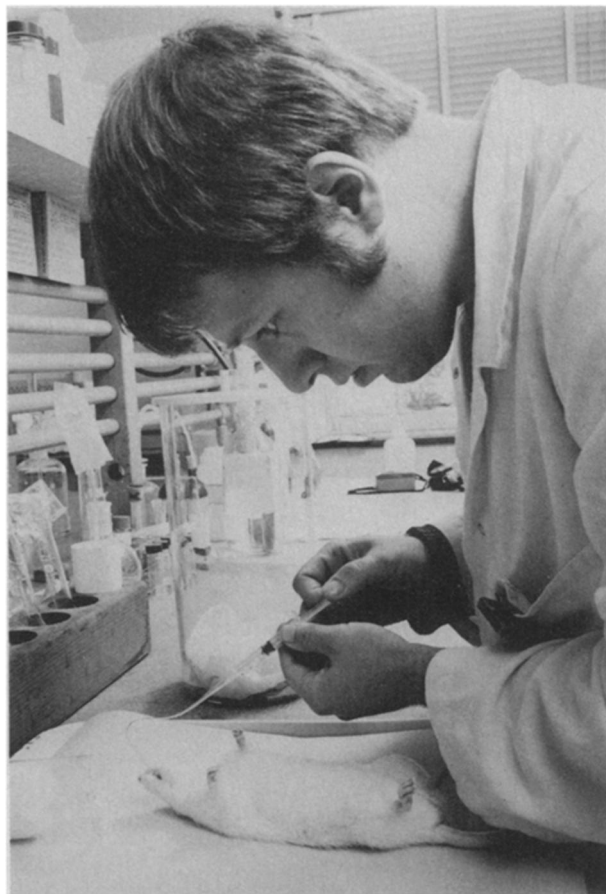


Animal Science From the Animals' Perspective

Scientists, as well as the public, are becoming increasingly concerned about the discomfort animals used in biomedical research sometimes experience. Now something is being done about it.



USDA

By JOAN AREHART-TREICHEL

Last year the Nobel Prize for Physiology or Medicine was shared by Roger W. Sperry of the California Institute of Technology and David H. Hubel and Torsten N. Wiesel of Harvard University. Sperry was cited for animal experiments showing that the two brain hemispheres perform different functions; Hubel and Wiesel were honored for cat and monkey research revealing that vision involves a hierarchy of brain cells.

Such discoveries undoubtedly hold great benefit for humanity. But is it ethical to use animals to obtain them? This question has become of increasing concern in recent months, not only to various segments of the public but to the scientific community itself.

For instance, the question of whether it is ethical to use animals in biomedical research boils down, essentially, to whether animals are morally equal to humans, Arthur Caplan of the Hastings Center (which concerns itself with biomedical ethics questions) pointed out at a recent New York Academy of Sciences Workshop on the Role of Animals in Biomedical Research. If you contend that animals are morally equal to humans and should not be used for research, he says, then to be philosophically consistent, you should also not eat them, hunt them, wear their pelts or use them as pets. But even if you hold that animals are morally inferior to

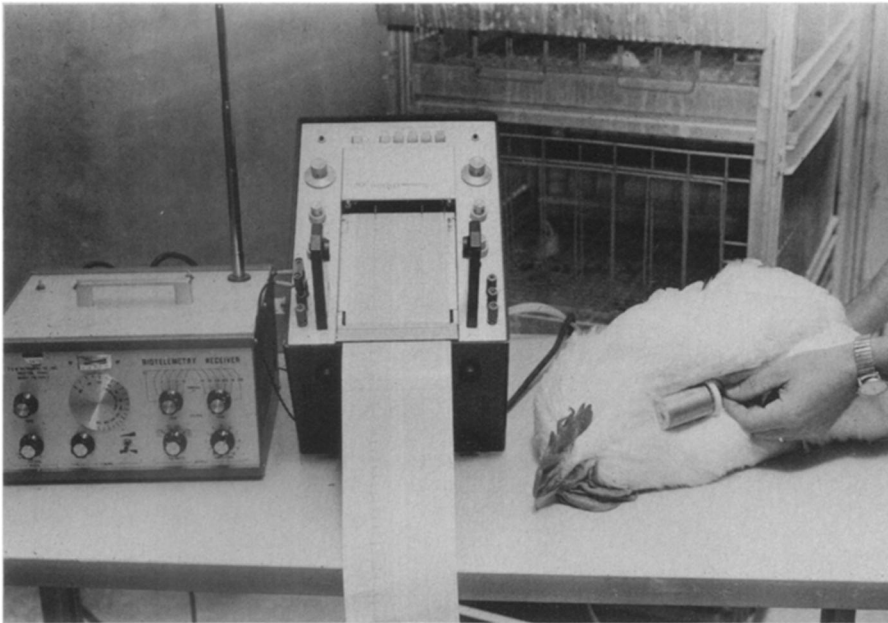
humans and should be used in scientific research, that does not give you license to experiment on them any way you like, Carolyn Ristau, an ethologist with Rockefeller University in New York City, stressed at the same workshop. "I think we are justified in animal experiments by the greater good," she said, "but remember in your experiments that animals are aware." A similar ethical position was voiced by Robert Sharpe, scientific adviser to Britain's National Anti-Vivisection Society, during a recent talk before the Washington branch of the National Tissue Culture Association: "The one important similarity between ourselves and other animals is that we can all suffer, and on this basis I believe a truly civilized society should extend the same consideration and respect to all sentient creatures," he said.

