tellectually disabled one—imagine that both have received painful but superficial injuries, and we have only enough painkiller for one of them—it is not nearly so clear how we ought to choose. The same is true when we consider other species. The evil of pain is, in itself, unaffected by the other characteristics of the being who feels the pain; the value of life is affected by these other characteristics. To give just one reason for this difference, to take the life of a being who has been hoping, planning, and working for some future goal is to deprive that being of the fulfillment of all those efforts; to take the life of a being with a mental capacity below the level needed to grasp that one is a being with a future—much less make plans for the future—cannot involve this particular kind of loss.[16]

Normally this will mean that if we have to choose between the life of a human being and the life of another animal, we should choose to save the life of the human; but there may be special cases in which the reverse holds true, because the human being in question does not have the capacities of a normal human being. So this view is not speciesist, although it may appear to be at first glance. The preference, in normal cases, for saving a human life over the life of an animal when a choice *has* to be made is a preference based on the characteristics that normal humans have, and not on the mere fact that they are members of our own species. This is why when we consider members of our own species who lack the characteristics of normal humans, we can no longer say that their lives are always to be preferred to those of other animals. This issue comes up in a practical way in the following chapter. In general, though, the question of when it is wrong to kill (painlessly) an animal is one to which we need give no precise answer. As long as we remember that we should give the same respect to the lives of animals as we give to the lives of those humans at a similar mental level, we shall not go far wrong.[17]

In any case, the conclusions that are argued for in this book flow from the principle of minimizing suffering alone. The idea that it is also wrong to kill animals painlessly gives some of these conclusions additional support that is welcome but strictly unnecessary. Interestingly enough, this is true even of the conclusion that we ought to become vegetarians, a conclusion that in the popular mind is generally based on some kind of absolute prohibition on killing.

PETER SINGER

Tools for Research

FROM *Animal Liberation*

AMONG THE TENS OF MILLIONS of experiments performed, only a few can possibly be regarded as contributing to important medical research. Huge numbers of animals are used in university departments such as forestry and psychology; many more are used for commercial purposes, to test new cosmetics, shampoos, food coloring agents, and other inessential items.[1] All this can happen only because of our prejudice against taking seriously the suffering of a being who is not a member of our own species. Typically, defenders of experiments on animals do not deny that animals suffer. They cannot deny the animals' suffering, because they need to stress the similarities between humans and other animals in order to claim that their experiments may have some relevance for human purposes. The experimenter who forces rats to choose between starvation and electric shock to see if they develop ulcers (which they do) does so because the rat has a nervous system very similar to a human being's, and presumably feels an electric shock in a similar way.

There has been opposition to experimenting on animals for a long time. The opposition has made little headway because experimenters, backed by commercial firms that profit by supplying laboratory animals and equipment, have been able to convince legislators and the public that opposition comes from uninformed fanatics who consider the interests of animals more important than the interests of human beings. To be op

posed to what is going on now it is not necessary to insist that all animal experiments stop immediately. All we need to say is that experiments serving no direct and urgent purpose should stop immediately, and in the remaining fields of research, we should, whenever possible, seek to replace experiments that involve animals with alternative methods that do not.

To understand why this seemingly modest change would be so important we need to know more about the experiments that are now being performed and have been performed for a century. Then we will be able to assess the claim by defenders of the present situation that experiments on animals are done only for important purposes. The following pages, therefore, describe some experiments on animals. Reading the reports of these experiments is not a pleasant experience; but we have an obligation to inform ourselves about what is done in our own community, especially since we are paying, through our taxes, for most of this research. If the animals have to undergo these experiments, the least we can do is read the reports and inform ourselves about them. That is why I have not attempted to tone down or gloss over some of the things that are done to animals. At the same time I have not tried to make these things worse than they really are. The reports that follow are all drawn from accounts written by the experimenters themselves and published by them in the scientific journals in which experimenters communicate with one another.

Such accounts are invariably more favorable to the experimenters than reports by an outside observer would be. There are two reasons for this. One is that the experimenters will not emphasize the suffering they have inflicted unless it is necessary to do so in order to communicate the results of the experiment, and this is rarely the case. Most suffering therefore goes unreported. Experimenters may consider it unnecessary to include in their reports any mention of what happens when electric shock devices are left on when they should have been turned off, when animals recover consciousness in the midst of an operation because of an improperly administered anesthetic, or when unattended animals sicken and die over the weekend. The second reason scientific journals are a source favorable to experimenters is that they include only those experiments that the experimenters and editors of the journals consider significant. A British government committee found that only about one quarter of experiments on animals ever found their way into print.[2] There is no reason to believe that accounts of a higher proportion of experiments are published in the United States; indeed, since the proportion of minor colleges with researchers of lesser talents is much higher in the United States than in Britain, it seems probable that an even smaller proportion of experiments yield results of any significance at all.

