enterprises for non-observance of the rules established in law. In some cases would have led to closure.”

“RSPCA Wins Test Case”

The RSPCA in England has won its case against a Surrey egg producer which may have wide repercussions within the poultry industry. The defendant was prosecuted under the Welfare of Livestock (Intensive Units) Regulations, 1978, for failing to ensure that 20,000 birds in his intensive unit were adequately inspected during a 24-hour period. The RSPCA produced evidence showing that no more than nine minutes were spent by the stockkeeper in his units of which part of this time was spent attending to the automatic feeding equipment. The RSPCA used two offices equipped with telephoto lenses and binoculars to obtain evidence. Expert veterinary opinion given during the trial stressed that if the intention of the animal welfare regulation governing adequate inspection for the well-being of the livestock was to be fulfilled, then it was clear from the evidence obtained by the RSPCA inspec-
Howard’s bill, H. R. 3170 “The Farm Animal Practices Act,” has already attracted 20 cosponsors: Peter Rodino (NJ), Walter E. Fauntroy (DC), Michael D. Barnes (MO), Barney Frank (MA), Richard L. Ottinger (NY), Thomas M. Foglietta (PA), Ted Weiss (NY), Ronald V. Dellums (CA), James Weaver (OR), Dennis Hertel (MI), Robert Roe (NJ), Norman Y. Mineta (CA), Louis Stokes (OH), Frank Annunzio (IL), George W. Crockett (MI), Tom Lantos (CA), William J. Hughes (NJ), Bob Edgar (PA), Mike Lowry (WA), and Bernard Dwyer (NJ).

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**An Animal Protection Law for Luxembourg**

The World Society for the Protection of Animals (May 19, 1983, No. 4) reports that on March 15, 1983, “the Grand-Duchy of Luxembourg issued a Law with the stated objective of the protection of the life and well-being of animals.” Mr. L. Frising, WSPA Advisory Director and President of the ‘Ligue Luxembourgeoise des Droits de l’Animal,’ expressed satisfaction with the Law which is, however, still awaiting implementing Regulations which are to be prepared by a Commission set up on 28 March 1983 by the Minister of Agriculture. In this Commission, Mr. Frising represents the interests of animal welfare.

“The humane movement of Luxembourg took some exception to Chapter 7 of the Law entitled ‘Animal Experiments’ but a statement issued by the Chamber of Deputies was considered reassuring. The statement reads as follows: ‘The limited enumeration of the purposes which would justify animal experiments is equivalent to a principal prohibition of animal experiments, for which it is designated by the improper term vivisection.’ Mr. Frising himself and his organization hold the view that there are three kinds of animal experiments: (1) those that even today cannot be replaced and are absolutely necessary to protect the life of man and also that of animals. Only few of these experiments are left; (2) Experiments that can be replaced by alternative methods already today and therefore can be absolutely avoided; and (3) tests that serve primarily lucrative and commercial purposes in the cosmetics industry. These tests should be prohibited without exception.” Copies of the Law in French can be obtained by writing to the WSPA Office, Dreikonigstrasse 37, CH-8002, Zurich, Switzerland.

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**Current Events**

**MEETING REPORT**

**Conference on the Human-Animal Bond: CENSHARE**

A two-day conference on the Human-Animal bond convened in Minneapolis June 13-14, 1983, sponsored by the Center to Study Human-Animal Relationships and Environments (CENSHARE), the College of Veterinary Medicine and the School of Public Health, University of Minnesota. The conference was coordinated with help from the Latham Foundation of California and the Delta Society in conjunction with a similar program being held at the University of California, June 17-18, 1983.

The conference format emphasized current scientific research in two areas: companion animals and people; and management, behavior, and well-being of farm animals. Posters and educational exhibits were displayed as well as film and video tape productions. Over sixty reports were presented representing the truly multidisciplinary approach needed to study the human-animal bond.

