

Old Myths Die Hard

A New View of Animal Research Questions Its Scientific Value

By Dr. Brandon Reines

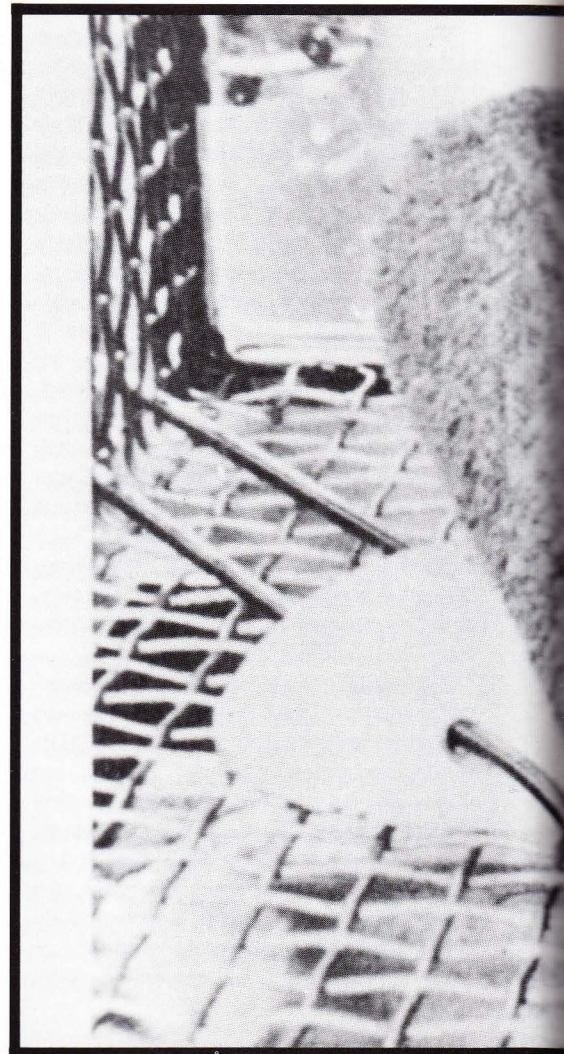
During the last week of April each year, as predictably as the chirping of robins, the deputy director of the National Institutes of Health sings the praises of animal experimentation. "Virtually every medical innovation of the last century," claims Dr. William F. Raub, "has been based to a significant extent upon the results of animal experimentation." The inspiration for such oratory is the agitation of animal-rights and animal-protection groups, marking the observance of April 21-28 as World Week for Laboratory Animals.

Dr. Raub is hardly alone in contending that medical discoveries usually come from animal experiments. In fact, that contention is an article of faith among thousands of animal researchers the world over. Not only scientists but the media and many members of the public, as well, believe that no breakthrough in treatment is possible without experiments on animals. This is due in part to the efforts of special-interest organizations whose sole purpose is the promotion of animal research. For example, the National Association for Biomedical Research (NABR) represents laboratory-animal-use interests, including animal breeders, dealers, and researchers. For many years, NABR spokesmen have utilized lobbying and public-relations techniques to promote the self-serving dogma that current medical science is a result of animal experimentation. A growing number of animal protectionists, nonetheless, are skeptical of Dr. Raub's and NABR's claims. The HSUS laboratory animals department regularly fields calls from members and activists who ask: is it

possible that the usefulness of animal experimentation has been exaggerated?

Answering that question accurately has been my occupation for the past several years.

