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## CHAPTER 2

# Animal Research Ethics

Anna S. Olsson, Paul Robinson, Kathleen Pritchett, and Peter Sandøe

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### INTRODUCTION

Contemporary research in the life sciences, and particularly biomedicine, involves experimentation on live animals.\* This research is considered an important tool in the progress of science. Much of it is directed towards the discovery of new ways to prevent, alleviate, or cure human diseases. However, the animals on which experiments are performed are often housed in such a way that they have limited freedom, or are subjected to distressing or severely painful interventions, or are killed. The overwhelming majority of these animals are mammals with highly developed nervous systems. They cannot, of course,

\* The relationship between human beings and other animals is a central theme in this chapter. In referring to non-human animals as "animals," we do not mean to deny that human beings are animals. Following many pieces of legislation, we use the term "laboratory animal" to refer to vertebrates only.

consent to their own participation in research. Nor, generally, will they benefit from such participation. And they appear to be capable of experiencing not only pain, but other forms of suffering as well.

These familiar facts present both the scientific community and society in general with a question: with the ultimate aim of alleviating or preventing human suffering, scientists carry out experiments causing pain and distress to animals, but are we, as human beings, morally justified in acting in this way?

This question has many dimensions, as we hope to show in this chapter. Some advocates of animal rights insist that we are not entitled to harm animals, even when our purpose is noble. Those who think that the human misery caused by the more serious kinds of ill health is a more urgent concern, on the other hand, respond that it would be unwise or unethical to abolish any animal-based experimental program that may lead to the effective treatment of a human disease. Most people appear to accept neither of these positions. Preferring to take a middle course, they regard the benefits gained through research as too important not to be pursued, but also believe we have a duty not to cause animals to suffer unduly.

In this chapter, we offer a survey of the ethical issues that animal research raises. We have not tried to provide a review paper, with comprehensive coverage of approaches and views. Nor have we attempted at any point to present a fully argued case for a particular conclusion about the ethics of animal experimentation — although it will be obvious at times where our sympathies lie. Our aim has instead been to set out prominent ideas in this area and to indicate how these ideas have been developed by specialists in animal ethics.

## HUMAN BENEFITS OF ANIMAL EXPERIMENTATION

Broadly speaking, modern animal experimentation began in seventeenth-century England and France. It has been central to our understanding of animal and human physiology ever since. A famous early example is William Harvey's investigation of the role of the heart in blood circulation. Observing the hearts of live animals with opened thoraxes, Harvey was able to see that the blood circulates in the body as a result of contractions of the heart.

In the first place, then, when the chest of a living animal is laid open and the capsule that immediately surrounds the heart is slit up or removed, the organ is seen now to move, now to be at rest; there is a time when it moves, and a time when it is motionless...We are, therefore, authorized to conclude that the heart, at the moment of its action, is at once constricted on all sides, rendered thicker in its parietes and smaller in its ventricles, and so made apt to project or expel its charge of blood.

William Harvey (1628) *On the Motion of the Heart and Blood in Animals*

It is difficult to imagine how discoveries such as this could have been made in Harvey's time without vivisection in its true sense — that is, without the cutting open of live animals.

More recently, experiments on animals have played a central role in the development of vaccines and therapeutic treatments for a number of infectious diseases, including anthrax, smallpox, rabies, yellow fever, typhus, and polio.<sup>1</sup> They have been equally important in the study of noninfectious diseases, playing a part in the development of insulin in the treatment of diabetes, techniques of blood dialysis for patients with kidney failure, transplantation techniques, and advances in various types of surgery.<sup>2</sup> And there is little doubt that, if it continues to be pursued, animal research will make important contributions to the development of new medical treatments at the initial stages of research, in the subsequent development of treatments, and in the safety testing of pharmaceutical products.

Live animal experimentation is also conducted outside the field of biomedicine. Animals are used in fundamental research in the life sciences, not only in studies pursued within a broadly biomedical perspective, but also in basic work in biology and psychology. They are also used to test new products and substances for toxicity and other possible negative effects on human health prior to marketing — although alternatives to animal use in toxicology studies are constantly being developed, and where animals are still used, refinement of the techniques has reduced the number of animals required and reduced suffering.<sup>3</sup>

We can summarize the current situation, then, by saying that most experimental animals are used

research in the life sciences; and to test the safety of potentially toxic products and substances. These, at least, are the uses of animals on which we shall concentrate in this chapter. We readily acknowledge that animals are used in biomedicine in other ways as well: for example, in the breeding of more animals for research, the education and training of scientists and veterinary personnel, and the diagnosis of disease and the production of biological matter, such as cells and antibodies.

The proportion of experimental animals used for each of the purposes just distinguished varies from country to country. It depends on the presence and activity of biomedical research and the pharmaceutical industry in that country and, less directly, on the way "animal experimentation" is defined in the relevant legislation. According to the latest available statistics from the European Union, in 1996, most experimental animals (44%) were used in the research, development, and quality control of products for human and veterinary medicine. Fewer animals (25%\*) were involved in fundamental biological research, and fewer still (9%) in toxicology and other safety testing.<sup>4</sup>

In connection with any research project falling into one of the three categories identified, we can ask: must this project involve animal experimentation? We can also ask: must this project be carried out at all? In some cases, the answer to one of these questions will be negative. It might be the case, for example, that the scientists are accustomed to proceeding in the way they currently do and are unaware of alternative methods. Similarly, regulatory bodies might continue to require animal tests that have always been applied even though there are now alternatives to using live animals as a means for research. Again, a comprehensive review of the literature may reveal that the results of an animal experiment involve duplication or are unnecessary for some other reason. To give more specific examples, it might be possible to exploit cell lines, or some other replacement method, or to use human volunteers.

Inevitably, however, there will be many cases in which it is essential to study an intact, living organism and in which the procedure or substance is too risky or too invasive to permit human volunteers to be used. In these cases especially, we need to consider carefully what costs we are imposing on the relevant animals.

## THE COSTS TO ANIMALS

Animal experiments can be costly in economic terms, and from an ethical point of view, it will sometimes be appropriate to ask whether the resources a study consumes could have been used more effectively or for some other purpose altogether. The cost we want to focus on here, however, is one carried not by those who fund or perform animal research, but by the experimental subjects — the animals. It is a cost measured not in monetary terms, but in suffering. Animals may suffer because the relevant experimental interventions provoke one or another of a wide range of unpleasant states. Pain, for instance, may be the result of surgical interventions, noxious stimuli, the application of irritating or corrosive substances, certain progressive diseases, genetic disorders, or infectious diseases. The systemic administration of test substances may provoke nausea and general discomfort. Fear is common in experimental situations because the animals are exposed to procedures to which they are averse and from which they cannot escape. And even when they are not specifically painful, most medical conditions occurring through provocation or spontaneously in laboratory animals are likely to be accompanied by some general discomfort. Finally, experimental animals are often housed in restrictive conditions in which they experience frustration when they cannot carry out species-specific behaviors.

