

The culture and agriculture of animal production

Animal mythology

According to the legends of the Ojibwa people of central Canada, humans were able to survive in the world because of the cooperation of animals, beginning with the turtle who allowed its shell to form the base of the land, and the toad who carried soil up from the depths. For the people of ancient Egypt, a person's destiny after death was decided by the god Anubis who was part jackal, by the goddess Matte who was part falcon, and by other deities who spanned the human, animal, and supernatural realms. In the opening chapter of the Bible, all beings were created by a single, omnipotent god who then gave humans the responsibility of ruling over the other species in his place.

As we see from these examples, there is a widespread tendency for cultures to possess an "animal mythol-

ogy" which helps to define the relationship between humans and other species. Animal mythology, in this sense, is not a negative term implying incorrect or outdated ideas; it refers rather to basic, popular beliefs and values regarding animals, often best seen in a culture's art and stories, which influence how people view animals and what they judge to be proper conduct toward them. This type of mythological view is not just different from a reductionist, scientific view of animals; it is, in a sense, almost the opposite. A reductionist view sees animals made up of parts such as genes, chemicals, and physiological processes, whereas the mythological view starts with the animal as a whole and then adds additional elements, such as symbolic meaning and positive or negative value, which resonate with human fears and aspirations.

Currently, in science and agriculture, animals are often viewed as "tools for research" (to use Peter Singer's phrase) or as commodities to be produced, processed and traded. However, this view of animals may clash with the animal mythology of our culture, and that clash can become a source of conflict and public concern. Thus, to understand public concerns over the use of animals in agriculture, we need first to understand the underlying mythology on which our culture's values are based. But what are the mythologies that pertain to animals in our culture? How are these mythological views changing? And are there ways to reconcile our use of farm animals with our animal mythology?

The nature of animals in Western mythology

Basic to any animal mythology are beliefs about what animals are like, and related beliefs about how valuable and important they are. In the West, the most highly valued animal has traditionally been the domestic dog which is consistently portrayed in art and literature as a loyal and sympathetic friend to humankind. Consistent with this mythology, dogs are typically treated as members of human families, given distinctive names, rescued from harm by public institutions, and totally exempted from slaughter for human food.

Ironically, the lowest end of the moral scale has traditionally been occupied by the dog's close relative, the wolf.

Through much of our history the wolf has been seen as an enemy of humans who, in our popular folk tales, connives to eat children and old people, and whose death, however gruesome, is always a source of satisfaction. And in line with this negative image, people for centuries have hunted, trapped and poisoned wolves with few regrets, and until recent decades, public funds in North America were spent to encourage people to exterminate them.

The farmed animals fall between these two extremes. They are seen as very much a part of human culture, and sometimes a source of great pride, but are valued mainly for their practical usefulness. Hence, they are seen as worthy of human care and consideration, but in ways that are generally consistent with their practical value.

Within our value system, therefore, it might seem completely logical for a person to take an ageing dog to a veterinarian to prolong its life, then carefully (so as to avoid causing undue stress) load a truck with six month-old pigs to be shipped for slaughter, and finally set out a leg-hold trap to do away with some pesky coyote. In reality, those three species are roughly similar in their level of mental functioning, their capacity for suffering, and other attributes that make the animals' welfare a legitimate concern. The fact that we treat the species so differently shows the powerful influence of our animal mythology on our day-to-day actions.

Contents ...

The culture and agriculture of animal production	1
Experimental research with laboratory animals: one sex or both?	5
Review of issues relating to animals in health research	6
ANZCCART's 2001 New Zealand conference	7
Factors contributing to the acceptance of biotechnology	8
Books reviews	9
Newly published	10
Letter	10
Coming up	11
News	12

Nonetheless, even deeply rooted traditional beliefs such as these are open to change. As one example, Thomas Dunlap (1988), in a book called *Saving America's Wildlife*, describes the vast changes that have occurred in the last 50 years in attitudes toward the wolf. As Dunlap notes, increased scientific study of wolves — their behaviour, communication, and role in ecological systems — led to the wolf losing its image of a treacherous villain, and being seen instead as an intelligent, family-living animal serving important ecological functions. In line with this about-face, public funding for the killing of wolves was withdrawn, and now public funds are even being spent to preserve wolves and to re-establish them in parts of their former range.

The whale provides another example. Traditionally the whale was a relatively minor character in our stories and art, appearing only occasionally in folk-tales to swallow a sinner or punish an egotistical sea-captain; and in practical terms, whales were treated as little more than floating blubber factories. In recent years, however, we have seen a greater understanding of whales' ability to migrate over vast distances, their complex system of communication, their social and cooperative living, and their care of their young. Patchy as this scientific understanding remains, it has led to a vast change in the value we attach to whales, to the point that holding whales in captivity, even for entertainment and education, has become a cause of intense controversy, and restoring a single performing whale to the wild has become a cause that attracts international support.

This rethinking the value of the wolf and whale are just two examples of a widespread change in public attitudes toward animals. One of our culture's longest-running debates, dating back at least to ancient Greece, is whether humans are unique and set apart from all other species, or whether we are simply one species among many, closely related to the animal world. At the one end of the debate

are such influential thinkers as René Descartes and Immanuel Kant who claimed that humans are unique, and saw animals as having been put on earth purely for human use. At the other end are equally influential thinkers such as Voltaire and Johann Wolfgang von Goethe who emphasised our relatedness to the rest of nature, and were horrified at the idea of treating animals as if they are purely for human use. This debate is nicely described in the Rod Preece's book *Animals and nature: cultural myths, cultural realities* (1999).

A few centuries ago, those who emphasised human uniqueness had some powerful arguments on their side. In terms of appearance, animals looked different: animals had four legs and fur, or wings and feathers, or fins and scales — nothing like the upright, smooth-skinned bipeds who saw themselves as designed to resemble God. In terms of origins, all other species were thought to have resulted from a separate act of creation, with humans fashioned either before or after the non-human animals, and living in a special relationship with the Creator. And in terms of mental and spiritual life, animals were often viewed as intellectually inferior, as not capable of logical thought, and as having bodies but no souls.

Over the centuries, however, science has slowly eroded these claims to human uniqueness, starting with the notion of unique appearance. During the Middle Ages, one of the frontiers of scientific research was anatomy, and "dissecting theatres" — where the public could watch the dissection of an animal or a human criminal cut down from the gallows — sprouted up across Europe. Through anatomical research, the basic similarity of the vertebrate body slowly came to be recognized — that the wing of a bird is really a modified arm; that the hoof of a horse is a modified toe — and this new understanding worked its way into popular culture. According to historian Dix Harwood (1928), by the year 1700 the basic anatomical similarity between humans and other species was widely

recognised. Thus, the perception that humans were made in a different mould became less and less accepted.

A second barrier fell with the evolutionary thinking of the 1800s. Through the ideas of Charles Darwin and others, people began to see the human species sharing not only a common anatomy with other species, but a common ancestry as well. This idea was resisted by many who saw it as a direct challenge to the special status of humans, but it has gradually moved from being a revolutionary idea to being the predominant view in society.