But how much discomfort or outright pain do research animals experience? The federal Animal Welfare Act requires American scientists to adequately house, feed and water research animals. However, some animal welfare advocates have argued that just being in cages constitutes suffering, and that housing standards established under the AWA do not address the social needs of primates and some other animal species. Creatures that serve as controls in experiments probably suffer no pain or discomfort from the experiments. And before lab animals are operated on, they are routinely given anesthe-

sia or analgesics. In fact, as Lawrence Soma, a veterinarian with the University of Pennsylvania School of Veterinary Medicine in Philadelphia, told SCIENCE NEWS, "I have had many scientists call me and say, 'I want to do this to an animal. What is my best approach? What type of anesthetic agent, an intravenous drug, an inhalation drug? How much anesthesia should I give? What's the recovery time?'"

And some 1,100 vets specializing in laboratory animal medicine are now advising scientists in large universities and drug companies on the proper care of lab animals before, during and after surgery.

However, in pain experiments, analgesics cannot be given because they would mask the pain phenomenon. And sleep, disease and stress studies also cause varying degrees of discomfort to research animals. Two other widely used tests that inflict pain on research animals, New York Academy of Sciences workshop speakers tended to agree, are the Draize test and the LD-50 test. The Draize test is used by cosmetic and chemical companies to determine before cosmetics or other chemicals are marketed whether they are eye irritants. It consists of putting the test cosmetics or chemicals in rabbits' eyes (SN: 10/25/80, p. 262). The LD-50 test is used by chemical companies to determine the systemic toxicity of chemicals before they are marketed; it consists of assessing how much of a chemical it takes to kill 50 per-



A transmitter is being strapped to a chicken to provide data on chickens infected with Newcastle disease or exposed to heat stress.

cent of lab animals injected with it. In fact, most of the animals used in all types of toxicology tests probably suffer ill effects from them, Andrew Rowan, a biochemist with the Humane Society of the United States in Washington, told *SCIENCE NEWS*. What's more, he points out, many of the rodents used in cancer studies develop painful tumors.

Opposition to animal experimentation is nothing new; anti-vivisectionists have been vocal since the 18th century at least and were especially forceful during the latter 19th century in England. But the number and diversity of persons expressing concern about the welfare of lab animals today is probably greater than ever before. Opposition to animal research comes from groups such as the Humane Society of the United States, United Action for Animals in New York, the New England Antivivisection Society, the American Fund for Alternatives to Animal Research, and the Friends of Animals. Individuals have also become involved in the movement. Henry Spira, a New York City public school teacher, devotes his spare time to animal welfare issues. Several years ago he led a campaign against some purportedly cruel animal experiments being conducted at the Museum of Natural History in New York. Don Burnes of San Antonio, for many years a research psychologist, decided it was morally wrong for him to continue research on animals and has become vocal in the research animal protection movement.

Burnes, Spira, the Humane Society and United Action for Animals have been especially instrumental in trying to get the 97th Congress interested in passing legislation that would protect research animals more than the Animal Welfare Act is doing. Last fall a handful of bills dealing with various aspects of animal experimenta-

tion were introduced into the House. The House Subcommittee on Science, Research and Technology (part of the House Science and Technology Committee) held hearings on the bills, with both animal welfare groups and the biomedical research community testifying. The subcommittee staff took all the bills, combined them into one — HR6245 — and asked for feedback from interested parties as well as from concerned members of Congress and made additional changes. More hearings were held on the bill, with NIH, the U.S. Department of Agriculture and the Veterans Administration testifying. The subcommittee made final changes in the bill on June 9.

As the bill now stands it would, in essence, promote investigation of alternatives to animal experimentation in biomedical research. It would require universities receiving federal research funds to establish an animal care committee including at least one veterinarian and a member from the community representing lab animal concerns. It would also require such universities to be accredited by an accrediting agency using NIH guidelines concerning the care and use of lab animals. Or as Don Rheem, technical consultant to the House Science, Research and Technology Subcommittee, explains it, "We are not concerned about the majority of researchers in the United States because the majority of them are very good. But there is an urgent need for a mechanism to assure the public that proper safeguards are in place. The subcommittee views this bill as that mechanism."