Some countries have made data available that show the impact of various kinds of experimentation on animals. Examples are given in Table 2.1. This kind of information has a significant bearing on the ethics of animal research. Data from Canada and Switzerland, for instance, show that toxicology studies and studies performed in the research, development, and quality control of pharmaceutical and other medical products are those that most frequently expose animals to severe discomfort.

In general, statistical information of this kind suggests that the vast majority of animals suffer little or no distress in experimental settings. Some observers have used this finding to defend the position that animal research is unproblematic because relatively few animals suffer greatly. However, this argument seems weak. First, the plight of the 5 to 10% of animals described in the data as being exposed to severe pain or distress certainly seems, on the face of things, to be an ethical problem. Generally speaking, morally objectionable conduct does not become unobjectionable when it is directed at only a few victims. Second, in connection with the remaining cases, in which the animal distress is minor, we need to ask:

Table 2.1 Estimated Degree of Discomfort in Laboratory Animals

Category	Switzerland <sup>a</sup> 2000		Canada <sup>b</sup> 1999		Category	U.S. <sup>c</sup> 2000	
	N animals	%	N animals	%		N animals <sup>d</sup>	%
No/Minor	296,888	70.2	1,128,866	64.6	No pain/distress	897,226	63.3
Moderate	103,653	24.5	558,912	32.0	Pain/distress Drugs for relief	415,215	28.6
Severe	31,668	5.3	58,828	3.4	Pain/distress No drugs for relief	104,202	7.3

<sup>a</sup> Swiss Federal Veterinary Office

<sup>b</sup> Canadian Council on Animal Care

<sup>c</sup> United States Department of Agriculture

<sup>d</sup> Includes vertebrates except rats, mice, birds, and animals used for food or fiber research

in what way are these experiments unproblematic? The suggestion that this kind of suffering simply does not matter morally looks dubious. Surely it does matter — it is just that it carries less weight than more serious suffering. The alternative suggestion that minor suffering is justifiable is more plausible, but it is implicit in it that even minor suffering needs to be justified and hence, matters. In this sense, such suffering is not unproblematic.

The moral acceptability of animal experimentation is bound to be less questionable where animal suffering is minimized. To reduce such suffering, however, we will need to be quite clear about its nature — about the way or ways in which animals suffer. Our intuitive perceptions of what causes distress to animals are not always reliable. Procedures that appear unpleasant to human beings may cause an animal little distress. Thus, for example, no increase in levels of the stress-related hormone corticosterone was observed in mice kept in a room where other mice were being killed.<sup>5</sup> Conversely, procedures that strike human beings as pleasant may be demonstrably stressful for an animal. Thus, the standard husbandry practice of cage-cleaning results in an immediate, although not necessarily prolonged, increase in aggression among male mice.<sup>6</sup> Again, photographs of animals with electrodes attached to their heads may appear shocking when shown in animal protection campaigns, but cranial implants often look more inhumane than they, in fact, are. If the implants are positioned correctly and kept clean and free of infection, the most that the animal experiences in day-to-day life is some itching at the site of the implant. Brain tissue is not itself innervated, so the implant does not cause pain beneath the skull.

If we are to avoid these anthropomorphic assessments of animal distress and suffering, we will need to employ technically defined measures of the impact of experimental procedures on the subjective experience — measures defined in research on laboratory animal welfare. Over the last three decades, the study of animal welfare has become an established scientific discipline. Methods of assessing animal welfare have emerged from studies of the ways in which animals react, behave, and function in different experimental and everyday husbandry situations. Within the field, there is some variation in the approach to animal welfare, in that some animal welfare scientists emphasize health and biological functioning (e.g., Reference 7), whereas others hold that animal welfare is primarily a matter of the feelings of the animals (e.g., Reference 8). These approaches may diverge less than they appear to, because in practice, the factors they appeal to generally correspond. Nevertheless, in defining animal welfare, it may be helpful to ask why we are interested in animal welfare and suffering in the first place. The following remarks set out an answer to this question:

Animal welfare involves the subjective feelings of animals. The growing concern for animals in laboratories, farms, and zoos is not just concern about their physical health, important though that is. Nor is it just to ensure that animals function properly, like well-maintained machines, desirable though that may be. Rather, it is a concern that some of the ways in which humans treat other animals cause mental suffering and that these animals may experience "pain," "boredom," "frustration," "hunger," and other unpleasant states perhaps not totally unlike those we experience.

This reasoning looks cogent. It suggests that any acceptable definition of animal welfare will take subjective feelings into account. If this is right, it follows that when animals are used as research models, it is the prospect of their experiencing pain or other kinds of unpleasant mental states that is the main cause for concern.

It should be acknowledged, however, that the occurrence of unpleasant mental states does not, by itself, imply that there is suffering. Such states are an unavoidable part of normal animal life and often serve as signals or behavioral prompts that help the animal to satisfy its biological needs. Sometimes, negative experiences are compensated for by corresponding positive experiences — few would argue that a hungry animal that finds food is suffering, even though the experience of being hungry is not pleasant. Unpleasant states, therefore, represent a welfare problem only when they are not compensated by corresponding positive feelings, or persist for an extended period of time, or occur frequently. Thus, a captive hungry animal that is not fed raises a welfare problem. So, too, does an animal that is strongly motivated to build a nest, or explore, but is kept in an environment where it has no opportunity to exercise these kinds of behavior.

Let us now turn to the measurement of animal welfare. Obviously, it is impossible to measure the intensity or duration of negative mental states directly. We therefore have to rely on physiological, behavioral, pathological, and other indirect parameters of feeling. Parameters of this kind include: changes in normal behavior; the occurrence of abnormal behaviors, such as stereotypies; altered activity of the hypothalamo-pituitary-adrenal axis or the sympatho-adrenal system; other hormonal changes; and modifications in body temperature, immunocompetence, plasma ion levels and body weight.<sup>9-13</sup> These parameters are connected with the activation of various physiological and behavioral systems. It is worth pointing out that, since these systems affect not just welfare levels, but also the way an animal will react in an experimental situation, an animal's welfare status might well affect its suitability as a research model.<sup>14-16</sup>

Much animal suffering can be avoided through the proper use of anaesthetics and analgesics, and by careful handling procedures and improved housing systems. However, the fact that a great deal of pain can be controlled neither removes nor diminishes the remaining discomfort. An animal that has been operated on or is developing a medical condition, such as ascites or tumors, will inevitably experience a degree of discomfort. Equally, it is almost always necessary to deprive animals of some freedom and control over their environments to experiment upon them, and experimental interventions will, in many cases, involve a certain amount of distress even when they are carried out with care. Welfare problems caused by restrictive housing are often overlooked, but they are clearly important, because they will affect not just the experimental animals, but control groups and breeding stock as well. Behavioral restrictions imposed by standard housing might be stressful either because animals experience frustration when species-specific behaviors cannot be carried out or because animals have no opportunity to control their environments.<sup>16,17</sup> In most cases, the experimental protocol does not require restrictive housing.