So in reading the following pages bear in mind that they are drawn from sources favorable to the experimenters; and if the results of the experiments do not appear to be of sufficient importance to justify the suffering they caused, remember that these examples are all taken from the small fraction of experiments that editors considered significant enough to publish. One last warning. The reports published in the journals always appear under the names of the experimenters. I have generally retained these names, since I see no reason to protect experimenters behind a cloak of anonymity. Nevertheless, it should not be assumed that the people named are especially evil or cruel people. They are doing what they were trained to do and what thousands of their colleagues do. The experiments are intended to illustrate not sadism on the part of individual experimenters but the institutionalized mentality of speciesism that makes it possible for these experimenters to do these things without serious consideration of the interests of the animals they are using.

Consider experiments designed to produce what is known as "learned helplessness"—supposedly a model of depression in human beings. In 1953 R. Solomon, L. Kamin, and L. Wynne, experimenters at Harvard University, placed forty dogs in a device called a "shuttlebox," which consists of a box divided into two compartments, separated by a barrier. Initially the barrier was set at the height of the dog's back. Hundreds of intense electric shocks were delivered to the dog's feet through a grid floor. At first the dogs could escape the shock if they learned to jump the barrier into the other compartment. In an attempt to "discourage" one dog from jumping, the experimenters forced the dog to jump one hundred times onto a grid floor in the other compartment that also delivered a shock to the dog's feet. They said that as the dog jumped he gave a "sharp anticipatory yip which turned into a yelp when he landed on the electrified grid." They then blocked the passage between the compartments with a piece of plate glass and tested the dog again. The dog "jumped forward and smashed his head against the glass." The dogs began by showing symptoms such as "defecation, urination, yelping and shrieking, trembling, attacking the apparatus, and so on; but after ten or twelve days of trials dogs who were prevented from escaping shock ceased to resist. The experimenters reported themselves "impressed" by this, and concluded that a combination of the plate glass barrier and foot shock was "very effective" in eliminating jumping by dogs.[3]

This study showed that it was possible to induce a state of hopelessness and despair by repeated administration of severe inescapable shock. Such "learned helplessness" studies were further refined in the 1960s. One prominent experimenter was Martin Seligman of the University of Pennsylvania. He electrically shocked dogs through a steel grid floor with such intensity and persistence that the dogs stopped trying to escape and "learned" to be helpless. In one study, written with his colleagues Steven Maier and James Geer, Seligman describes his work as follows:

> When a normal, naive dog receives escape/avoidance training in a shuttlebox, the following behavior typically occurs: at the onset of electric shock the dog runs frantically about, defecating, urinating, and howling until it scrambles over the barrier and so escapes from shock. On the next trial the dog, running and howling, crosses the barrier more quickly, and so on, until efficient avoidance emerges.

Seligman altered this pattern by strapping dogs in harnesses and giving them shocks from which they had no means of escape. When the dogs were then placed in the original shuttlebox situation from which escape was possible, he found that

> such a dog reacts initially to shock in the shuttlebox in the same manner as the naive dog. However in dramatic contrast to the naive dog it soon stops running and remains silent until shock terminates. The dog does not cross the barrier and escape from shock. Rather it seems to "give up" and passively "accept" the shock. On succeeding trials the dog continues to fail to make escape movements and thus takes 50 seconds of severe, pulsating shock on each trial. . . . A dog previously exposed to inescapable shock . . . may take unlimited shock without escaping or avoiding at all.[4]

In the 1980s, psychologists have continued to carry out these "learned helplessness" experiments. At Temple University in Philadelphia, Philip Bersh and three other experimenters trained rats to recognize a warning light that alerted them to a shock that would be delivered within five seconds. Once they understood the warning, the rats could avoid the shock by moving into the safe compartment. After the rats had learned this avoidance behavior, the experimenters walled off the safe chamber and subjected them to prolonged periods of inescapable shock. Predictably, they found that even after escape was possible, the rats were unable to relearn the escape behavior quickly.[5]

Bersh and colleagues also subjected 372 rats to aversive shock testing to try to determine the relationship between Pavlovian conditioning and learned helplessness. They reported that the "implications of these findings for learned helplessness theory are not entirely clear" and that "a substantial number of questions remain."[6]

At the University of Tennessee at Martin, G. Brown, P. Smith, and R. Peters went to a lot of trouble to create a specially designed shuttlebox for goldfish, perhaps to see if Seligman's theory holds water. The experimenters subjected forty-five fish to sixty-five shock sessions each and concluded that "the data in the present study do not provide much support for Seligman's hypothesis that helplessness is learned."[7]

