



**ISAZ '96**

**The Animal Contract**  
*Exploring the relationships between  
humans & other animals*

**ABSTRACT BOOK**

**Downing College, Cambridge,  
United Kingdom  
July 24th - 26th, 1996**



## **Welcome**

It is with great pleasure that I welcome you to Cambridge and **ISAZ '96**.

The interest in human-animal relationships has grown tremendously over the last few decades and this in turn has stimulated a growing scientific and scholarly interest in the new field of Anthrozoology - the study of human-animal interactions and relationships. ISAZ, the International Society for Anthrozoology, was founded in 1991 as a supportive organization for this type of research.

This year, under the rather broad umbrella title of '**The Animal Contract**', we aim to highlight the diversity of topics studied, and the methodologies used, in the study of human-animal relationships. Should be good, huh? Well at least there should be something here for everyone!

I hope you enjoy the conference.

Anthony L. Podberscek  
**Conference Co-ordinator, ISAZ '96**

### **Organizing Committee**

Anthony L. Podberscek (University of Cambridge, UK)  
Elizabeth S. Paul (University of Edinburgh, UK)  
James A. Serpell (University of Pennsylvania, USA)

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<b>Contents</b>	<b>Page</b>
• Plenary Abstracts	3
Session Abstracts	10
Poster Abstracts	54
Index	67

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# ***Plenary Abstracts***



## **EFFECTS OF CHANGING HUMAN ATTITUDES AND HUMAN-ANIMAL INTERACTIONS ON ANIMAL WELFARE**

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Increasing knowledge about animal biology, especially behaviour, has led to greater respect for animals. However, where animals are used commercially, increasing economic pressures have sometimes had adverse effects on animals. In general, the greater respect and the rapid development of the scientific study of animal welfare are prevailing over commercial pressures and there is a trend towards improvement in animal welfare by education and legislation.

Attitudes to animals have in the past been very inconsistent in that animals like dogs, sheep and rats, whose potential for suffering is probably very similar, were treated quite differently. Public concerns about animal welfare have expanded from, firstly being principally about cruelty to pets, to secondly encompass also poor welfare in laboratory animals used in experimental studies and thirdly to take account of the effects of modern farming practices on the welfare of farm animals. It is logical that this last development should have occurred because most animals used by humans are on farms, indeed most are chickens.

The consequences of behavioural interactions between humans and other species have been the subject of much study in recent years. Some interactions, such as the infliction by humans of physical injury to other animals obviously result in poor welfare. Just how poor welfare is after injury is the subject of study, especially in relation to farm and laboratory operations. Other interactions can result in fear or sufficient disturbance of the animal's control systems to cause it problems. On the other hand, interactions which lead to good relationships between the human and the animal will generally result in better welfare for both. Examples of such studies in companion animals are quite well known but the recent studies have also shown how farm animals can benefit from human contact. Where relationships between humans and individuals of other species are established, it is always important to consider the consequences for the welfare of the animals as well as those for human welfare.

## **HUMAN-ANIMAL INTERACTIONS: IMPLICATIONS FOR INTENSIVE FARMING**

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Where animals are intensively farmed, there are times when there is close physical contact between the stockperson and farm animals. Research has shown that if stockperson behaviour is negative, then it adversely affects the animal's behaviour and production. Similarly, if stockperson behaviour is improved, then there is a subsequent improvement in animal behaviour and production. Evidence supports the view that the attitudes of the stockperson influence the stockperson's behaviour; if attitudes are negative, the stockperson treats the animals adversely and this leads to increased fear, increased stress and a subsequent decrease in production.

Data from research in the pig industry clearly show that there is a strong relationship between stockperson attitudes and behaviour both in small, single-operator piggeries as well as in large commercial piggeries. Research has also demonstrated that it is possible to train stockpersons to modify both attitudes and behaviour towards pigs. Recent, unpublished, data show that in the case of broiler chickens, similar relationships between attitudes and behaviour can be observed. In this case, the relevant behaviours are different; in pigs, adverse behaviours include mild slaps and hits while in chickens it is more speed of movement which has adverse consequences. Preliminary data from the dairy industry also shows a similar relationship. The dairy industry is characterised by several stockpersons usually working in the milking shed at any given time. One interesting finding is that the strongest attitude-behaviour relationships are observed when data from the most extreme of the stockpersons is analysed.

While a key feature of the role of the stockperson is the stockperson's behaviour towards farm animals, there also may be indirect effects on production and welfare resulting from the stockperson's job satisfaction, work ethic and willingness to acquire technical skills and knowledge. Therefore, there is an opportunity to develop selection and training procedures which optimise the capacity of the stockperson to provide an appropriate behavioural environment for animals under the stockperson's care.

Results from a recent study at a large commercial pig farm showed that attitude variables were the most consistent predictors of behaviour, and that other, job-related variables correlated with attitudes but did not contribute greatly to predicting behaviour. There was some limited evidence to suggest that empathy might contribute directly to predicting behaviour. These results provide a basis for developing training programs for stockpersons which target specific attitude-behaviour areas in which the individual stockperson requires improvement. There is also a case for developing selection procedures for both inexperienced and experienced stockpersons although this will require further research to identify generic factors which predict good performance from inexperienced stockpersons.

## **PUBLIC ATTITUDES AND ANIMAL RESEARCH: THE SOCIAL PSYCHOLOGY OF A MORAL ISSUE**

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In many countries, public sentiment regarding the use of non-human animals in biomedical and behavioural research is deeply divided. Much of the research on this issue falls into two categories. The first consists of opinion polls which are typically sponsored by news organizations or special interest groups. Although these surveys often use sophisticated sampling methods to assess the attitudes of the "general public," care must be used in interpreting their results. Responses, for example, are often influenced by the specific wording of the questions. As a result, response patterns may be obtained which are, at least on the surface, paradoxical. In addition, the psychology of attitudes held by the proverbial person-on-the-street is quite different from that of individuals such as animal activists whose lives may revolve around issues related to the treatment of animals. In the latter case, attitudes toward the use of animals in research are likely to be part of a deeplyheld system of beliefs and are often translated into behaviour. This is much less true of the public at large.

A second body of research has focused on factors which underlie positive and negative attitudes toward animal research. Variables known to influence individual differences in attitudes about the treatment of animals include gender, some personality traits, beliefs concerning the mental capacities of non-human animals, interpersonal empathy, and personal moral philosophy. But, while such factors have been found to account for a statistically significant proportion of variance in attitudes toward animal research, effect sizes (with the exception of gender) are typically modest. In most studies, much of the variation in attitudes is unexplained.

The relationship between public attitudes and social policy is discussed as are factors related to the effectiveness of materials designed to change attitudes toward animal research.

## **THE NATURE OF CONSERVATION: INTERVENING IN THE LIVES OF WILD ANIMALS**

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How we define the natural world, and the role of human beings in that natural world, specifies what human actions we consider to be appropriate towards nature. In turn this specifies what is the acceptable relationship between humans and wild animals.

Much of the debate on this relationship is structured by one's beliefs about what is natural and what is human. Do natural systems exist? Can they be defined as discrete entities? Are human beings a part of natural systems, or does nature, by definition, exclude human beings? The answers to these questions helps define whether one believes that natural systems should be managed; if they are to be managed, what they should be managed for; and what are acceptable interventions in the lives of wild animals.

After outlining the logical relationships within these belief systems, I consider a series of examples which test the utility of these logical frameworks. I examine the resilience and persistence of tropical forests under conditions of human exploitation. I consider the impact that indigenous traditional hunting has on wildlife populations. I conclude that while natural systems are dynamic and often exist in a state of disequilibrium, they can be defined. And while humans are integral parts of natural landscapes, their activities, especially in the modern world, have had a significant impact on natural diversity. Because of this impact, we human beings must take responsibility for the survival of species in nature. Natural areas must be managed, and I make the argument that they should be managed for biodiversity and ecosystem functioning. This can involve significant intervention in the lives of wild animals, and I consider what kinds and levels of intervention are acceptable -- if one is concerned with biological conservation. Specifically I examine the establishment and management of parks and protected areas, the culling of large mammals in wild areas, and the collecting of animals for zoos.

## **ANTHROZOOLOGY, RED HERRINGS, MARCH HARES AND OTHER BEINGS**

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Over the past decade, various organizations around the world, including ISAZ, have succeeded in launching a new multidisciplinary field of academic inquiry - anthrozoology. As with any new field, there are questions about the boundaries of appropriate anthrozoological inquiry and who might claim membership. Such questions are exacerbated by the fact that anthrozoology is as multidisciplinary as any scholarly field can be. Apart from the fact that the term is itself of mongrel etymological roots (it should be "anthropozoology" from the greek roots "anthropo-" and "zo"), almost anybody can set him or herself up as an anthrozoologist. On my bookshelf, I have works by zoologists, anthropologists, sociologists, ecologists, veterinarians, historians, literature scholars, art historians, social workers, ethologists, political scientists, philosophers, folklorists, journalists, pharmacologists, psychologists and wildlife managers (to name some of the specialists). How does one even begin to digest such diversity down into a single field of scholarship?

This paper will explore what the field of anthrozoology does and might encompass by selecting noteworthy articles and books published mostly in the last decade and discussing how they contribute to a greater understanding of human-animal interactions. One of the obvious conclusions to be drawn from research in the field is that our relationships with animals are replete with paradox and contradictions. Thus, we take great pains to oversee how mice are used and cared for in research situations while those same mice, when they escape from the cages, are unceremoniously trapped, killed and incinerated. Love of pets and kindness to animals is regarded as an important virtue but, if the human-pet interaction is tinged with any hint of a sexual relationship, it is treated as the most heinous and unmentionable (literally) of transgressions.

Anthrozoology is much more than the narrow area of the human health benefits of interacting with dogs, cats, horses or birds. It also includes the breadth and richness of symbolic meanings of animals in human existence, both good and bad, the way we use animals to define what is or is not human, and the more obvious(?) epidemiological investigations that describe the range of human-animal relationships.



## **CREATURES OF THE UNCONSCIOUS: COMPANION ANIMALS AS MEDIATORS**

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Throughout the early literature on the benefits of human-animal interactions, or animal-assisted therapy, frequent references are found to the importance of companion animals as 'mediators'. Companion animals are said to function as 'social lubricants', 'socialization catalysts' and 'non-verbal communication mediators', as well as having the ability to 'reconnect' us with other people, with ourselves, with reality, and with nature itself. Typically, this mediating role is portrayed as a special, even unique, property of companion animals that cannot be achieved easily by others means. The aim of the present paper is to describe the different contexts in which companion animals have traditionally been thought to play a mediating role. I will also explore the history and underlying psychology behind this idea, as well as attempting to generate a unifying theory to account for the power and persistence of this interesting metaphor.

Whether wild or domestic in origin, companion animals tend to occupy an unusually ambiguous position on the boundary that separates human from nonhuman. By virtue of this peculiar status, companion animals may have the potential to link us socially and ethically with other categories of animals, and with the broader category of 'nature' of which other animals are perceived to be an integral part. This capacity has obvious implications for the development of moral attitudes to animals and the environment, but it may also effect our own emotional well-being and stability by, so to speak, 'grounding' us in the simpler, more basic, and more 'natural' rhythms and routines of animals' lives.

By blending a unique mixture of human and nonhuman characteristics, companion animals also appear to be able to elicit prosocial behaviour from humans without the conventional inhibitions that usually accompany direct human-human interactions. In this sense, a pet may indeed serve as bridge across the gulf that ordinarily separates one person from another.

Finally, animals provide a fertile medium for expressing or symbolizing things about ourselves or others that we are either unable or unwilling to express more directly. In particular, animals tend to be used unconsciously to represent our own repressed and unacceptable thoughts and impulses. This can be understood as a coping strategy. By cloaking our inner thoughts and feelings in animal skins we render them into forms that can be confronted, overcome and, hopefully, tamed. And judging from detailed analyses of the contents of people's dreams, dogs, cats and other companion animals are the species most commonly employed for this purpose, at least among western cultures.

In all of these cases, it is the liminal, intermediate status of companion animals --- their curious admixture of human and nonhuman traits --- that endows them with special social and therapeutic properties. However, one logical implication of this perspective is that these properties will be lost if companion animals are assimilated into the human and cultural domain too completely. As we progressively modify, restrict and curtail the abilities of pets to express their true animal natures, we simultaneously destroy their capacity to mediate on our behalf.

# ***Session Abstracts***



## **COMPANION ANIMALS FOR HEALTH AND SOCIAL CARE: TOWARDS AN EVIDENCE-BASED APPROACH**

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There is a considerable body of opinion that companion animals can offer tangible benefits to people in terms of health and social aspects of life. Many supporters of companion animals believe that they can improve physical, psychological and social wellbeing in children and adults, especially in mentally disturbed and elderly people. Disadvantaged groups such as physically disabled persons, old single people in residential housing and offenders in penal institutions are all said to have received benefits through contact with, and possibly therapeutic interactions with, companion animals.

The language of current companion animal literature reads in places very much like that of medical and psychosocial research. However, in comparison with 'mainstream' biomedical scientific research, what is the basis of using this language in respect of companion animals? Healthcare in western countries is moving towards an 'evidence-based' approach - principally because of the need for governments to rationalise (and ration) an increasingly large range of therapeutic options with differing financial and social costs. Can we apply the evidence-based approach to companion animal claims of benefit?

Ten years ago the answer to this question would have been resoundingly 'No'. (To be fair, the unbiased scientific basis of many medically held beliefs and practices would also have been quite suspect one or two decades ago.) Recently, there is emerging a new trend towards controlled studies with classical biomedical models e.g. using randomised controlled trials (RCTs). The use of observational and other qualitative (ethnographic) approaches is also undergoing a process of maturation.

How can companion animal research become more evidence-based? Lessons to be learnt from biomedical research include: greater use of RCTs; multicentres studies, multidisciplinary research with appropriate mixtures of quantitative and qualitative methodologies; systematic reviews and meta-analyses of existing literature, consensus of appropriate and meaningful outcome measures. An agreed research agenda is also required, with clear priorities being set jointly by clinicians social scientists, ethologists, ethicists and policy-makers in health and social care.

Research funding to support an evidence-based approach for companion animal research needs to be considerably increased. The contributions from industry, government and health and social care research charities should be publicized alongside those for human and veterinary biomedical research. A co-ordinated campaign to fund more research, predominantly in association with universities, needs to be supported by all interested parties, regardless of vested interests.

Influential organizations such as SCAS and ISAZ have a crucial role to play in setting these targets and monitoring the progress towards them. The major advantage that SCAS possesses is, paradoxically, its predominantly non-scientific membership (in spite of its title). The unique admixture of lay people, writers, educationalists and researchers in SCAS assures that its personal research role, though modest, is firmly rooted in the 'real world'. The umbrella group IAHAIIO also will be very important in disseminating these evidence-based findings in a thoughtful and constructive way that validates the work of scientists in the eyes of 'practitioners'.

Ultimately, it may be that the evidence-based approach is self-limiting and will be seen to be primarily serving the needs of harassed governments. Even so, the short-term gains for the field of human-companion animal interactions could be very valuable in helping to restore a more balanced, ecological view of modern urban life. If some of these findings could also be translated into visible changes in health and social policy, then the pain of embarking on the evidence-based route would have been worthwhile.