In most countries, direct cruelty and the infliction of unnecessary suffering are illegal. In practice, the focus on *unnecessary* suffering will obviously permit some animal suffering — namely, that which secures a sufficiently important benefit for human beings. But in this formula, what is to count as a sufficiently important benefit? Is it enough that we will understand the function of all the genes in the mouse genome, or find an effective vaccine for HIV, or develop new agricultural pesticides and test their toxicity? And what should we say about the common situation in which the benefits of a line of research are, as the research gets underway, uncertain? Can a potentially large benefit that cannot be guaranteed be sufficiently important to license animal suffering?\*

## THE ETHICAL DILEMMA

Behind questions such as these lies an "ethical dilemma." Ordinarily, when we describe someone as facing a dilemma, we mean that the person is in a no-win situation: whatever he or she does, the result will be unsatisfactory in some way. An ethical dilemma is a special case of this. It again involves a no-win situ-

\* Questions like these are examined at greater length at the end of the section entitled "Claim (1): The Need for Animal

ation, but this time, whatever the person does, the result will be *morally* unsatisfactory in some way. The ethical dilemma that animal experimentation presents is summed up by the following four claims:

1. Live animal research is the only effective way of bringing certain important benefits to mankind, particularly in the prevention and therapeutic treatment of serious human diseases.
2. It is morally imperative to find new ways to prevent or treat serious human diseases.
3. In the course of live animal research, individual animals will inevitably be caused suffering or distress, and the interventions will not benefit the animals concerned.
4. It is morally imperative to preserve the welfare of animals, and in particular, one should not cause an animal to suffer if that suffering is not compensated for by a corresponding benefit of some kind.

It is easily seen that these claims are in conflict with one another. To ease the tension between them, we need to show that at least one of the claims is false, or at least an overstatement. Unsurprisingly, people who oppose animal research are normally skeptical about one or other of the first two claims. Some argue that there are ways of obtaining the necessary research results without animal experimentation and that the first claim is therefore incorrect. Cosmetics are an obvious example of a product for which this might be claimed. Much less commonly, it is suggested that we do not need to refine new medical responses to serious human diseases and hence that the second claim is misguided. This attitude is sometimes found among those with deeply held religious or ideological convictions.

By contrast, people who argue for continued animal experimentation reject the third and fourth claims. They maintain, in other words, either that animals do not suffer at all because they are not conscious in the way required for feeling, or that animals, unlike humans, do not matter from a moral point of view. Either way, the conclusion is that there is no dilemma because what we do to animals does not matter from a moral point of view.

As already mentioned, serious skepticism about the suggestion that it is morally imperative, or at least highly desirable, to discover ways of preventing or treating life-threatening human diseases is rare. We can, therefore, assume for the purposes of this chapter that the second claim is overall correct. The first, third, and fourth claims are a great deal more contentious, however, and we therefore need to examine them with some care.

### **Claim 1: The Need for Animal Research**

It is often said that live animal research *must* be performed if we are to enjoy human benefits of the kind it brings. How true is this? Obviously, we cannot here scrutinize specific projects involving animal experimentation. Let us, instead, first note that it is extremely implausible to suggest that live animal research is totally unnecessary — that all the human benefits it delivers could be secured using methods that do not involve animals. With this noted, we can now look at reservations about the need for animal research that cannot be dismissed out of hand.

One reservation is so obvious it hardly merits mention. Some experiments are badly designed, or are carried out in unsuitable conditions, or unnecessarily repeat previous research. It cannot be claimed that these experiments are essential in bringing important benefits to mankind because they do not produce new benefits at all. Ill-conceived experiments of this sort may indeed be morally wrong, regardless of any animal suffering involved, because they waste material resources. Causing animal distress under such conditions can never be justified.

Doubts about the need for animal research can arise even when an animal experiment is well designed and capable of delivering valuable results. Suppose an alternative research method — a method involving, say, cell lines, bacteria, or human volunteers — will deliver the sought-after results equally readily. Here, it cannot be said that animal experimentation is required. Again, it might be possible to secure certain health benefits by encouraging people to change their lifestyles or avoid risky behaviors. Where ill health can be avoided in this way, it would be misleading at best to insist that we need to develop drug treatments using animal research.

In certain cases, doubts of the kind described in the last paragraph are fuelled by the fact that economic profit is a dominant motive within the pharmaceutical industry. Is it not conceivable that the R&D departments of pharmaceutical companies are guided as much by potential monetary gain as the

toxicology and safety testing. The immediate goal of such testing, whether or not it involves animals, is to protect human health and the environment by preventing hazardous products from being marketed and thus allowed to enter the biosystem. However, some products that undergo toxicological analysis and safety testing are of questionable human importance. How important is it to provide a new garden herbicide? Do we need a new kitchen disinfectant or a shampoo with a different formula? Where these products do not offer substantial human benefits, any connected animal research can hardly be described as essential in bringing important benefits to mankind.

Finally, we have already mentioned that some animal experimentation is undertaken in fundamental research in the life sciences. This research produces information that may come to be useful in the understanding of disease, but it is mainly pursued with the aim of advancing general knowledge. Some might deny that such experimentation plays a vital role in the delivery of substantial new human benefits. Against this, it should be pointed out that efforts to combat human ailments always depend to some degree on knowledge gained through more fundamental research.

Perhaps this problem — the problem of predicting benefits — is quite general. In many experiments, fundamental and applied, it can be hard to know at the outset whether the hours spent in the laboratory will result in human benefit. It might be said that in applied studies, at least, it is often possible to guarantee benefits at a late stage in the research process: for instance, when studying the dose effect of a substance that has already been proven efficient. However, it is an unavoidable fact that the later stages of research cannot be reached without going through previous ones, and while they go through previous stages, researchers will often have to follow leads that will turn out to be fruitless. This complicates the assessment of experimental necessity. It means that we will not always be able to look merely at the human benefits of single experiments: at times, the net gains of research projects, or even of entire theoretical approaches, will be what we should try to assess. Often, scientific quality will be the only criterion to which we can appeal if we wish to know whether the relevant experiment will secure important benefits for mankind.

### Claim 3: The Animal's Experience of Pain

Let us now turn to the claim that individual animals are inevitably caused suffering and distress in the course of live animal research. There is a long tradition of animal experimentation in the natural sciences. For centuries, such experimentation must, at its worst, have caused terrible pain and suffering to animals because anaesthetics and analgesics were virtually unknown. Had they been available, however, these palliatives might still not have been used, since for a long time, it was believed that animals were automata and incapable of feeling pain in the way human beings do.\* In the following passage, a seventeenth-century eyewitness describes the undeniably grim implications of this view for experimental animals:

They administered beatings to dogs with perfect indifference, and made fun of those who pitied the creatures as if they had felt pain. They said that the animals were clocks; that the cries they emitted when struck, were only the noise of a little spring which had been touched, but that the whole body was without feeling. They nailed poor animals up on boards by their four paws to vivisect them and see the circulation of the blood which was a great subject of conversation.

