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## When to experiment on animals

Conflicts of interest between experimenters and their critics might be resolved by weighing up the degree of suffering against the value of the research

Patrick Bateson

A new law controlling the use of animals in scientific experiments is likely to come into force in Britain this year. A government bill called *Animals (Scientific Procedures)* is now passing through parliament. New legislation is long overdue. Biology has undergone a revolution since 1876 when Britain last enacted a major piece of legislation. Scientific knowledge of what is and what is not likely to cause suffering in animals is now substantial. Furthermore, public concern about animal welfare has increased greatly. Scientists who simply want to be left alone to get on with their work cannot and should not ignore concern about the ways animals are treated in laboratories. Nor should they brush aside the animal suffering that can undoubtedly arise in research. Yet as debate intensifies a major worry is that all reason will fly out of the window. The positions on the use of animals in scientific work are likely to become so polarised that useful dialogue between experimenters and their critics will be exceedingly difficult.

Extreme anti-vivisectionists are obviously determined to inflict a major defeat on the scientific community. One of their main targets is my own subject, the study of animal behaviour. In a pamphlet published last summer and given considerable publicity in the media, a coalition of antivivisection groups demanded a ban on psychological and behavioural experiments (Robert Shapre, 1985, *Psychological and Behavioural Research*, published by "Mobilisation for Laboratory Animals Against the Governments Proposals"). My guess is that the anti-vivisectionists have picked on psychology and ethology, the biological study of behavior, because these subjects lack the powerful backing from the medical establishment given to, say, physiology. Furthermore, they know that many members of the public are more worried about behavioural experiments than they are about surgery on anaesthetized animals. In justifying the demand that current research be stopped, the pamphlet suggests that behavioural work is scientifically trivial, of no medical importance, or better done on humans. These arguments are backed by the device of selectivity quoting from original papers in such a way as to make the studies seem cruel and pointless.

My colleagues and I have an obvious interest in protecting our own subject. Our professional society, the Association for the Study of Animal Behaviour, will soon issue a pamphlet that makes the case for the scientific study of animal behavior. Briefly, we

argue that studies of animal behavior, far from being stopped, should be allowed to flourish in the interests of both human and, indeed, animal welfare. Medicine has directly benefitted from an understanding of the social conditions necessary for the normal development of behaviour in animals. For instance, losing a mother early in life can lead to long-lasting mental and physical disorders in humans. Thanks to the work on animals, the developmental processes that depend on interactions with the mother are being uncovered. Effective forms of therapy for humans have been found and brought into practice.

Knowledge of the natural behaviour of animals and the way they respond to stress is improving husbandry for animals kept in zoos, farms and laboratories. Veterinarians draw on behavioural expertise when assessing the health of an animal or when designing housing. An animal's behaviour is one of the best guides to its state of well-being. Training veterinary surgeons to detect abnormalities of behaviour can provide them with quick, non-invasive methods for assessing distress and is increasingly recognised within the veterinary profession as an important contribution to animal welfare. We should not forget that the studies of animal behavior made famous through television programmes give pleasure and understanding to millions of people. At a practical level, this knowledge of the relationship between the behavior of animals and their natural environment helps us to conserve wildlife. Finally, solving how and why animals behave as they do raises some of the most challenging and exciting problems in science.

Sometimes people object to scientific studies on the grounds that research simply tells everybody what they knew already. Studies of behavior are particularly likely to evoke this reaction because people have insight into their own actions and the behavior of pets. Yet the feeling that a discovery is obvious after it has been made is not the same as knowing all along that it is true. Most people readily fit old observations into a new explanation without realizing that, if they had been asked to make sense of those observations before given the explanation, they would have got the answer wrong. For instance, many people believe on the basis of introspection that aggressive impulses accumulate until they can no longer be contained and then manifest themselves as uncontrollable rage. This notion led to the serious proposal that human aggression be controlled by providing opportunities for relatively harmless outlets for aggression. Yet the scientific study of animals and humans has shown that behaving aggressively may make that behaviour *more* rather than less likely on a future occasion.