## **HUMAN VICTIMS IN COMPANION ANIMAL ABUSE**

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Researchers who study companion animal abuse typically examine two questions. Either they catalogue the rates of abuse and types of animals abused or they describe the abuser's methods of, and motivation for, abuse. While such questions are important to investigate, a different kind of victim - the owner of the abused animal - is absent in these studies. Studies of human victims of domestic violence indicate the enormity of this trauma for survivors and suggest that a corresponding trauma might be experienced by people who themselves are not the direct target of violence but who are close to, and responsible for, the target victim, as in the case of a mother whose daughter is abused by a boyfriend.

This study asks whether a similar kind of secondary or shared trauma is experienced by companion animal owners when their animals are abused by others. In order to examine this question, open-ended exploratory interviews were conducted with 20 companion animal owners whose animals were maliciously tortured or killed. The interviews encouraged respondents to describe their prior relationships with their animals, the abusive incident(s) that occurred, and their subsequent responses to the abuser, law enforcement personnel, friends, family, and other animals.

The vast majority of these owners were found to progress through a series of psychosocial stages, following what was often initial confusion about the nature of their animal's injury or death. More specifically, after determining that their animals had been abused, owners experienced shock, grief and anger before they could construct a version of the incident that they could live with, albeit with certain conditions.

## **IN SEARCH OF THE ANCIENT PET KEEPER'S MOTIVATIONS: ANIMAL MERITS AND HUMAN GRIEFS IN ANCIENT GREEK AND ROMAN PET EPITAPHS**

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Pet keeping is deeply embedded in Classical antiquity at both the individual and social level. The phenomenon, although it might prove not to fit the modern standards of statistical testing, is well evidenced: extensively in arts and literature and to some degree in archaeozoological finds. Taphonomic animal remains are unmistakably identified as pets' e.g. when they were buried along with their keeper or on their own in purposely designed graves. But the pet owner's motivations are rarely, if ever, explicitly assessed with respect to related matters: seeking animal companionship and choosing a particular animal species, the one prevailing on the other, depending on the geographic origin, external aspect and behaviour of the animals, and their emotional and social significance.

When one wants to investigate why the ancient Greeks and Romans valued pets so much, one has to rely mostly upon indirect clues. Some of them are contained in pet epitaphs. Indeed, burying animals, though ostentatious funerals could be criticized, was an unquestioned practice at that time and did not raise the philosophical or religious issues that appeared later in christianized Europe. Tombstones and monuments with reliefs or sculptures portraying an animal were erected on the grave ground and inscribed with prose or verse epitaphs similar in purpose and in style to the inscriptions commemorating humans. Although representing only a limited part of the ancient collection of funerary texts celebrating animals, pet epitaphs raise the same technical questions as the whole series concerning dating, authorship, etc. Shorter or longer, they emphasize the animal's memorable traits on the one hand and the feelings of the bereaved owner on the other.

After briefly introducing the historical and literary background of ancient Greek and Roman pet epitaphs, this paper surveys their characterization of the animals and how the grief of the pet keepers was conveyed, in an attempt to understand their motivations better. Ancient pet keeping relates to the widespread attitude towards companion animals, yet with distinctive features. These shed further light on the general status of the animal in Classical antiquity. They are also worth considering for comparison with the practice of pet keeping in other cultures and for an evaluation of its older or more recent changes, especially in western countries.

## **BEEF CALVES REACT DIFFERENTLY TO DIFFERENT HANDLERS ACCORDING TO THE TEST SITUATION AND THEIR PREVIOUS INTERACTIONS WITH THEIR CARETAKER**

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Because farm animals and caretakers interact regularly, animal responses to humans could be influenced by the familiarity of the handler. However, many experiments have recorded general responses of animals to humans without considering the identity of the handler. The present experiment investigated how beef calves react to different handlers according to the test situation and their previous experience with their caretaker.

Twenty-four beef calves (French mountain breed) from both sexes were allocated into two rearing treatments: R1) separation from the mother 24 H after birth, twice a day suckling the mother under human control, one minute per day of stroking the whole body of each calf; R2) no separation from the mother except for cleaning the free stall, no additional human contact. Only one caretaker, always wearing the same type of clothes, was present in the calves' environment. Animals from both treatments were also regularly trained to eat alone from a bucket of concentrates in a 6x2.4 metre test pen.

The first procedure (T1) was designed to test half of the animals with the familiar caretaker and half with a stranger. Two tests were performed over two days for each animal. Each human stood motionless close to the bucket and wore either the familiar overall or a new coat. The same procedure was reproduced the following week, exchanging the identity of the human for each animal. The second procedure (T2) consisted of touching the calf successively on the shoulder and on the head when it was eating. Animals were tested over two days with the familiar caretaker and with a new stranger. The last procedure (T3) was one weighing test a day during two days. The ease of leading each animal onto the scale either by the familiar caretaker or a new stranger was recorded. Matched pair *t* tests and GLM variance analyses were used to analyse the data. Means and Standard Errors are given as results.

T1: Calves spent less time far from the bucket when with the familiar caretaker (5.6 +/- 4.0 s) than when with the stranger (21.3 +/- 19.5 s) during the first week of test ( $F=9.4$ ,  $P<0.01$ ). Differences between humans during the second week were not significant. The effects of clothes or rearing treatment were also not significant. Animals showed an habituation to the test (first week 13.5 +/- 15.9 s; second week 4.3 +/- 4.0 s,  $F=19.12$ ,  $P<0.01$ ). T2: R1 animals accepted to be touched on the shoulder much more quickly (50.4 +/- 52.4 s) than R2 animals (89.6 +/- 55.5 s) whatever the human involved ( $F=5.4$ ,  $P<0.05$ ). However, R2 animals accepted being touched on the head much sooner by the familiar caretaker (106.7 +/- 64.1 s) than by the stranger (161.7 +/- 34.6) ( $t=-3.71$ ,  $P<0.05$ ). No significant difference ( $P>0.7$ ) on this criteria was observed for R1 animals with the familiar human (55.8 +/- 61.1s) or with the stranger (61.8 +/- 64.1s). This interaction between human identity and rearing treatment is significant ( $F = 5.51$ ,  $P<0.05$ ). T3: no significant effect was observed during the weighing test.

Results confirm the existence of a variable response to human identity by cattle and highlights the importance of such factors in interaction within the context of the human-animal encounter and the previous experience with humans.

## **CHARACTERISTICS OF PET OWNERSHIP IN FAMILIES**

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This study investigated the characteristics of person-pet relationships within pet owning households. Approximately half of all households in developed western countries keep companion animals, the most common varieties by far being cats and dogs. These pets are often experienced as family members and are considered particularly important to children (Levinson, 1972; Bryant, 1982, 1990; Furman, 1989), but little is known of variation within families of individuals' relationships with pets. Data concerning 240 person-pet relationships were collected using Furman and Buhrmester's (1985) Network of Relationships Inventory (NRI). Age of subjects ranged from 10 years to 70 years. Subjects' ratings for cats and dogs were significantly different on most of the NRI subscales ( $p < 0.05$ ), with higher ratings given to dogs. This suggests a greater involvement with the dogs not only on positive subscales such as companionship, affection and satisfaction, but also on negative relationship aspects such as conflict.

The NRI also yields an index of social support, which differed significantly according to family role type (e.g. daughter, son); subject gender; and pet type (dog or cat). The social support index for adults was significantly higher for relationships with dogs than cats, whereas for children there was no significant difference between the two types of pet.

Subjects rated on a 5 point scale how much they considered they owned each pet. These ratings were significantly related to family role type; the social support index; and whether subjects rated the pet as "more trouble than it is worth" to the family as a whole.

Overall, the results provide evidence for differences in person-pet relationships resulting from factors such as family role, gender and pet type. These factors are also significant in how subjects regard themselves as sharing in ownership of the pet. The results suggest that a variety of person-pet relationships can occur within a family sharing ownership of a single pet. This has important implications for research seeking to explain associations between pet ownership and health, as previous studies have tended to equate ownership simply with the presence of a pet in the household. This study implies that a more refined analysis is needed to explore the role of person-pet relationships in human health.

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## **THE INFLUENCE OF NOMADIC PASTORALISM ON THE EXPRESSION OF HUMAN PREDATORY AGGRESSION**

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Like most other animals, humans possess a 'predatory instinct' which enables the individual to 'switch off pity' for the target animal during the hunt. The brain centre for this predatory aggression is located slightly lateral to the other forms of aggression in the hypothalamus. In opposition to the hot fury of the usual affective aggression, predatory aggression is characterised by a curious lack of emotion. The individual displays a cool non-affective frame of mind, lasting for minutes, hours or even days, as long as the hunt demands. Immediately after the hunt the innate 'instinct switch' reverts back to the usual position of vegetative identification with one's fellow creatures.

The workings of the 'instinct switch', perfectly developed for the life of a hunter-gatherer, probably became less smooth during the transition to animal domestication, when humans routinely began to exercise power over the entire lifetimes of individuals from non-human species. With the advent of nomadic pastoralism approximately 7,000 years ago, the herders' 'instinct switch' may have become stuck in the non-affective position for days on end. The daily sight of running herds may have acted as a powerful continuous releaser for predatory aggression.

This unacknowledged 'predatory instinct on the loose' probably had a decisive influence on the social organisation of the ancient nomadic societies, and still defines much of modern humans dealings with their fellow creatures.



## **PERSONAL PERCEPTIONS AND AFFECT TOWARDS HOUSEHOLD CATS**

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Although owners often ascribe descriptive "personalities" to their cats, it is unclear how these relate to the "behavioural styles" of the cats themselves, or to the degree of attachment between owner and cat. In this study we have investigated owners' perceptions of their cats' personalities, and have related these to characteristics of the cat (age, sex, origin, number of cats in household) and a measure of attachment.

Subjects were 119 adults (77 female, 42 male, 18-84 years old) who had responded to requests posted in veterinary surgeries. All were members of cat-owning households; no more than two respondents describing the same cat were included (cats,  $N=102$ ). Each subject completed (a) 58 bipolar semantic differentials describing the cat's character and behaviour, and their feelings towards and relationship with the cat, and (b) 12 scales describing the extent to which they would turn to their cat for support under different circumstances. Reliability of all 70 items was estimated from a retest using 62 of the same participants; six semantic differentials and three support items were discarded before analysis due to poor repeatability ( $\rho < 0.50$ ).

Principal components analysis of the semantic differentials produced four factors, which were labelled Companionship, Wildness (characteristics of a wild mammal), Reactivity (child-like behaviour) and Timidity (nervousness, inoffensiveness) on the basis of the component loadings. Companionship ratings were significantly higher for cats that lived in multicat households ( $t = 2.64$ ,  $P < 0.01$ ) and/or had been obtained as strays or from animal shelters ( $t = 2.08$ ,  $P < 0.05$ ). Male respondents generally gave lower ratings for Companionship than female respondents, but this difference was not statistically significant. Wildness ratings were higher for female cats ( $t = 2.45$ ,  $P < 0.05$ ) and young cats ( $\rho = 0.214$ ,  $P < 0.05$ ), and the cats of older respondents ( $t_{(\text{slope})} = 2.48$ ,  $P < 0.05$ ). Younger cats were also rated more highly on Reactivity ( $\rho = 0.407$ ,  $P < 0.001$ ). Female respondents tended to rate their cats highly on Reactivity ( $t = 2.55$ ,  $P < 0.05$ ). Young male cats were most likely to be rated low on Timidity ( $\rho = 0.361$ ,  $P < 0.01$ ). Apart from Companionship, all these ratings are influenced by characteristics of the cat itself, such as its age and gender, and may therefore reflect aspects of the cat's own "behavioural style".

Examination of the nine reliable support items by multivariate techniques suggested a single underlying variable, which we have termed General Support. Female respondents gave higher ratings for General Support than males ( $t = 3.0$ ,  $P < 0.01$ ); male respondents gave higher ratings if there were no children in the household ( $t = 4.44$ ,  $P < 0.001$ ). The relationship between General Support and the four underlying factors for cat "personality" was found to be affected by the gender of the respondent. Female respondents showed a stronger correlation between General Support and Companionship ( $\rho = 0.71$ ,  $P < 0.001$ ) than males did ( $\rho = 0.31$ ,  $P < 0.05$ ). This trend was reversed when comparing General Support with Reactivity (males,  $\rho = 0.40$ ,  $P < 0.01$ ; females,  $\rho = 0.19$ , NS). This dichotomy suggests an underlying difference in the expression of the cat-owner relationship between men and women. Women who obtain emotional support from their cat may tend to perceive it as a companion, whereas men who (admit to) obtaining emotional support describe their cat as being reactive, and may therefore need to interact with it directly to obtain the support.



## **CONSCIOUSNESS IN NON-HUMAN ANIMALS: THOUGHTLESS BEASTS OR SENTIENT BEINGS?**

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Debate concerning the existence and nature of consciousness in non-human animals is as old as the subject of philosophy itself and directly measuring such a phenomenon will, most likely, remain impossible. The law of parsimony, adhered to in the application of the scientific method, dictates that if a simpler explanation can account for an observed phenomenon a more complex explanation should not be invoked. Thus many researchers persist in refuting the existence of consciousness in animals since observed behaviour can often be explained by simpler models. Yet failure to unambiguously identify consciousness in animals should not necessarily lead to the assumption that it does not exist; there are a number of arguments which favour the potential existence of such a phenomenon in non-human animals, whatever form it may take and however difficult it may be to measure.

Firstly, it is illogical to assume a discontinuity in consciousness between non-human animals and human beings since there is now overwhelming evidence to support the theory of evolution, and evolutionary continuity between physical morphology is widely accepted. The accepted orthodoxy, a discontinuity between humans and other animals, should be viewed as an assumption and not a fact based on evidence.

Secondly, continuity in morphological characteristics between species may be easily observable but continuity in consciousness is very difficult to observe. Any lack of evidence for its existence may therefore be due to a failing in method and should not necessarily lead to the conclusion that it does not exist.

Thirdly, scientists have tended to assume consciousness in animals does not exist (due to lack of supporting evidence) and they have therefore tended not to specifically look for its existence, rather than accepting a hypothesis suggesting it may exist and actively seeking evidence in support.

It is clear that our views on these issues have major implications for our treatment of animals in scientific research, farming and zoos. An open and constructive discussion is therefore essential since the lives of a vast number of non-human animals depend on our attitudes for their survival and welfare.

## RELIABILITY AND VALIDITY OF A HOLDING TEST TO MEASURE "FRIENDLINESS" IN CATS

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In general, studies of genetic and environmental effects on the socialisation of kittens have not addressed whether these influences persist unchanged into adulthood, or the extent to which socialisation generalises from the specific individuals who handle the kitten to people in general. We have investigated the consistency of pet cats' reactions to an unfamiliar person over the first 33 months of their lives, using a holding test adapted from that devised by Karsh.

Subjects were 29 cross-bred cats (16 males and 13 females), from nine litters born over a nine-month period, whose mothers were household pets. The first test was carried out at 2 months old (in the home where the kittens had been born), and further tests, in their new homes, were carried out at 4, 12, 24 (N=22) and 33 (N=19) months. A standard person (SEC) sat and held the cat on her lap facing away, and talked to it while stroking its head. If the cat attempted to escape, it was gently pulled back into the original position. The number of escape attempts was recorded, and also the presence of any distress behaviour (any or several of: anger wail, growl, scratch, bite, claws out). An estimate of the amount of handling the litter received between 4-8 weeks of age, and a ranking of the kittens in each litter with respect to the proportion of handling each had received, were obtained from a questionnaire given to the owners of the mother cats. Reliability of the holding test was estimated by Spearman rank correlations (escape attempts) and Fisher's exact test (distress) between all pairwise combinations of tests.