Fontaine (1968/1738) *Mémoires pour Servir à L'Histoire de Port-Royal*

How did scientists come to think in this way? Why did they adopt the view that sophisticated animals were mere mechanisms, rather like clocks, capable of producing visible behaviors, such as crying, but incapable of feeling? The view has its origins in the work of the seventeenth-century French mathematician and philosopher René Descartes. Descartes is associated with what is referred to today as mind-body dualism. He believed that men and women consist of a material body and an immaterial soul. He could not accept, however, that animals have a soul, so in effect, he was materialist about nonhuman animals. The upshot of this can easily be guessed. According to Descartes, feelings are properties of the soul. Since animals do not possess souls, they cannot have any feelings: animals are, in effect, machines.

\* Although physicians from the ancient Egyptians onwards were aware of the sedative qualities of both alcohol and opium, genuine anaesthetics suitable for human use were not available until the 1840s. It was not until the late 1800s that anaesthetics



Generations of natural scientists inherited this belief. Their modern heirs no longer believe, of course, that human beings have immaterial souls. More to the point, most would deny that possession of such a soul is a prerequisite of feeling. However, the view that animals are devoid of feeling has persisted in parts of the scientific world into the twentieth century.<sup>18</sup>

Descartes' view that animals cannot suffer prevents an ethical dilemma from arising even in the most invasive animal experiments. It does so by implying that our third claim is false. However, is it at all plausible today to deny that animals experience feeling? Descartes' own case for such a denial was, primarily, that in the absence of language animals cannot communicate feelings. However, we do not rely exclusively on linguistic behaviors in diagnosing other people's feelings: nonlinguistic behaviors and facial expressions often communicate as much as speech. Thus, seeing a sprinter limping off the track with distorted facial features, we rarely feel the need to await a verbal pain report. We know enough already to be sure that he or she is feeling pain. There seems to be no reason why we should not draw a similar conclusion about, say, a dog that holds an injured paw close to its body, whimpers, and turns to bite anyone who attempts to touch the leg.

Today's scientists largely agree that all vertebrates, and some invertebrates (such as octopuses), have the capacity for pain. but a further complication arises at this point. The complication arises because it can sensibly be asked whether the pain that animals have is actually felt as an unpleasant mental state — and it can therefore be asked whether animal pain involves suffering. This is a contentious issue, and one to which both philosophers of mind and scientists might be expected to contribute. In defense of the view that animal pain does not involve feeling, it has been claimed that to feel pain, it is necessary to have cognitive capacities, and hence, a developed prefrontal cortex of a kind that most animals other than anthropoid apes do not possess.<sup>19</sup> On the other hand, it is clear that animal pain, like human pain, is causally connected with aversive behavior, and some observers believe that this causal connection between peripheral nociceptive nerve signalling and centrally controlled aversive behavior could not occur in the absence of unpleasant feelings, and thus in the absence of suffering.

As we have said, this issue is contentious. Nevertheless, most of us, including most scientists, are convinced that animals can suffer. In view of the seriousness of the issue, agnostics should probably also adopt a reasonable measure of precaution and give animals the benefit of the doubt. They should act as though animals are capable of suffering and assume that a procedure that is painful to humans is also painful for animals. The adoption of this working assumption does not necessarily force us to accept the third claim. For clearly, even if animals have the capacity to suffer, it does not follow that in the course of live animal research, they will inevitably suffer. And, as will be obvious to most scientists reading this, animal suffering and distress during experimentation can be reduced or eliminated in several ways. Refinements in experimental methods, such as more rapid and exact sampling techniques, or the introduction of noninvasive sampling methods, as well as extended use of anaesthetics and analgesics, reduce the distress an experiment causes. Likewise, improvements to the conditions under which experimental animals are housed using so-called environmental enrichment mitigate animal stress. And through improved animal models and the correct use of statistics, the number of animals needed to obtain valid results can be reduced, thus reducing the total amount of any inevitable suffering.

#### Claim 4: The Moral Status of Animals

Suppose none of the aforementioned pain-reduction strategies were available. Would this show that the relevant research should cease, or be radically limited, on moral grounds? If we were discussing the pain of human volunteers, the reply would almost certainly be "yes."\* But where animals are concerned, matters are less straightforward. This is because, traditionally, animals have been thought to be less important than human beings, morally speaking. It is this claim that we need to examine now.

The attitude that animals matter less than human beings is widespread in western society. It is often linked with the Judeo-Christian tradition upon which much of our culture is based, for according to the Bible, man occupies a special position in the world: he was created in the image of God and given dominion over other living creatures (Genesis 1:26–28). However, other reasons can be given for the view that human beings have a different moral status from animals. A common argument runs as follows: only human beings are known to possess language and to be able to reason in abstract terms. Because

animals can neither reason nor communicate reasons, they cannot act morally, and therefore we have no moral obligations towards them.

But should the capacity to act morally determine whether an individual should be given moral consideration? The notion that it should is not obviously correct. As early as the eighteenth century, the English philosopher Jeremy Bentham asked why we deny animals moral rights that we ascribe to ourselves. He wrote:

Is it the faculty of reason, or, perhaps, the faculty of discourse? But a full-grown horse or dog is beyond comparison a more rational, as well as a more conversible animal, than an infant of a day, or a week, or even a month, old...The question is not, Can they *reason*?, nor, Can they *talk*? but Can they *suffer*?

Bentham (1789) *The Principles of Morals and Legislation*

In this well-known passage, Bentham does two things. First, he offers a philosophical argument designed to embarrass those who suggest that human beings are morally superior to animals because they possess intelligence and language. This argument is simple and proceeds in the following way: certain human beings — Bentham speaks of infants, but we could also mention the mentally impaired — have lower levels of intelligence and linguistic ability than some higher animals. Therefore, intelligence and linguistic ability cannot be the criteria of human moral superiority. This argument is basically sound. It obliges us either to offer an alternative rationale for the view that human beings matter more than animals or to drop that view. Bentham himself takes the latter course, for the second thing he does is to suggest that it is the capacity to suffer that confers moral status. This suggestion brings infants back into the moral realm. It also brings in any animals that are able to suffer. Bentham would have regarded both of these implications as welcome.