The answer is an unqualified "Yes." In fact, animal-research interests have been engaged in a propaganda campaign every bit as vigorous and distorted as that they attribute to animal protectionists. Animal-research interests have consistently taken anecdotal information, "expert" opinion, and selected case studies to construct an allegedly airtight case for the indispensability of animals for medical discovery and testing. However, analysis of the history of modern medical miracles—wonder drugs, hormonal therapies, and surgical procedures—reveals that animal research has often not served a *scientific* function at all. The primary historical role of animal experimentation is forensic. It is a method of "selling" a favored hypothesis to the medical community and/or the public. Medical breakthroughs almost always have arisen from detective work done by doctors in the context of clinical practice (with patients). In the fields of research





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This rhesus monkey raised with a cloth-covered surrogate mother was one of the subjects studied by Dr. Harry Harlow and his colleagues at the University of Wisconsin Primate Laboratory.

that have seen the most spectacular advances and milestones (cardiology, immunology, oncology, neurology, pharmacology, endocrinology, hematology), the role of animal experimentation in advancing progress has been grossly exaggerated. An increasing number of scientists share that view.

Dr. Irwin D. J. Bross, former director of biostatistics at Roswell Park Memorial Institute for Cancer Research in Buffalo, New York, maintains that none of the major drugs for the treatment of childhood leukemia was discovered through animal experimentation. He claims that the drugs were actually developed in the clinic by direct observations of human patients. This conclusion seems to contradict the findings of scientists such as Dr. C. G. Zubrod, who has written repeatedly that all of the major anti-cancer drugs were discovered by animal experimentation. Based on my historical research, it has become clear that Drs. Zubrod and Bross have been “talking past each other.” The apparent contradiction is due to a lack of semantic precision in Dr. Zubrod’s published statements. Although his formal claims in the literature imply that the main

antileukemic drugs were *discovered* in animal experiments, in a personal communication, Dr. Zubrod conceded, “I guess the role of the animal experiments was to convince the clinicians to allow the tests in man.” That is a very different conclusion from the one he has championed in print for years—that the drugs were actually *discovered* by animal experiments. Most of the main drugs for cancer treatment were discovered in human studies and, only later, tested on animals.

One of the main anti-leukemic drugs is nitrogen mustard. It became of interest to oncologists when a surgeon treating victims of mustard-gas poisoning showed that it knocked out the white blood cells of those victims. Since leukemia is a proliferation of white blood cells, the surgeon argued, any substance that kills white blood cells should be effective against leukemia. With that rationale, researchers proceeded to test nitrogen mustard on a variety of mouse and rat tumors. The results were mixed; nitrogen mustard was actually ineffective against most of the strains tested. The researchers discounted the largely negative studies because

the experience with human victims was too convincing to ignore. Researchers convinced doctors to try nitrogen mustard as a therapy by emphasizing its positive effects against certain mouse tumors. These positive results did more to reassure doctors than prove the accuracy of the original hypothesis. That was their value. In studying the history of cancer chemotherapy, heart surgery, and several other areas, it becomes clear that animal experiments are often not even part of the scientific research process. They are a sales tool used to *dramatize* hypotheses. Of course, experiments in the modern view of science are supposed to *test* hypotheses—not *dramatize* them. If this new perspective is correct, then animal experiments are no more inherently scientific than is an inspirational speech.

Consider psychological research for a moment. The most famous experimental psychologist in the world, Harry Harlow, is immortalized for his mother/infant separation experiments utilizing rhesus monkeys. He ostensibly sought to answer the question of whether human infants love their mothers because they provide contact comfort or because they are a source of nourishment. To test various theories emanating from clinical observation, Harlow chose an animal species—the rhesus monkey—that has a highly-developed need to cling to its mother in order to survive. Ethnologists were already well aware that contact comfort is more important for rhesus infants than for human infants. “Anyone who has ever watched an infant monkey cling tightly to its mother as the latter swings through the trees can easily understand why,” writes Dr. Dallas Pratt. By his choice of experimental

species, Harlow stacked the deck in favor of contact comfort as the preferred stimulus. Lo and behold, infant rhesus monkeys preferred the cloth surrogate mother to the wire surrogate mother equipped with a milk nipple.

Regardless of whether or not Harlow had a personal bias towards the contact-comfort theory, his experimental design itself favored a particular result. Rather than a scientific breakthrough, Harlow's experiment, extremely cruel in its many variations, emerges as nothing but a dramatic illustration of an old hypothesis. As far as *human* infants are concerned, however, the relative importance of contact comfort and nursing remains unsettled. Nonetheless, Harlow, named president of the American Psychological Association, was revered for his research for decades.