No cats showed signs of distress at 2 months, suggesting that socialisation had been adequate for all litters. Three cats were distressed at 4 months, 13 at 12, 3 at 24, and 6 at 33. Eight cats were distressed in at least two tests, implying a degree of consistency, born out by a significant association between the 12 and 24 month tests, and the 12 and 33 month tests (both  $P=0.01$ ). The number of escape attempts varied between 0 and more than 10 at each test. Although distressed cats always made slightly more escape attempts, this difference was only significant at 33 months ( $Z=2.19$ ,  $P<0.05$ ), implying that some cats escaped repeatedly for reasons other than distress. Significant ( $P<0.05$ ) positive correlations between numbers of escape attempts were found between tests at 4 and 24 months ( $\rho = 0.630$ ), 24 and 33 months (0.558), and 4 and 33 months (0.660). No significant correlations were found between the test at 12 months and any other test. Considering the possibility that escape with and without distress might be different, separate sets of correlations for escape at 12 months were carried out for cats that had or had not been distressed during those tests, but none were significant. All four correlations involving the 2 month test were negative, and one was significant (with 24 months;  $\rho = -0.544$ ).

The amount of handling that each cat had received as a kitten was, as expected, negatively correlated with the number of escape attempts at 2 months ( $\rho = -0.461$ ,  $P<0.05$ ). However, the correlation between handling and the number of escape attempts at 4 months was positive ( $\rho = 0.384$ ,  $P<0.05$ ), i.e. cats which had received the least socialisation tended to make fewer escape attempts. No relationship could be detected between handling and distress at any age.

After the kitten had been rehomed, the holding test produced consistent results, with the unexplained exception of the escape measure at 12 months. However, interpretation of the escape measure at 4, 24 and 33 months is still not straightforward, since (a) its relationship with distress is complex; (b) it is not positively correlated with the escape measure taken at 2 months, and (c) its relationship to the amount of handling received during the weaning period suggests that minimal socialisation produces more docility than thorough socialisation.

## **HUMAN ACTIVITY AND REHABILITATION OF BIRDS OF PREY**

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Nowadays human activity is a major threat to wildlife. Birds of prey are particularly affected due to their location at the top of trophic pyramids and to their low numbers. Ethical and ecological considerations have led to the development of programmes to treat birds with injuries and their later release back into the wild. This paper deals with a crucial aspect of that programme: the survival success of birds of prey after such release.

In a first study a sample of 16 rehabilitated buzzards (*Buteo buteo*) was released during different seasons in a farming area near the Po River. The birds had been taken to the Rehabilitation Centre (RC) nearby because of injuries due to shots by poachers. After release, the birds showed a progressive acclimatisation to the new environment, increasing their distance from the release site which suggested an improvement of the endurance of pectoral muscles, not fully acquired in captivity. Flight length was correlated with both distance from the release site ( $r_s = 0.133, P < 0.001$ ) and flight height ( $r_s = 0.314, P < 0.001$ ). They appeared to avoid human presence, and although the area chosen for this study had a high level of human population, this was not a major source of active interference. However, 3 birds died within 7 days by electrocution; one of which had been shot and injured a few hours earlier.

A second study concerned a sample of 7 young long-eared owls (*Asio otus*). In recent years an increasing number of orphaned but uninjured Strigiform fledglings entered the RC. Most of these are collected by people from the base of trees because they have fallen either from the nest or when learning to fly. The fledglings are generally attended by parents but people believe they are injured or abandoned and need help to survive from predators. Such human behaviour is a consequence of the Italian people's increasing concern for animal species. As a result, a large number of young owlets are unnecessarily captive reared and this is potentially affecting negatively their post-release survival in the wild. In contrast to the buzzards, owlets remained very close to the release site (less than 1700 m) and did not avoid human settlements. They too increased their distance from the release site ( $r_s = 0.796, P < 0.001$ ), but their survival rate was very low; in fact, 3 birds died within a few days and another was recaptured because it had fallen into a stream.

The results show how rehabilitation of birds of prey is very important to aid recovery from injuries, but is almost useless if not accomplished by good monitoring and surveillance of individuals after release into the wild.

## **THE HORSE BAR MITZVAH: UNDERSTANDING ANIMAL CELEBRATIONS AND OTHER PET PASSIONS**

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Through the Long Islander's horse bar mitzvah to the cats adorned with Easter bunny ears to the Christmas trees placed on animal graves, humans demonstrate a need to transmit folklore to animals in their care. While folklorists have long been attracted to the study of human celebrations, focus on human rituals for animals has been limited. This paper documents and analyzes folkloristic practices for animals by pet owners and some institutional environmental enrichment programs.

Points to be made: A. When a society has no ready-made festivals honoring animals, people incorporate the animals into human celebrations. B. Animal celebrations may express urban people's detachment from nature and a need to reconnect. C. By involving themselves in animal celebrations, people make a spiritual statement about the connectedness of all living creatures.

The focus is on celebrations as one method of exposing the meaning of the human/animal relationship. Because folklorists often study rites of passage and ceremonies, this seemed a natural way to examine this phenomenon. The primary data were collected through observation of events and/or interviews with key participants.

While some might label animal weddings, bar mitzvahs, funerals and holiday celebrations as amusing, even foolish, a serious purpose exists. These ceremonies allow people to express how meaningful animals are to humans, creating a bridge between natural, social, and spiritual levels of life. Humans sharing celebrations with animals heightens awareness of an interrelatedness within a larger universe. Through these rituals, humans acknowledge a union with other creatures.

**ON THE GENERALITY OF THE CARDIOVASCULAR BENEFITS OF COMPANION ANIMALS: THE EFFECT OF A SERPENT ON HIS OWNER**  
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A growing body of literature indicates that canine companions affect the physiological functioning of their human owners in beneficial ways. Interestingly, however, despite the fact that dogs comprise only 22% of all the companion animals in U.S. households, little is known about the acute effects of less traditional companion animals on their owner's blood pressure. To examine the generality of the phenomenon of pet-induced reductions in cardiovascular activity, I measured the cardiac responses of an amateur herpetologist to his 10.5-year-old boa constrictor under conditions of relaxing while his snake was visually absent, watching his snake, and touching his snake. Compared to when he relaxed, each of three of the herpetologists' cardiac measures (systolic pressure, diastolic pressure and heart rate) were reduced in response to his watching and touching his snake (binomial test,  $p=0.01$ ). This result suggests that nontraditional companion animals may bestow similar cardiovascular benefits upon their owners as those provided by their more traditional counterparts. When considered from a public health perspective, the results of this experiment indicate that studies of the health benefits of companion animals on their human owners would be of better service provided that they more thoroughly consider the potential effects of a greater number of companion animal species.



## **COMPANION ANIMALS IN REPRESENTATIONAL ART**

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Representational art is a rich source of information on people and their companion animals. This is seen most vividly in paintings over the last 500 years but is also evident in sculptures, bronzes, wall paintings, relief carvings, ceramics and manuscripts over periods of several thousand years. Close study of such works has revealed many aspects of human/companion animal interactions, as well as a number of animal/animal relationships. The accuracy of the artist's observations of the behaviour of animals such as attitudes assumed during aggressive and playing activity can be confirmed by comparison with photographs.

An examination of a large number of works has indicated that animals such as dogs and cats are included in works for a variety of reasons. These include a number of allegorical and symbolic uses. These can be positive as in dogs as symbols of fidelity, nobility and watchfulness; or negative attributes as in cats representing deviousness, lust and untameability, as well as witches' familiars. However, this may be much more complex if not ambivalent. There is also the simple application of a small animal as a key part of the composition. Dogs are especially useful as they can be used to introduce a focus of interest on a lower plane. That is they provide something to animate the lower reaches of works such as full length portraits. They are also ideal when placed in a strategic position to help lead the eye around the work and giving movement to an otherwise static work. This not only applies to the pointed muzzle but can make use of the tail as well. In addition, the characteristics of individual animals illustrated several hundred years ago can be compared with similar varieties as they appear today. It is clear from some works dating from as early as the 16th century, that many dogs were clipped and groomed almost as much as they are today.

The social aspects of keeping companion animals show that these activities are seen at every level of society from tramps and peasants, to the aristocracy and royalty. The work which animals do is frequently illustrated in paintings. Dogs used for hunting and retrieving game and cats used in their anti-vermin role feature widely. There are also strong indications of the public health significance of animals such as dogs and cats. This is especially so with respect to external parasitism.

This presentation takes the form of a commentary on some works of representational art featuring companion animals in human society over a period of several hundred years.

**PROMOTING LABORATORY ANIMAL HEALTH AND WELFARE: A QUALITATIVE ANALYSIS OF BRITISH LABORATORY ANIMAL VETERINARY SURGEONS' VIEWS OF THEIR CONTROVERSIAL ROLE**

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Veterinary surgeons' role in laboratory animal work has long been controversial within the profession and among the concerned public in the United Kingdom. In 1986, the Animals (Scientific Procedures) Act established a new legal requirement for the appointment of veterinary surgeons as advisors on animal health and welfare as part of the local control system to be established in each institution registered for animal experimentation or breeding. In some institutions, appointing a 'Named Veterinary Surgeon' (NVS) gave statutory force to existing arrangements. In others, it created a new role which has been filled in a variety of ways. This paper examines the ways in which the role has been organised, the career paths of NVSs and their views about their work, with particular reference to the controversy over animal experimentation and the relationship between promoting health and promoting welfare in their work.

The paper is based on qualitative analysis of in-depth interviews with 29 veterinarians, all of whom were NVSs. The sample was obtained through 'snowballing' techniques drawing on animal welfare and pro-research networks to gain contrasting views and was part of a larger study of the culture and organisation of work with laboratory animals.

All interviewees were familiar with criticisms of veterinary involvement in laboratory animal work (and a minority had experienced direct attacks from militant protesters). The paper analyses the ways in which these criticisms were countered by interviewees and moral justifications for their work formulated. For example, some interviewees emphasised the greater moral probity of laboratory work compared to commercial practice. The paper identifies different interpretations of health and welfare responsibilities and different approaches to achieving them, including 'missionary' and 'managerial' representations of their roles. These formulations are related to interviewees' professional backgrounds and organisational position.



## **QUALITATIVE ANALYSIS OF THE LIFE HISTORIES OF AGED CAT AND DOG OWNERS: THE MEANING OF COMPANION ANIMALS**

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In our research into the meaning of companion animals for the quality of life of the elderly (70 - 80 years) we hypothesized that companion animals are 'social supporters'. Social support is known as having positive effects on wellbeing and buffers against the negative effects of stress. Elderly live in an environment that gets smaller and smaller by the loss of mobility, work, friends and partner by illness and death; therefore the physical and mental health of the elderly are threatened. Their need of social support increases but the possibility to get social support decreases. Companion animals possibly can fill in the gap.

In the reported part of the study, we examined the life-histories of elderly people, as told in the interviews. We were interested in the narratives elderly use to describe the meaning of their companion animal. We hypothesized that aspects of social support, as given in a human-human bond, would be equally found in the human-animal bond.

We analyzed the data by means of a qualitative analysis of the interviews (computer program Qualitan). For our analysis, we used as a framework the constructs as used in the social support theories and in the theory of "social provisions" by Weiss (1975, 1993).

The population comprised aged participants (N=96; 19 cat- and 43 dog owners, 25 men, 71 women), living in different parts of The Netherlands. The groups were controlled for demographic variables.

The results demonstrate that most of the aspects of the constructs as described in the social support theories were used by the elderly to describe the human-animal bond. This implies that for the elderly the human-animal relation offered the same support as the human-human relation, although not in every aspect. This finding may have important implications in governmental decisions as for the access of companion animals into elderly homes and shelters. Also it means an extension of the construct "social support".

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## **DOG OWNERSHIP, CAT OWNERSHIP, SOCIAL SUPPORT, AND ONE YEAR SURVIVAL AMONG POST-MYOCARDIAL INFARCTION PATIENTS**

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Social isolation has been associated with coronary heart disease morbidity and mortality. Evidence suggests that keeping pets, a non-human form of social support, might be associated with decreases in coronary heart disease morbidity and mortality. This study examines the effect of pet ownership on survival of post myocardial infarction patients independent of the effects of the physiological severity of the disease and of other psychosocial factors, including social support.

The Cardiac Arrhythmia Suppression Trial (CAST) provided cardiovascular data on a group of post myocardial infarction patients who experienced ventricular arrhythmias. Psychosocial data including: pet ownership, social support, recent life events, future life events, anxiety, depression, coronary prone behavior, and expression of anger, were obtained via questionnaire at baseline from 424 randomly selected CAST participants attending 13 sites. One year survival data were obtained from 369 (87%), of whom 112 (30.4%) owned pets and 20 (5.4%) died. Among the pet owners, 87 owned dogs and 44 owned cats.

Logistic regression indicates that dog owners ( $n = 87$ , 1 died) are significantly less likely to die within one year than individuals who did not own dogs [ $n = 282$ , 19 died; Wald = 2.77,  $p < .05$ ,  $\text{Exp}(B) = .1068$ ]. Amount of social support as measured on the SSQ-6 is also an independent predictor of survival [Wald = 2.38,  $p = .065$ ,  $\text{exp}(B) = .942$ ]. Both dog ownership and social support are significant predictors of survival, independent of the effects of the other psychosocial factors and physiological status. Cat ownership was not related to survival independent of social support. Additional research is needed to further investigate the inter-relationship between dog ownership, cat ownership, social support, and physiological status.

## THE RELATIONSHIP BETWEEN DOG/DOG AND DOG/HUMAN DOMINANCE INTERACTIONS

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The social behaviour of the domestic dog is conventionally thought of as being derived directly from that of its ancestral species, the wolf *Canis lupus*. A feature of the domestication of the dog has been the inclusion of man in a mixed-species dominance hierarchy. The ability of man to occupy the alpha position, both with individuals and groups of dogs, is thought to have played a key role both in the process of domestication and the maintenance of the relationship between the two species. We have attempted to explore the way in which interactions between familiar and unfamiliar people, with individual dogs in established groups, affects the inter- and intra-specific behaviour of the group.

Three single breed groups of dogs were observed, each consisting of six individuals which had been living together for at least a year. The three breeds were Siberian Huskies (6 females; ages 4-13y), Golden Retrievers (4 females, 2 males; ages 1.5-7y), and Cavalier King Charles Spaniels (6 females; ages 1-6y). Each group was observed in interactions with their owner and then one of six unfamiliar people, on six separate occasions. Each session consisted of all members of the group being petted in turn for 30 seconds, in an order determined by a Latin Square; we recorded the number of times that the five non-focal dogs attempted to displace the focal dog, or gain the person's attention, collectively referred to as intrusions.

In all three groups, non-focal dogs made considerably more attempts to attract the attention of the person than to displace the focal dog (Cavaliers,  $F_{(1,23)} = 46.3$ ; Retrievers,  $F_{(1,23)} = 38.7$ ; Huskies,  $F_{(1,23)} = 26.8$ ; all  $P < 0.001$ ). There was also a general trend for more intrusions to occur in the presence of an unfamiliar person than the owner, although this was only significant in the Huskies ( $F_{(1,23)} = 34.8$ ,  $P < 0.001$ ). Both these general trends appear to be consistent with the idea that the dogs in these groups perceived people as actual or (in the case of the unfamiliar people) potential alphas; the strategy of attempting to attract the attention of the person, rather than attempting to displace the focal dog, is less threatening to the focal dog and so less risky to the non-focal dog performing the intrusion.