The contemporary Australian philosopher Peter Singer is Bentham's modern heir. Having explored the options at length, he claims that it is impossible to identify a difference between human beings and animals that separates them morally. And he concludes that when we imagine that animals have no moral standing or a lower moral status than human beings, we are laboring under a moral prejudice similar to that found among racists or sexists:

I am urging that we extend to other species the basic principle of equality that most of us recognize should be extended to all members of our own species...The racist violates the principle of equality by giving greater weight to the interests of members of his own race when there is a clash between their interests and the interests of those of another race. Similarly, the speciesist allows the interests of his own species to override the greater interests of members of other species. The pattern is the same in each case.

Peter Singer (1989) *All Animals are Equal, in Animal Rights and Human Obligations*

Again, the problem for those who prioritize human interests is to explain what they take to be the moral difference between animals and human beings. Singer's point is that just pointing to a difference in species does not seem to be sufficient.

Most of us assume, most of the time and more or less consciously, that human beings deserve special moral consideration — consideration that is not due to animals. In this section, we have seen, however, how difficult it is to provide a compelling rationale for this assumption. The discussion has been more exploratory than conclusive. To make further progress with the issues, we need to look at morality in general terms. We must enquire into its basis and purpose. In other words, we must examine ethical theories.

## IS ETHICAL THEORY NECESSARY?

humane manner? Surely the ethical theorizing can be left to philosophers and theologians. This attitude is understandable. However, there are, in fact, several ways in which scientists can benefit from explicit appreciation of ethical theory. Here, we shall briefly sketch three such benefits.

In today's society, there are many different views about what we are entitled to do to animals in the name of scientific progress. Animals and animal materials continue to be used in laboratories, yet this usage is repeatedly challenged. Gruesome images of cats, dogs, and monkeys in experimental conditions have been put before the general public by animal rights organizations. They often evoke strong feelings in observers, but there is absolutely no doubt that people also want access to effective medical treatments and safe chemical products. Indeed, they may even be willing to support the research such access entails through taxes and fund-raising campaigns. Likewise, when asked if scientists should be allowed to continue to experiment on animals, 64% of the participants in a British survey opposed the use of living animals in research.<sup>20</sup> But when the question was prefaced with the statement, "Some scientists are developing and testing new drugs to reduce pain, or are developing new treatments for life-threatening diseases, such as leukaemia and AIDS. By conducting experiments on live animals, scientists believe they can make more rapid progress than would otherwise have been possible," disapproval dropped to 41%.

The first problem, then, with being led by one's feelings, rather than approaching matters through ethical theory, is simply that people's feelings about animal research are often unstable or ambivalent. Such feelings cannot be relied upon as a rational guide. This immediately leads to a second problem. This ambivalence encourages double standards, and these standards are both morally objectionable and logically indefensible.

However, the third problem is perhaps the most serious. It is clear that, at present, we are engaged in the West in an increasingly serious debate about the rights and wrongs of animal use. However, it seems unlikely that scientists and others taking part in this debate will be able to communicate effectively while they merely press their intuitively held beliefs. These beliefs are normally sincere, and often strongly held, but they can be extremely difficult to understand and highly resistant to change. The ideal of meaningful and transparent discussion that leads to mutual understanding of the arguments is attainable, however. For people's gut feelings about matters such as animal research are often based on underlying ethical theories, and these theories are much more susceptible to rational assessment than the individual beliefs to which they give rise. The suggestion we wish to make here, then, is that if laypeople and scientists are willing to think a little about fundamental ethical theory, they will have a much greater prospect of communicating with one another effectively, articulating their convictions in a coherent manner, and perhaps even reaching a compromise upon which all can agree.

Moral philosophers distinguish a number of types of ethical theory, and, in principle, any of these might underlie a person's views about animal experimentation. Here, we will discuss three prominent theoretical positions: contractarianism, utilitarianism, and rights views. These have been selected because they have direct and obvious implications for the ongoing debate over animal use.

## CONTRACTARIANISM

Why should we act morally? This is a central question in moral philosophy, and one to which the contractarian gives a straightforward answer: one should act morally because it is in one's self-interest. The outlook underlying contractarianism is egoism. According to the egoist, when one is obliged to show consideration for other people, this is really for one's own sake. In general, by respecting the rules of morality, one contributes to the maintenance of a society that is essential to one's own welfare. The moral rules are thus those that best serve the self-interest of all members of the society. Contractarian morality is confined to those individuals who can "contract in" to the moral community, so it is important to define who these members are:

On the contract view of morality, morality is a sort of agreement among rational, independent, self-interested persons, persons who have something to gain from entering into such an agreement...

A major feature of this view of morality is that it explains why we have it and who is party to it. We have it for reasons of long-term self-interest and "contract in" to the moral community...

run, compared with not doing so. 2. They are *capable* of entering into (and keeping) an agreement... Given these requirements, it will be clear why animals do not have rights. For there are evident shortcomings on both scores. On the one hand, humans have nothing generally to gain by voluntarily refraining from (for instance) killing animals or "treating them as mere means." And on the other, animals cannot generally make agreements with us anyway, even if we wanted to have them do so....

#### Narveson (1983) Animal Rights Revisited, in *Ethics and Animals*

On this view, there is clearly a morally relevant difference between my relationship to other human beings and my relation to animals. I am dependent on the respect and cooperation of other people. If I treat my fellow humans badly, they will respond by treating me badly. By contrast, the animal community will not strike back if, let us say, I use some of its members in painful experiments. From an egoistic point of view, I need only treat the animals well enough for them to be fit for my own purposes. And in any case, as Narveson points out, nonhuman animals cannot enter into a contract, or agreement, governing future conduct, so they cannot join the moral community.

For the contractarian, since neither animal suffering nor the killing of animals is an ethical problem *per se*, animal experimentation is in itself ethically acceptable. It may even be ethically desirable, since, as long as the experiments are effective, it is certainly in the interest of the moral community to run animal experiments to find treatments for diseases that cause human suffering. The lack of standing of animals in the moral community does not necessarily mean that the way animals are treated is irrelevant from the contractarian point of view: if people *like* animals, for example, and dislike the practice of their being used in this or that way, animal use can become an ethical issue, because it is in a person's interests to get what he or she likes. Nevertheless, the contractarian view of animals is highly anthropocentric, since any rights to protection animals have will always be dependent on human concern. Inevitably, we tend to like some types of animals more than others. We are more troubled by the suffering of our favorite sorts of animals. Hence, levels of protection will differ across different species of animal. For example, because most people like cats and dogs more than rats and mice, causing distress to cats and dogs is likely to turn out to be a more serious ethical problem than causing the same amount of distress to rats and mice. Likewise, nonhuman primates will probably receive more protection than other animals, because (perhaps because they are perceived as closer to humans) their plight is of considerable concern to people.

Since it is egoistic human concern that determines how animals should be treated on the contractarian approach, this approach requires an open dialogue between those who use animals and those who are concerned about their welfare. Both activists in animal protection organizations and the general public as taxpayers and consumers of animal-tested products should be permitted free access to information about the ways in which animals are used in research and other activities.