During the late 1900s, I think the study of animal behaviour has led to a further major change in our view of animals, this one centred on their mental and emotional lives. Key figures in this development were field biologists such as Jane Goodall who studied animals — in her case chimpanzees — not just as examples of a species type, but studied them more as "persons" who possess unique life histories and complex social and mental lives. For example, from Jane Goodall we learn of McGregor, a chimpanzee who was stricken with polio in adulthood and tried pathetically to be accepted by his old friends who avoided him once he was crippled; and we learn of Flint, an eight-year-old who remained so attached to his aging mother that when she died, he stayed near her death place until he, too, died of starvation (Goodall, 1971).

These field studies — which have been well presented to the public in popular books and the media — have been accompanied by other types of ground-breaking research. In books such as *Reaching into Thought: The Minds of the Great Apes* (Russon *et al.*, 1996), we see psychologists using the methods of child psychology to study the stages of mental development in other species. In Roger Fouts' book *Next of Kin* (1997) we learn about remarkable attempts at inter-species communication, including Fouts' own experiences in teaching American Sign Language to chim-

panzees. Summing up these observations, Fouts describes the chimpanzee as, "a highly intelligent, co-operative, and violent primate who nurtures family bonds, adopts orphans, mourns the death of mothers, practises self-medication, struggles for power, and wages war."

The gap between humans and other species could hardly seem more narrow.

This new popular understanding of animals is leading to a major rethinking of how animals should be treated. A few decades ago it was socially acceptable in our society to shoot a chimpanzee mother in order to capture her infant, raise it in a cage, and use it as a living test-crash dummy in vehicle safety research. Today such conduct would spark a riot in many countries and prosecution in New Zealand. Moreover, this heightened concern for wolves, whales and chimpanzees is just the most visible tip of a much broader change in our thinking about the nature and value of animals — a change which causes serious questioning of ways of treating animals that seemed uncontroversial a few decades ago. The implications for our use of farm animals are profound.

The agricultural use of animals in Western mythology

The farming of animals involves a mythology of its own, including at least two deeply rooted ideas that influence people's perception and acceptance of animal production.

A key element is the image of the kindly shepherd, inherited in part from the Bible. In the early Biblical culture, raising animals was a major economic activity, so it is not surprising that the ownership and use of animals were seen as perfectly legitimate. However, for animal herders to prosper, they had to provide their animals with appropriate care: animals had to be rested in green pastures, led beside still waters, defended when in danger, even nursed back to health when injured. These practical necessities were reinforced by a culture that attached great

value to the diligent care of animals. For the Biblical king David, the first indication of his kingly qualities was his diligence and courage in protecting his father's sheep. When God selected Rebecca as the wife of Isaac and mother of her nation, the sign that she had been chosen was her offer, when asked for water by a thirsty stranger, to water his camels as well. And of course, a diligent shepherd protecting a flock of sheep was such a positive image that it was often used as a metaphor for divine goodness. Thus, the Biblical culture created a "pastoralist ideal" which put the animal herder on a moral pedestal; and the raising and killing of animals was seen as a legitimate — even virtuous — activity as long as it occurred in that context.

In North America at least, the mythology of animal farming also includes a special respect for farm families living in a harmonious relationship with the land — an idea that philosopher Paul Thompson (1998) has called the "agrarian ideal". As Thompson notes, the idea of the family farm is closely linked to American political values. At the time of American Independence there was serious debate as to whether democracy was a workable form of government. Critics claimed that democracy was doomed to fail because the common people would vote themselves benefits that the nation could not support. On this basis, countries like the United Kingdom tried to balance the power of the elected parliament with a second tier of government consisting of hereditary land owners whose connection to the land was thought to give them a long-term commitment to the nation. In response to this concern, Thomas Jefferson claimed that democracy is feasible in America because many ordinary citizens would own land and would therefore exercise their democratic powers judiciously. Thus, as Thompson notes, American political thought linked family farming with the ideals of democracy and citizenship.

In the traditional image of

the family farm, animals played important roles. They were an integral part of the ecology and economy of the farm, with the different species serving important and complementary functions. Animals were also important for moral education, because children often learned responsibility by caring for animals. Animals on traditional farms were seen as living a natural and wholesome life, just as the farming family was seen as living a natural and wholesome life removed from the artificiality of the city. Thus the "agrarian ideal" puts the family farm on a moral pedestal, and again the raising and killing of animals was seen as a legitimate or even virtuous activity as long as it happened within that context.

In summary, our culture has at least two influential beliefs about the relationship between people and farm animals: a "pastoralist ideal" which values diligent animal care, and (perhaps especially in America) an "agrarian ideal" which reveres the farm family living a wholesome life in harmony with its animals and the land. As long as animal production is perceived by the public as conforming to one or both of these ideals, it is almost guaranteed a certain level of public trust and approval. This popular mythology has helped set the stage for a vigorous battle to mould public perceptions of modern animal production.

Conflicting portrayals of animal agriculture

Partly because the value we attach to animals is in such a state of change, there has been intense debate about commercial animal production. Some of the opponents have been active in trying to reshape public perceptions of animal production. Consider the following quotations.

In the United States, as elsewhere, factory farming has become a major commercial enterprise that is threatening the family farm with extinction. (Dolan, 1986).

The problem is that the behemoths of modern agribusiness seek profit without reference to

any ethical sensitivity to the animals in their keeping. (Robbins, 1987).

Whether they are battery chickens in their cages or pigs in sow stalls, all experience the same mental anguish that would drive many humans to suicide — but factory-farmed animals do not have that option. (Penman, 1996).

Eating meat has been linked to heart disease, cancer, diabetes, arthritis, and osteoporosis. Animal fat and cholesterol ... are the leading causes of heart attacks and strokes. Other health risks are increased by the chemicals, antibiotics, and hormones found in meat... Not eating meat, on the other hand, significantly reduces your risk of illness. (Fraser et al., 1990)

[Cattle] are destroying the very biosphere itself, threatening the future stability and viability of entire bioregions of the world. Cattle are among the major environmental threats facing the planet today. (Rifkin, 1992)

The vast tonnage of food fed to animals to supply the rich countries with their heavily meat-based diet is given at the expense of hungry people around the world. (Coats, 1989).

In these quotations we see a complex set of criticisms of animal production that have developed over the past 40 years. In the 1960s, the major ethical concern about animal agriculture was the welfare of farm animals. When the famous Brambell Committee reported in Britain in 1965, the focus was on animal production technology and how it affects animal welfare; and scientists could respond, for example, by trying to design cages where animal welfare problems would be reduced. Today, we almost look back at those times as the good old days when life was simpler, because now animal welfare has become embedded in a much more complex critique which portrays animal production as no longer reflecting pastoralist animal care, farm families, and agrarian harmony with the land. Instead, the critics have created a whole new mythology of faceless corporate monsters displacing farm families, exploiting animals, polluting the environment, poisoning

consumers, and taking food away from the hungry nations.

In response to these negative portrayals, many agricultural organisations have created promotional materials of their own, often in the form of brochures, websites, and videos. These depict animal agriculture as fully reflecting ethical animal care and family farming, while adding certain advantages made available by modern knowledge and technology. According to these materials, modern farming is thoroughly beneficial for animal welfare. To quote a few examples, domestic cattle are said to *live in the lap of luxury*. Confinement housing, instead of causing animals to suffer, is claimed to *protect the health and welfare of the animals* and to facilitate *provision of proper nutrition, clean water and regular care*.