Many biologists interested in behavior --ethologist-- study animals living freely. Much has been and will be learnt from such research. However, we can also discover a great deal by studying captive animals. Konrad Lorenz, one of the winners of the Nobel Prize for Medicine in 1973, obtained striking insights when his hand-reared animals behaved "naturally" in the artificial environment of his home and garden. His knowledge of "imprinting", in which he established a social relationship with young birds, came in this way. Furthermore, a point is reached in most field studies when

further understanding can be achieved only by keeping the animals under controlled conditions – which usually means keeping them in a laboratory.

Conditions in the laboratory must be reasonably good, if only because sick, frightened or maltreated animals simply will not do most of the things in which ethologists are interested, such as court each other, play, explore and solve difficult problems. Furthermore, most ethologists began their careers because they have an affection for animals, and much of their effectiveness as scientists derives from this concern.

The anti-vivisectionist organizations that seek to ban experiments of animal behavior appear to have been misinformed. Furthermore, head on confrontations is likely to exclude possibilities for reconciling conflicts of interest. A much better way forward can be found. Those of us who study animal behavior do not deny that some experiments ought not to have been done. Some scientists who repeatedly use animals in their research may become less sensitive and overstep proper bounds. In order to deal with this problem, the Association for the Study of Animal Behaviour established an ethical committee in 1979.

The ethical committee publishes guidelines on the use of animals in research and helps all those researchers who approach it to design non-stressful experiments. The committee also monitors articles submitted to the association's journal *Animal Behaviour*. Articles are rejected when the ethical committee judges them to be unacceptable. Examples have been articles on staged attacks and mutilation of young rodents by adults in research designed to analyse the influences on infanticide. This form of control is important because publication in a leading journal is the major way in which a scientist establishes a reputation and obtains funds for further research. The benefits of rejecting unethical in articles extend outside Britain. *Animal Behaviour* is the major international journal on the subject, and in many ways the standards of animal care are much higher in this country than in most others.

Six years ago the Association for the Study of Animal Behaviour organized a meeting to which it invited anti-vivisectionist organizations (*New Scientist*, 27 March 1980, p 1002).

At that meeting I suggested a way in which we might resolve conflicts of interested. The idea was based on the way most people unconsciously take many different things into account when making everyday decisions. Suppose for instance, that you want to buy a new pair of shoes. You will want good quality and you will also wish to pay as little as possible. You will probably set an upper limit on how much you will pay and a lower limit on the quality, but the limit for one will depend on the other. If you are forced to pay more, you will expect higher quality. I believe that a similar approach could be used to decide whether or not research on animals should be carried out. The essential point was that a much lower amount of suffering would be tolerated if the work were not regarded as being important (Figure 1). The analogy with buying shoes was not quite exact, however, because I did believe that the quality of scientific research on animals is related in any way to the amount of suffering that is involved.

Since I first proposed this attempt at a resolution, colleagues have raised a number of queries. It is worth considering the most important ones in some detail.

- *Who determines the quality of the science?*

A well-organized structure of committees assess whether public funds should support a scientific project. These committees are largely run by the government-funded research councils, but many charitable grant-giving bodies operate in similar fashion. Admittedly, the judgments made by these committees depend on decisions made by other scientists. The procedure invites the suspicion that, if scientists are left to run their own affairs, they will ignore public concern. The system of allocating grants may seem cosy to the outsider, but the processes of assessment are extremely rigorous and searching. In my experience, the members of the committees that rank grant proposals are impressively objective when making decisions. Furthermore, the degree of consensus about what constitutes good science is remarkably high. That, of course, is a view from within. A great deal of public concern would be allayed if a non-scientist with an interest in animal welfare could witness the decision making process.

- *How do we measure suffering?*

This question is more likely to be asked by members of the scientific community than by many anti-vivisectionists who seem to think that the answer is obvious. Many people feel that *all* animals are like themselves. Just as discrimination between human races and sexes has been properly attacked on moral grounds, exploitation of other species is felt to be equally wrong. The argument is strengthened by the scientific theory of evolution which links the origins of humans to those of other species.