In the Retrievers, the identity of the focal dog had no effect on the number of intrusions ( $F_{(5,23)} = 0.25$ ,  $P > 0.90$ ), suggesting that the dominance hierarchy in this group was secondary to the owner/dog hierarchy. In the Cavaliers, the identity of the focal dog had a significant effect on the number of intrusions received ( $F_{(5,23)} = 4.97$ ,  $P < 0.01$ ), but this may have been due to a potentiating effect of the behaviour of the dog being petted, since it was the younger, more active dogs that induced more intrusions in the others. In the Huskies, a breed which maintains strong dog-dog dominance behaviour, the alpha-female received fewest intrusions from the other group members when focal, and the deposed alpha-female (10.5 years, recently neutered) received the most ( $F_{(5,23)} = 3.19$ ,  $P < 0.05$ ). Differences between individual focal dogs in the number of intrusions they received may be interpreted in terms of their position within the hierarchy of the group. If human attention is a valuable resource, then high-ranking dogs receiving that attention are less likely to be challenged than subordinate individuals.

## **CULTURAL INFLUENCES ON ANIMAL WELFARE IN HONG KONG**

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Hong Kong is an intense interface between Chinese and European cultures. Both cultures undoubtedly influence the territory's lifestyle - they also determine the attitudes to animals. Hong Kong presents an opportunity to examine sociological factors affecting attitudes to animals, which is the aim of the present study. Eventually it is hoped to establish an appropriate, local Code of Animal Welfare, and perhaps in the process uncover some general requirements of animal welfare codes. Little has been written about cultural influences on animal welfare anywhere, probably least of all in the Orient.

Attitudes to animals in Hong Kong develop against the background of a heterogeneous, social environment. The practices and ideologies of the Chinese population, with obvious connections to the culture of the mainland Republic, differ in several ways to those of the population with links to the more welfare-oriented European cultures. Typically, Europeans are critical of actions suggesting lack of feeling or respect for animals. Chinese on the other hand express surprise that Europeans allow such concerns to limit opportunities to utilize and enjoy the abundance of nature. Chinese culture reflects primarily pragmatic rather than altruistic attitudes towards animals.

Powerful factors, unexpected in the west, affect views about animals and the consequent patterns of animal use in Hong Kong. Religion and superstition, cultural and social mores, traditional agrarian practices, and a unique accent on diet must be considered as influences. Co-existing with the modern trappings of this cosmopolitan city are views derived from centuries-old religious doctrines (mainly Buddhist and Taoist), Confucian principles, animist superstition and strict cultural and moral codes.

Such factors dictate for example that when the pet animal (dog, cat, turtle, orangutan, etc.) of a Chinese family is no longer wanted, it should be released into the wild. Responsibility for the pet's welfare is lifted once the animal is released. Europeans generally regard euthanasia of unwanted animals as a final act of responsibility; Chinese do not deem euthanasia proper as there may be negative repercussions for the owner. The twelve animals of the Chinese zodiac also play a major role in Hong Kong life, being venerated for their specific virtues identified in ancient Chinese beliefs about life and nature. Human actions dictated by astrology are usually not driven by concern for the animals, but rather associated with reverence for and appeasement of various related demons, spirits and gods that promote prosperity.

If informed argument is to be used to promote the well-being of animals in Hong Kong, an understanding of underlying differences in attitudes to animals must be acquired. Establishing guidelines in these circumstances requires sensitivity. As with Animal Welfare codes elsewhere, study should perhaps seek initially to identify the more and the less unpleasant impositions on animals, discourage the more unpleasant, and try to understand the reason for the difference.

## **THE INFLUENCE OF CURRENT RELATIONSHIPS UPON PET ANIMAL ACQUISITION**

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This study examines pet ownership and person-pet relationships within the context of human-human relationships.

Jungermann (1980) introduced the notion of *possibility of continuity*, a principle which aims to identify when dissatisfaction with current life circumstances will serve as a motivational force for lifestyle change. The current study views acquisition of a pet animal as a lifestyle change. Therefore, it is hypothesised that consideration of pet ownership will be related to levels of satisfaction with life circumstances .

Satisfaction with current life circumstances is assessed by application of the Network of Relationships Inventory (N.R.I.), developed by Furman & Burhmester (1985). The N.R.I. measures both supportive and non-supportive aspects of close relationships.

Adult subjects were recruited from individuals attending adult education classes. A total of 197 subjects were questioned about their close relationships and desire to acquire a pet animal. 106 subjects wished to become pet owners (pet seeking group), whilst the remaining 91 individuals had no desire to obtain a pet animal (non pet seeking group).

Regarding supportive aspects of relationships, N.R.I. ratings did not show a significant difference between groups. However, a significant difference between the groups emerged concerning negative relational provisions (conflict, antagonism and punishment). Pet seeking subjects provided significantly higher ratings of negative relational provisions than did non pet seeking subjects ( $F_{(1,196)}=17.168, p<0.0001$ ).

This finding suggests that pet ownership is most likely to be contemplated by individuals whose close relationships are characterised as judgmental and conflict prone. This notion will be discussed with reference to data on the subjects' expectations of the costs and benefits of pet ownership.

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## THE EFFECTS OF ROAD TRAFFIC ON NEW FOREST PONIES

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The greatest threat to the health of New Forest ponies, in terms of the number of annual mortalities, comes from road traffic accidents. This study aimed to examine the causes of pony deaths by considering factors leading ponies to use roadside habitats during July and August 1994. Four sites were chosen in the Forest, two containing roads associated with high mortality rates, and two with low numbers of pony deaths. During the study, 1160 ponies were recorded, although no attempt was made to distinguish individuals. Biological factors such as age, sex and body condition of the ponies were considered, along with environmental factors such as weather conditions and the vegetation within 40m of the road. The effect of traffic density on average pony distance from the road, and pony behaviour were also examined. Data extracted from records held by the Verderers of the New Forest for the period 1990 to 1994 was used to assess seasonal and diurnal factors associated with high numbers of traffic accidents, and to determine the effectiveness of speed restrictions first introduced in the Forest in 1992.

At all sites ponies were found to move closer to the road as the day progressed ( $F_{(2,1157)}=3.1$ ,  $p<0.05$ ). Ponies are attracted to the roadside verges as they are preferential grazers and the verges represent a valuable resource. The age, sex and reproductive status of ponies was not shown to affect their probability of utilising habitat around the road margins, but ponies in relatively poor body condition were found closer to the road ( $F_{(2,1157)}=6.3$ ;  $p<0.05$ ). The effects of weather on the ponies' behaviour varied with the ecology of the site, but ponies tended to move away from the road as wind speed and rainfall increased ( $F_{(2,1157)}=4.4$  rain, 8.3 wind speed; both  $p<0.001$ ); although their mean distance from the road was then dependant on the proximity of shelter such as gorse break or trees. Ponies sheltering close to busy roads in conditions of poor visibility are immediately at risk if they then move onto the roads. The effect of sunshine and temperature on mean pony distance from the road also varied between sites. At three of the sites the general trend was to graze closer to the road on warm sunny days, but to stand further from the road when the highest temperatures and hours of sunshine were recorded ( $F_{(4,219)}=4.7$ ;  $p<0.01$  -  $F_{(4,425)}=5.2$ ;  $p<0.0005$ ), in areas associated with reduced fly harassment, such as beneath trees, or in open concreted areas on wartime airfields. At one of the sites with high traffic densities the lack of suitable fly shading sites away from the road often lead to ponies fly shading on the road itself. Therefore, adverse weather conditions and dense vegetation close to the road margin make ponies vulnerable to road traffic.

Data on numbers of pony traffic accidents at the four study sites in 1994 were significantly correlated with traffic density ( $r=0.9958$ ;  $n=4$   $p<0.005$ ). The distribution of accidents through the year showed a marked seasonal effect ( $F_{(3,8)}=5.7$ ;  $p<0.05$ ); accidents were lowest in the period April to June and highest in the period October to December. Accidents were more likely to occur during the evening rush hour, and so more pony deaths were recorded in daylight hours during July to September, which coincides with the period when ponies were found closest to the road in this study. More deaths occurred in the dark during January and the period September to December. During the period 1990 to 1994, 48% of accidents were caused by local drivers. The introduction of a 40 mph speed limit into areas of the Forest resulted in a decrease in pony deaths in those areas in 1992, and 1993, but when the scheme was extended in 1994 to cover the whole Forest, pony deaths increased almost to previous levels.

## MERGING ANIMAL WELFARE AND CONSERVATION CODES

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Philosophical propositions about animals can be difficult to reconcile with conventional biology. Conflicting views on key questions have hindered the development of a general code of animal welfare, therefore a study has been made of some of the points of discord. What has emerged is not a more complicated welfare code but a simple conservation code.

Pain features prominently in Animal Liberation and Animal Rights literature, where it has been referred to not only as undesirable but even as "evil" (Singer, 1990). To biologists, however, pain is considered essential for survival despite its inherent unpleasantness. Referring to pain as evil inclines biologists to dismiss this claim, and perhaps related propositions as well.

Sentience is a key term in Animal Liberation philosophy, reflecting an animal's ability to react to pain and be conscious of it. Animal Liberation philosophers suggest (and Animal Rights proponents imply) that there is a 'lower' biological limit beyond which animals are not sentient. It is necessary to have such a limit to justify clearing land and controlling invertebrate pests on plants providing food for vegetarians; 'suffering' in such animals is held to be meaningless. Conventional biology on the other hand depicts animal life ranging from simple to complex across a seamless spectrum. Biologists (Jennings, 1906; Dawkins, 1993) have thrown light on which animals suffer, but offer no unequivocal conclusion. Many biologists still regard the limiting of sentience to certain species as contrived.

We have attempted to reconcile philosophical and biological views, mindful of calls to give animals 'the benefit of the doubt' in cases of uncertainty (Carpenter, 1980; McFarland, 1985). One obvious solution is to move the boundary of sentience to include simpler species. At first this seems unrewarding, because avoiding impositions on every animal is impossible. However if the expectation is expressed simply as concern for all animals, the code translates closely to a plea for 'reverence for life' (Schweitzer, 1966).

Following that approach, we should accept the necessity for some pain and for impositions on some animals in certain circumstances. We should simply propose that noxious stimulation to animals be minimised. Abandoning the goals of always avoiding pain and of limiting sentience to certain species allows us to discard two biologically unsound propositions while still advocating a general concern for all animals. Philosophical and biological proposals then arguably merge to become a code of compassionate conservation.

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## **CHARACTERISTICS OF VOLUNTEERS WORKING IN WILDLIFE REHABILITATION**

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There are no studies of the motivations and attitudes of volunteers in the physically and emotionally difficult area of wildlife rehabilitation. In this study, lists of volunteers were obtained from three wildlife rehab centers. Each volunteer was interviewed by telephone and asked to participate in the research. 82% of the volunteers (17 men, 63 women) agreed. They were asked about demographic information, about the onset of their interest in wildlife, about their motivation for continuing to work in rehab, and about their management of negative emotions resulting from animal deaths. Standard errors of proportion were used to compare this group to groups not involved with wildlife.

The subjects were mature and had more education than the average Californian ( $Z=2.30$ ,  $p<0.05$ ). They grew up in families with significantly more pets ( $Z=5.18$ ,  $p<0.01$ ) than the average family of the time, and they currently had more pets than the average family today ( $Z=8.50$ ,  $p<0.01$ ). 75% reported being interested in animals from early childhood; the remaining subjects had developed their interest through contact with wildlife itself or with people concerned with wildlife. 29% continued to work in wildlife rehab because they loved animals and wanted to help them, and 23% enjoyed hands-on nurturing. The remainder felt that rehab work makes a real difference in animals' lives, nature, and the environment.

Because only half of the animals brought into rehab centers survive, volunteer workers must deal with personal feelings of grief, loss, and sometimes failure. Although 86% felt that death was part of the life cycle and often prevented further suffering, 33% said that they nonetheless grieved, especially if they were attached to the animal or had expected it to live. 13% focused on the animals they had saved. But despite hard work and death, all volunteers stated that they would continue in wildlife rehab as long as they were physically capable of doing so.

Increasing numbers of people moving into wildlife areas increases the number of injured wild animals and increases the number of necessary rehabilitations. Awareness of the characteristics and motivation of volunteers qualified to care for injured wildlife can make it possible for rehab centers to select people who can genuinely make a difference in the lives of injured animals.

**BEARS IN THE PADDYFIELD: DISPLACED FOREST WILDLIFE AND ENVIRONMENTAL DISORDER IN PRESENT-DAY UPLAND JAPAN**

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Wild animal farm crop-raiding has become a major problem in upland Japan in recent decades. Japanese mountain villagers complain that wild boar, deer, monkeys and even bears increasingly descend on village farms, devastating crops and causing great economic loss.

Based on ethnographic data from Wakayama mountain villages, this paper presents a local case study of this displacement of forest wildlife, the specific way in which this is culturally reckoned by upland dwellers, and the various responses to it (fencing, culling, and even calls for the re-introduction of extinct predators).

The problem of animal crop-raiding is analysed in terms of the changing relationship between mountain villagers and forest animals in the post-war period. The paper outlines the factors underlying this changing relationship, including the expansion of timber forestry and rural depopulation.

Data presented by the paper include the differing perspectives of mountain villagers: the farmer, the forester, and the hunter.

## **PET MEMORIAL TEMPLES IN JAPAN: A CASE STUDY**

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In recent decades Buddhist temples in Japan have established pet mausoleums where deceased pets can be brought for funeral rites, cremations and posthumous memorial services. This paper presents ethnographic data on one such temple located in the city of Nagoya.

Four main themes are covered.

(i) **Spiritual Character of Animals.** The relationship between pets and people in Japan is first of all placed in the wider context of Japanese cultural views of animals, in particular the idea, central to Japanese Buddhism, that non-human animals, like humans, live on posthumously as spirits for whom humans have certain ritual responsibilities.

(ii) **Pet Ownership in Post-war Japan.** Ethnographic data are presented on the way this trend is understood by many Japanese.

(iii) **Pet Mortuary and Memorial Rites.** The paper goes on to account for the rise in ritual services for pets in terms of the decline of the traditional temple parishes in post-war Japan which obliges the temples to seek alternative sources of revenue.

(iv) **The Meaning of Pet Memorials.** This is considered: (a) in relation to other animal memorial rites in Japan (e.g. for game animals or for laboratory animals); and (b) in terms of the idea of posthumous animal suffering on which it is based which is contrasted with the emphasis on sentient suffering found in (utilitarian) ideas of animal liberationism.

## CHILDREN, 'INSECTS' AND PLAY IN JAPAN

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From spring till late fall each year in the countryside and cities of Japan, swarms of children using an assortment of tools try to catch all sorts of insects. As part of an ongoing study on insects (the category known as *mushi* to be specific) and their signification in Japanese culture, this paper deals with their cultural status in the world of the child. For children, are they mere toys, playing companions, or pets? And what is their importance in teaching children about nature?