These experiments have inflicted acute, prolonged pain on many animals, first to prove a theory, then to disprove the theory, and finally to support modified versions of the original theory. Steven Maier, who with Seligman and Geer was a coauthor of the previously quoted report on inducing learned helplessness in dogs, has made a career out of perpetuating the learned helplessness model. Yet in a recent review article, Maier had this to say about the validity of this "animal model" of depression:

> It can be argued that there is not enough agreement about the characteristics, neurobiology, induction, and prevention/cure of depression to make such comparison meaningful. . . . It would thus appear unlikely that learned helplessness is a model of depression in any general sense.[8]

Although Maier tries to salvage something from this dismaying conclusion by saying that learned helplessness may constitute a model not of depression but of "stress and coping," he has effectively admitted that more than thirty years of animal experimentation have been a waste of time and of substantial amounts of taxpayers' money, quite apart from the immense amount of acute physical pain that they have caused.

When are experiments on animals justifiable? Upon learning of the nature of many of the experiments carried out, some people react by saying that all experiments on animals should be prohibited immediately. But if we make our demands as absolute as this, the experimenters have a ready reply: Would we be prepared to let thousands of humans die if they could be saved by a single experiment on a single animal?

This question is, of course, purely hypothetical. There has never been

and never could be a single experiment that saved thousands of lives. The way to reply to this hypothetical question is to pose another: Would the experimenters be prepared to carry out their experiment on a human orphan under six months old if that were the only way to save thousands of lives?

If the experimenters would not be prepared to use a human infant, then their readiness to use nonhuman animals reveals an unjustifiable form of discrimination on the basis of species, since adult apes, monkeys, dogs, cats, rats, and other animals are more aware of what is happening to them, more self-directing, and, so far as we can tell, at least as sensitive to pain as a human infant. (I have specified that the human infant be an orphan, to avoid the complications of the feelings of parents. Specifying the case in this way is, if anything, overgenerous to those defending the use of nonhuman animals in experiments, since mammals intended for experimental use are usually separated from their mothers at an early age, when the separation causes distress for both mother and young.)

So far as we know, human infants possess no morally relevant characteristic to a higher degree than adult nonhuman animals, unless we are to count the infants' potential as a characteristic that makes it wrong to experiment on them. Whether this characteristic should count is controversial—if we count it, we shall have to condemn abortion along with experiments on infants, since the potential of the infant and the fetus is the same. To avoid the complexities of this issue, however, we can alter our original question a little and assume that the infant is one with irreversible brain damage so severe as to rule out any mental development beyond the level of a six-month-old infant. There are, unfortunately, many such human beings, locked away in special wards throughout the country, some of them long since abandoned by their parents and other relatives, and, sadly, sometimes unloved by anyone else. Despite their mental deficiencies, the anatomy and physiology of these infants are in nearly all respects identical to those of normal humans. If, therefore, we were to force-feed them with large quantities of floor polish or drip concentrated solutions of cosmetics into their eyes, we would have a much more reliable indication of the safety of these products for humans than we now get by attempting to extrapolate the results of tests on a variety of other species. The LD50 tests, the Draize eye tests, the radiation experiments, the heatstroke experiments, and many others that cause suffering to nonhuman animals could have told us more about human reactions to the experimental situation if they had been carried out on severely brain-damaged humans instead of dogs or rabbits.

So whenever experimenters claim that their experiments are important enough to justify the use of animals, we should ask them whether they would be prepared to use a brain-damaged human being at a mental level similar to that of the animals they are planning to use. I cannot imagine that anyone would seriously propose carrying out the experiments described in this chapter on brain-damaged human beings. Occasionally it has become known that medical experiments have been performed on human beings without their consent; one case did concern institutionalized intellectually disabled children, who were given hepatitis.[9] When such harmful experiments on human beings become known, they usually lead to an outcry against the experimenters, and rightly so. They are, very often, a further example of the arrogance of the research worker who justifies everything on the grounds of increasing knowledge. But if the experimenter claims that the experiment is important enough to justify inflicting suffering on animals, why is it not important enough to justify inflicting suffering on humans at the same mental level? What difference is there between the two? Only that one is a member of our species and the other is not? But to appeal to that difference is to reveal a bias no more defensible than racism or any other form of arbitrary discrimination.