The contractarian view agrees with certain attitudes towards animal treatment that are prevalent in our society. Thus, it serves to explain why legislation, allegedly for the protection of animals, usually protects the animals that matter most to humans, such as cats and dogs. Contractarianism can, however, seem inadequate. Can it really be correct to hold that causing animals to suffer, even for a trivial reason, or for no particular reason, is morally unproblematic as long as no human being is bothered by the relevant conduct? Many would want to insist that it is immoral as such to cause another to suffer for little or no reason, whether one's victim is a human being or an animal. An ethical theory that captures this insistence is utilitarianism.

### UTILITARIANISM

According to the utilitarian, the interests of every individual affected by an action count morally and deserve equal consideration. In utilitarian writings, the notion of an interest is usually defined in terms of "the capacity for suffering or enjoyment or happiness".<sup>21</sup> Thus, individuals have an interest in acts that will enhance their enjoyment or reduce their suffering. From this it follows that all sentient beings, human and nonhuman, have interests. And, since for the utilitarian, all interests count morally and

Many philosophers have proposed the principle of equal consideration of interests, in some form or other, as a basic moral principle; but...not many of them have recognized that this principle applies to members of other species as well as to our own.... If a being suffers, there can be no moral justification for refusing to take that suffering into consideration. No matter what the nature of the being, the principle of equality requires that its suffering be counted equally with the like suffering — in so far as rough comparisons can be made — of any other being.

**Peter Singer (1989) All Animals are Equal, in *Animal Rights and Human Obligations***

For the utilitarian, then, ethical decisions require us to strike the most favorable balance of benefits and costs for all the sentient individuals affected by what we do. However, doing the right thing, according to the utilitarian, is not only a matter of doing what is optimal. It is also essential to do something rather than nothing: if something can be done to increase well-being, we have a duty to do it. This utilitarian duty to act always to bring about improvements has important consequences for society. In contemporary Western society, we have a general tendency to give ourselves priority over animals. A thoroughgoing utilitarian will regard this tendency as essentially wrong. However, the anthropocentric outlook is obviously well established, and in view of this, it may well be that, for the time being at least, any attempt to ensure that sentient animals are accorded the same status as human beings is bound to fail. It may be that the best thing a utilitarian can do is to secure higher levels of animal welfare within the current system. To give a specific illustration, in the case of laboratory animals, a utilitarian realist might be willing to apply the so-called "principle of the three Rs" — that is, endorse actions and policies leading to the *replacement* of existing live-animal experiments with alternatives, or *reductions* in the number of animals used, or *refined* methods that cause animals less suffering.<sup>22</sup> It can be seen, then, that less-invasive sampling techniques, improved housing systems, and more precise models requiring fewer animals to be used are likely to be viewed as morally attractive developments within the realist utilitarian perspective.

In the ethical conflicts prompted by animal research, human interest in obtaining some benefit stands against the animal's interest in avoiding suffering. Sometimes, however, the utilitarian will want to weigh not just animal interests against human interests, but also the interests of different animals against each other. Animal experiments can benefit animals as well as humans: many of the insights underlying veterinary medicine have been derived from experiments on animals. When a pet cat receives a vaccination against FIV (feline immunodeficiency virus), it benefits from immunology research done on other cats, even though the primary purpose of this research was to develop treatments for HIV. It can be seen, then, that in deciding whether an animal experiment is ethically justifiable, it is sometimes necessary to take into account both the animals whose interests are sacrificed in the experiment and the animals that may benefit from the results.

Animal-based research is just one of the many ways in which we make use of animals. The overwhelming majority of domestic animals are kept for food production. Most are kept under restrictive conditions in which basic behavioral or physiological needs are thwarted. Laying hens, for example, are commonly kept in battery cages where they cannot perform strongly motivated nesting behaviors before egg laying and where the restriction of their movement results in bone brittleness and a high incidence of broken bones. Similarly, breeding sows are often confined to crates in a way that limits most movements other than simply lying down and standing up. It seems beyond doubt that food production under the conditions currently prevalent in commercial farming causes considerable animal distress. Naturally, this cost must be weighed against the benefit, to human beings, of access to cheap meat and eggs. However, given that the average citizen in the developed world consumes far more protein than is physiologically necessary, and often more animal fat than is healthy, low-cost meat cannot be considered a vital human interest.

We have gone into this matter in some detail because the welfare implications of present-day commercial farming have a significant bearing on the utilitarian response to animal experimentation. This bearing is easily seen: the abandonment of intensive animal husbandry practices will probably promote animal well-being (without jeopardizing vital human interests) much more effectively than the abolition of animal-based research.

In this section, we have described a pragmatic utilitarian approach. We have suggested that realistically the utilitarian should perhaps accept that

the satisfaction of vital human interests — as happens in much biomedical research. But for all that has been said, a more radical utilitarianism might be worth exploring. Animal experimentation sometimes means sacrificing vital animal interests in continued life and in the avoidance of abject suffering. Insisting that human and animal interests deserve equal consideration, Singer concludes that the sacrifice of such vital animal interests is acceptable only where the benefits are extraordinarily important:

...If a single experiment could cure a major disease, that experiment would be justifiable. But in actual life the benefits are always much, much more remote, and more often than not they are nonexistent...an experiment cannot be justifiable unless the experiment is so important that the use of a retarded human being would also be justifiable.

Singer (1975) *Animal Liberation*

It is evident, then, that within the utilitarian approach to animal experimentation a wide range of views are represented. Some utilitarian observers accept most animal experiments as long as we do our utmost to prevent and alleviate animal suffering. Others, like Singer, setting the demand for human benefit higher, would prefer to see nearly all such experiments abolished. What all utilitarians agree on, however, is the methodological precept that ethical decisions in animal research require us to balance the harm we do to laboratory animals against the benefits we derive for humans and other animals. Interestingly, some moral philosophers have attacked this very precept — the notion that we can work out what is ethical by trading off one set of interests against another. The allegation is that such trade-offs violate the rights of the individuals whose interests are in the moral balance. To get clearer about this, we need to turn to rights theory.