In order to answer these questions, three types of research were undertaken. First, during fieldwork in rural areas, children's activities involving *mushi* were all recorded: catching them, playing with them, observing them, listening to them, breeding them, singing songs about them, collecting them as homework during holidays. Secondly, an analysis of the contents of children's books about nature in general (in which the part devoted to *mushi* is sizeable) was carried out. Lastly, interviews at the "Japan Pet Fair" with representatives of companies selling both *mushi* and tools and equipment for breeding them were conducted along with an analysis of the contents of their leaflets.

Three major results emerged. The most salient was that of specificity: each species of *mushi* is linked with (and sometimes used as a symbol for it) a particular period of the year, and related to a particular time of day, as well as particular methods for catching and modes of play. Another remarkable finding was the economic importance of *mushi*. Many species are sold in post offices and department stores, sometimes along with a great variety of accessory goods. Finally, through analysis of songs about *mushi* (in which children address them as *egal*) and leaflets (in which the *mushi* are totally anthropomorphized, shown listening to walkman tape recorders, surfing, jogging with children, etc.) or books, we can discern that the child does not consider *mushi* as toys, but rather as playmates.

In conclusion we can say that while *mushi* are "wild animals", they are still a part of "familiar nature", and of everyday life in Japan, especially for children. It may well be that more than any other animal, the *mushi* is the one that children play with most, providing an experimental dialogue with nature, and teaching lessons not to be found in books. According to the claims of companies selling *mushi*, certain species should be considered as pets or playing companions. This closeness challenges the image of the insect as a cold, alien animal, an entity which even in those moments when given due attention never rises above the status of a toy.

## **ETHICAL, PHILOSOPHICAL, AND PRACTICAL CONSIDERATIONS ON KILLING FARM ANIMALS**

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This lecture is an extended part of a lecture about ethical considerations on killing animals, in which I defended that the ethical reasons to kill animals are dependent on the different practices in which animals are killed. Normally ethicists suppose that arguments, which are bound to the commercial practice of cattle-breeding and raising, are less moral with regard to the need of killing farm animals. In my lecture I will show you, that an economic way of thinking about cattle-breeding and raising always depends on normative politics, which does not preclude a moral concern about killing farm animals.

With regard to the killing of farm animals, a distinction must be made between practices, in which the killing of animals is and is not a logical necessity, because in both cases the arguments 'pro' and 'contra' killing animals are different. In the first case, the arguments 'pro' and 'contra' killing farm animals are always arguments 'pro' and 'contra' the practice itself, because it is impossible to allow this kind of practice, but to doubt the killing of animals, and vice versa. The need of killing animals in this case depends on a political decision about the allowance of earning and spending money by means of certain animal products.

In the second case, it is not logically necessary to kill animals, because the needed products are the products of living animals. Although the allowance of these practices implies an economic way of thinking about animals, it does not imply automatically killing farm animals for economic reasons. Killing animals in these practices depends on the production method and standard of efficiency, made possible by the zootechnological sciences.

The conclusion is that a moral concern about killing farm animals should be part of the actual, normative political debate about solutions for the crisis in western agriculture, and agricultural sciences.



## **ANIMAL EXPERIMENTATION AS BLOOD SACRIFICE**

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Animals used in modern medical research are said by the experimenters to be "sacrificed." I argue that the *structural, ideological, historical, and functional* links between modern animal experimentation and ancient rituals of blood sacrifice are significant enough to warrant classifying animal experimentation as Western Civilization's form of animal sacrifice.

In their superficial *structure*, animal experimentation and blood sacrifice are strikingly similar, both involving the highly regulated/ritualized manipulation of animal bodies by members of a restricted elite class.

At the most general level, the *ideologies* behind animal experimentation and blood sacrifice are identical: both practices are expected to bring social benefits and ultimately human salvation.

Western science emerged from medieval Christianity; since Christianity retained the ancient doctrine of blood sacrifice through its interpretation of Christ's crucifixion (Jesus as sacrificial lamb), this provided a nexus of *historical transmission* of ancient sacrificial ideology into modern experimental practices.

In her book '*Throughout Your Generations Forever*', Nancy Jay argues that the cross-cultural *function* of blood sacrifice is to establish patriliney. I argue that animal experimentation has also functioned to establish a patriliney, in this case a genealogy of male biomedical researchers and physicians in contradistinction to a previous genealogy of female lay healers.

This study has numerous significant implications for our understanding and assessment of modern institutions of animal experimentation.



## RELATIONSHIP BETWEEN PERSONALITY TRAITS AND ATTITUDES TO CATS IN MEMBERS OF CAT-OWNING HOUSEHOLDS

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Conventional wisdom suggests that people with positive attitudes towards cats may have different personality profiles from those with negative attitudes. We have tested this as part of a larger study investigating various aspects of cat-human interactions. Attitudes to cats in general as distinct from their own cat, were measured using a 33 item Lickert-type questionnaire. Personality traits of empathy, venturesomeness and impulsiveness were measured using the 54 item Eysenck IVE questionnaire. 137 people (53 male, 84 female) from 75 cat-owning households in semi-rural, suburban and urban areas of Southampton acted as participants; age class distribution: < 25 (n=26), 25 - 35 (n=37), 36 - 45 (n=30), 46 - 55 (n= 23), 56 and over (n = 21). Participants were given the questionnaires as part of structured interviews conducted in their own homes.

The items in the attitude questionnaire were subjected to principal components analysis, which produced 4 components accounting for 39.5% of the total variance. Based on the loadings of each item, these could be described as (component 1) 'liking cats', (component 2) 'unpredictability of cats', (component 3) 'inoffensivity of cats' and (component 4) 'cats are quiet and cheap'. Each of these components was then subjected to a two factor ANOVA (age, sex) with interaction.

It was found that women liked cats more than men ( $F_{(1, 132)} = 14.48, p < 0.001$ ). Subjects under the age of 25 and those over 56 showed a significantly greater liking for cats than the other age groups ( $F_{(4, 132)} = 3.55, p < 0.01$ ). There was no interaction between age and sex. No differences due to age or sex were found for 'unpredictability'. Likewise for 'inoffensiveness', no sex differences were found. However, participants over 56 years of age rated cats significantly more offensive than those under 25 ( $F_{(4, 132)} = 3.97, p < 0.01$ ). With regard to 'quiet and cheap' females rated cats slightly more favourably than males ( $F_{(1, 132)} = 6.59, p < 0.05$ ). In contrast, participants under 25, regardless of sex, considered cats to be more 'noisy/expensive' than those in the other age groups ( $F_{(4, 132)} = 8.8, p < 0.0001$ ).

Personality traits and attitudes were compared by Spearman rank correlations. A positive correlation was found between impulsiveness and 'liking for cats' for males only ( $\rho = +0.345, p < 0.01, n = 53$ ), but this was largely driven by the youngest age group, and may not imply causal link. An overall correlation between 'liking cats' and empathy ( $\rho = +0.274, p < 0.001, n = 137$ ) was entirely due to sex differences in both measures; within-sex correlations were low ( $\rho = +0.121, p < 0.05, n = 53$  males,  $\rho = +0.143, p < 0.05, n = 84$  females). No correlations were detected between 'unpredictability', 'inoffensiveness' or 'quiet/cheap'.

In conclusion, with regard to the traits of impulsiveness, empathy and venturesomness, no direct relationship was found between personality and attitudes to cats in general, among subjects with direct experience of cats.

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## **ATTACHMENT TO DOGS IN THE PRE-MODERN PERIOD: NEW PERSPECTIVES OF RESEARCH**

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In approaching dogs as convenient symbols for whatever people want to make of them, social research emphasizes the centrality of dog-keeping in "contemporary society." There is a wide consensus that with their ambiguous roles and cultural values, their constant presence in human experience, coupled with their nearness to the feral world, dogs have become the alter ego of human beings, a reflection of both human culture and human savagery. As Gordon White commented, "There is much of man in his dogs, much of the dog in us, and behind this, much of the wolf in both the dog and man." (Myths of the Dog-Man, 1991, p. 15) Thus, a widespread premise of research maintains that attachment to dogs - with all its emotional strength - results from the previous divorce of humankind from nature and the encroachment of modernization, especially the urbanization process. In other words, when the mega-cities detached people from the countryside, the latter found in the dog a suitable substitute for the natural world that was left behind.

The alleged modernity of pet-keeping lays behind the prevailing analyses of attitudes toward the canine species in pre-modern societies, mainly, from a utilitarian perspective. In other words, there is a wide consensus in the literature that pre-modern societies, being under the protective shelter of the extended household and, as such, free of the tensions affecting the nuclear family in industrial cities, lacked the emotional stress and indigence that condition or support dog-keeping. A careful examination of the sources, however, suggests more ambivalent attitudes. This ambivalence challenges widespread premises informing past research and justifies further analysis.

This study examines affectionate attitudes to dogs in the ancient and medieval periods as they appear in pictorial and written evidence, both covering a rich spectrum of sources. One basic premise of this study is that since dogs are the receptors of man's dreams, expectations, and fears, the different attitudes toward them were obviously affected by changing circumstances. In other words, the image of dogs did change as a result of different time and space, but these changes did not affect the basic attachment of "western" persons to the canine species. In this regard, one can discern a long story of affection and friendship from the ancient period, through the Middle Ages, up to our own days.

## **SEPARATION ANXIETY - PHARMACOLOGICAL TREATMENT FOR OVERLY DEPENDENT DOGS**

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Dogs are highly social animals and form strong bonds with individuals from other species. The function of attachment is to maintain close social contact, providing security for each member of the group. Since many dog owners are forced to leave their dogs alone at home, an increasing number of dogs presented to behaviourists show signs of separation anxiety, including continuous barking, destructive behaviour, house soiling and attempts to escape when isolated. Treatment of those dogs can present a problem for veterinarians and behaviourists, since conservative treatment methods, like systematic desensitisation, require that dogs are not left alone for several weeks.

This retrospective clinical study summarises the diagnostics, treatment and outcome of 10 cases of separation anxiety which failed to respond to conservative treatment, using a tricyclic antidepressant (amitriptyline) with anxiolytic properties. The dogs were presented at Tufts University School of Veterinary Medicine between July 1994 and June 1995. Owners had to leave the dogs unattended for an average duration of 8.7 hours (between 5 and 11 hours) per day. During this period of isolation the dogs had barked excessively (8 dogs), destroyed various pieces of furniture (7 dogs), soiled the house repeatedly (6 dogs), and tried to escape from their confinement by jumping out of closed windows or chewing through doors (5 dogs). The majority of the dogs (8) were acquired from an animal shelter or had experienced some other form of abrupt change in life style earlier. Following a complete clinical examination and anamnesis, owners were advised to medicate the dogs with amitriptyline at 2 mg/kg orally, twice daily. The first significant improvements were reported after a treatment period of approximately 4 weeks. Within a follow-up period of 6 months, 8 out of 10 dogs showed an improvement (> 4, on a scale from 1 (no change) to 10 (complete improvement)). Two of these dogs showed no further signs of anxiety. The dogs were weaned off the medication successfully after 8 weeks of treatment. Side effects reported by the owners included temporary increase of water intake (dry mouth, anticholinergic side effects), which was observed in 2 dogs. One dog suffered from diarrhoea, which resolved after the owners took the dog off medication for 24 hours.

Separation anxiety represents a serious behavioural problem in dogs, often caused by the owners' life style which is more or less incompatible with dog ownership. Dogs suffering from being separated develop signs of anxiety or panic which they can not control. The use of psychotropic drugs with anxiolytic properties might be a valuable alternative in treating dogs which fail to respond to other treatment. Tricyclic antidepressants are known to involve a lower risk of potential side effects and do not cause sedation or dizziness. This fact is one of the most important advantages, compared to other drugs, like benzodiazepines (e.g. Valium®), since sedation inhibits the animals ability to learn. We feel that the use of anxiolytics, like amitriptyline could be a valuable addition to conservative treatment regimes, allowing the dog to relax more easily in fear-eliciting situations and enabling the owner to achieve faster results. Therefore, owner frustration and a decrease in compliance can be avoided, which is an important factor in animal behaviour therapy.

## **THE EFFECT OF DEPENDENCE AND ANTHROPOMORPHIC ATTITUDES OF THE OWNER ON PROBLEM SOLVING IN THE DOMESTIC DOG**

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It is widely accepted that domestication had an important influence on the behaviour of the domestic dog. The integration within human families resulted in different selective pressures to those that the animals are usually faced with in nature. A series of arguments led to the hypothesis that the difference in cognitive abilities between dogs and wolves is the result of the relaxed adaptational demands of domestication. We show experimental evidence that simple problem solving in the dog is under strong influence of their relationship with the owner and therefore variations in problem solving might not reflect directly impaired cognitive functioning.

Twenty-eight dog-owner pairs were observed in an open field situation and in a simple problem solving task. In the presence of the owner, dogs had to pull a small dish (containing food) from under a "fence". The latency of manipulation, the number of successful manipulations and number of glances at the owner were measured. The anthropomorphic attitudes of the owners were assessed by a questionnaire. Dogs were categorized according to their relationship to the owners into two groups: 16 "companion dogs" and 12 "working dogs".

We found that working dogs manipulated earlier ( $F_{(1,27)}=12.5$ ,  $p<0.03$ ), ate more food items ( $F_{(1,27)}=4.8$ ,  $p<0.04$ ), and glanced less often at the owner ( $F_{(1,27)}=4.8$ ,  $p<0.04$ ). Companion dogs tended to follow the owner ( $F_{(1,27)}=5.3$ ,  $p<0.03$ ) during the open field situation. The analysis of the questionnaire scores showed that owners expressed more pronounced anthropomorphic attitudes toward companion dogs ( $F_{(1,27)}=6.22$ ,  $p=0.02$ ).

We suggest that the decreased performance of companion dogs in the problem solving task is less dependent on their cognitive abilities than the strong, dependent relation to the owner which prevents them from completing the task successfully.



## THE SIGNIFICANCE AND STUDY OF PERSONALITY IN THE HORSE

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Personality describes the behavioural tendencies of an individual in a wide variety of situations. Such individual distinctiveness is recognised in many species. Attempts have been made to quantify these traits in animals as diverse as the octopus (Mather and Anderson 1993), pig (Hessing et al 1993, Forkman et al 1995) and gorilla (Gold and Maple 1994). Certain personality types are associated with how an individual is likely to react when ill, predispose an individual to certain illnesses or be indicative of certain disease states. People may look for particular personality traits in animals, which they intend to use for a given type of work. Individual distinctiveness may also be a significant variable requiring control in certain experimental procedures. This field of study is thus of great importance to the clinician, animal scientist and those involved in practical animal management.

Simple trait theories divide subjects into active and passive copers (Benus et al, 1991). The latter are likely to become withdrawn at times of ill-health whereas the former would tend to be more overtly expressive of their suffering in similar conditions. It is important to realise that this difference does not reflect differing levels of welfare. An alternative approach is to define a personality profile for the individual through reference to a large number of traits. Certain terms (e.g. bold, sharp, sociable) have been used for a long time by horse-masters to describe the personality of the horse and may be of some use in such a system if their meaning could be validated.

Twenty horses (10 mares and 10 geldings) all known to seven assessors (4 male and 3 female British Horse Society Instructors) for a minimum of seven months were scored for the following traits: lazy, intelligent, sharp, flighty, bold, enthusiastic, affectionate, moody, fizzy, alert, sensitive, confident, honest and laid back. No attempt was made by the experimenters to define these terms but all assessors believed they understood the nature of the traits and were invited to offer their own definitions. Thus the test assessed the reliability of the common usage of the terms alone. The scores given by each assessor for each trait were ranked. Inter-assessor correlation was analysed using Kendall's coefficient of concordance and Spearman's rank correlation coefficient. There was significant correlation for the terms "sharp" and "flighty" ( $P < 0.05$  and  $P < 0.01$  respectively).

