

have not been able to come to terms with our biases and prejudices in the matter of human race relations, religion and sexuality. What hope remains for our attitude towards animals?

Schweitzer⁶ fully grasped the enormity of this problem and realized that we are indeed far from a final solution. He thus concludes his brilliant essay entitled 'The ethic of reverence for life' with the following words, and I can think of no better way than to end this essay with them:

'Wherever any animal is forced into the service of man, the sufferings that it has to bear on that account are the concern of every one of us. No one ought to permit, insofar as he can prevent it, pain or suffering for which he will not take the responsibility . . . The ethic of reverence for life . . . inspires us to join in a search for opportunities to afford help of some kind or other to the animals, to make up for the great amount of misery which they endure at our hands, and thus to escape for the moment from the inconceivable horrors of existence.'⁶

1. Reported in *Science Digest*, November 1973, p. 32.

2. Regan, T. and Singer, P. (eds). *Animal Rights and Human Obligations*, Prentice-Hall, New Jersey, 1976.

3. Aquinas, St. Thomas, *Summa Contra Gentiles*, (translated by the English Dominican Fathers), Benziger Brothers, 1928. Reprinted in *Animal Rights and Human Obligations* (eds Regan, T. and Singer, P.), Prentice-Hall, New Jersey, 1976, pp. 118-121
4. Plutarch, reprinted in *Animal Rights and Human Obligations* (eds Regan, T. and Singer, P.), Prentice-Hall, New Jersey, 1976, pp. 111-117.
5. Bentham, J., *The Principles of Morals and Legislation*, 1789. Reprinted in *Animal Rights and Human Obligations* (eds Regan, T. and Singer, P.), Prentice-Hall, New Jersey, 1976, pp. 129-130.
6. Schweitzer, A., in *Civilization and Ethics (The Philosophy of Civilization, Part II)*, Macmillan, New York, 1950, pp. 130-138.
7. Singer, P., in *Animal Rights and Human Obligations* (eds Regan, T. and Singer, P.), Prentice-Hall, New Jersey, 1976, pp. 148-162
8. Feinberg, J., in *Philosophy and Environmental Crisis* (ed. Blackstone, W.), University of Georgia Press, Georgia, 1974, pp. 190-196.
9. McCloskey, H. J., *Phil. Quart.*, 1965, 15, 115-127.
10. Salt, H. S., *Animals' Rights*, The Humanitarian League, London, 1912
11. Ritchie, D. G., *Natural Rights*, Allen and Unwin, London, 1894.
12. Regan, T., reprinted in *Animal Rights and Human Obligations* (eds Regan, T. and Singer, P.), Prentice-Hall, New Jersey, 1976, pp. 197-204
13. Rachels, J., in *Animal Rights and Human Obligations* (eds Regan, T. and Singer, P.), Prentice-Hall, New Jersey, 1976, pp. 205-223
14. Cheney, D. L. and Seyfarth, R. M., *How Monkeys See the World*, University of Chicago Press, Chicago, 1990.

In late 1994, Jane Goodall, the eminent primatologist and now a noted advocate for the noninvasive use of animals in research, gave a call to academicians the world over to participate in a dialogue. This was essentially aimed not only at raising the awareness of researchers, but more importantly, at opening up a serious discussion on the ethics of using laboratory animals in often painful and sometimes relatively unwarranted basic and medical research. We reprint below some excerpts from this call.

— Editors

On the use of animals in research and education

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The use of nonhuman animals for the purposes of humans has long been taken for granted in our culture, and has been institutionalized by entire industries. In recent years, however, a new awareness of animals has been developing, and new attitudes and practices have come into being.

Over the last two decades, the ethical and broad scientific implications of the use of animals in laboratory experiments have come to be examined more and more critically, and new research methods have been developed. There may now be some consensus among scientists, as well as among the public, that the use of animals raises ethical questions that must be dealt with.

However, discussion of the use of animals in general and as experimental subjects in particular has been polarized and contentious. Research scientists and animal rights advocates have regarded each other with distrust, and constructive dialogue has been scarce. Stereotypes of the researcher as unfeeling, and of the animal advocate as fanatical, have been persistent.

It is time for the ethical, scientific and practical issues raised by the use of animals in research and education to be aired anew, with a fresh measure of good will.

By and large, institutions of higher learning have not paid enough attention to the status and treatment of animals in society and in the institutions themselves. We,



Animals are frequently subjected to avoidable torture. This animal is fistulated – a process of cutting a circular hole of about 25 cm and covering with a removable plug so as to draw the contents from inside whenever needed.

therefore, urge that educational programmes and public forums, such as conferences, symposia, debates, film showings and seminars, be organized to consider the full range of questions raised by animal experimentation and by the use of animals in academic settings.

For example:

- ◆ What are the ethics of using animals as tools for human purposes, and of invasive or otherwise harmful experimentation on animals? Do animals have a right to be treated as ends in themselves and not as means only?
- ◆ What are the practical limits on the pain and suffering to which nonhuman animals in laboratories can be subjected? What kind of protection is given by existing laws and institutions? How common are practices that involve unalleviated pain? Are such experiments ever justified? Is there a conflict between limits on pain and suffering and the advancement of science or academic freedom?
- ◆ What animals are subjected to what experiments at your school? What are the experiments most harmful to animals? Do any involve causing pain without administering pain killers?
- ◆ To what degree have animal experiments been useful and valuable? What role have they played in the history of medicine? With respect to the future: would human health suffer if medical research were guided by a new vision in which animal experiments had no place? Would it benefit?