Ronald Kilgour criticized the antagonism between animal welfare groups and farmers because that degree of polarization puts animals at risk. He suggested that to adequately examine the welfare of animals, one must first know the natural history, evolution, and behavior of individual species. He stressed the need to: 1) design livestock systems to fit the animal; 2) use knowledge of behavior and indicators of distress to identify areas of concern; 3) precondition to housing and husbandry; 4) select strains/breeds to match farm conditions; and 5) prevent disease and accidents.

Stan Curtis reviewed current research in swine behavior and commented that swine ethology is not being applied as fast as he anticipated because of a gap between behavioral scientists and farmers. To bridge that gap, overtures must be made to farm management specialists in order to package new systems attractively. This may involve minor changes in existing systems as well as major new ones. Reproductive management was one area mentioned where major changes are needed; the use of boars discriminating anestrus and estrus sows haven't been incorporated into mating schemes and designs.

Increasing the welfare of laying hens involves changes in the physical environment (pen design), social environment (group size, debeaking) and genetic selection for hysterical resistant stock, according to J.V. Craig. Beak trimming with a hot blade is presumed to be temporarily painful, but when done properly it can actually enhance the well-being of laying hens. It may increase nesting time, decrease fear and agonistic behavior, decrease pain of dominant hen on subordinate, decrease mortality, increase eggs laid and decrease cortisol levels.

W.B. Gross characterized the chicken's response to stressors in its environment as an allocation of resources based on genetic potential and life long environmental experiences. Stress indicators include ratio of heterophils to lymphocytes (H/L), vocalizations, and feed efficiency. A high level of social stress resulted in increased H/L ratios and feed consumption; increased resistance to mites, and bacterial infection; decreased resistance to Marek tumors and viral infection; decreased weight gain and feed efficiency. Highest feed conversion and efficiency levels were obtained with 4-8 birds/cage. An important component of the bird's response is human exposure. Socialized birds (hand-held, spoken to) showed increased feed efficiency, growth rate, uniformity of responses to all tests, resistance to stressors, antibody response to antigen and increased resistance to a wide variety of infectious agents.

The companion animals and people sessions were organized according to: Perspectives on animal awareness and interspecies communication; Developing curriculums of Human/Animal relationships for children K-12; Research reports on interactions of people and companion animals; Horseback riding for the handicapped; Research reports on pet-facilitated therapy—long-term care; Research reports on behavior and temperament; Workshop—how to improve behavior of pets and the quality of companionship. The premier showing of Intimate Companions, an Adelphi Productions film, was featured. The film creates Dr. Aaron H. Katcher's blood pressure experiments in which he compared people interacting with animals, and people interacting with their pets.

S.R. Kellert presented the results of a study of over 250 children in the 2nd, 5th, 8th, and 11th grades. A battery of tests were used to examine children's knowledge and attitudes toward animals, species, preferences, and behavioral contacts with animals. It identified three stages of development in children's relationships to animals. Six to nine years of age involved changes in affective, emotional relationships; ten to thirteen showed an increase in awareness and cognitive understanding; thirteen to sixteen was marked by the development of an ethical concern and abstract conceptual understanding of animals.—Scott Sanderson

**Book News**

**BOOK REVIEWS**


This is a collection of papers by various persons involved in laboratory animal care and research, which was presented at the First Conference on Scientific Perspectives in Animal Welfare sponsored by The Scientists Center for Animal Welfare. The book is divided into five sections with an introductory overview on the history of the use of animals in medical research by Dr. Franklin M. Loew and a paper by Dr. Thomas E. Malone, Acting Director, National Institutes of Health, entitled "Towards Refinement, Replacement, and Reduction in the Care and Use of Laboratory Animals." The book is divided into five sections, dealing respectively with: investigator responsibilities in animal experimentation; institutional responsibilities in animal experimentation; funding agency responsibilities; and journal editor responsibilities in relation to the care and use of animals, the findings from which are submitted for publication in technical journals.
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Each of the above sections concludes with a summary of conclusions and recommendations drawn up by a small task force of participants. The fifth and final section deals with public policy and recommendations. This symposium proceeding is a welcome contribution to the field of laboratory animal science and to such related areas as public concern over the care and use of laboratory animals and the responsibilities of those involved in their care and exploitation for biomedical and other purposes.

