FOR PURPOSES OF RESEARCH, TESTING, AND experimentation, millions of animals are used in laboratories under conditions and in procedures that cause pain, stress, and discomfort. Many years ago the U.S. Congress took action to recognize public concern for this suffering by the passage of the Animal Welfare Act. In 1985 Congress took further action with the passage of significant amendments to that Act. These amendments emphasize certain basic factors to be considered and acted upon for the reduction of the suffering of animals used in laboratories. Among these factors are the minimizing of pain and stress by means of veterinary care and the use of anesthetics, analgesics, tranquilizing drugs, or euthanasia; the consideration of alternatives to any procedure likely to produce pain or distress; methods of testing that do not use animals; measures which minimize or eliminate duplication of experiments. There are special provisions in the amendments for standards to include minimum requirements as to the “exercise of dogs” and “a physical environment adequate to promote the psychological well-being of primates.”

These 1985 amendments to the Animal Welfare Act also specify that each facility shall establish an institutional animal committee which “shall represent society’s concerns regarding the welfare of animals subjects used at such facility” and that at least one member of the committee “shall not be affiliated in any way with such facility” and “is intended to provide representation for general community interests in the proper care and treatment of animals.” Each member of the committee, including the member or members representing community interests, is appointed by the “chief executive officer” of the facility.

Having served for over a year on the Institutional Animal Committee of the University of Colorado Health Sciences Center, I feel that I have an obligation as well as an opportunity to report on the operations of the committee at that institution and on the subjects it considers. This would be a part of an obligation with respect to “society’s concerns” and “community interests.” It would also seem that the public has an interest in the manner in which public monies are used.

Certain responsibilities and functions of the institutional animal committees (sometimes called animal-care committees or institutional animal care-and-use committees) are stated in the Animal Welfare Act and the Public Health Service Policy on Humane Care and Use of Laboratory Animals. At the University of Colorado Health Sciences Center, the committee functioned primarily in two areas: inspection of facilities and animals and review of protocols submitted by persons called investigators seeking approval of the committee for certain experiments or procedures using animals. The review of protocols took by far the largest part of the committee’s time, there being on the average more than twenty a month.

The Institutional Animal Committee at the University of Colorado Health Sciences Center serves an important function in the animal-use process at that facility. It is my impression that it would compare favorably with other committees around the country. Given the basic assumption under which it operates, an assumption which the Animal Welfare Act makes, that the use of animals for experiments and testing is appropriate, the committee, under its conscientious chairman, operated generally in a responsible and constructive manner with an approach to the analysis of protocols that was professional and clinical on the questions of animal pain and the numbers of animals used. It was hesitant to turn down a protocol and to consider questions of necessity and duplication. A person of sensitivity and competence was in charge of what was called the Animal Resource Center, the care of animals in confinement. This care involved support from the persons using the animals and was limited by the facilities and funds provided.

The submissions of protocols were on forms prepared by the institution. They asked for certain information, including: a description of the planned use of animals, rationale for use of animals and the appropriateness of the species and the number to be used, description of health changes, whether the animals will suffer pain or distress during the experiment (excluding survival surgery), abnormal environmental conditions, use of restraining devices, special housing or diet, description of survival surgery personnel and procedures, anesthesia procedures, post-surgical care, drugs to be used to alleviate post-surgical pain or distress, whether paralytic drugs are to be used, special information if the procedures require animal immunization and bleeding, form of euthanasia, information with respect to toxic and hazardous substances, information as to transplantable tumors and cells. The committee met at least monthly to review the many protocols with some re-reviews and other matters to be considered. Many types of animals were involved: dogs, mice, chickens, monkeys, cats, rats, sheep, pigs, with the largest numbers being mice and rats. Much of the discussion revolved around medical matters, the procedures to be followed, anesthesia, euthanasia. Veterinarian and physician members of the staff and committee commented from the professional standpoint and frequently investigators were called upon to make changes. Almost never was a protocol turned down, although consideration was critical and approval was often delayed pending more information or changes or investigation by a member of the committee. At one point when the question of duplication was raised the committee was advised that institutions are reluctant to exchange or make public information about their experiments and thus it is difficult to check duplication. As to the question of necessity, it was sometimes said that this was not within the purview of the committee and that experimentation must not be hampered by questioning whether a significant result is to be achieved.

It would seem that a helpful way to describe the operations of the Institutional Animal Committee at the University of Colorado Health Sciences Center would be to refer for illustration to a few of the matters that were considered.

1. Research expected to make contributions to the understanding of network formation in the brain and of nerve regeneration involved obtaining nerve tissue from rats. Pregnant rats would be purchased from a
Committee History

Animal-care-and-use committees (ACUCs) are legally mandated review boards that oversee the care and use of laboratory animals within research facilities. Each facility has its own ACUC, composed of in-house staff (researchers and non-researchers) and at least one outside member from the local community. The two main tasks of ACUCs are to review research proposals and periodically to inspect animal quarters to ascertain their compliance with federal and institutional humane standards.