Industry materials claim that traditional animal care values are firmly in place — that producers *have always recognised their moral obligation to provide humane care for their animals*, and are *committed to providing the utmost in humane care*. Animal production is also said to benefit the environment because *grazing improves vegetation health and diversity, and livestock complete the nutrient cycle, returning valuable manure to the land*. In a similar way, industry materials contradict each of the various criticisms, countering the thoroughly negative over-generalisations of the critics with thoroughly positive over-generalisations from the industry itself.

The situation has, in effect, become a propaganda battle involving two oversimplified portrayals of animal production which simply contradict each other on a wide range of issues. The result is a profound confusion, not just about whether animal production needs to be reformed and how, but about the simple facts of what animal production entails. And when there is such profound confusion about the facts, there is very little hope of achieving consensus on what actions or policy changes would be desirable.

Perhaps even worse, there have been cases where scientists, ethicists and other academics, instead of helping people to see past the over-simplifications of the advocates, have themselves given simplistic, rhetorical accounts of animal agriculture, seemingly based on scholarly research or expert knowledge. In so doing, scientists and ethicists have perhaps lost some of their ability to create knowledge-based consensus-building around the issues.

Reconciling animal agriculture with our animal mythology

In this state of public confusion and conflict, are there ways of reconciling our use of farm animals with our animal mythology?

In spite of all the confusion, the issues that have been raised in the advocacy battles over animal agriculture are nonetheless extremely important issues. Animal agriculture is one of the world's most diverse and important activities. During the past 50 years and continuing today, animal agriculture is undergoing revolutionary change, with profound and diverse effects on people, animals, the planet, and future generations. But these changes are being driven largely by economics and technological innovation, with very little informed discussion and explicit social consensus.

To create that informed discussion and social consensus, we need answers to some very basic questions about how animal agriculture affects:

- the welfare of animals and their keepers;
- sustainability;
- world hunger and food security
- human health; and
- global climate and environment.

These are difficult questions that require careful multidisciplinary research so that we can identify better and worse options. There is, of course, some research being done on some of these issues. But the great majority of our agricultural research talent

and resources continue to go into research with the more conventional goals of improving productivity or production efficiency. In contrast, the fundamental issues listed above remain so under-researched as to leave wide latitude for advocates to make their outlandish and contradictory claims. Thus, I want to propose as a challenge to scientists, research managers and funding agencies, that in addition to the practical, technical research, scientists also needs to apply their skills to the big questions that we must answer as a basis for building a beneficial, ethical, and culturally appropriate animal agriculture.

Obviously the challenge that comes from our changing animal mythology is too large for any country, any commodity, or any scientific discipline to tackle by itself. The issues will require international and interdisciplinary integration. Research will not solve the problems; we also need industry, government, and development agencies to act on the results. However, shedding real light on the issues is an essential first step toward having the issues taken seriously rather than dismissed as an area of ill-informed public agitation.

How does an organisation like ANZCCART and its clients contribute to this process? Although a wide range of issues need to be addressed, animal welfare remains one of the key concerns. Scientists doing research on commercial animal production are often quite limited in how much they can think and experiment beyond the boundaries of conventional production practices. In contrast, researchers working with farm animals in a laboratory setting have a different mindset. Many of them are accustomed to accepting a new species as a new challenge, trying to understand the animals' needs from first principles, and providing for their needs in innovative ways. Thus, scientists involved in laboratory animal care but working with farm animals are well positioned to develop a fresh understanding of the welfare needs of farm ani-

mals and how to accommodate those needs in novel ways.

References

- Brambell, F. W. R. (1965). *Report of the technical committee to enquire into the welfare of animals kept under intensive livestock husbandry systems*. Her Majesty's Stationery Office, London.
- Coats, C.D. (1989). *Old MacDonald's factory farm*. Continuum Publishing, New York.
- Dolan, E.F. Jr. (1986). *Animal rights*. Franklin Watts, New York.
- Dunlap, T.R. (1988). *Saving America's wildlife: ecology and the American mind, 1850-1990*. Princeton University Press, Princeton.
- Fouts, R. (1997). *Next of kin*. William Morrow, New York.
- Fraser, L., Zawistowski, S., Horwitz, J. and Tukul, S. (1990). *The animal rights handbook*. Living Planet Press, Los Angeles.
- Goodall, J. (1971). *In the shadow of man*. William Collins. London.
- Harwood, D. (1928). *Love for animals and how it developed in Great Britain*. Privately published. New York.
- Penman, D. (1996). *The price of meat*. Victor Gollancz, London.
- Preece, R. (1999). *Animals and nature: cultural myths, cultural realities*. UBC Press, Vancouver.
- Rifkin, J. (1992). *Beyond beef: the rise and fall of the cattle culture*. Dutton, New York.
- Robbins, J. (1987). *Diet for a new America*. Walpole: Stillpoint Publishing.
- Russon, A.E., Bard K.A., and Taylor Parker, S., editors. (1996). *Reaching into thought: the minds of the*

great apes. Cambridge University Press, Cambridge.

Thompson, P.B. (1998). *Agricultural ethics - research, teaching, and public policy*. Iowa State University Press, Ames, Iowa.

Acknowledgement

I am grateful to Dr. Robert Baker and ANZCCART for the kind reception I received when giving this presentation to their conference in Adelaide, November 30-December 1, 2000. The presentation is based on papers to be published in *Journal of Applied Animal Welfare Science* and *Journal of Animal Science*.

David Fraser
Animal Welfare Program
Faculty of Agricultural
Sciences and Centre for
Applied Ethics
University of British
Columbia
Vancouver, Canada

email:
fraserd@popinterchange.ubc.ca

Editor's Note

This paper will shortly be published in the Proceedings of ANZCCART's 2000 Conference - *Farm animals in research - can we meet the demands of ethics, welfare, science and industry?*

Further details re the availability of these Proceedings will be provided in the next issue of ANZCCART News.

Experimental research with laboratory animals: one sex or both?

Inspection of reports of experiments involving non-human animals will usually reveal the conspicuous absence of any recognition of the subjects' sex as a factor that might interact with, or at least partially determine, the outcome of an experimental manipulation. This usually appears as the involvement of one sex alone or, less frequently, if both have been included, as a lack of analysis that takes account of the sex variable. In most cases males are the favoured choice even though there are obvious endocrinological differences between the sexes that could influence treatments, with biochemical or physiological consequences.

The exclusive use of males has been based on arguments ranging from the possibly greater (and inconvenient) variability between individual female subjects arising from their oestrous cycle and "everyone else in the area uses males only"! To use one sex alone in research and then assume that the results relate to both sexes may not always be justified, particularly when a sex difference in some critical feature could determine the outcome of an experimental treatment. The major aim is to seek implications for subsequent research with human beings; it makes little sense to effectively restrict such implications to one sex alone, unless the findings are only of relevance to that sex.

Over many years, my studies of the behaviour of laboratory animals have frequently indicated the importance of the sex of the subjects in determining the effects of psychotropic drugs and other experimental manipulations. For example, while the benzodiazepine anxiolytic, chlordiazepoxide reduced vertical motor activity (or rearing) in female rats but not males, the psychomotor stimulant methylphenidate increased the

same behaviour for males only (Hughes and Syme, 1972). Similarly, the later suppression of rats' rearing behaviour by an earlier experience with the antimuscarinic drugs, scopolamine and methylscopolamine, only occurred for females (Horsburgh and Hughes, 1981). More recently, I have consistently observed differences between male and female offspring in postnatal outcomes of prenatal exposure to caffeine administered to, or ingested by, pregnant rats. These differences suggest a greater susceptibility of male foetuses to subsequent anxiogenic effects of the prenatal treatment (Hughes and Beveridge, 1987, 1990, 1991; Hughes and Loader, 1996).