- ◆ There is an array of research methods, including clinical study, epidemiology, *in vitro* tissue culture research and computer modelling, that do not use animals. What is the adequacy and scope of these methods?

- ◆ Animal experiments generally begin not with sick animals in need of healing, but with healthy animals, who may then be inoculated with approximations of human diseases, or exposed to toxic substances, or subjected to a variety of surgical or other procedures. Psychological experiments have included work on such themes as 'maternal deprivation' of primates and 'learned helplessness', and military experimenters subject animals to wounds and burns. What would be the effect on medical science if experiments were limited to attempts to heal already sick or injured animals?

- ◆ Is the elimination of animal experiments a worthwhile goal? What about reduction in numbers of animals used, replacement of animals with nonanimal methods, and 'refinement' of experimental procedures? If such goals are worthwhile, how should they best be achieved? What is being done towards these ends today, and what is not being done that could be? How much room for improvement is there?

- ◆ Under what conditions are the animals at your school housed and cared for? Are their cages kept clean? Are their physical needs cared for adequately? Do they have veterinary care? Are their psychological and social needs met? How does the disruption of normal family life affect them? Do they receive loving attention? Can they be visited by members of the community? If not, why not?

- ◆ Millions of animals each year are killed for dissection to teach students life sciences. Is dissection necessary as an educational tool? What options are in use at your school for students who conscientiously object to dissection?

- ◆ Who are the suppliers of animals for dissection at your school? How many animals are killed each year for dissection? How much is paid for them? What are the conditions under which these animals are bred or captured and under which they are maintained and killed? Are visits to the suppliers' premises possible?

For help organizing a forum, The Green World Center will provide consultation, advice, and resources concerning

- (a) organizing forums, film showings, educational activities and events;
- (b) educating yourself and others about the issues related to animal experimentation;
- (c) learning about animal experimentation on your campus.

Resources include speakers, literature, and an excellent Canadian Broadcasting Company video on animal research with David Suzuki.

If you think you might like to help in any capacity, or if you just want to learn more about animal experimentation, please write to or phone:

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Human-animal interactions

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There has been limited research conducted on the importance of the human-animal relationship. This paper describes the ways in which human behaviour or attitude might influence the welfare of tamed animals.

That man is important in an animal's environment is not disputed. Direct interactions between humans and animals have always been a part of the animal production system. The way in which the animals respond to human contact is governed by the way in which they perceive humans, and this is influenced both by their early developmental experience and by their natural responses or genetics. In general, it is believed that domestic animals are less fearful of humans, their flight distances are shorter than their wild counterparts, and they are more able to cope with human intervention. But animal responses are at least in part governed by fear. The fear response of animals is thought to be one cause of a chronic stress situation. Simply by being in, and imposing themselves on, the environment of an animal, humans induce fear and adverse reactions in the animals¹.

Animal responses to humans have been measured. For example, in battery-housed hens there was an increase in the resting heart rate from 140–240 beats/min up to 280–350 beats/min when a human entered the building; and rose to 480 beats/min when the human approached the cage and encroached upon the birds' natural flight zone (or personal space).

Effect of handling animals

Recent studies have shown that different handling procedures influence the performance and behaviour of animals. Growth rates in pigs were shown to be adversely influenced by what were termed 'aversive' and 'negative' handling. Pigs were conditioned to elicit a

particular response from a human every time they interacted. The aversive treatment involved prodding with an electric prod every time a pig approached a human, and negative treatments involved a human approaching the pig in an upright posture and reaching towards it. Growth rates were approximately 10% lower in these treatments than in minimal contact or positive contact treatments. The reduction in growth rate was attributed to the chronic psychological stress experienced by the animal as a consequence of the handling treatments. In order to test this, the morphology of each treatment groups' adrenal glands was examined; it was found that the area of the adrenal cortex in pigs that experienced aversive treatments was almost 30% greater than those subjected to minimum, or positive treatments².

In other studies³, reproductive performance has been shown to be influenced by handling treatments. When gilts were conditioned to expect to be scratched and stroked by humans, or pleasantly treated, they were easily mated at second oestrus, with a pregnancy rate of 87.5% as compared to only 33% in gilts that had been conditioned to expect a shock from an electric prodder. Boars in the unpleasant treatment groups were on an average 31 days older before they demonstrated a fully coordinated mating response, and their testicles were 10 cm² smaller. Measures of the concentration of plasma cortiosteroids in the absence of humans showed higher concentrations in all pigs following the unpleasant treatment.

Thus, it appears that different forms of handling can influence growth and productivity, and that it is probable that this is due to the animals' fear response to humans. There are several more examples of the effect humans have on farm animals: milk yield has been shown to vary between stockpeople; handling can negatively affect ovulation rate in ewes; regular handling during early development can enhance growth in broilers (neat-producing hens), and so on. It is obvious that