We have still not answered the question of when an experiment might be justifiable. It will not do to say "Never!" Putting morality in such black-and-white terms is appealing, because it eliminates the need to think about particular cases; but in extreme circumstances, such absolutist answers always break down. Torturing a human being is almost always wrong, but it is not absolutely wrong. If torture were the only way in which we could discover the location of a nuclear bomb hidden in a New York City basement and timed to go off within the hour, then torture would be justifiable. Similarly, if a single experiment could cure a disease like leukemia, that experiment would be justifiable. But in actual life the benefits are always more remote, and more often than not they are nonexistent. So how do we decide when an experiment is justifiable?

We have seen that experimenters reveal a bias in favor of their own species whenever they carry out experiments on nonhumans for purposes that they would not think justified using human beings, even brain-damaged ones. This principle gives us a guide toward an answer to our question. Since a speciesist bias, like a racist bias, is unjustifiable, an experiment cannot be justifiable unless the experiment is so important that the use of a brain-damaged human would also be justifiable.

This is not an absolutist principle. I do not believe that it could never be

justifiable to experiment on a brain-damaged human. If it really were possible to save several lives by an experiment that would take just one life, and there were no other way those lives could be saved, it would be right to do the experiment. But this would be an extremely rare case. Certainly none of the experiments described in this chapter could pass this test. Admittedly, as with any dividing line, there would be a gray area where it was difficult to decide if an experiment could be justified. But we need not get distracted by such considerations now. As this chapter has shown, we are in the midst of an emergency in which appalling suffering is being inflicted on millions of animals for purposes that on any impartial view are obviously inadequate to justify the suffering. When we have ceased to carry out all those experiments, then there will be time enough to discuss what to do about the remaining ones which are claimed to be essential to save lives or prevent greater suffering.

THE DEFENDERS of animal experimentation are fond of telling us that animal experimentation has greatly increased our life expectancy. In the midst of the debate over reform of the British law on animal experimentation, for example, the Association of the British Pharmaceutical Industry ran a full-page advertisement in the *Guardian* under the headline "They say life begins at forty. Not so long ago, that's about when it ended." The advertisement went on to say that it is now considered to be a tragedy if a man dies in his forties, whereas in the nineteenth century it was commonplace to attend the funeral of a man in his forties, for the average life expectancy was only forty-two. The advertisement stated that "it is thanks largely to the breakthroughs that have been made through research which requires animals that most of us are able to live into our seventies."

Such claims are simply false. In fact, this particular advertisement was so blatantly misleading that a specialist in community medicine, Dr. David St. George, wrote to *The Lancet* saying, "The advertisement is good teaching material, since it illustrates two major errors in the interpretation of statistics." He also referred to Thomas McKeown's influential book *The Role of Medicine*,[10] which set off a debate about the relative contributions of social and environmental changes, as compared with medical intervention, in improvements in mortality since the mid-nineteenth century; and he added:

> This debate has been resolved, and it is now widely accepted that medical interventions had only a marginal effect on population mortality and mainly at a very late stage, after death rates had already fallen strikingly.[11]

J. B. and S. M. McKinley and R. Beaglehole reached a similar conclusion in a study of the decline of ten major infectious diseases in the United States. They showed that in every case except poliomyelitis the death rate had already fallen dramatically (presumably because of improved sanitation and diet) before any new form of medical treatment was introduced. Concentrating on the 40 percent fall in crude mortality in the United States between 1910 and 1984, they estimated "conservatively" that

> perhaps 3.5 percent of the fall in the overall death rate can be explained through medical interventions for the major infectious diseases. Indeed, given that it is precisely for these diseases that medicine claims most success in lowering mortality, 3.5 percent probably represents a reasonable upper-limit estimate of the total contribution of medical measures to the decline in infectious disease mortality in the United States.[12]

Remember that this 3.5 percent is a figure for all medical intervention. The contribution of animal experimentation itself can be, at most, only a fraction of this tiny contribution to the decline in mortality.

No doubt there are some fields of scientific research that will be hampered by any genuine consideration of the interests of animals used in experimentation. No doubt there have been some advances in knowledge which would not have been attained as easily without using animals. Examples of important discoveries often mentioned by those defending animal experimentation go back as far as Harvey's work on the circulation of blood. They include Banting and Best's discovery of insulin and its role in diabetes; the recognition of poliomyelitis as a virus and the development of a vaccine for it; several discoveries that served to make open heart surgery and coronary artery bypass graft surgery possible; and the understanding of our immune system and ways to overcome rejection of transplanted organs.[13] The claim that animal experimentation was essential in making these discoveries has been denied by some opponents of experimentation.[14] I do not intend to go into the controversy here. We have just seen that any knowledge gained from animal experimentation has made at best a very small contribution to our increased life span; its contribution to improving the quality of life is more difficult to estimate. In a more fundamental sense, the controversy over the benefits derived from animal experimentation is essentially unresolvable, because even if valuable discoveries were made using animals, we cannot say how successful medical research would have been if it had been compelled, from the outset, to develop alternative methods of investigation. Some discoveries would probably have been delayed, or perhaps not made at all; but

many false leads would also not have been pursued, and it is possible that medicine would have developed in a very different and more efficacious direction, emphasizing healthy living rather than cures.