It is concluded that the terms lazy, intelligent, bold, enthusiastic, affectionate, moody, fizzy, alert, sensitive, confident, honest and laid back are not applied reliably in the horse and so should not be used in any scientific context unless an objective definition is offered. However, the terms 'sharp' and 'flighty' may be used to describe individual traits and may also be indicative of the active coping mechanisms recognised in simple trait theories. If multiple trait theories are to be used to describe animal personality, it is suggested that the terms may be apparent from factor analysis of objective observations.

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## **MAPPING THE ANIMAL MOVEMENT: A SURVEY OF ANIMAL RIGHTS AND WELFARE ADVOCATES IN AUSTRALIA**

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Soon after the publication of Peter Singer's (1975) *Animal Liberation: A new ethic in our treatment of animals*, Australia became the first country in the world to establish an organisation based on the principles espoused in the book. There is now an Animal Liberation branch in most Australian states along with dozens of other animal rights or welfare groups with similar objectives. Yet little is known about the animal movement in Australia or of the many groups and organisations that are part of the broader movement.

The Australian and New Zealand Federation of Animal Societies (ANZFAS) acts as an umbrella organisation for groups as diverse as the RSPCA, Animal Liberation and anti-vivisectionists in various Humane Societies. A nine-page questionnaire completed and returned by 87 percent (n=437) of ANZFAS members in late 1995 provides a much needed sociological profile of animal supporters, advocates and activists in Australia, including their views on relationships between human and non-human animals.

The data were analysed to produce a social profile of ANZFAS members that had more in common with animal activists in the USA than with the mainstream Australian population. The results also explain how respondents feel about the treatment of animals, why they are involved in the movement, and what they believe are the most effective ways to improve animal welfare.

The survey produced some interesting and unexpected results on attitudes towards meat eating, the personal sacrifices involved in animal activism, on direct action and on the role of the media in animal welfare campaigns. It is clear from the very high response rate (87 percent) as well as from both solicited and unsolicited comments from the respondents, that while ANZFAS members are ambivalent about the effectiveness of peaceful opposition to animal exploitation, there is a clear ideological consensus and commitment to animal rights which augurs well for the animal movement in Australia.



## **DESCRIPTORS OF CAPTIVE FISH IN AN UNDERWATER AQUARIUM DOME**

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As important domains of human-animal interaction, zoological gardens and aquaria have received surprisingly little systematic attention. The purpose of this study was to record and analyze human descriptors of captive fish within an underwater aquarium dome. Understanding which wild captive fish attributes humans attend to and dialogue about within aquaria is important for a better understanding of the complex pattern of relationship between humans and wild captive animals.

The data consisted of 1,300 parsed verbal statements spontaneously spoken by adults and children during 30 hours of data collection at The Seattle Aquarium's underwater dome (Seattle, USA). Every effort was made to collect statements from different individuals to maximize independence of the data. Individual datum cases were then sorted into categories and quantified. Due to the nature of the data, no statistical tests for significance were used in analysis.

The results suggest that human attention to and dialogue about wild captive fish can be divided into three groups of frequency within recorded statements: physical attributes and naming of fish (36% and 32%, respectively); location/proximity and behavior of fish (7% each); and fish as a food resource, anthropomorphism of fish, emotional response to fish, attention to fish number, attention to the aliveness/deadness of fish, and factual information about fish ( $\leq 3\%$  each).

When compared to previous research conducted within zoological gardens, these results demonstrate that there appears to be discreet and predictable ways in which humans describe animals housed within zoological gardens and aquaria. It is argued that the pattern of response to wild captive animals is a result of the context of interaction, where animals housed within zoological gardens and aquaria are primarily perceived by humans as learning tools for describing specific attributes of animal form and function.

In addition, this study denotes the variety of human response to captive wild animals housed within zoological gardens and aquaria. The differences found between previous research within zoological gardens and this study suggest that human response to captive wild animals is partially a function of the relative phylogenetic distance between humans and the animals being perceived. It is argued that humans are more apt to assimilate increasingly similar (more "human like") captive wild animals into their social group/behavior, resulting in a different pattern of attention to animal attributes.

## **THE IDEA OF CONTRACT BETWEEN HUMAN BEINGS AND DOMESTICATED ANIMALS**

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Some recent writers have suggested that human beings have a relationship with nonhuman animals, in particular domesticated animals, which might be described as contractual (Callicott 1988, Morris 1990, Budiansky 1992). This paper both examines these particular suggestions and more generally explores what might be understood by interpreting the relationship between human beings and domesticated animals to be contractual.

Existing accounts of a suggested contract between human beings and domesticated animals are described and then are examined in the light of a range of philosophical understandings of contract theory. From this analysis, it is argued that these existing accounts do not meet the conditions of contract relationships understood in philosophical terms. The possibility of other ways of developing ideas of a human/domesticated animal contract in philosophical terms are then explored, drawing on the work of Rawls (1972) Nozick (1974) and Narveson (1983). In subsequent discussion of these models it is, however, concluded that the language of contract is inappropriate as a description of the relationship between human beings and domesticated animals.

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## **THE WEB OF LIFE: REKINDLING A SENSE OF CONNECTEDNESS AND RELATIONSHIP TO NATURE AND ANIMALS**

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Until recently, social movements pursuing emancipatory ideals have been primarily concerned with human liberation, but in recent years they have been criticised for their anthropocentric orientation. It is only since the 1960/70s that a social movement has emerged promoting the extension of the emancipatory ideal to nature and animals. For example, Regan (1986) uses the rights argument, Naess (1985) adopts the deep ecology perspective, while Diamond and Orenstein et al. (1990) approach the issue from a cultural/radical ecofeminist standpoint. The divisions which arise from these 'anthropocentric' and 'ecocentric' approaches respectively have not overcome the cleavages between the two positions. Some have argued that these are now the key divisions within philosophical and political thought (Eckersley 1992), which now pose a hindrance to further advances. The current ecological 'crisis' is said to derive from anthropocentric values which are attributed largely to the mechanical world view nurtured in the West. These attitudes, it is asserted, emerged during the sixteenth and seventeenth centuries and led to the subordination of the organic understanding of the world and to the 'death of nature' (Merchant 1980).

Plumwood (1993) believes that the Western interpretation of nature has been reinforced by a 'master form of rationality'. It is expressed in such dualisms as human/animal, culture/nature, spirituality/sexuality, reason/emotion. The poles of these dualisms are posed in opposition to each other and treated as positive and negative terms respectively. For example, within the influential Cartesian paradigm reason is highly regarded while emotion is devalued. Reason has been used as a vehicle of domination by man over nature and likewise the attribution of these dualisms or categories to men/women, the ruling class/working class, whites/blacks, civilised/primitive, humans/animals, has meant that half the world has been denigrated and rendered powerless.

To overcome the defects arising from instrumental rationality and the typical cleavages listed above, we need to develop a new approach. Currently, the problem is that the emancipatory movement has been heavily dependent on the Enlightenment model and closely linked with rationalism and instrumental/technical approaches. Even the prioritisation of feeling and emotion, which is said to have arisen with the Romantics, is still to a great extent limited by its linkages and subordination to rationalism.

The question is: can new approaches be developed or have we come to a point at which we are stuck? Can animal rights, deep ecology or the contribution from ecological feminism finally lead us to make a break with the dualisms? Do we need to dispense with the dualism altogether if further progress is to be made? The paper will offer some ideas on how we might go forward.

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## **YIKES! OWNER PERSONALITY AND AGGRESSIVE BEHAVIOUR IN ENGLISH COCKER SPANIELS**

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The interest in English Cocker Spaniels as an aggressive breed gained momentum in the early 1980s and led to a long term research project at the Cambridge Veterinary School. Part of this project involves studying the various factors which may be important in the behavioural development of pet cocker spaniels. This paper considers the potentially important factor of owner personality on the behaviour of dogs of this breed.

Two sub-samples were selected from a sample of 1109 English Cocker Spaniels (ECSs), which had been collected for a previous study (Podberscek and Serpell, in press). In the earlier study, two thousand questionnaires had been randomly distributed through the postal system to UK owners of purebred ECSs. Owners were asked to rate the likelihood of their dog(s) showing aggression (on a scale of 1 to 5) in 13 different situations. From these data, aggregate scores were calculated (sum of the 13 possible rating scores for each dog). Based on the frequency distribution of these aggregate scores, the lower and upper 25th percentiles were calculated and used as cut-off points for the two sub-samples in the present study. Those in the lower 25th percentile were classified as 'low' aggression dogs while those in the upper 25th percentile were classified as 'high' aggression dogs. Following this procedure, 521 owners (owning 596 dogs) were selected for the study. Of these, 241 owned 290 'low' aggression dogs, and 280 owned 306 'high' aggression dogs. The owners in these groups were asked to complete a Catell 16 Personality Factor Questionnaire (Catell, Eber and Tatsuoka, 1970).

Of those sent out, 285 (128 from the 'low' aggression group; 157 from the 'high' aggression group) were completed and returned, which represented 55% of owners. Analyses of data, using unpaired *t*-tests, revealed that respondents from the 'high' aggression group were more likely to be 'emotionally unstable' ( $t = 3.168, p < 0.01$ ), 'shy' ( $t = 2.745, p < 0.01$ ), 'undisciplined' ( $t = 1.991, p < 0.05$ ) and 'tense' ( $t = 4.122, p < 0.001$ ) than those from the 'low' aggression group. The 'high' aggression dogs were then classified in terms of the type of aggression shown, based on a cluster analysis of the original data set (1109 dogs). The 'types' of aggression were labelled 'protective (of itself & owner)', 'protective (territory)', 'intraspecific', 'competitive', 'possessive' and 'dominance-type'. For all types of aggression, the consistent difference between owners was that owners of aggressive dogs were significantly more likely to be 'emotionally unstable' and 'tense'. Owners of 'protective (of itself & owner)' and 'possessive' Cocker Spaniels were also more likely to be 'apprehensive' ( $t = 2.274, p < 0.05$ ;  $t = 2.099, p < 0.05$ , respectively). Owners who were 'undisciplined' were more likely to have 'competitive' Cocker Spaniels ( $t = 2.15, p < 0.05$ ) and ones which fought with unfamiliar dogs (intraspecific) ( $t = 2.038, p < 0.05$ ). 'Bold' and 'dominant' owners were also more likely to have Cocker Spaniels that fought with unfamiliar dogs ( $t = 2.14, p < 0.05$ ;  $t = 2.108, p < 0.05$  respectively).

Although these data do not prove a causal link between owner personality and canine aggression, they do offer some empirical data to support the popular notion that such a connection exists. While some may suggest that it is the *dog's behaviour* which has changed the owner's personality, this appears unlikely and reasons for this will be presented.

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## PHYSIOLOGICAL RESPONSES TO DISTURBING EVENTS IN DOG-OWNING AND NON DOG-OWNING WOMEN IN THE HOME ENVIRONMENT

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Studies of cardiovascular responses to potential stressors show that these are smaller during interaction with a pet dog. In this study we examined the physiological responses of dog-owners with their dog present and non dog-owners to three types of disturbing event: running up and down stairs, reading aloud, and hearing a sudden alarm clock sound.

The subjects (n=58), consisted of normotensive females (systolic blood pressure not >140mmHg, diastolic blood pressure not > 90mmHg), divided into test group (n=30), and control group (n=28), of dog-owners and non dog-owners respectively. Subjects were neither taking medication known to affect their blood pressure or heart rate, nor were they currently suffering from asthma or breathlessness. Blood pressures in both the test and control groups were measured immediately preceding and immediately following each potential stressor. The entire experimental procedure lasted 20 minutes and all subjects were tested in their familiar home environments. Systolic and diastolic blood pressures were measured using an automatically inflating Omron Blood Pressure Monitor. Heart rate was recorded continuously by a Polar Heart Rate Monitor.

Mann-Whitney *U* tests showed that non dog-owners experienced a significantly larger increase in their heart rate (6.0:4.1 bpm), when listening to an alarming sound than dog owners (n=58,  $z=-1.97$ ,  $p<0.05$ ), and that this observed difference was only significant among those who regularly undertook active exercise (n=32,  $z=-2.30$ ,  $p=0.011$ ). When considering only those that took regular gentle exercise, the systolic blood pressure response to the sound was also significantly greater in non dog-owners than in dog owners (3.9:0.2mmHg, n=21,  $z=-1.75$ ,  $p<0.05$ ). No significant differences were observed in terms of how dog-owners and non dog-owners perceived their level of fitness, or in their actual exercise habits. Dog owners who owned their dogs for 0.5-1.5 years (n=10), had a smaller systolic blood pressure change ( $z=-1.84$ ,  $p<0.05$ ), and heart rate change ( $z=-1.65$ ,  $p<0.05$ ), in response to the sound than dog owners who owned their dogs for two or more years (n=20). Level of attachment to the dog was not found to be a significant factor in the differences observed. Physiological responses to running up and down stairs and to reading aloud did not differ significantly between the test and control groups.

The results indicate that interaction with a pet dog does result in smaller physiological responses to a sudden alarm clock sound. This finding supports the view that interaction with a pet dog may moderate physiological responses of owners in potentially stressful situations, in this case, when exposed to alarming sounds in the home environment.

## **THE EFFECTS OF QUARANTINE ON CATS : OWNERS' REPORTS**

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Domestic cats imported into the UK undergo a period of 6 months in quarantine. During this time, they are confined to a small, enclosed space and are relatively isolated from people and other animals. To date, there have been little published data on the effects of this environment on cats.

This study examined the effects of quarantine on the behaviour and temperament of cats, and on the owner-cat relationship, using questionnaires. These were completed by the owners at the start of quarantine, after 3 months, at the end of quarantine and three months later. Eleven owners, owning a total of 16 cats, completed questionnaires.

Half-way through quarantine, owners of 10 cats (67%, one owner did not reply) reported that their cat's temperament had changed, compared with before quarantine. These changes included being less relaxed, more excitable, more aggressive, more timid, more nervous and less playful. At the end of quarantine, owners of 11 cats (69%) said that their cat's temperament had changed. These changes included being friendlier, more affectionate, more timid, more playful and more vocal. Six of these cats were described as being fearful of loud noises, and showed crouching or hiding behaviour when frightened. Three months following release, the temperament of 8 cats (67%) was reported to be different, compared with before quarantine (2 owners of 4 cats did not complete the final questionnaire). They were described as being more affectionate, more timid, more nervous and less playful. Four of these cats were still frightened of loud noises.

The strength of attachment of owners to their cats did not change significantly during and after quarantine, although owners were spending more time with their cats following release from quarantine than before (Cochran Q test;  $Q=8.4$ ,  $p=0.02$ ). Owners reported that their cats seemed significantly less attached to them during quarantine than following release (Friedman test;  $F=8$ ,  $p=0.018$ ). Three months following release, cats were reported as being more vocal, compared with before entering quarantine (Wilcoxon signed-ranks test;  $z=-2.45$ ,  $p=0.014$ ).

This study shows that quarantine has significant short and long term effects on the behaviour and temperament of cats, and on the owner-cat relationship.