M.W. Fox

ALL THAT DWELL THEREIN. ANIMAL RIGHTS & ENVIRONMENTAL ETHICS, Tom Regan, University of California Press, Berkeley, California. (1982) $18.95

This series of essays written between 1975 and 1981 deals with the rights-based theory for more humane treatment of animals, and later essays also explore the question of environmental ethics from the rights perspective.

With reference to vegetarianism he states, “The question of the obligatoriness of vegetarianism...can arise only if and when the animals we eat are the kind of beings who have interests.” His critique of the limitations of such concepts as kindness and cruelty, which are widely used by animal wellfarists, is extremely perceptive, and reveals how judgmental and human-centered these concepts are. There might be less judgment and more constructive dialogue between animal protectors and their perceived adversaries (especially animal researchers) if the former were more aware of the shortcomings of their own attitudes and perceptions.

While the author states that “fundamentally my intentions are practical, not theoretical,” the major impetus of his book is to expand the scope of concern for the treatment of animals in society by appealing to reason and moral sensibility. But since his position is stolidly against using animals in research, raising farm animals for food, and the exploitation of wildlife and the natural environment, his position will seem ideologically unreasonable to many. However, Regan’s work should be widely read by all who are involved in one form of animal exploitation or another since his views are gaining wide acceptance by the more militant animal-liberation faction of the humane movement.

He is rightly critical of the Cartesians view that animals are “unfeeling machines” and in many of the essays fairly attacks his nemesis, the Benthamite utilitarianism of Australian Peter Singer, another leading philosopher in the animal liberation movement. His attack on Singer’s utilitarianism seem to reflect his own ideological resistance to make the necessary integration of his animal rights ideology with the pragmatic necessity of having to exploit life in order to sustain human life. He is right, I believe, in pointing out Singer’s dialectical quality of existence. But perhaps he is right in doubting that man can have an ethical, spiritual relationship with animals and nature and a utilitarian one, such that we can respect and exploit at the same time when the exploitation is on a wholesale, commercially industrialized scale for profit, rather than on an ecologically sound and more humane scale for subsistence.

By integrating a more ecological utilitarianism with animal rights, both views would be strengthened. The former lacks reference to the animal’s telos or intrinsic qualities (other than sentience, in Singer’s philosophy) and the latter, as presented by Regan, lacks the empiricism and ecological perspective that utilitarianism can give. The negative ecological and long-term economic consequences of “factory” farming of livestock and poultry, for example, provide a rational and realistic utilitarian basis to question the ethics of such industrialized exploitation which violates animals’ rights. Utilitarianism, combined with respect for the intrinsic worth (or rights) of animals, could more effectively lead to the social reforms Regan hopes for, through enlightened self-interest. This dialectical tension between the rights of individuals and the good of the whole may be resolved, I believe, by integrating Regan’s respect for the life of the individual with a deep understanding of the dynamic relationships of all individuals within the ecological whole which, through reciprocal maintenance, (possibly the highest form of utilitarian enlightened self-interest) insures balance and harmony (philosophically, an egalitarian ecology).

I also think that if Regan were to discuss the importance of empathy and the reasons why animals are treated inhumanely and unethically, his work might be even more influential. Furthermore, the philosophical, rational approach to this entire issue, if it is not to be itself upon some barren and impractical ideology (which appeals to moral anarchy), must address reality: the tragedy of reality that we must kill life (but not overkill) in order to sustain our own. But the increasing anxiety of the times, along with self-righteous moral indignation and outrage at man’s inhumanity, can paralyze the ability to reason, empathize and love. Regan helps us begin to reason, to objectively and dispassionately look at ourselves, and for this reason, his book should be read by all who are involved with animals in whatever mode—research, teaching, biology, psychology, medicine, farm animal science, and wildlife biology and management, as well as conservation and animal welfare.