My concern for the importance of the sex of animal subjects in determining drug effects is by no means unique. There has been awareness of the need to take account of this variable for over forty years (e.g., Irwin *et al.*, 1958), and yet, in spite of a few exceptions (e.g., Meehan and Schechter, 1998), studies of one sex alone still continue to be the norm. Many observations of sex differences in responsiveness to drugs can be accounted for by differences between males and females in the extent of their ability to absorb, store, metabolise and excrete them, rather than to differences in mechanisms at the cellular or receptor level. However, in terms of actual and practical outcomes, this is surely no reason for ignoring the reactions of one sex (usually females) in favour of the other.

If one is particularly interested in evaluating the behavioural effects of an experimental treatment there are sex differences in some mechanisms that are more central to the core of behavioural functioning and warrant consideration. For example, I have observed that female

rats and hamsters are able to familiarise themselves with a novel environment more rapidly than males (Hughes, 1989, 1990). With rats, this ability appears to be dependent more on visual than on olfactory cues for females (Hughes, 1999). Of related relevance is evidence of sex differences in organisation of the rat's visual cortex (Reid and Juraska, 1995).

There are more examples of sex differences in a variety of behavioural and physiological processes in rats (and other animals) than can be included in this brief commentary. Nevertheless, I hope that it will awaken awareness of the need to consider the sex of animal subjects as a possible influence on the effect of an experimental treatment. As well as improving the scientific value of any results, such awareness also has ethical implications. If, for example, an experimental design requires a minimum number of rats, the use of one sex only when both would be appropriate might result in the breeding of double the number actually needed. One might then wonder about the fate of those members of the sex not used because, while a certain proportion could be used for other purposes, there is always the temptation of euthanasia in the interests of cost. Provided a minimum number of each sex is included to enable detection of meaningful sex-related influences, then the total number of rats bred could be considerably less, avoiding unnecessary loss of life.

References

Horsburgh, R.J. and Hughes, R.N. (1981). Modification of novelty preferences in rats by current and prior treatment with scopolamine and methylscopolamine. *Psychopharmacology*, **73**, 388-390.

Hughes, R.N. (1989). Sex differences in spontaneous alternation and open-field behavior of hamsters: Habituation differences. *Current Psychology: Research and Reviews*, **8**, 144-150.

Hughes, R.N. (1990). Sex-dependent habituation to novelty in rats. *Current Psychology: Research and Reviews*, **9**, 277-284.

Hughes, R.N. (1999). Sex differences in novelty-related location preferences of hooded rats. *The Quarterly Journal of Experimental Psychology*, **52B**, 235-252.

Hughes, R.N. and Beveridge, I.J. (1987). Effects of prenatal exposure to chronic caffeine on locomotor and emotional behavior. *Psychobiology*, **15**, 179-185.

Hughes, R.N. and Beveridge, I.J. (1990). Sex- and age-dependent effects of prenatal exposure to caffeine on open-field behavior, emergence latency and adrenal weights in rats. *Life Sciences*, **47**, 2075-2088.

Hughes, R.N. and Beveridge, I. J. (1991). Behavioral effects of exposure to caffeine during gestation, lactation or both. *Neurotoxicology and Teratology*, **13**, 641-647.

Hughes, R.N. and Loader, V.G. (1996). Effects on elevated plus-maze behavior of exposure to caffeine during both gestation and lactation. *Psychobiology*, **24**, 314-319.

Hughes, R.N. and Syme, L.A. (1972). The role of social isolation and sex in determining effects of chlordiazepoxide and methylphenidate on exploratory behaviour. *Psychopharmacologia*, **27**, 359-366.

Review of issues relating to animals in health research

Irwin, S., Slabok, M. and Thomas, G. (1958). Individual differences: I. Correlations between control locomotor activity and sensitivity to stimulant and depressant drugs. *Journal of Pharmacology and Experimental Therapeutics*, **125**, 206-211.

Meehan, S.M. and Schechter, M.D. (1998). LSD produces conditioned place preference in male but not female fawn hooded rats. *Pharmacology, Biochemistry and Behavior*, **105-108**.

Reid, S.N.M. and Juraska, J.M. (1995). Sex differences in the number of synaptic junctions in the binocular area of the rat visual cortex. *Journal of Comparative Neurology*, **352**, 560-566.

Rob Hughes
Department of Psychology
University of Canterbury
Christchurch
New Zealand

Introduction

Animal-based studies offer vital contributions to health research in New Zealand, whether in fundamental biomedical investigations; in characterisation and diagnosis of disease by use of animal models; in the discovery, development, or testing of therapeutic products; in toxicological or other safety evaluations; or in development of surgical procedures. The Health Research Council (HRC), as the major agency investing in fundamental, strategic and applied health research for the New Zealand Government, funds a number of research groups that involve use of animals. In order to ensure the welfare and humane treatment of these experimental animals, the HRC Ethics Committee delegates authority to institutional Animal Ethics Committees (AECs) to review and approve each research project according to an established Code of Ethical Conduct.

The Animal Welfare Act 1999

This system has been refined and formalised by Part 6 of the recent Animal Welfare Act (AWA 1999). Each institutional AEC must develop a Code of Ethical Conduct, under the guidance and review of the National Animal Ethics Advisory Committee (NAEAC), an independent body established to advise the Minister of Agriculture and Forestry (MAF) on matters affecting animal welfare policy and practice in New Zealand. The HRC Ethics Committee has fostered close professional links with NAEAC, which includes one member nominated by the HRC, Dr Bernhard Breier, and another, Professor John Marbrook, who sits on both committees. Approximately 90% of HRC grants are awarded to University-based research projects, which accounted for

less than one quarter of New Zealand's total animal usage in 1999 (NAEAC 1999). About sixty of the 350 research programmes currently funded by the HRC, predominantly biomedical research contracts, required institutional AEC approval for use of animals.

In the drafting and implementation of the new Act, NAEAC and MAF considered recommendations from researchers, ethicists and interest groups, and this process of public input and communication is reflected in the readable style of the Act. Institutional AECs provide regular forums for informed discussion and debate about emerging issues and technologies, from which new research information and ethical consensus can be relatively rapidly considered and communicated to other researchers by NAEAC. Many of the new provisions emphasise effective administration, and although some researchers have criticised the apparent red tape involved with ethical compliance, the Act is generally agreed to be very workable. Its codes of conduct are designed to promote self-regulatory behaviour, accountability and personal involvement in ethical decision-making, but the Act also enables enforcement of minimum standards by monitoring and independent review. The HRC also maintains the right to inspect the animal welfare standards of any HRC-funded projects.

Scientific Best Practice and Animal Welfare

Application for ethical approval poses the scientific challenge of maximising the quality and importance of research results, while minimising possible harm to research subjects (s72 AWA 1999). The utilitarian comparison of costs and benefits embodied in the Codes of Ethical Conduct is an added incentive to optimise strategic use of results by disseminat-

ing or applying information for the greatest benefit. The HRC funds biostatistical and advisory services to assist with design and analysis of health research projects, and it is an absolute requirement that any results intended for direct application to human health, such as pre-clinical therapeutic trials, will be particularly carefully monitored and assessed. Improvements in animal welfare are achieved by applying the Three Rs to research design, namely refinement of technique to reduce suffering, reduction in the numbers of experimental animals used, and replacement of animals with non-sentient or molecular models (s80 (2)(b) AWA 1999).