## **KIN AND KINE: MAASAI SOCIAL RELATIONS AND CATTLE CARE**

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African pastoralists face particular environmental challenges - drought, human and livestock disease, land constriction, and often famine - because of their habitation of semi-desert, arid, or semi-arid lands. Despite these constraints, many groups continue to depend on livestock for subsistence, utilising patterns of adaptation to grasslands which have been practised successfully by pastoral societies over many millennia in Africa.

A pastoral ecosystem has three main components: people, animals, and environment, that under certain conditions combine in a dynamic relationship to achieve a balance among all three. How this balance is achieved is largely dependent on decisions taken by the herd owners who are constrained by the environment in which they live and the biology of the animals on which they depend.

Our emphasis is on the interactions of humans and cattle, and how social relations become part of the ecology of the animal. We argue that cattle are part of both the biological and social environments, and that social relationships, cemented through cattle, are an essential part of the survival strategy of humans in pastoral ecosystems. Husbandry of a particular species of animal imposes particular constraints on a society, and these are reflected in the behaviour, social organisation, and socio-political relationships of pastoral groups.

We focus on one pastoral group, the Maasai, until recently semi-nomadic, but now largely settled, who inhabit semi-arid rangelands in Kenya and Tanzania. Maasai are probably one of the best known cattle-keeping societies in Africa. In this paper, we illustrate links between the special needs of cattle and some features of Maasai social relations. We examine the social significance of cattle transactions in Maasai society and identify some of those actions which we suggest have a direct causal link to animal welfare. Our discussion focuses on three aspects of herd management: cattle naming and classification systems; how animals are acquired, exchanged or redistributed; and how social rules in Maasai society militate in favour of the care and well-being of the animals.

## **ETHICAL ASPECTS OF THE HUMAN-NONHUMAN RELATIONSHIP**

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J Baird Callicott's 1980 portrayal of a triangular relationship between animal liberation, the land ethic of Aldo Leopold and conventional humanism can be seen as a simplification. The animal liberation ethic itself can be divided into at least three subdivisions - the Utilitarian approach of Singer, the Rights position of Regan and my own attack upon speciesism.<sup>1</sup> Environmentalism, too, has many forms and can be subdivided using psychological criteria.<sup>2</sup>

In my paper I will outline my reasons for advocating my painist ethic<sup>3</sup> and, for the first time, examine problems that it raises - the questions of innocence, responsibility for actions, the basis for regarding pain as evil, the nature of morality (and, incidentally, its psychological functions) and the apparent conflict between individuality and holism.

I will conclude with some historical observations suggesting links between the state of human society and patterns of concern for nonhumans.

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## **VETERINARY DILEMMAS: AMBIVALENCE AND AMBIGUITY IN HUMAN-ANIMAL INTERACTION**

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The relationship between humans and other animals is replete with contradictions. Our association with other creatures can be characterised by both intimacy and exploitation. To put it crudely: some species we keep and devour for food, upon others we lavish affection. The ambivalence and ambiguity that typically characterise our relationship with domesticated animals is most clearly reflected in settings within which human-animal interactions play a central role. For example, the pervasiveness of ambiguity and ambivalence in human-animal relations can routinely be observed in veterinary practice.

The veterinarian is commonly portrayed as the champion of animals in society. The animals' friend, however, can at times also be the animals' foe. Veterinarians routinely face many dilemmas, which challenge their responsibilities to their animal patients and may conflict with the professional code by which they are bound. The resolution of such dilemmas is often determined by practical and financial, rather than moral, considerations. The most fundamental predicament with which vets are routinely confronted is the question of whether the patient should be killed or cured. In agricultural practice, the decision to treat - particularly through surgery - is wholly dependent upon the value of the animal, its age, its future potential economic capacity, the nature of its injury or sickness, etc., whereas in small animal practice, decisions are generally taken upon the basis of the owner's emotional attachment to their pet, although economics may also to some extent determine the animal's fate. Similarly, veterinarians are often asked to perform surgical interventions that have no therapeutic value to the animal whatsoever. Some of these 'mutilations', e.g. declawing and debarking, have been outlawed in The Netherlands, though they are often performed in other countries. Others, such as dehorning and tail docking are commonly practised in agricultural settings as a form of animal management; yet similar procedures, performed for aesthetic purposes, are prohibited in small animal practice. Neutering is also a common surgical intervention designed to manage the size and nature of animal populations, in addition to altering the animal's behaviour. In short, these mutilations are generally performed in the interest of humans, rather than animals.

This paper intends to illustrate the very diverse ways in which animals are treated, both culturally and medically, according to which species they belong. Moreover, it will highlight the dilemmas that veterinarians experience in their daily working lives, which are, in turn, reflective of the ambivalence and ambiguity that pervade the human-animal relationship.

## **ATTITUDES EXPRESSED BY PRIMARY SCHOOL AND FAMILY GROUPS TO DIFFERENT TYPES OF ANIMAL EXHIBITS**

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This study was undertaken to ascertain the content of conversations of primary children and their accompanying adults when they visited live animal specimens in a zoo or preserved animals or animatronics in a museum with particular reference to affective attitudes and interpretative comments.

1466 conversational segments of primary school children and their accompanying adults, teachers or chaperones, and 503 conversational exchanges of family groups that contained children of primary age or younger were recorded. The transcripts were coded using a systemic network which had been designed after examining data collected from pilot studies. A range of variables was created from the coded data. The number of conversations that contained at least one reference to the categories concerned with affective attitudinal topics were compared using Chi-square analysis (2 degrees of freedom) and at probability at the  $<.01$  or  $<.005$  levels. Phi<sup>2</sup> values for the data were also obtained.

The highest number of affective comments amongst school groups were at the animatronics animals ( $p < 0.005$ ). Affective comments were generated by school groups in similar numbers at preserved and live animals. Analysis of data obtained from families showed a similar pattern. The number of conversations containing emotive comments generated by both school and family groups was significantly higher at the animatronics ( $p < 0.005$ ) but, whereas school groups made similar numbers of emotive comments when at the live and preserved animals, families made significantly fewer comments ( $p < 0.005$ ) at the live animals than at the preserved museum animals. Most interpretations of animals in human terms were made at animatronics and live animals by school groups and only at live animals ( $p < 0.005$ ) by families. Significantly more families explained an animal in human terms at least once in a conversation at the animatronics. In contrast, significantly fewer school groups referred in this way to the preserved animals and remarked to a similar extent at the other two types.

The study shows that, whilst these school groups made similar overall affective responses to the preserved and zoo animals, they made significantly more comments ( $p < 0.005$ ) about the animatronics and significantly fewer emotive comments about the live animals. Affective responses to the animal specimens was least at the live animals in the zoo, suggesting that such a response is not so much a reaction to the type of the animal but to the way in which they are exhibited. Contrary to popular belief, visitors to the museum generated overall more affective comments than they did in the zoo.

# ***Poster Abstracts***



## **EMOTIONAL EXPERIENCES OF DOG OWNERS FACING DISCIPLINING SITUATIONS WITH DOGS**

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Dogs are regularly subjected to the same kind of human treatment as human infants. The compatibility of the social systems of humans and of their pets has facilitated the formation of this unique inter-species relationship. The behaviour of a companion pet is a very important determinant of the success of this relationship, as problematic behaviour by the pet can often interfere with the development of a satisfactory relationship between a pet and its owner.

Some of the most common behaviour problems that people have with their pets originate from the type of relationship that has formed between them. In most cases, pets and owners demonstrate normal species-typical behaviour that is sometimes unacceptable to the other species. Behaviour problems in pets may be manifestations of normal and adaptive activity or abnormal activity; the distinction often lies in the owner's point of view.

The average pet owner thinks of his pet in human terms; they not only regard their pet as part of the family, but as their child. When owners interact with their dogs, one can hypothesize that they might use 'human' criteria of problematic behaviour as well as human methods of rearing and disciplining their dogs.

Dog owners (N=125) were offered a situation-reaction questionnaire (situation: a prototypical situation with dog) and asked to what extent they thought each of the situations was problematic, how often each situation occurred in their dog-rearing practice, how intensely they experienced emotions such as irritation, anger, sorrow, anxiety in facing these situations and which disciplinary reactions they showed in each of these situations.

To obtain more information about the characteristics of a problematic dog rearing situation and about the frequency of occurrence and the extent of the problems, the following questions were asked:

1. How often do problematic dog rearing situations occur?
2. What is the extent of the problem, as perceived by the dog owner?

A situation can also be experienced in terms of emotions. Therefore the intensity of the emotions experienced by dog owners in a dog rearing situation was evaluated by asking dog owners to describe the degree to which they experienced a set of emotions such as irritation, anger, sorrow, anxiety. The question referring to this issue is:

3. Is there a relationship between the nature and the extent of emotions experienced by dog owners in a dog rearing situation and the nature of the dog rearing situation?

Power assertion and induction are the most commonly used disciplining methods with children. This issue (concerning dogs) was addressed with the following question:

4. What disciplining methods are used by the dog owner?

Research with children proved that disciplinary behaviour might be influenced by the frequency of occurrence, the extent of the problem and the emotional reactions to the situation. Therefore the following questions were addressed:

5. Is there a relationship between the frequency of occurrence and the nature of the disciplinary reaction by its owner?
6. Is there a relationship between the extent of the problem of the dog rearing situation and the nature of the disciplinary reaction by its owner?
7. Is there relationship between the emotional reaction of the dog-owner and the discipline methods he uses in problematic situations?

Using ANOVA procedures the data are now being analyzed.

## **REDUCING ANIMAL-NUMBERS IN EXPERIMENTS**

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Commonly, when we wish to carry out an experiment, we decide on the number of subjects to use based on (a) how many subjects there are available, (b) the cost to us or to them of the test procedure, and (c) some gut feeling about how many we need in order to make the sort of decision that we hope to make. In many situations it is desirable to keep the number of subjects used as low as possible, especially when the test procedures are stressful or painful. The "gut-feeling" estimation method usually greatly overestimates the number of subjects needed.

If you both (1) know the mean and variability of your population, and magnitude of effect of interest and (2) are able to test your subjects one at a time, then you can more economically carry out experiments using many fewer subjects. From prior research or from control group data, we often have an estimate of mean and variance, and can estimate an important magnitude of effect.

Sequential Sampling techniques were developed for quality control engineers and are rarely used by behavioural scientists. Sequential sampling is preferable to commonly used procedures as it is more powerful, in that fewer subjects (around 50%) are required in order to arrive at a decision with the same degree of certainty.

Sequential sampling involves collecting data from single subjects in succession, plotting the subjects' scores on a predetermined graph, and then stopping the study when that plot exceeds a set level.

The technique is simple to use, readily available in computer statistics packages (e.g. STATISTICA by StatSoft), makes statistical analysis simpler, is more powerful, and uses fewer subjects. It is a more ethical alternative in contentious experiments, and it should be more widely known and used.

**ANIMAL-RELATED ACTIVITY THERAPY, INCLUDING HORSE RIDING,  
AND HOW IT HELPS PEOPLE WITH SPECIAL NEEDS AND DISABILITIES**

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In 1992 activities related to the care of animals were analysed by the Camomile Centre. All the activities, including horse riding and dog training were broken down into components and then related to basic living skills.

The students involved in this innovative therapy were aged between 4 and 56 years. They all had disabilities ranging from developmental delay to severe brain damage, and from cerebral palsy to sensory deprivation. The belief being that activities related to animal care and horse riding can, with support, be carried out by anyone of any age or ability. By 1994 the Camomile Centre was fully committed to 28 students per week. Each student attended for 2 hours and had an individual work plan which linked in with their particular special need. Method of assessment included video and written reports focusing on the amount of support needed to carry out specific tasks.

60% of the students had learning difficulties ranging from moderate to severe, 20% had acquired brain injuries, 10% had emotional and behavioural disorders, 10% had sensory impairment.

Activities included cleaning out animal housing, making up feeds, measuring water into containers, pushing wheelbarrows and sweeping, carrying buckets, collecting eggs, dog training and horse riding, and keeping records. Cognitive benefits from the above include improved numeracy and literacy. Communication and motor skills, both fine and gross also improved. Physical benefits were improved posture and pace, with the result that internal organs could have stimulation. Muscle tone is improved, as is balance and co-ordination.

The measuring of recorded outcomes is underway, and the development of qualified therapists is in progress. Animal Related Activity Therapy (ARAT) is delivered by professionals with specialised experience incorporating a variety of animals as an integral part of the therapy.

## **ATTACHMENT TO CATS AND DOGS OF AGED PET OWNERS**

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Studies of the human-animal bond suggest that people become closely bonded with their companion animals. Within the framework of our main research project into the meaning of companion animals for the quality of life of the elderly, we theorized that a human-animal bond is comparable to a human-human bond. Therefore we took three attachment constructs into consideration. All constructs are based on attachment styles, as described by Bowlby (1969) and by Weiss (1975). These human-human attachment bonds were: a parent-child bond, a transference bond and a romantic love bond. Preceding this study, we piloted 6 pet owners at the mean age of 30 years. After revising the instruments, we carried this study out with the intended population. The respondents (N=20; 10 cat owners and 10 dog owners) were aged 70-80 years. They were asked to fill in the general attitude questionnaire and to keep a diary for one week, three times a day (after breakfast, lunch and dinner).

The results were subsequently analysed by SPSS-PC. The various characteristic styles of the human-pet attachment bonds as described by Bowlby and Weiss, were identifiable in the analysis. We will discuss whether the limitation to one attachment style gives more every day problems such as feelings of depression and loneliness than having a variety of attachment styles to a pet.

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## **ENHANCING THE THERAPEUTIC ENVIRONMENT: THE ROLE OF THE 'PAT' (PETS AS THERAPY) DOG**

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This study evaluated the role of 'Bibá' - a visiting PAT (Pets as Therapy) dog - in enhancing the therapeutic environment of The Royal Star and Garter Home (RSG) for disabled ex-service men and women, a nursing home in Richmond, Surrey.

A Case study design was adopted for gathering data from 100 care staff and 100 of the predominantly elderly male residents. Women account for less than 10% of the resident population. The inquiry focused on the roles of both Biba and her handler during their weekly visits. The methods utilised included 2 visit assessment questionnaires, one for staff and one for residents focusing on their differing perspectives; semi-structured interviews with selected residents and senior staff; and participant observation. The study explored theory identifying social support as the major health benefit of pet ownership and investigated whether elements of the theory are relevant to treatment/visitation conditions. Specific questions were also addressed regarding the dog's potential to normalise the nursing home environment and any 'Interfacing' problems between the visits and the seemingly dominant 'Medical model' at the Home. Questionnaire data were initially analysed using Factor analysis. Social support was identified as the primary Factor for both staff and residents. Reliability analysis was conducted on the suggested Social Support scales, Alpha = 0.9149 for staff and 0.9347 for residents. Using a two-tailed *t* test, Social Support scale scores within the staff sample were compared for differences between owners and non-owners of pets and between men and women. Social Support Scale scores in the residents' sample were only compared in terms of previous ownership / non ownership. Comparisons based on sex were inappropriate since this sample contained only one woman. Interview data were subjected to thematic content analysis and observational data were examined for contextual description.

Perception of Biba as socially supportive was significantly higher ( $t=4.01$ ,  $p<0.005$ ) amongst pet owning staff than staff without pets, and amongst female staff in comparison with male staff ( $t=3.53$ ,  $p<0.003$ ). Residents' findings indicated that Biba had a limited normalising effect. 'Interfacing' problems were generally considered to be avoidable as long as Biba remained healthy and obedient. The handler also appeared to contribute to the therapeutic process relating to social support and normalisation.

