

REVIEWS

The Review Section of E&A consists of three parts. The first is made up of brief reviews of books and articles (and perhaps films, etc.) that are concerned in some way with the rights and wrongs of human treatment of non-human animals. The second part of this Section is entitled 'Replies' and contains comments on or responses to reviews published in earlier issues of E&A. By letter the Editor invites the authors of works reviewed to respond, and by this proclamation in each issue invites all other interested readers to submit comments. The third part of the Reviews Section is a list of works of which reviews are invited. Any member who wishes to review any work in this continuing 'Reviews Needed' list should contact the Editor.

Ron Dagani, "Alternative Methods Could Cut Animal Use in Toxicity Tests," *Chemical & Engineering News*, Vol. 61, No. 44 (October 31, 1983).

W. M. S. Russell and R. L. Burch (*Principles of Humane Experimental Technique*) advocate the three R's of replacement, refinement, and reduction in discussing the use of animals in research. Ron Dagani (and *C & EN*) have done us a service in presenting an up-to-date report on how new methods may help to replace, or at least reduce, the animals used in traditional tests for toxicity. As Dagani notes, twenty percent (some fourteen million) of all animals used in research and testing are used in toxicity tests. The quest for alternatives here has been motivated largely by attacks from animal welfare activists and reinforced by the increasing cost of lab animals and the questionable usefulness of the test results.

Dagani focuses on research on alternatives to the Draize test and the LD50--both have been major targets of animal rights groups. The Draize test, involving the testing of consumer products by evaluating their irritancy in rabbits' eyes, has been criticized for its subjectivity as well as the pain and injury it causes the animals involved. Major cosmetic firms, under pressure from animal

advocates, have now supported research to find substitutes for such animal testing. Dagani outlines especially the efforts at Rockefeller University's Laboratory Animal Research Center and the Center for Alternatives to Animal Testing at Johns Hopkins University. From tests with cell cultures to those on chick embryo membranes, the search for alternatives seems promising. The least that one can expect is the reduction of the numbers of animals used and the minimization of the pain involved. But the criteria of a successful alternative to the Draize test, for example, are still not easy to fulfill. Dagani lists the following as indicated by the Rockefeller scientists: (1) the test must be easy to standardize, (2) it must be able to detect toxicity over a wide range of chemicals and tissues, (3) it should be able to evaluate the toxicity of complex mixtures, and (4) it should indicate whether recovery from the toxic effect is possible. (p. 8)

The LD50 (Lethal Dose--50%), "designed to determine the single dose of a test chemical that will kill 50% of the animals under study," has been

met with a similar attack and responsive research for alternatives. Although consumer-products companies justify maintaining the LD50 on the basis of moral obligations to ensure public safety and legal obligations from federal agencies, the test may have outlived whatever usefulness it might have had. It is perhaps, in animal-rights activist Henry Spira's words, "a wasteful ritual exercise in misleading, meaningless precision." (p. 12) The main obstacle to abandoning this test seems to be the bureaucratic inertia of the regulatory agencies involved. Again, at least reduction of animal numbers is possible with alternatives already available. In Robert Bruce's "up-and-down" method a computer program converts data from tests on a few animals to an estimated LD50. Other computer-generated mathematical models can estimate the LD50 of new compounds from

their chemical structure and properties. The hope is that the alternatives Dagani notes will make toxicity tests on animals obsolete as methods of product testing.

As Dagani points out, many claim there are still types of research for which animal substitutes are not possible. Others argue that alternatives could be found if scientists just tried hard enough. What does seem clear from this report is that the animal welfare movement has had a significant impact on forcing industry support for research into alternatives to animal toxicity tests. This should be heartening for those who have struggled (and continue to do so!) for an end to animal suffering in product testing. For a good introduction to recent research in this area, Dagani's article is recommended.

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