## RIGHTS VIEW

There is an obvious sense in which, in focusing on overall improvements in welfare, the utilitarian treats sentient beings as mere instruments. The utilitarian believes that it is ethically justifiable to sacrifice the welfare of one individual when this sacrifice is outweighed by connected gains in welfare. Rights theorists object to this, holding that it is always unacceptable to treat a sentient being merely as a means to obtain a goal. Historically, rights theory is associated with the eighteenth-century German philosopher, Immanuel Kant. In Kant's view, human beings have "an intrinsic worth, i.e., dignity" and should therefore be treated "always as an end and never as a means only." Clearly, this view is at variance with the utilitarian's willingness to sacrifice one individual's welfare when this leads overall to welfare gains. Kant himself confined the right to be treated as an end to human beings, but later rights theorists, such as the American philosopher Tom Regan,<sup>23</sup> have argued that the principle of dignity should be extended to animals:

...Attempts to limit its scope to humans only can be shown to be rationally defective. Animals, it is true, lack many of the abilities humans possess. They can't read, do higher mathematics, build a bookcase, or make *baba ghanoush*. Neither can many human beings, however, and yet we don't (and shouldn't) say that they (these humans) therefore have less inherent value, less of a right to be treated with respect, than do others. It is the *similarities* between those human beings who most clearly, most noncontroversially, have such value (the people reading this, for example), not our differences that matter most. And the really crucial, the basic similarity, is simply this: we are each of us the experiencing subject of a life, a conscious creature having an individual welfare that has importance to us whatever our usefulness to others. We want and prefer things, believe and feel things, recall and expect things. And all these dimensions of our life, including our pleasure and pain, our enjoyment and suffering, our satisfaction and frustration, our continued existence or our untimely death — all make a difference to the quality of our life as lived, as experienced, by us as individuals. As the same is true of those animals that concern us (the ones that are eaten and trapped, for example), they, too, must be viewed as the experiencing subjects of a life, with inherent value of their own.

What implications does the rights view have for animal experimentation? The answer to this question will depend on whether we are prepared to go along with Regan and ascribe rights to animals. If we refuse to take this step, rights theory will have little to tell us about animal research. However, if we allow that animals possess intrinsic dignity and have rights, various things will follow. To begin with, the balancing of human benefits against animal suffering that has been central in our discussion so far becomes, to some extent, a background issue. No benefit can justify disrespect for the rights of an individual — human or animal — so where an experiment violates an animal's rights, there is no reason to look for its expected benefits. To find out whether an experiment is morally justified, we need only ask whether it is respectful and preserves the animal's dignity. The implications of this way of looking at matters are radical, as Regan<sup>23</sup> explains:

...Having set out the broad outlines of the rights view, I can now say why its implications for farming and science, among other fields, are both clear and uncompromising. In the case of the use of animals in science, the rights view is categorically abolitionist. Lab animals are not our tasters; we are not their kings. Because these animals are treated routinely, systematically, as if their value were reducible to their usefulness to others, their rights are routinely, systematically, violated. This is just as true when they are used in trivial, duplicative, unnecessary, or unwise research as it is when they are used in studies that hold out real promise of human benefits...The best we can do when it comes to using animals in science is — not to use them. That is where our duty lies, according to the rights view.

**Regan (1989) The Case for Animal Rights, in *Animal Rights and Human Obligations***

This view is radical enough to merit repeating. It does not matter that an experiment will cause only minor harm to the animals it involves. It does not matter that this experiment is of extraordinary importance to humanity at large. Animal experiments are simply unacceptable because they treat animals as means to an end.

Categorical abolitionism of this sort probably goes further in its attempt to limit the utilitarian trade-offs than most of us would consider necessary. After all, weighing costs against benefits is part of our daily life. Every day, we balance outcomes and seek what is best overall in private decisions that involve friends, family, and ourselves. We expect others — for example, employers and government bodies — to do the same. In all this, we accept that we are not treated, and do not treat others, purely as ends. On the other hand, most people would presumably allow that certain rights are sacrosanct, and that there are limits to the extent to which an individual can be sacrificed for an overall benefit. Only (what we might call) a *moderate* rights view is likely to command widespread acceptance.

How would such a moderate view apply to animal research? The detail would depend on what rights we take to be fundamental. The right to life — or more accurately, the right not to be killed — is often regarded as basic. Curiously, however, this does not appear to be a basic right that people would ascribe to animals: after all, most of us happily eat animals that have been killed just for this purpose. Something like a right to protection from suffering, or significant suffering, seems to be much more promising. We might agree that all animals should be protected from suffering if this involves intense or prolonged pain or distress that the animal cannot control. We might conclude that such suffering in experimental conditions is always unjustified. This would be consistent with the toleration of some balancing of animal and human interests.

In essence, this is the view on which animal research legislation is based in some countries, such as the U.K. and Denmark. Through this combination of utilitarianism and the moderate rights view, animal research that promises to deliver human benefits is allowed as long as the animals are guaranteed protection from serious pain and distress.

## TWO CONCERNS ABOUT THINGS OTHER THAN SUFFERING

We have seen that the notion of intrinsic dignity, which is central to the rights view, is a

However, some aspects of animal experimentation appear to raise ethical issues even though they need not involve suffering of any kind. In this section, we shall discuss two practices of this kind: genetic modification and, in particular, transgenesis and euthanasia.\*

Turning to the first of these, genetic interventions, and particularly the production of transgenic animals, concern many observers. Often the animals themselves do not suffer as a result of having their genome modified. Even so, people feel uneasy at the thought of introducing spinach genes into the pig genome. In this unease, there seems to be a sense that the "naturalness" of an animal is important: a pig should be a pig and nothing else. In trying to capture this attitude, the philosopher Bernard Rollin<sup>24</sup> refers to the "telos" of an animal. Using this notion, we might say that the creation of transgenic animals is morally unacceptable because animals have the right to have their telos respected. Against this, it has been suggested that the idea that there is a genuine ethical issue here is an illusion: human beings altered the genetic makeup of various animals through breeding long before anybody knew how to manipulate genes directly, and the only significant difference between traditional breeding techniques and direct manipulation of the genome is that the latter is faster. This is a fascinating, if rather intractable, issue. We cannot devote any more space to it in the present chapter, but interested readers might like to consult Rollin,<sup>24</sup> Sandøe et al.,<sup>25,26</sup> and Appleby.<sup>27</sup>

We now comment briefly on animal euthanasia. At the end of an experiment, animals are often killed in a manner that, as far as possible, prevents their feeling any fear or pain. Properly carried out, euthanasia involves no suffering, but some people feel that the killing of sentient creatures in this way nevertheless raises ethical issues. Is this correct? Should we worry about euthanasia?

To answer this question satisfactorily, we would need to stand back from the animal question and ask in general terms why killing is unethical. This question is too complex to deal with here, but let us just sketch one relevant line of thought. It has been suggested that killing an individual is wrong because it prevents him or her from realizing future desires. This account of the wrongness of killing can be used to defend the killing of animals because it is plausible that animals lack a concept of the future and therefore possess only immediate desires. On the other hand, if we can justify the killing of animals on the basis of their limited cognitive capacities, it would appear that we can also justify the killing of human beings, such as infants or mentally deficient adults, with similar cognitive limitations. One way to block this unwelcome implication is to say that killing a person tends to cause more harm than killing an animal because the person will be mourned by relatives and friends, and because knowledge about the killing will provoke fear among other people. For more extensive discussion of the ethics of killing animals, we refer readers to References 28 through 31.