Yet it can be difficult to put oneself inside the mind of an animal. Some animals, when threatened by extreme danger, remain rigid and silent because that is the safest thing to do. They do not look as though they are in a state of stress, because alarmed humans would not normally behave like this. Some species can experience subtle odours, high-pitched sounds, infrared light, ultraviolet light or magnetic fields which we cannot detect. Few people have much fellow feeling for fish even though many fish are long-lived, have complex nervous systems and are capable of learning complicated tasks.

With knowledge of how animals behave, there are often grounds for broadening rather than narrowing the range of animals that are believed to suffer. Awareness of an animal's natural behaviour can also provide great insight into what is and what is not likely to be stressful. For example, isolation from other members of its own kind is obviously traumatic for an individual belonging to a gregarious species, such as many monkeys. However, members of species that are habitually solitary, such as birds of prey, many prefer to be isolated from their fellows.

All this indicates that the assessment of suffering is not straightforward, but can be greatly assisted by expert knowledge. Such knowledge would dry up if the extreme

anti-vivisectionists had their way and all studies of animal behaviour were stopped. In general, I believe that we can reach a reasonable consensus on what would constitute low, intermediate and high levels of suffering in a particular animal. However, we will need to update the guidelines by which judgments are made at regular intervals.

- *Who determines what shall be allowed?*

The decisions ought to be made by a group that has representatives of both scientific and animal-welfare organizations. A body that could do the job is proposed by the *Animals (Scientific Procedures) Bill*, now before parliament. The suggestion is that the committee should consist of at least 12 people and at half of them should not have held a Home Office licence to do scientific research on animals in the previous six years. At least two-thirds of the committee should have had either full registration as a medical practitioner or veterinary surgeon or have had experience in biological subject. At least one should be a lawyer. If a reasonable measure of trust could be established within such a committee, useful guidelines for decision-making could be formulated.

- *How can any animal suffering be justified merely in the name of good science?*

If we substitute the words "medical benefit" for "good science", the answer will seem clear to most people. Great human suffering is felt to be worse than the possibility of mild discomfort inflicted on an animal in the course of research. The problem is, however, that it is difficult to predict the likely benefits of biological science for the welfare of humans and animals. The best bet is to back science that is likely to lead to the discovery of fundamental and unifying principles. The Medical Research Council has wisely accepted that the funding of high-quality biological research is one of the ways of contributing to the medicine of the future. Nonetheless, the delivery of real benefits to humans or animals is uncertain. Many people would be deeply unhappy about the thought of animals suffering when the possible medical or veterinary value of the experiments was uncertain. We can overcome this difficulty if we include the probability of generating medically important results in the decision rules about whether research should be permitted (Figure 2). In the decision cube, the opaque part indicates what should not be permitted and the clear part what should be allowed.

One advantage of a set of rules, such as those suggested in Figure 2, is the acknowledgment that, in deciding whether a civilised society should tolerate a particular activity more than one thing matters. Both the extreme anti-vivisectionists and my more zealous scientific colleagues tend to suppose that the values they hold dear are the only ones that could possibly be important. Even when people holding such different moral positions are so inflexible and seem set for to the finish, it is possible to devise practical ways of resolving the conflict.

Whatever parliamentary debate does to the details of the new legislative, many scientists working on animals are bound to experience further restriction on their professional activities. The restrictions will be much greater than are deserved if the public are not adequately informed about the real benefits that flow from biology and also about the genuine concern for animal welfare felt by most people who are

engaged in the research. Many scientists are deeply upset by the selective quotations from their work and the unfairness of the criticisms levelled against them. For the most part, however, they have lain low because they were frightened by the violence of some of their opponents. They did not want their laboratories wrecked, their homes attacked and children abused (all of which have happened to some of my colleagues).

Nonetheless, I believe that the long-term damage generated by misinformation and widespread public mistrust is likely to be much greater if scientists do not join in the debate. Members of the public will be reassured when they discover that the seemingly pointless work done by the scientist is indeed worthwhile. Furthermore, a big step forward will be taken if the currently opposed organisations work together to achieve a set of controls that take into account both the interest of what is best in science and those of the animals used in research.

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