First, refinements in scientific methodologies allow the duration and invasiveness of experimentation to be minimized, for example by using biophysical technologies to observe processes occurring in living animals. More invasive tests are accompanied by sensitive monitoring of pain or distress indicators, together with effective anaesthesia, analgesia and after-care. Progressive improvements in animal husbandry, such as housing conditions and nutritional requirements, are implemented wherever possible to allow laboratory animals the "five basic freedoms" of life. These have been summarised as freedom from thirst, hunger, malnutrition, pain, injury, disease, fear, distress and environmental discomfort, as well as freedom to express normal behaviour (Mellor and Reid, 1994).

Second, the replacement of animals with lower organisms, computer modelling simulations or alternative experimental systems such as cell, tissue and organ cultures may offer potential for examining some mechanisms of disease or drug response. New developments in growth of cultures, together with

ANZCCART's 2001 AGM

This meeting will be held at 5 pm on Monday, 14 May 2001 in the You Yangs Meeting Room on level two of the Melbourne Convention Centre, near the corner of Flinders Street and Spencer Street, Melbourne.

A notice of meeting will be sent to members in April and the agenda and a copy of the 2000 Annual Report will be provided at the end of April.

advances in use of genetic modification and embryonic stem cell lines allow the development of differentiated cultures that incorporate specific characteristics or enzymatic capacities. However, these methods will complement rather than supplant animal models, which remain the most valuable sources of data about integrative physiology at the level of the whole organism. In particular, rigorous pre-clinical trials of therapeutic products or procedures using live animals will still be required before approval for safe use in human health.

Third, the numbers of animals used in health research in New Zealand seems to be reducing (NAEAC, 1999) although clearly numbers of experimental animals should not be reduced below a credible minimum at which results and conclusions remain valid and statistically significant.

Trends in biotechnology

The growing use of biotechnology in medical research may generate entirely new issues for the animal welfare infrastructure in New Zealand. Applications of transgenic technologies include the production of pharmaceuticals or supplementary nutrients in genetically modified animals, use of animals as models for fundamental study of human genetic diseases or for screening of possible therapeutic products, xenotransplantation of donor organs between species, and development of human cell-based gene therapy. Reproductive manipulations such as cloning, *in vitro* fertilisation, embryo transplantation or splitting and long-term storage of embryos also challenge current ethical norms. Each provoke a range of implications, although some commentators argue that new technologies do not alter the application of established principles of animal welfare, and that the current system of committee-based consensus and self-regulated ethical conduct is sufficiently flexible to accommodate any new challenges.

Social attitudes to animal use in health research

One of the challenges for health researchers is to respond to contemporary criticism of the scientific community, and to demonstrate the ethical integrity of their methods and aims. For example, the current debate surrounding the Royal Commission on Genetic Modification illustrates public concern about animal welfare in the context of genetic technologies (Submissions from S.A.F.E. and New Zealand Transgenic Animal Users, 2000). However, many observers feel that the AWA's Codes of Ethical Conduct encourage public understanding and acceptance of animal use in research by establishing a transparent philosophy and infrastructure for the management and care of laboratory animals. Animal Ethics Committees have commented that scientists also benefit from the opportunity to analyse the ethical justifications of their work and to communicate their objectives in a way that emphasises the balance between the beneficial objectives of the research and the unavoidable harm to animals. There is also growing international support for the concept of a professional oath or code of conduct for scientists (UNESCO 1999).

In conclusion, the HRC supports the current policy and practice of animal welfare in New Zealand, particularly the trend towards integration of scientific, social and ethical ideals, and will continue to monitor the needs and concerns of researchers, institutions, ethical committees, interest groups and the general public.

Tara Satyanand
Health Research Council of
New Zealand
Auckland

References and further reading

Animal Welfare Act (1999). Full text at <http://www.knowledgebasket.co.nz/kete/database.html>

Health Research Council Annual Report (1999) Wellington, New Zealand

NAEAC *Guidelines for Institutional Animal Ethics Committees* (1988) Wellington, New Zealand.

NAEAC *Model Code of Ethical Conduct for Animal Ethics Committees* (1994) Wellington, New Zealand.

NAEAC *The Use of Animals in Research, Testing and Teaching – Users Guide to Part 6 of the Animal Welfare Act* (1999) Policy information Paper No. 33. Text at <http://www.maf.govt.nz>

Mellor, D.J. and Reid, C.S.W. (1994) Concepts of animal wellbeing and predicting the impact of procedures on experimental animals. In *Improving the well-being of animals in the research environment*. ANZCCART, Adelaide.

National Animal Ethics Advisory Committee 1999 Annual Report. Ministry of Agriculture and Forestry, Wellington, New Zealand.

Submissions to the Royal Commission on Genetic Modification, S.A.F.E. and New Zealand Transgenic Animal Users Full text at <http://www.gmcommission.govt.nz>

UNESCO (1999) *Declaration on Science and the Use of Scientific Knowledge*. Full text at http://www.unesco.org/science/wcs/eng/declaration_e.htm

Joint ANZCCART/NAEAC Conference

28 - 29 June, 2001

Hamilton,
New Zealand

*Learning, animals
and the environment
— changing the face
of the future.*

The conference will explore the relationship between humans, other animals and the environment.

Issues to be covered include the interdependence and interconnectedness of all life, the images of science and scientists, relevant legislation, dealing with new technology, fish research and what could or should statistics or the popular media tell us.

For registration or further information, contact:

Mrs Gill Sutherland,
email:

anzccart@rsnz.govt.nz

or visit the website at
anzccart.rsnz.govt.nz/

Factors contributing to the acceptance of biotechnology *

The Australian and New Zealand Council for the Care of Animals in Research and Teaching (ANZCCART) aims to provide leadership in developing community consensus on ethical, social, and scientific issues relating to the use of animals in research and teaching. While our emphasis is clearly on the use of animals in science and education, an emphasis shared with parts of the biotechnology debate, biotechnological developments and applications also raise animal welfare and animal ethical issues. Furthermore, we note that no member of the Independent Biotechnology Advisory Council has such a formal interest in the question of animal use in science, though several have relevant research links. We therefore feel that ANZCCART could contribute to any consideration of biotechnology as it affects animals and offer our expertise accordingly.

The ANZCCART (NZ) Board generally accepts that biotechnology provides a number of unique opportunities to protect and enhance the well-being of human, animal, plant and microbial communities. However, it has also the potential to be unacceptable and even cause harm. Additionally, because of the novel nature of some of the techniques, and difficulty many people have in understanding them, there is significant social concern. Consequently, we advocate a comprehensive approach in addressing the issues.

Many of the issues discussed below are not restricted to animals or even biotechnology, but also apply to, for example, traditional selective breeding, arguably providing an opportunity to also question the morality of some of our current practices. Importantly, we believe that the social, ethical and welfare

concerns relating to animal biotechnology cannot be considered in isolation, and suggest that the following aspects are crucial to any consideration of biotechnology.