## SOCIETY AND THE ETHICAL DILEMMA

About any given animal research project — whether it involves experimental techniques that are standard practice or puts animals to novel use — the scientist can always ask: would it be morally acceptable to use animals in this way? Ultimately, in individual cases, researchers and research teams will make up their own minds about this question, and people will undoubtedly come to different conclusions. This need not be a problem in a pluralistic, democratic society. Nevertheless, society needs legislation and professional codes of practice that the majority of citizens can agree on, and it is therefore necessary to find a minimal consensus among the different views. In a democracy, compromise is normally the best way of achieving consensus. (If this seems too obvious to be worth mentioning, it should be borne in mind that under tyranny, consensus is generally reached without compromise.) In this chapter, we have tried to set out the issues that inform this compromise.

Broadly speaking, the compromise towards which much of what we have said points is one in which animal experimentation is held to be acceptable where, and only where, it is the case both that substantial human benefits are at stake and that animal suffering is minimized. From the perspective of this compromise position, research projects causing great suffering in which pain relief cannot be offered are unacceptable even if they are crucial for the advancement of knowledge. Equally, as was urged in the previous edition of this book, "If doing without a harmful animal experiment involves only a slight risk or loss to humans, we should do without it."<sup>32</sup> "Great suffering" and "slight risk" are relative terms;



their definition is itself an ethical decision, and one that must be made before the acceptability of any research project can be determined.

The three Rs proposed by Russell and Burch<sup>22</sup> — the replacement of existing experiments with animal-free alternatives, or reductions in the number of animals used, or refined methods that cause animals less suffering — will help animal researchers to ensure that their work is acceptable. In actual fact, this threefold rubric often figures in codes of practice governing animal research, and in most Western countries, at least, scientists are required by law to apply something like it. However, if Russell and Burch's recommendations are to be effective, scientists will have to take them seriously. Scientists will need to ensure that they are up-to-date with developments in experimental methodology, bearing in mind, particularly, the design of alternative methods. Again, those responsible for the housing and daily care of laboratory animals will ideally be equipped with a thorough understanding of the behavioral and physiological needs of the relevant animal species and know how to implement various forms of environmental enrichment. In view of this, it is not stretching matters unduly to say that the study of laboratory animal science is a moral duty for researchers and others involved in animal experiments.

Perhaps the main thing is to keep the channels of communication open. In the twenty-first century, transparency and accountability are watchwords. They are expected, and indeed demanded, in most areas of collective human endeavour. Thus, faced with questions about their work, the worst thing animal researchers can do is try to shut the enquirer out. A society in which animal experimentation enjoys a secure, unchallenged role is likely to be one in which there is open dialogue between the scientists and lay observers — somewhat paradoxically, it is likely to be one in which scientists welcome challenges from all sides.

## ETHICS COMMITTEES

Finally, we need to say something about regulation. Animal research is not like sex. Many people think that certain sexual practices are immoral or distasteful, but it is generally acknowledged that what consenting adults do in their bedrooms is up to them. Perhaps, in good part, because animals are not "consenting adults" and have limited ability to defend their own interests, we do not take the same attitude to animal experiments. The recognition that animal treatment in the laboratory raises ethical questions leads quickly to a demand for regulation. This demand is surely reasonable. First, it is in the interest of society to ensure that ethical norms that prevail among us are adhered to. Second, if a research proposal raises moral issues, any decision about its acceptability must be made by a third party — an individual or body of individuals that is not involved in the relevant project and does not stand to gain from its completion. The researcher has a vested interest in his proposed investigation, since his career may depend on the results. Certainly, it is up to him or her to present the ethical and scientific case for the line of experimentation being proposed, but the decision about acceptability must be made by people who are independent and who can represent society as a whole.

For obvious reasons, verdicts on acceptability will ideally be based on extensive knowledge of the scientific area in question, the relevant animal welfare parameters, and ethics. In the majority of cases, a single individual is highly unlikely to possess such knowledge, and so the best way to ensure that decisions are properly informed is by forming an ethics committee. Such committees are indeed now mandatory in many countries. They usually employ researchers, animal specialists, people with training in law and ethics, animal advocates, and representatives of the general public. And they are not, in general, enemies of the researcher. They can, for example, be quite helpful in making suggestions about how to minimize animal distress.

Naturally, each member of the ethics committee will look at the ethical dilemmas research proposals raise in his or her own personal way. Committee members will agree, however, both that it is important to minimize any harm to animals and that animal experiments need to be justified by (primarily) human benefits. Once these broad principles are agreed upon, the committee needs to find a common language in which to describe animal costs and human benefits. However, if there are significant negative effects on animal welfare, the committee should — perhaps in dialogue with the researchers — find out whether it is possible to derive the same benefits in a way that will have a less harmful impact on the animals. And, at the end of the day, the committee must decide whether or not the experiment is acceptable. For interesting attempts to develop instruments for decision-making in ethics committees, see References 3

When they play a proactive role in the development of animal research projects, competent ethics committees function as a crucial interface between the research community and society in general. Researchers, whose future may depend on the ethical approval of the committee, are forced to present their projects in an accessible way and to think of alternatives. Because of this, the committee does not remove ethical responsibility from scientists — rather, it helps them to ensure that their activities are transparent and challenges them to proceed in an ethically sound way.

## CONCLUSION

We have suggested that the ethical dilemma at the heart of animal research can be captured in four straightforward propositions. How did these help? The idea was that because these propositions are in conflict, we can make progress in thinking about the ethics of animal experimentation by asking which of them is incorrect, or at least an overstatement. We looked at three ethical theories — contractarianism, utilitarianism, and the rights view — and noticed that these generate different conclusions about the rights and wrongs of animal experimentation. Potentially, the contractarian viewpoint seems the most liberal. At the other end of the scale, the rights view places severe restrictions on animal use, restrictions essentially the same as those we would expect to govern the use of human “guinea pigs.” Midway between these two approaches lies utilitarianism. Within utilitarianism, animal suffering is treated as no less important, morally, than human suffering. However, looking at the overall balance of suffering and benefit, the utilitarian concludes that research projects in which animal suffering is minimized and the human dividends are substantial are best permitted.

In the course of the discussion, we have noted several ways in which, in practice, the researcher can keep animal suffering to a minimum: by devising experiments that use no animals at all, by using fewer animals, and by refining experimental techniques so that the pain or distress they cause is lessened. We have also observed that, while there is absolutely no doubt that animal research has delivered significant human benefits, in some research, the anticipated benefits do not justify continuance — for example, because they are too unimportant, or because there is a good chance that they will not be secured.

These days, more and more people take an interest in what is happening in the laboratory, and a substantial number of people have grave concerns about animal welfare. As a result, scientists who do animal research often need to explain and justify their work to others — to friends and colleagues or, more formally, to funding or ethics committees. In our view, researchers are better equipped to account for their methods when they understand both the ethical dilemma those methods pose and the ethical theories that lie behind this dilemma. In this chapter, we have tried to set out a theoretical framework that, we hope, will help interested readers to acquire this understanding.

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