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He is rightly critical of the Cartesian view that animals are “unfeeling machines” and in many of the essays fairly attacks his nemesis, the Benthamite utilitarianism of Australian Peter Singer, another leading philosopher in the animal liberation movement. His attacks on Singer’s utilitarianism seem to reflect his own ideological resistance to make the necessary integration of his animal rights ideology with the pragmatic necessity of having to exploit life in order to sustain human life. He is right, I believe, in pointing out Singer’s paradoxes in his inability or resistant to incorporating animal rights into his strictly utilitarian philosophy, which is anthropocentric and thus flawed with potential “speciesism.” It is ironic that these two philosophers, whose ideas have much to offer the animal welfare movement, have not seen the wisdom of their paradoxically complementary views, a reconciliation of which would allow for much greater strength and clarity. Such a necessary unity, of utility and respect for the life of the individual (both human and non-human) is the pejorative step toward a more unified theory which casts the paradoxical, yet complementary, dualities of Bentham-Singer utilitarian exploitation (i.e., objectivity) and Schweitzer-Regan reverence for life, animal rights and intrinsic value (i.e., subjectivity) into an ecological/cosmological framework. This ecological view, although mentioned repeatedly by Regan, is not, unfortunately, incorporated into his animal rights argument because, no doubt, it contains that element of utilitarian exploitation between animal and plant communities to which he has become allergic. This is quite understandable, since to penetrate the depths of reason, as he has, entails much suffering through empathizing with those creatures whose lives are cruelly and trivially exploited by “civilized” man, for profit and pleasure.

His essay entitled “The Nature and Possibility of an Environmental Ethics” echoes, in its preservationist conclusion, the same vegetarian-antivivisectionist anti-utilitarian position argued for in earlier essays. Likewise in his last chapter which explores the native American Indians’ relationship with nature (and who engaged in widespread commercial trapping soon after contact with the white man in apparent violation of their alleged spiritual attitude toward nature) he asks if the Indians “viewed nature primarily as having value in its own right…(or) primarily as a system of resources…” In questioning which view is primary, Regan creates a polarity which again reflects his own inability or resistance to accept neither “utopian dialectical quality of existence. But perhaps he is right in doubting that man can have an ethical, spiritual relationship with animals and nature and a utilitarian one, such that we can respect and exploit at the same time when the exploitation is on a wholesale, commercially industrialized scale for profit, rather than on an ecologically sound and humane scale for subsistence. By integrating a more ecological utilitarianism with animal rights, both views would be strengthened. The former lacks reference to the animal’s telos or intrinsic qualities (other than sentence, in Singer’s philosophy) and the latter, as presented by Regan, lacks the empiricism and ecological perspective that utilitarianism can give. The negative ecological (and long-term economic) consequences of “factory” farming of livestock and poultry, for example, provide a rational and realistic utilitarian basis to question the ethics of such industrialized exploitation which violates animals’ rights. Utilitarianism, combined with respect for the intrinsic worth (or rights) of animals, could more effectively lead to the social reforms Regan hopes for, through enlightened self-interest. This dialectical tension between the rights of individuals and the good of the whole may be resolved. I believe, by integrating Regan’s respect for the life of the individual with a deep understanding of the dynamic relationships of all individuals within the ecological whole which, through reciprocal maintenance, (possibly the highest form of utilitarian enlightened self-interest) insures balance and harmony (philosophically, an egalitarian ecology). I also think that if Regan were to discuss the importance of empathy and the reasons why animals are treated inhumanely and unethically, his work might be even more influential. Furthermore, the philosophical, rational approach to this entire issue, if it is not to be beached upon some barren and impractical ideology (which appeals to moral anarchy), must address reality; the tragedy of reality that we must kill life (but not overlook) in order to sustain our own. But the increasing anxiety of the times, along with self-righteous moral indignation and outrage at man’s inhumanity, can paralyze the ability to reason, empathize and love. Regan helps us begin to reason, to objectively and dispassionately look at ourselves, and for this reason, his book should be read by all who are involved with animals in whatever mode—research, teaching, biology, psychology, medicine, farm animal science, and wildlife biology and management, as well as conservation and animal welfare.

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