Animal welfare

While early attempts to modify animals did result in unacceptably poor welfare, as control of gene function has improved, so has the welfare of the animals. Nevertheless, the welfare of the animals should be paramount and traditional and novel indicators of well-being used to assess their welfare. This extends to future generations as well as the individuals initially produced, owing to the dynamic nature of the genome. Some have advocated the principle of conservation of welfare – an animal should be no worse off for having been for example, genetically manipulated – and this seems to be an acceptable foundation. There is the real possibility that these techniques could be used to eliminate harmful genetic traits and thus reduce suffering.

Safety

Environmental, public, and consumer safety is essential. Clearly, biotechnology concerns and regulatory authorities will have to consider both the direct effects of the biotechnology and any resulting indirect effects (e.g., bST produced from genetically-engineered bacteria causes elevated hormone levels in cows milk). Like any product an assessment of safety will be required before general release. Two additional points are worth noting here. First, most traditional foods and organisms have been around for a very long time; we have had ample opportunity to incorporate their safety into our culture. Truly novel foods and organisms may require especially extensive or novel testing. Second,

since food allergens can be transferred from one organism to another, and since individual avoidance of foods known to be allergenic may be the best and sometimes only defence against an allergic reaction, then food safety would be best ensured by labelling the source of the food.

Socio-economic issues

While technology makes many things possible, it is the social, political, and cultural context that determines what effects technology will have on the world. Thus, issues such as who benefits from biotechnology and who carries the risk are critical. What enhanced opportunities for businesses and communities will there be, and which businesses and communities will suffer? If we genetically engineer bananas so they can grow in the South Island high country, have we a responsibility to the people of Ecuador? As the agricultural revolution brought changing social relationships (e.g., the growth of a body of landless farm workers), what relationships will prosper or diminish with the biotechnological revolution? How we handle these may well shape the future of society.

Implications for humanity

A question which is perhaps most important to opponents of biotechnology asks what sort of people do we want to become? Arguments stating that genetic engineering is unnatural and against the will of God, although indefensible, (travelling in a jet is unnatural, and to be human is to participate responsibly in the ongoing work of creation) may, in fact, express this sentiment in a different language. Attitudes in society are changing from those of Francis Bacon's that nature is something to be dominated, to something in which human

kind should participate, value and nurture. Evidence for this is seen in the increasing popularity of alternative medical therapies and organic farming, for example. What cultural ideal do we want for ourselves and how does biotechnology fit with it?

Conclusion

The ANZCCART (NZ) Board acknowledges that a preoccupation with the risks of biotechnology might well reduce the benefits. However, we equally acknowledge that life rarely holds the absolute guarantees that some may maintain, demand or hope for. We should therefore expect some adverse effects of biotechnology and plan to minimise any detrimental health, ecological, economic and social consequences. Acceptance of biotechnology will, furthermore, be based on a diverse array of points, involving society at large, and not just experts, since different people will be affected in different ways. We also strongly support judging the merits of biotechnology on an individual case-by-case basis.

* A submission to the Independent Biotechnology Advisory Council on behalf of the ANZCCART (NZ) Board

The Independent Biotechnology Advisory Council (IBAC) was established by the New Zealand Minister of Research, Science and Technology in 1999 to meet the need for advice and informed public debate about biotechnology. IBAC's main role is to stimulate dialogue and enhance public understanding in New Zealand about biotechnology.

Mark Fisher
Board Member
ANZCCART New Zealand

Book reviews

Laboratory animal law

by Kevin Dolan

Blackwell Science, Oxford
232 pages, paperback
ISBN 0-632-05278-3
£24.99

As the book's preface suggests, the author did not set out to write a legal text book but rather a working tool for those who undertake research. It sets out what their legal obligations are. As a British text it will not be of direct benefit to Australian experimenters. It will, however, form the basis of an understanding of why there is legislation governing the use of live animals in experiments. Chapters 1 and 2 are a useful short history of the English legislation.

Whilst the English system of training varies from that in Australia, Chapter 8 is also useful in that it shows the degree of detailed knowledge required, namely the recognition of well-being, pain, suffering or distress, humane methods of killing, surgical anaesthesia and analgesia and the ethical aspects of the use of live animals. This training, *inter alia*, is required in England unless an exemption is obtained.

There are chapters which are of universal use in that they are indicators of good animal handling. For instance the chapter entitled "Legal Aspects of the Transport of Animals" is useful, but the differences in distances in the two countries means there are limitations in its application.

In a more general sense the author, who incidentally is a Professor of Pastoral Theology and has academic qualifications in both Theology and Law, touches on the Five Freedoms which are now outlined in the RSPCA Australia Policies and

Position Papers. He is a Moral Philosopher and ethicist.

The chapter on the re-use of animals shows the contrast between the English system and the Australia code.

To the best of my knowledge there is no equivalent publication in Australia, and this throws up a challenge for someone working in or on the fringe of the discipline. It would be a worthwhile post-graduate project. In any event the book is a useful text for members of AECs, for Laboratory Technicians and for Experimenters alike. I urge someone to undertake the task of writing an Australian equivalent.

John Strachan
President
RSPCA (SA)
Adelaide

What should we do about animal welfare?

by Mike Appleby

Blackwell Science,
Melbourne, 1999
\$54.95 soft cover
ISBN 0-632-05066-7

This 192-page book was the result of a Hume Fellowship from the Universities Federation for Animal Welfare (UFAW) to Dr Appleby, who is a Senior Lecturer in Farm Animal Welfare and Behaviour at the University of Edinburgh.

The book comprises nine stand-alone chapters, each with a set of conclusions and its own list of references. The first chapter begins with the story of Noah's Ark from the Bible's book of Genesis, as an example of man caring for the welfare of animals. Appleby uses this to illustrate the

moral aspects of human behaviour and the origin of animal domestication by man. While the predominant factor was obviously human benefit, it also led to understanding of animal behaviour. As Appleby puts it: *Understanding the behaviour of a wolf who might eat you or a deer you might eat had been important for millennia.* Chapter One includes a discussion of utilitarianism — the idea that we should act to produce the greatest good (or utility) for the greatest number of individuals. Appleby also discusses ethics and the theory of animal rights, including the views of the philosophers Singer, Regan, Midgeley and Sandoe.

Chapter Two asks what is animal welfare and considers work by leading animal welfare scientists. It includes farm animals and zoo animals and discusses current concepts of what actually is animal welfare.

The author moves on to discuss sentience and consciousness and asks where do we draw the line in the animal kingdom? Should we have the same welfare concerns for invertebrates and chickens as for humans and chimpanzees? Appleby's text is clear and easy to read and well illustrated with figures and sketches. Subsequent chapters deal with the difficult issues of keeping animals for killing, selection and modification of animals, animal housing and environments, and caring for animals, whether they be from farm, laboratory or zoo. He makes the point that welfare of animals under human care must be considered 24 hours a day all and every year, not just at the times when we are using them or interacting with them.

Chapter Eight deals with the question of individual actions in improving animal welfare. Some are major and others are of minor consequence, yet all count and are important, Appleby argues, both for their effects, direct and indirect and for our own integrity. He relates this to

the title of the book and argues that we must all act to improve animal welfare. This includes those with special responsibility (farmers, scientists and politicians), those with a special interest (certain philosophers, animal welfare activities) and the general public — *groups may take actions but so may people acting on their own.* Other ways of improving animal welfare discussed include joining an animal welfare organisation and buying meat and other animal products from producers with high welfare standards, which Appleby argues, does more to improve the welfare of farm animals than does vegetarianism.