In case after case, animal experiments are used merely to dramatize a clinical hypothesis. If one strain does not respond in the "right" way, some other strain surely will. Given the thousands of possible combinations of species, experimental manipulation, and environmental circumstances, someone with a vested interest in a particular result can almost always either cite or produce an experimental finding that will justify almost any public-health decision—even a dangerous one. In fact, some scientists prefer to base public-health decision on highly-variable animal data, even when reliable data on human exposure is available!

For example, on occasion, it is virtually impossible to find an experimental species whose reactions mimic those of the human body. Take the rodent—and later beagle—experiments conducted to determine the safety of cigarette smoking. When attempts to develop cancer in rodents through smoking failed, public-health actions against cigarette smoking were stalled for more than a decade. While human population studies had clearly shown that smoking caused cancer in people by 1950, experimenters could not produce cancer in animals, no matter how many dif-

Historically, animal research has been used to dramatize scientific hypotheses rather than discover them. Such a distinction proved little comfort to research animals such as the dog below, kept in a small cage on a wire floor.

ferent animal strains they tried. Tobacco apologists marshalled leading laboratory scientists to defend the accuracy of the rodent data. No less a scientist than Dr. C. C. Little, the founder of Jackson Memorial Laboratories in Bar Harbor, Maine, insisted that the negative findings in rodents were absolutely conclusive for man; there was no evidence that cigarette smoking causes cancer because human studies are "merely statisti-

cal." Dr. Little maintained that only *animal* experiments could prove that cigarette smoking causes cancer in *humans*. By sheer persistence, the American epidemiologist who had already shown that cigarettes cause cancer in man managed to find a strain of mouse whose skin would become cancerous after painting it with tobacco tars. In desperation, Dr. Ernest Wynder appeared on national television to hold up the mouse he had rendered malignant with cigarette tars. Dr. Wynder's statistician at the time was the aforementioned Irwin Bross, who, after witnessing that demeaning display of scientific showmanship, developed a profound distrust of animal experiments.

Dr. Bross maintains that the dogma that clinical hypotheses must be "proven" by animal experiments dates back to the late nineteenth century. "At that time, the dogma made sense," he asserts.

That was the heyday of the germ theory of disease, when it appeared as if all diseases were caused by bacteria (or viruses). The analogy between an animal inoculated with a germ and a human being with a germ disease is pretty straightforward. If they absolutely couldn't find an animal strain that would contract the disease no matter how many times they infected it, then it wasn't too likely that the germ caused human disease either, although there were many exceptions even at that early date. In the early 1950s, when I was involved in the cigarette/lung-cancer controversy, most scientists still believed in the old nineteenth century dogma known as "Koch's postulates." The postulates just don't have any applicability at all to the noninfectious diseases such as cancer and heart disease. The biochemical differences between human and animal tissues are simply too great. When they started making beagles smoke cigarettes in the late '60s, I wrote a letter to the Buffalo Courier pointing out how foolish it was. I'm no animal lover, but it was a real waste of money.

The evidence that cigarette smoking caused a kind of cancer in dogs finally convinced most of the skeptics although a few holdouts remain. They still reject the cigarette/ lung-cancer theory because the dogs did not contract the human form of lung cancer.

There are still scientists who attribute the discovery that tobacco causes cancer to experiments on beagles. The image of beagles hooked up to smoking machines is certainly indelible, but its dramatic impact should not be confused with its scientific content. Like the earlier rodent studies, the beagle experiments were not performed for scientific but political reasons. Beware of NIH administrators who parrot the old party line that "Virtually every medical advance of the past century arose from animal experimentation." Look out for the songbirds of NIH and NABR. ■

Dr. Brandon Reines is associate director of the laboratory animals department of The HSUS and author of Masked Men of Medicine, to be published within the year.



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