In any case, the ethical question of the justifiability of animal experimentation cannot be settled by pointing to its benefits for us, no matter how persuasive the evidence in favor of such benefits may be. The ethical principle of equal consideration of interests will rule out some means of obtaining knowledge. There is nothing sacred about the right to pursue knowledge. We already accept many restrictions on scientific enterprise. We do not believe that scientists have a general right to perform painful or lethal experiments on human beings without their consent, although there are many cases in which such experiments would advance knowledge far more rapidly than any other method. Now we need to broaden the scope of this existing restriction on scientific research.

Finally, it is important to realize that the major health problems of the world largely continue to exist, not because we do not know how to prevent disease and keep people healthy, but because no one is putting enough effort and money into doing what we already know how to do. The diseases that ravage Asia, Africa, Latin America, and the pockets of poverty in the industrialized West are diseases that, by and large, we know how to cure. They have been eliminated in communities that have adequate nutrition, sanitation, and health care. It has been estimated that 250,000 children die each week around the world, and that one quarter of these deaths are by dehydration caused by diarrhea. A simple treatment, already known and needing no animal experimentation, could prevent the deaths of these children.[15] Those who are genuinely concerned about improving health care would probably make a more effective contribution to human health if they left the laboratories and saw to it that our existing stock of medical knowledge reached those who need it most.

The exploitation of laboratory animals is part of the larger problem of speciesism and it is unlikely to be eliminated altogether until speciesism itself is eliminated. Surely one day, though, our children's children, reading about what was done in laboratories in the twentieth century, will feel the same sense of horror and incredulity at what otherwise civilized people could do that we now feel when we read about the atrocities of the Roman gladiatorial arenas or the eighteenth-century slave trade.

Down on the Factory Farm . . .

from *Animal Liberation*

or what happened to your dinner when it was still an animal

For most human beings, especially those in modern urban and suburban communities, the most direct form of contact with nonhuman animals is at mealtime: we eat them. This simple fact is the key to our attitudes toward other animals, and also the key to what each one of us can do about changing these attitudes. The use and abuse of animals raised for food far exceeds, in sheer numbers of animals affected, any other kind of mistreatment. Over 100 million cows, pigs, and sheep are raised and slaughtered in the United States alone each year; and for poultry the figure is a staggering 5 billion. (That means that about eight thousand birds—mostly chickens—will have been slaughtered in the time it takes you to read this page.) It is here, on our dinner table and in our neighborhood supermarket or butcher's shop, that we are brought into direct touch with the most extensive exploitation of other species that has ever existed.

In general, we are ignorant of the abuse of living creatures that lies behind the food we eat. Buying food in a store or restaurant is the culmination of a long process, of which all but the end product is delicately screened from our eyes. We buy our meat and poultry in neat plastic packages. It hardly bleeds. There is no reason to associate this package with a living, breathing, walking, suffering animal. The very words we use conceal its origins. we eat beef, not bull, steer, or cow; and pork, not pig–

1) List *and describe* the experiments described by Singer (47-51).

2) What is the hypothetical question Singer poses to us? (top of page 52).

3) Explain why, according to Singer, using human infants for experiments would be better than animals? (rest of page 52 and the top of 53).

4) Throughout this discussion, Singer speaks about a type of discrimination- one just as bad as racism. What is this discrimination based upon? (Most of page 52 and top of 53).

5) Does Singer think that animal experimentation is always wrong? (bottom half of page 53) Explain his reasoning.

6) Some have claimed that experimentation on animals has helped to improve and lengthen human life. What does Singer think of this view? (pages 54 to 56). What are his reasons?

tellectually disabled one—imagine that both have received painful but superficial injuries, and we have only enough painkiller for one of them—it is not nearly so clear how we ought to choose. The same is true when we consider other species. The evil of pain is, in itself, unaffected by the other characteristics of the being who feels the pain; the value of life is affected by these other characteristics. To give just one reason for this difference, to take the life of a being who has been hoping, planning, and working for some future goal is to deprive that being of the fulfillment of all those efforts; to take the life of a being with a mental capacity below the level needed to grasp that one is a being with a future—much less make plans for the future—cannot involve this particular kind of loss.[16]

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