The final chapter discusses how society as a whole treats its animals and how this can be improved. This can be addressed via international trade agreements, changes to legislation and the effects of changing societal opinions on the marketing strategies of supermarkets and fast-food outlets.

Appleby concludes by recommending that animal welfare ethical advisory committees be established by all national governments. Such committees should have public input and accountability.

The book is easy to read and is presumably intended for the general public, although it is unclear to whom it is directed. While Appleby's writing is sometimes a little simplistic in style, it covers the major societal issues clearly and concisely, although there is not a lot of discussion of the ethical and welfare issues associated with the use of animals for scientific purposes.

Nevertheless, the question posted by Appleby in the book's title is addressed well and the reader is given a clear description of the complex issue that is animal welfare in Western society.

Robert M. Baker
ANZCCART

Letter

Response to: **Research using non-human primates: only Two Rs**

Brinkman, in her article *Research using non-human primates* in the December 2000 issue of *ANZCCART News*, states that *Figures for [the number of NHPs used in research in] countries other than the US are difficult to obtain*. The UK has published figures on the use of animals for scientific procedures for many years, and now requires that information be submitted by those who hold project licences under the *Animals (Scientific Procedures) Act 1986*.

The use of publications as an indicator of use is flawed in that it fails to account for animals used for regulatory purposes, e.g., safety testing of new drugs. In 1999, 68% of primates used in the UK under the *Animals (Scientific Procedures) Act 1986* were used for regulatory purposes, required by the EU or a combination of EU, UK and other countries regulators. Brinkman acknowledges this omission but not its extent.

Statistics published annually in the UK allow a much more detailed analysis of use of animals for scientific procedure, without assumption and with well defined inclusion and exclusion criteria. Behavioural studies are excluded from the figures when they do not cause pain, suffering, distress or lasting harm. Such studies are not regulated under the Act. In 1999, the primary purpose of use of 86% of primates used under the Act was applied human medicine or dentistry. When analysed by body system, 17% were used in nervous system research and 1% on research into the senses, which broadly agree with the figures presented by Brinkman (24% and 3% respectively from figure 1). Thus the pattern of usage in the UK is similar to that

described by publication analysis, if one excludes use for regulatory toxicology.

Figures for the UK on the use of primates, cats and dogs in the years 1980, 1990 and 1999 are shown in the table below.

These figures show that within the UK there has been a reduction in use of all three species since 1990. This is contrary to the data presented for the US and the EU in the article. It must be considered however, that there are times when the use of a greater number of animals in a mild procedure may be preferable to the application of a more invasive procedure to fewer. The application of this "R" (reduction) is not always a straightforward assessment of numbers.

All proposed scientific procedures on animals in the UK, including in primates, are assessed prospectively by medical or veterinary qualified inspectors from the Animal (Scientific Procedures) Inspectorate to ensure that the minimum numbers of the least neurosentient species are to be used. The inspectorate must be convinced that there is no non-animal alternative to use (replacement). We must also be assured that the procedures cannot be performed completely under anaesthesia or on ex-vivo tissue (refinement). Re-refinement also occurs to ensure minimum suffering during the procedure, not only as part of the procedure itself but also in the husbandry of the animal before, during and after the procedure. The inspectors carry out continuing assessment of the balance between severity of the procedure to the animal and the benefits likely to be gained. We advise on and encourage the uptake of best practice in both procedures and husbandry. We believe that in the UK ALL of the Three Rs are being applied rigorously. While society wants the development of safe medicines to

improve the lot of sick people (and animals) it may have to accept the use of some primates. Ensuring uniform application of these standards and that international regulatory requirements fulfil these criteria perhaps should be the next goals.

Dr Kathryn Ryder
Animals (Scientific Procedures) Inspector
Home Office
London

Editor's note:

The US National Research Council's *ILAR Journal* has recently published a review of the role of non-human primates in biomedical research.

The article *Non human primates: A critical role in current disease research*, by L. Sibal and K. Samson (2001), (*ILAR Journal* **42(2)**: 74-84), focuses on the contributions that studies on non-human primates have made to the understanding, treatment and prevention of important human infectious diseases (e.g., acquired immunodeficiency syndrome, hepatitis, malaria) and chronic degenerative diseases of the nervous system (e.g., Parkinson's and Alzheimer's diseases).

	1980	1990	1999
Non-Human Primates	5 195	5 284	4 003
Dogs	11 482	11 000	8 175
Cats	6 827	4 392	1 623

Newly Published

Animals in research, for and against

by Lesley Grayson

Published by The British Library, April 2000
Price £35.00

Paperback, approx 300 pages
ISBN 0-7123-0858-X

Following a debate in 1998 at the British Association Annual Festival of Science in Leeds, the Boyd Group asked the British Library to produce an independent review of the issues relating to animal use in research to help underpin constructive debate. The Boyd Group is a committee of researchers, regulators, antivivisectionists, animal welfare, ethicists, philosophers and others who are dedicated to constructive debate on the complex and controversial issues surrounding the use of animals in research.

Animal experimentation is a perennially controversial

topic, and access to a balanced range of information is vital if there is to be constructive debate about issues on which people hold very different views. The British Library is ideally placed to provide such a service. Drawing on its vast collections in science, history, philosophy, ethics and the social sciences, this book reviews the spectrum of scientific, pressure group and public opinion on the use of animals in research; traces the development and continuing evolution of UK and EU legislation and regulation; reviews laboratory animal welfare issues and the development of alternatives to animal use; and looks at the issues raised by new technological developments such as genetic modification. A directory section gives access to key UK organisations and Internet sites which are particularly useful as sources of further information. It is intended for a general readership and for scientists wanting an overview of animal research issues.

ANZSLAS 2001 Conference

This will be held at the Carlton Crest Hotel, Sydney from 18 to 20 September, 2001. The conference will have two major themes:

1. Promoting researcher training as a critical prerequisite to excellence in animal research.
2. The design and equipping of animal facilities to meet international standards.

It will be preceded by a one-day workshop on 17 September on the topic *Basic genetics - how it applies to genetically manipulated animals and problems that arise*.

For further information contact Dr Malcolm France:

Tel: 02-9357-3603
Fax: 02-9351-4950
email:
mfrance@vetp.usyd.edu.au

Great apes at the threshold: Implications for law, ethics, conservation and science

The goal of this conference to be held in Boston, USA is to evaluate the tension created by the changing ethical and legal status of the great apes, particularly in the international area, and the continued demand for their use to serve human ends. To achieve this purpose, attendees will review recent information about the evolution, natural history, culture and cognitive abilities of apes; the nature of the arguments concerning the basis of moral and legal standing; the justifications for continued use; and the status of the national and international initiatives for conservation and other forms of basic

protection. The conference is intended for scientists, researchers, ethicists, lawyers and legislators, the animal protection community and interested public. Through the use of facilitated group discussions, didactic lectures, and social functions, this conference will enable you to interact on a personal basis with leaders in these fields.

The conference is co-sponsored by the Kennedy Institute of Georgetown University and the Centre for Animals and Public Policy at Tufts University. It will be held in Boston from 28 April to 1 May, 2001.