The HSUS believes that the widespread establishment of ACUCs in the mid-1980s was a significant advance for laboratory animals. At the very least, ACUCs appear to be doing a good job at calling for research proposals to be revised so that the animals experience less pain or suffering. We realize, however, that such committees are not panaceas. Several animal protectionists have resigned from their positions as community representatives on ACUCs, frustrated at being the lone voice for animals. Nevertheless, we support efforts, such as Robert Velhorn's, to compel ACUCs to live up to the spirit of their mandates.

3. A protocol to develop tracers of cerebral blood flow and metabolism sought the use of three hundred rats over a period of five years. The animals were to be anesthetized for the insertion of catheters, and radiotracers were to be injected. It was stated that the maximum survival time would be forty-five minutes. Lidocaine was to be used for local pain control. After considering this planned use of animals, the committee raised questions regarding anesthesia monitoring, recommended a different anesthetic, noted that the proposed dose of lidocaine might not be adequate and questioned the proposed means of euthanasia. The investigator wrote a memorandum of explanation and made some changes. With all of this background, the protocol was approved. The handling of this protocol indicates the professional approach that a committee may follow.

4. There was a protocol to study social and environmental factors involved in high-dose alcohol consumption by group-living primates (monkeys). The inclination to use alcohol is accomplished by reducing the food allowance or by having food available only at limited times. One aim of the experiment is to consider the role of food deprivation in alcohol consumption. The subjects would be the same monkeys used in a previous procedure. Food deprivation would be used to retrain drinking. It was found that food manipulation produces high-dose sustained, oral alcohol consumption, that when the animals receive their food in small, discrete amounts on an intermittent schedule, they drink large quantities of whatever fluids are available to them between food deliveries. It was observed that under the alcohol program monkeys fell off shelves, had gross morning tremors, missed their footing after jumps, and some became hairless and had other physical changes. In another, related protocol, it was proposed to use the monkeys that were already trained to voluntarily drink alcohol to examine the effects of cocaine alone and with alcohol on social behavior. The monkeys would receive repeated intramuscular injections of cocaine and in another part of the project they would have the opportunity to voluntarily breathe cocaine flames. It was stated in the proposal that the monkeys in this project would be in an environment which supports the "psychological well-being of primates" as they are caused to use alcohol and cocaine in various amounts, such as acute or long-term cocaine dosing, chronic exposure to cocaine or alcohol.

5. A study to examine cardiovascular mechanisms in effect during fetal hypoxia planned the use of seventy-five ewes in the last one to two months of pregnancy. The animals would be fasted forty-eight hours prior to surgery, which would, of course, be performed under anesthesia. A procedure is followed with respect to both mother and the fetus and catheters are inserted. Fetal hypoxia is produced by reducing oxygen delivery to the uterus. The cardiovascular and metabolic effects of the hypoxia will be examined as will be circulatory changes to the hindlimb, oxygen consumption, lactate production, and glucose and amino-acid utilization by the hindlimb as a function of fetal hypoxia. It was said the ultimate goal of these studies is to gain some understanding of fetal growth and metabolism in the chronic animal model which may then be applied to an understanding of those conditions which lead to human intrauterine growth retardation. The sheep would experience discomfort at times during this procedure before they were euthanized.

6. A procedure for the instruction and practice of respiratory therapists, registered nurses, neonatal nurse practitioners, medical doctors, and emergency medical technicians involved the use of sixty cats. The cats would be anesthetized, then intubated and uncuffed neonatal endotracheal tubes and DeLee catheters would be introduced to their trachea. The animals would be euthanized before recovering from anesthesia. It was said that learning and practicing these procedures on live cats benefits the quality of patient care in the Newborn Intensive Care by decreasing trauma and potential morbidity/mortality in the ill newborn.

7. An experiment using sixty-five cats was designed to determine whether the action of certain drugs used for the treatment of asthma and other chronic obstructive lung diseases could be prolonged by the encapsulation of the drug in liposomes as compared with administering the drug in aerosol. A number of manipulations and procedures would be carried out on the anesthetized animals, including the insertion of a cannula. It was stated that there was an allowance for the death of some animals during induction of anesthesia and that death during such induction usually results from respiratory depression after unconsciousness. Anesthesia would be defined by loss of pain withdrawal and corneal reflexes. Unanticipated changes in arterial blood
pressure and heart rate would be used as an indicator of pain during experiments. The investigator stressed that the animals would experience no pain except for that induced by needle application during administration of anesthesia.