The findings suggest that past and present pet owners perceive Biba as offering a degree of social support to residents and that the level of support derived may be restricted by the short duration of the visiting periods.



## **DOLPHIN THERAPY AND MENTAL HEALTH**

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Anecdotal reports have suggested that close dolphin contact may be of therapeutic benefit to people with mental health problems. This study examined the effects of close dolphin contact on 6 clinically diagnosed sufferers of mental health problems. Their diagnoses included: Manic Depression, Schizophrenia, Depression, Personality Disorder and Anxiety states. The sample contained 3 men and 3 women. The study was conducted with the last dolphins held in captivity in England at Flamingo Land, Yorkshire, just prior to their release into the wild.

Both quantitative and qualitative research methods were utilised. These included:

- i) The completion of Spielberger State and Trait Anxiety Inventories (SSTAI) by participants at 3 time points: 1 week before the encounter; immediately after contact with the dolphins; 1 week following contact.
- ii) Participants interactions with the dolphins were recorded on video.
- iii) Independent observations were made by a Community Psychiatric Nurse.
- iv) Semi-structured interviews 3/4 days after the encounter.

Participants spent two hours with 3 adult female dolphins. All contact was from poolside. Interaction with the dolphins included throwing balls / hoops and calling / talking. Each member of the sample spent approximately five minutes feeding and stroking the dolphins ( supported by the dolphin 'keeper'). Individual SSTAI scores in each condition were compared and the video/observational data were examined for positive and negative responses to the encounter. Interview data were subjected to thematic content analysis.

Qualitative data indicated that all participants found the encounter to be a positive experience. Both qualitative and quantitative data suggested that two female participants, both diagnosed as suffering from Depression and both victims of sexual abuse as children, may have derived a particular therapeutic effect. Their State Anxiety scores decreased by over 20% immediately after contact with the dolphins, however, this was no longer the case 1 week after contact. Their Trait scores remained constant over all 3 timepoints. Their interview responses were similar, describing the dolphins as offering acceptable love / affection. They reported that they found it extremely difficult to accept love from humans and that their time with the dolphins enabled them to reflect on the loss of trust due to their sexual abuse as children.

The study suggests that the dolphins may offer a respite for some from their mental health problems. It also identifies the possible potential of animals, dolphins in particular, as therapeutic adjuncts for work with victims of child sexual abuse.

## **CONTROLLING FOR SOCIAL CATALYSIS EFFECTS OF ANIMALS ON HUMAN CARDIOVASCULAR RESPONSES TO STRESS**

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There are now a number of investigations suggesting that the presence of a pet may have a moderating effect on cardiovascular responses to laboratory stress tasks (Friedmann, 1995). However, there are a number of possible explanations of these findings, some of which would not generalise beyond the laboratory setting. One such explanation is that the animal acts as an initiator of social interaction between the subject and experimenter, establishing greater rapport, and it is this rapport which is responsible for the stress reduction during the experiment. Two studies are reported. Both controlled for the possible rapport effects of social catalysis by having the experimenter follow a pre-written script. As it has been suggested that cardiovascular responses to verbal tasks are partly a consequence of the respiratory and motor activity of speaking, both studies compared responses to verbal (reading aloud) and non-verbal (mental arithmetic) stress tasks. Finally, in experiment 2, the effect of an animal was compared with music as another potential moderator of stress. Cardiovascular responses to standard stress tasks were monitored using a Critikon Dinamap.

In Study One, 40 student subjects were divided into two groups, tested with or without a dog present. There were clear cardiovascular responses to the stress tasks in that diastolic and systolic blood pressure, and heart rate, were higher than baseline levels. There was a main effect of the presence of the dog in decreasing heart rate across both resting and task phases. However, we failed to demonstrate that the presence of the dog decreased reactivity, i.e. the response relative to baseline. Subjects rated the experimenter as significantly less reassuring in the dog present condition, contrary to what would be expected if the dog was indirectly enhancing the rapport between subject and experimenter, or positively influencing the subject's appraisal of the experimenter or task.

In Study Two, 60 non-student subjects were divided into three groups, with a dog, with music, and a control group with neither. As in experiment one, there were clear cardiovascular responses to the stress tasks compared with baseline levels. A Multivariate Analysis of Variance of this data showed that these responses differed in magnitude according to condition. Multivariate pairwise contrasts showed that there was a smaller response in both the dog and music conditions than in the control condition and no difference between the music and dog conditions. Systolic blood pressure and heart rate contributed most to these effects. There were differences between the reading and maths tasks, but these differences were similar for all three groups.

The results suggest that the previously observed attenuation in stress reactivity in the presence of a companion animal can be found even when social interaction is controlled. Alternative explanations of this process are considered and methodological problems inherent in this type of experiment are discussed.

June McNicholas is a Waltham Research Fellow. Orla Dunn is supported by a collaborative studentship from the ESRC and the Waltham Centre for Pet Nutrition.

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## **BEHAVIOURAL PROBLEMS OF DOGS BROUGHT TO ANIMAL SHELTERS**

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Behavioural problems affect the relationship between owners and dogs to a degree that is not tolerable to the owners. The goal of this study was to investigate how many behaviourally disturbed dogs are brought to German shelters every year and the effects these problems have on adoption success.

A questionnaire answered by 47% of all German shelters contained questions regarding the number and origin of dogs brought to the shelter, number and nature of behavioural problems, criteria for selection of prospective owners, number of successful adoptions, number of dogs being returned after adoption and reasons for returning a dog to the shelter. Further data collected in 2 animal shelters included the number of dogs brought to these shelters, their origin, the age distribution, breed and, gender, behavioural problems, and the duration of stay in the shelter. Four weeks after the dogs' placement, the new owners were asked to answer a questionnaire including inquiries regarding their expectations before choosing their new dog, selection criteria, personality of their new dog, and problems arising after adoption.

Each year more than 100,000 dogs are brought to animal shelters in Germany. Approximately 60% of the dogs are mongrels. The majority are large sized dogs (>40 cm = 67%), 3 years of age or younger (68%). Sixty-five percent of the dogs are male. Our results show that stereotypies (10%), fear and dominance-related aggression (10%) and other fear-related problems (5%) belong to the most commonly observed behavioural problems of dogs in animal shelters. Shelter employees select prospective dog owners using criteria such as house or apartment size (71%), employment and daily schedule (50%), rather than experience with keeping dogs (15%) and character/personality (17%). Visitors are mostly interested in adopting a family dog (69%) and companion animal for themselves or their children (55%). Most owners select their dog spontaneously, without further consideration or counselling (56%). The dogs appearance, including size (37%), age (38%), gender (27%) and breed (20%), is more important to owners than the dogs behaviour (17%) as observed in the kennels, or the caretaker's opinion regarding the dog (14%). Owners report that behavioural problems occurring within 4 weeks after adoption include destructiveness (35%), intraspecific aggression (29%), barking (27%), house soiling (20%), dominance aggression (18%), fear aggression (15%), and roaming (9%). Up to 25% of all dogs placed with a new owner are returned to the shelters, with aggression, disobedience and house soiling being the most common reasons.

The present results indicate that behavioural problems of dogs are one of the most frequent reasons leading to the decision to give the dog for adoption. Intolerable behaviour, such as dominance aggression, disturbs the owners relationship with the dog significantly, and for variable reasons many persons seem to be unable to cope with these problems. Attempts to find a suitable and competent new owner for problem dogs fail, and the animals are returned to the shelters repeatedly. Behavioural problems might subsequently lead to the dogs' euthanasia if problems intensify or endanger people. Therefore, it is suggested that the most effective means to avoid that dogs are brought to the shelters are preventative measures, such as dog training and behaviour counselling. If veterinarians and employees of animal shelters were to offer classes and counselling for dog owners, enabling dog owners to train their dogs effectively, they might be able to prevent and solve behavioural problems and thereby lead to reduced numbers of dogs being brought to the shelters.

## **BEHAVIOURAL ANALYSIS OF THE DOG'S SOCIAL ATTACHMENT TO HUMANS: A NEW APPLICATION OF THE AINSWORTH STRANGE SITUATION TEST**

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The dog was the earliest species reared as a companion to man, and its relation to humans has a more than ten thousand year long history. The dog's ancestor was originally a social species that had various social skills, or "sociocognitive abilities". Intraspecific social attachment is one of the basic factors for any species' social structure and leads to group formation. However, during domestication, since man unconsciously selected the dog for interspecific social attraction, a biological basis of attachment to humans has evolved. Nevertheless, dogs were selectively bred for "infantile" features.

As a consequence of this, people are apt to consider their dogs as a child substitute. On the basis of these considerations we assumed that the application of Ainsworth's Strange Situation method (elaborated on mother-child interactions) could provide useful information regarding the dog owner relationship.

Fifty dogs were observed in an unfamiliar environment in the presence/absence of the owner and a stranger. Since attachment is defined as the behavioural patterns of seeking and maintaining proximity to another individual, we could assess the dog-owner social relations by an ethological analysis of the dog's behaviour. Similarly to children, not only the separation from the "attachment figures" (owners) but the reunion with them, elicited the dogs' attachment behaviour.

Factor analysis of the behaviour variables resulted in two significant factors related to the dog-owner bond (accounting for 50% of the total variance). The individual factor scores, by which we can determine each dog's position, were also calculated. Individuals positioned highly on factor(1) tended to behave passively in this situation and they sought close physical contact with humans. Dogs with high scores on factor(2) waited for the absent owner at the door, immediately and fully approached the returning owner and were unwilling to play with the stranger. Factor scores were then analyzed by ANOVA and it was found that the dogs considered as family members showed more explicit attachment behaviour toward the owner ( $p < 0.01$ ). The effect of social status of the dog was also reflected in the individual behaviour, since dogs living in the house together with the family tended to be in close proximity to the door in the absence of the owner but not the stranger (ANOVA,  $p < 0.01$ ).

So we found that the dog-owner relationship could be described similarly to mother-child interactions. Dogs showed considerable variability with respect to attachment security that indicates a relationship based on dependency between the pet and the owner. This method adopted from child psychology combined with an ethological analysis appears useful in the assessment of the intensity of dog-human social attachment.



## **CONTENT OF CONVERSATIONS GENERATED BY SCHOOL CHILDREN VIEWING FARM ANIMALS COMPARED WITH THAT ELICITED AT ZOO ANIMALS**

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This study was undertaken to ascertain whether there were any differences or similarities in what interested school groups and hence about which they commented in their conversations when they visited live animals on a farm or in a zoo.

707 conversational segments generated in a zoo or a farm by primary school children and their accompanying adults, teachers or chaperones, were recorded. The transcripts were coded using a systemic network which had been designed after examining data collected from pilot studies. A range of variables was created from the coded data. Chi-square analysis was applied to the resultant data.

There was overall a uniformity in the responses to the animal specimens from the different sites but there were some statistically significant differences between some categories of conversation at the two types of animal specimens which the site apparently influenced.

This study shows that the site where the animal specimens are observed has an important influence on conversational content. Farm animals, which were not exhibited in the museum sense as were the zoo animals, elicited significantly more ( $p < 0.005$ ) affective responses but less ( $p < 0.005$ ) comments about behaviour. The similarity in content referring to body parts at both sites suggest a shared basic level of interest in structures of animals amongst the school groups. Exhibit access, 'other exhibit' comments and those related to interpreting the animals in their surroundings were generated by the school groups significantly more ( $p < 0.005$ ) at the 'exhibited' zoo animals. However, the number of conversations with management and/or social comments are similar, reflecting the ethos of a school visit. School groups named farm animals, which were fewer in diversity and were all familiar, significantly ( $p < 0.005$ ) less than they did the zoo animals.

School visits to farms elicited a more affective response than do similar visits to zoos. In the spectrum of companion animals, which runs from free living wild animals to pet animals kept at home, farm animals are nearer the pet image than are zoo animals and this may account for the more affective emphasis that was found in this analysis of conversational content.



## **POST-CONFLICT BEHAVIOUR IN DOMESTIC CATS IN CONFINEMENT**

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This study - part of a long-term project on cat social behaviour - concentrated on three aspects of post-conflict behaviour: (i) which behavioural patterns occur more often than expected in the victim of a conflict, (ii) which mechanisms (redirection of aggression, reconciliation and consolation) exist after conflicts, and (iii) if present, do these mechanisms affect the occurrence of the behavioural patterns mentioned under (i).

During a period of 24 days (34 hr 51 min of observation) spontaneously occurring conflicts were studied in a group of indoor living neutered males (n=8) and females (n=9). The behaviour of a victim of a conflict was recorded for a period of 10 minutes following the conflict (PC-period). A control period was recorded on the day following the conflict (MC-period). Behavioural patterns, which were recorded, were: yawning, shaking leg, oral behaviour (licking nasal and oral area), scratching and autogrooming. If in a particular minute the rate of a pattern in the PC-period was higher than the mean rate plus 95% confidence interval calculated over the entire MC-period, the pattern was considered to occur more often than expected in that minute. To account for individual differences a Wilcoxon matched-pairs signed-ranks test was applied to the thus formed time-window. To assess the existence of post-conflict mechanisms, the distributions of the first affiliative contact with a former opponent (reconciliation) or another cat (consolation) as well as the distributions of the first aggressive contact (redirected aggression) of the PC period and MC-period were compared using a Kolmogorov-Smirnov test.

Oral behaviour, shaking head and scratching occurred more often than expected in the first minute of the PC-period; autogrooming during the first eight minutes. These behavioural patterns have been suggested to occur in cats after supposedly stressful or arousing events. They may be signs of arousal experienced by victims (displacement behaviours). To what extent they aid in de-arousing the animal remains an open question.

The limited number of conflicts studied thusfar (n=33) precludes any conclusion regarding the existence of post-conflict mechanisms to be drawn as yet.

This study was supported by a grant from the Joint Scientific Research Programme of the Netherlands Organization for Scientific Research (NWO) and the British Council.

## **BIOCOMMUNICATION AND CO-ORDINATED INTERACTION**

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Holistic understanding of the human communication and biocommunication processes assumes an interlink among the systems (biological, psychological, social) and communication system with subsystems (personal, interactional and social communication). In their explanations of information transfer, communication scientists derived from a mathematical model of information theory (Shanon, Weaver, Cherry), systems theory (Buckley, Ritsert, Reimann) and from a cybernetic information transfer (Miller, Krippendorff, Klaus). The whole interdisciplinary area of biocommunication based on bionics, however, remained unresearched. Modern communication science advanced new views upon symbolic interactionism, functionalism, communicative action, strategic interaction, domination and aggressiveness (McQuail, Habermas, Hardt).

Interactional (bio)communication can be defined as a process through which living beings can understand each other, communicate and coordinate their actions: Interactional (bio)communication is an intentional sending of messages (transmission of information, threats, sexual invitations) to a communication partner, who responds to the (bio)message as an equal partner (reciprocity).

Transactional exchange between an organism and the environment is "conscious", intentional, directed towards a goal. Animals (and not only human beings) become actively and deliberately involved in a goal-oriented selection of choices from the environment. This can be exemplified with the model of a "hidden trial" (Hulett), with the concept of autopoiesis (Maturana).

A complex adaptive system (an organism) should be observed in the processes of co-ordinated interactions and selective decisions in the processes of self-preservation and evolution.

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