Whether the bill is passed or not, biomedical scientists are already discussing ways by which they might lessen research animals' discomfort and pain. For instance, at the recent New York Academy

of Sciences workshop, Gerard P. Smith, a psychiatrist at Cornell University Medical Center in White Plains, N.Y., pointed out that no matter how many results support a scientific hypothesis, they will never verify it completely. So scientists must use "experience, intelligence and judgment" in deciding how many tests are enough, he said, especially when the tests involve research animals.

Scientists, in fact, are already stepping up their efforts to reduce lab animals' pain. For instance, Ronald Dubner, a neurobiologist with the National Institute of Dental Research in Bethesda, Md., and colleagues are conducting pain research on monkeys, but the monkeys are exposed to painful stimuli for as short a time as possible and are able to switch off the stimuli as soon as they become uncomfortable. "These procedures are consistent with the ethical position that experimental animals should not be exposed to pain and suffering greater than humans themselves would accept," Dubner says. In 1980, he continues, the International Association for the Study of Pain published guidelines for the humane treatment of animals during pain research, and investigators who wish to have their research manuscripts published in the association's journal *PAIN* must assess how much pain they subject animals to in their experiments and specify it in their manuscripts. Robert A. Scala, a toxicologist with Exxon Corp. in East Millstone, N.J., reports that some of the scientists using the Draize test are placing chemicals in rabbits' eyes in the lowest possible doses and increasing the doses only until they get the smallest perceptible effect. Also, if a chemical hurts the eye of one rabbit, it is not placed in the eyes of other rabbits, he says. In addition, the Scientists Center for Animal Welfare, headquartered in Potomac, Md., was founded in 1978 by Barbara Orlans of the National Heart, Lung and Blood Institute in Bethesda, Md., and other scientists in



Rat used to study the effects of injections of rare earth metals on liver lipids.

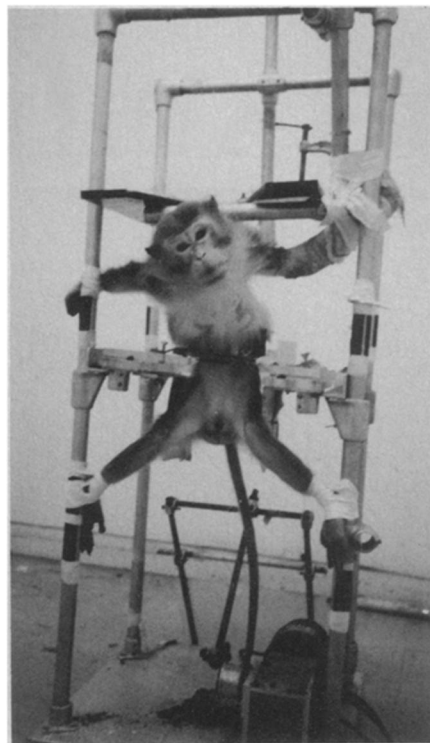
order to increase researchers' sensitivity to the welfare of research animals. The center held a conference last November that was attended by more than 100 scientists. One of the things investigators attending the conference generally agreed on was that lab animals' distress could be reduced if scientists took time to train them to accept experimental procedures rather than simply forcing them into procedures.

Still other promising signs for research animals are emerging: The National Academy of Sciences' Institute of Laboratory Animal Resources conducted a survey of lab animal use in 1968 and again in 1978 and found a 40 percent decrease — from 33 million mammals and birds in 1968 down to 20 million in 1978. Rowan has reason to think that the decrease has not been as great as 40 percent because the firm of Charles River, which provides 20 percent of the rodents used in American research labs, is now producing 15 to 17 million rodents alone. Still, he, too, believes that the use of lab animals has been falling since the late 1960s. And while the total number of research animals used in the United States from 1978 to the present is not known, figures from the USDA in Hyattsville, Md., reveal that the use of hamsters and guinea pigs for research de-

clined from 1,800,000 in 1978 to 1,700,000 in 1981.

Two factors explain this recent fall in lab animal use, concur Rowan and Franklin M. Loew, dean of Tufts University School of Veterinary Medicine in Boston and chairman of the NAS Institute of Laboratory Animal Resources: the increasing cost of acquiring and maintaining lab animals under ever more stringent standards and the replacement of lab animals by new, economical tissue culture assays, recombinant DNA technology and other tests.

To promote further research along these lines the New England Antivivisection Society has given \$100,000 to William Douglas, a tissue culture specialist at Tufts University Schools of Medicine, Dental Medicine and Veterinary Medicine in Boston to develop tissue culture assays that might replace the Draize test. Revlon, largely at the prompting of Spira, has donated money to Rockefeller University to do the same. And thanks to \$1 million from the Cosmetic, Toiletry and Fragrance Associations and \$2 million from Bristol-Myers, the Johns Hopkins School of Hygiene and Public Health in Baltimore has set up a Center for Alternatives to Animal Testing to find *in vitro* assays to replace both the Draize test and the LD-50 test. □



Alex Pacheco

Monkey strapped into a Foringer chair, a standard piece of lab equipment used to restrain monkeys for certain procedures.

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