8. An experiment was proposed to study acute lung injury by creating in anesthetized rats a model of hemorrhagic shock, a condition seen in trauma victims. This injury is a common sequela of post-shock reperfusion. It is believed the injury is related to circulating mediators released from the intestine and other organs. It was stated that a model of shock in a fully anesthetized rat would allow further identification of circulating mediators of injury and their effects.

9. A program said to be of benefit to the treatment of schizophrenic patients would involve the use of five monkeys in whose heads electrodes would be implanted. It was said that previous experience is that monkeys have shown rapid recovery from electrode implant surgery, with animals returning to normal behavior within several days and tolerating their acrylic head caps for several years without evidence of pain or discomfort. The project would seek the ability to relate evoked potential abnormalities to specific temporal lobe regions and thus provide the first new way to assess functional brain status in this mental illness. Simultaneous depth electrode recordings would be compared with surface topography data. These studies, it is said, are important for determining which specific temporal lobe structures are functioning normally in schizophrenic patients. It is said the animals would be chair restrained for up to two hours four days a week and would be trained to a specifically designed nonmagnetic chair. It was stated that the procedures proposed should not result in any overt pain but it was not stated whether there would be potential pain and/or distress. It was stated that after completion of the experimental protocols the animals would be sacrificed by described means of euthanasia.

All of the above experiments or procedures were approved by the committee. The committee considered many other matters such as separation of mother and child monkeys in a psychological experiment; a study of osteoporosis by placing baby chicks on a diet that affected bone formation, mineralization, and resorption; the implantation of catheters in monkeys to provide access to blood and cerebrospinal fluid; the use of piglets to study the role of dopamine and serotonin receptors in regulating formation of cerebrospinal fluid.

There can be no doubt that institutional animal committees, if they proceed diligently and sensitively, can be a significant means for controlling and minimizing the suffering of animals used in experiments and testing. But the questions of necessity, duplication, and alternatives are not only basic from the humane and moral standpoint, they are germane from the economic standpoint. There are billions of dollars available for experiments and testing using animals and thousands of people vying for those dollars. The use of animals in laboratories and the supplying of animals for laboratories are big items of business. Certainly these questions of necessity, duplication, and alternatives should be raised. The Animal Welfare Act specifically refers to the fact that "methods of testing that do not use animals are being and continue to be developed which are faster, less expensive, and more accurate than the traditional animal experiments for some purposes" and to the fact that "measures which eliminate or minimize the unnecessary duplication of experiments on animals can result in more productive use of federal funds."

Service on the Institutional Animal Committee indicates that consideration should be given to additional amendments to the Animal Welfare Act. It would serve the purpose expressed in the Act of avoiding duplication to have a specific requirement that institutions make available information as to the use of animals for experiments, testing, or otherwise so that duplication may be avoided and to have with that a specific provision constraining duplication. It would also seem to implement the purpose of the Act to have a specific requirement that, with respect to any proposed use of animals, a reasonable rationale for the use, for the absence of alternatives to the use, and for the experiment or test itself to be shown. In regard to this protocol form of the University of Colorado Health Sciences Center is significant and commendable. It calls for: "Rationale for use of animals and the appropriateness of the species and numbers used (include the potential contribution that information obtained may have on the disciplines of biology and medicine; also state briefly why living animals are required for this study, rather than some alternative model)." An important step in completion of the review of animal usage would seem to be a reporting of the progress and result of the procedure. This reporting would put the program to an appropriate final consideration and could be a significant and beneficial control with respect to animal usage and cost.

It is felt by many that there is a difference in terms of justification between the usage of animals by an institution such as the University of Colorado Health Sciences Center for appropriate medical research and the usage of animals by commercial organizations for the testing of products as in the so-called Draize test, whereby the product to be tested is sprayed or placed in the eye of a live, conscious rabbit causing great pain and misery. In the context of human society's concept of and concern about the usage of animals for research, testing, and experiments, a basic question must be whether there are real needed benefits, not otherwise available, which justify the usage of animals under conditions which will be painful, stressful, or otherwise miserable for the animal. Certainly institutional animal committees can and will serve an important and constructive function in relation to that question. The Institutional Animal Committee at the University of Colorado Health Sciences Center is indeed serving such a function.

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NOTE
This article is an attempt to describe objectively the experience of serving on an institutional animal committee, the workings of such a committee, certain laws or procedures that pertain to such workings, and changes in laws or procedures that might be considered. The article does not state the personal thoughts and feelings of the author in regard to the use of animals in laboratories. These thoughts and feelings derive from the question—by what moral right or justification do human beings inflict suffering upon animals for the purpose of testing products to be used by humans or for the purpose of dealing with illnesses or maladies the human species has brought upon itself? If animals are to be used for these purposes, certainly it must be with respect, compassion, and gratitude, knowing that these are sentient creatures experiencing pain and stress for assumed human benefit.—Robert F. Welborn, Esq.