For additional information contact:

Susan Brogan
Conference Coordinator
Tufts University School of
Veterinary Medicine

Phone: 1-508-887-4723
Fax: 1-508-887-4539
Email:
Susan.Brogan@tufts.edu

[www.tufts.edu/vet/cfa/ethics conf.html](http://www.tufts.edu/vet/cfa/ethics/conf.html)

Seminars on Wildlife, Ethics and Welfare in New Zealand and Australia

ANZCCART is pleased to be sponsoring seminars in Sydney and Melbourne by Professor John Cooper and Mrs Margaret Cooper on 29 and 31 May, following their visit to New Zealand, where they will be speaking in Auckland, Palmerston North and Wellington.

Professor Cooper is a veterinarian with extensive experience in wildlife disease and comparative medicine. Mrs Margaret Cooper is a lawyer with particular interest in animal welfare law, on which she has published a

book and a number of papers.

They will be speaking in Auckland on 17 to 20 May at UNITEC and at the RNZSPCA conference. On 21 May they will speak at a seminar in Wellington on *Legal and ethical aspects of work with wildlife*. They will then speak at Massey University on 25 and 26 May on wildlife rehabilitation and on forensic work with wildlife.

The Coopers will then visit Australia as guests of ANZCCART, to speak at meetings in Sydney and Melbourne on the topic *Legal and ethical aspects of work with wildlife*.

The dates and venues are:

Sydney — Taronga Zoo, Mosman, Tuesday 29 May

This seminar is hosted by the Australian Association for Veterinary Conservation Biologists and will be chaired by Associate Professor Tony English of the University of Sydney.

Melbourne — Victorian Institute of Animal Science (VIAS), Attwood, Thursday, 31 May

This seminar will be chaired by Professor Paul Hems-worth, Director of the Animal Welfare Centre of VIAS.

For further information contact:

New Zealand — Neil Wells
email:
neil.wells@amcon.co.nz

Sydney — Tony English
email:
anthonye@camden.usyd.edu.au

Melbourne — Paul Hems-worth
email:
paul.hemsworth@nre.vic.gov.au

Coming up

Pan-Pacific Veterinary Conference

Melbourne
13-18 May, 2001

Contact: AVACOS
Tel: 02-6273-8855
Tax: 02-6273-8899

email: avacos@ava.com.au

Australasian Vertebrate Pest Conference

21-25 May, Melbourne

Contact: Convention
Associates
Tel: 03 - 9887 - 8003
Fax: 03 - 9887 - 8773
email:
convention@optushome.com.au

International Symposium on Regulatory Testing and Animal Welfare

ICLAS - CCAC

Quebec City, Canada
21-23 June, 2001

Contact: Micheline Harvey
Fax: 1-418-654-2761
email:
ICLAS.CCAC@crchul.ulaval.ca

ANZCCART 2001 Conference

Hamilton, New Zealand
28-29 June, 2001

*Learning, animals and the
environment: changing the
face of the future*

Contact: Mrs Gill
Sutherland
Fax: 64-4-470-5784
email:
anzccart@rsnz.govt.nz

Wildlife Health and Management in Australia

International Joint
Conference
2-6 July, 2001, Sydney

Contact: Dr Larry
Vogelnest
Fax: 02 - 9978 - 4516
email:
lvogelnest@zoo.nsw.gov.au

News

New animal research ethics website online

The University of Melbourne has launched this addition to its website. It includes information relating to functioning of animal ethics committees, e.g.,

- * approval and reporting; meeting schedules; and
- * policies and relevant Codes of Practice and legislation.

It will be further developed to cover:

- * occupational health and safety support;
- * audit and inspection;
- * workshops and training programs; and
- * news.

The address is:

www.unimelb.edu.au/research/ethics/animal/animal-home.htm

For further information or to provide suggestions, contact Mr Tim Anning at: t.anning@unimelb.edu.au

Interesting websites

1. Sources of information about alternatives.:

University of California website:
<http://research.ucsb.edu/connect/acc/alternvs.html>

2. ECVAM workshop reports

The European Centre for the Validation of Alternative Methods (ECVAM) has published over 40 workshop reports covering a wide range of topics. These are now accessible on-line at:

<http://altweb.jhsph.edu/science/pubs/ECVAM/ecvam.htm>

ANZCCART's website also offers information on alternatives databases.

3. Choosing an appropriate endpoint :

The Canadian Council on Animal Care (CCAC) now includes in its general guidelines *Choosing an appropriate endpoint in experiments using animals for research, teaching and testing* at: www.ccac.ca

Abolition of LD50 test

The OECD announced in December 2000 that its 29 member countries had agreed to abolish the use of the LD50 test. The LD50 is the lethal dose of a substance which will kill 50% of animals. In the test, groups of animals, usually rats, are given increasing doses of the substance being tested until half die. Organisations wishing to conduct the LD50 now have the choice of three alternative tests.

The first alternative, developed in Britain, requires only four animals. They seldom die. Instead, toxicologists note signs that hint at the lethal dose.

In the second, German test, a single animal receives escalating doses, often but not always until it dies. Again, there is a cut-off point where no more chemical is given even if the animal remains alive. The final dose, whether lethal or not, is confirmed in two other animals.

The third, American alternative is dubbed the "up and down method". Experimenters raise or lower the initial dose, depending on what happens in the first animal. Although half die, only around nine animals are used.

Regulatory authorities now have a year to get rid of the LD50 test.

Source: *New Scientist*, 9 December, 2000. p.6

Future ANZCCART publications

Two publications are in the final stages of review before publication. They are:

- * The second edition of *Euthanasia of animals used for scientific purposes*, edited by Dr Julie Reilly; and
- * The Proceedings of ANZCCART's 2000 Conference: *Farm animals in research - can we meet the demands of ethics, welfare, science and industry?*

New Chair in Alternatives

The Netherlands Centre for Alternatives to Animal Use, part of the Faculty of Veterinary Science at the University of Utrecht,

has appointed Dr Coenraad Hendriksen as its first Professor of Alternatives.

His research interests focus on the development and validation of methods to replace, reduce and/or refine the use of laboratory animals, especially in the production and quality control of immunobiologicals.

Animal use in science in Canada

Detailed statistics for animal use for scientific purposes in Canada for 1996, 1997 and 1998 are now available on the website of the Canadian Council on Animal Care — www.ccac.ca

The total number of animals used for scientific purposes in Canada in 1998 was 1,766,000, an increase of 295,000 from 1997.

See *Resource* (CCAC Newsletter), Fall 2000, **24(1)**: 11-12.

ANZCCART News is published quarterly by the Australian and New Zealand Council for the Care of Animals in Research and Teaching Limited.

It is a publication for researchers and teachers; members of animal ethics committees; staff of organisations concerned with research, teaching and funding; and parliamentarians and members of the public with interests in the conduct of animal-based research and teaching and the welfare of animals so used.

Contributions to ANZCCART News are welcomed and should be sent to:

Dr R.M. Baker, Director, ANZCCART,
Room 128, Darling Building
Department of Environmental Biology
Adelaide University
ADELAIDE, SA, 5005

Tel. 61-8- 8303 7586: Fax. 61-8- 8303 7587
E-mail address: anzccart@adelaide.edu.au

<http://www.adelaide.edu.au/ANZCCART/>

or

Mrs G. Sutherland, ANZCCART New Zealand
PO Box 598, Wellington, New Zealand

Tel. 64-4-472 7421: Fax. 64-4-473 1841
E-mail address: anzccart@rsnz.govt.nz

<http://anzccart.rsnz.govt.nz>

ISSN 1039-9089