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 declined 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.*

# BOOKS

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**ASIMOV'S BIOGRAPHICAL ENCYCLOPEDIA OF SCIENCE AND TECHNOLOGY: The Lives and Achievements of 1510 Great Scientists from Ancient Times to the Present Chronologically Arranged** — Isaac Asimov. This edition includes 310 additional biographies — about half taken from contemporary scientists and half scattered through history. Doubleday, 1982, 941 p., illus., $24.95.

**THE ATOM BESIEGED: Antinuclear Movements in France and Germany** — Dorothy Nelkin and Michael Pollak. Argues that persistent opposition to nuclear power goes far beyond the fear of risk. It is a social movement that embodies fundamental questions about the social and political properties of nuclear technology and its effect on political life. Originally published in hardback in 1981. MIT Pr, 1982, 235 p., illus., paper, $7.95.

**BEHAVIORAL ENRICHMENT IN THE ZOO** — Hal Markowitz. Looks at the options for enhancing the quality of animal life in restricted environments. Assesses existing and planned projects that illustrate the achievement of behavioral enrichment efforts in the zoo. Van Nos Reinhold, 1982, 210 p., illus., $24.

**CONCISE ENCYCLOPEDIA OF THE SCIENCES** — John-David Yule, Ed. A beautifully illustrated reference work that supplies both a dictionary of the most commonly encountered words of science and an encyclopedia of the background material necessary for understanding their use. Includes more than 1,000 brief biographical notices of men and women who have contributed to the development of modern science and technology. Originally published by Phaidon Pr, Ltd. in 1978. Van Nos Reinhold, 1982, 590 p., color illus., paper, $17.95.

**CONTACT WITH THE STARS: The Search for Extraterrestrial Life** — Reinhard Breuer, translated from the German by Cecilia Payne-Gaposchkin and Mark Lowery. Examines the significant theories concerning the origin of life. Considers the astronomical evidence for the existence of alien life forms, the habitability of other planets and the possible presence of ecospheres around distant stars. WH Freeman, 1982, 292 p., illus., $28.50.

**A FIELD GUIDE TO MUSHROOMS AND THEIR RELATIVES** — Booth Courtenay and Harold H. Burdsall, Jr. A beautifully illustrated guide for the amateur mushroom hunter with which one can identify any of more than 350 species of mushrooms. Although the subject of edibility is addressed, identification of all mushrooms to be eaten should be verified by an experienced mycologist. Van Nos Reinhold, 1982, 144 p., color illus., $18.95.

**LIFE IN THE SEA: Readings from *Scientific American*** — Introductions by Andrew Todd Newberry. The articles were chosen to convey how thoroughly organisms are "embedded in the conditions and selective pressures of their environment." Topics included are habitats and inhabitants, how relationships work, behavior, food from the sea and waste disposal. W H Freeman, 1982, 248 p., color/b&w illus., paper, $12.95.

**THE SOLAR DECISION BOOK OF HOMES: A Guide to Designing and Remodeling for Solar Heating** — Richard H. Montgomery with Walter F. Miles. Provides help for American home owners who wish to modify their present home in order to make better use of solar energy, to put good conservation into practice, to design and build new, energy-efficient solar-utilizing residences. The authors believe that active and passive solar techniques should be blended together to produce the most practical and economical results. Wiley, 1982, 332 p., illus., paper, $15.95.

**TIDAL ENERGY** — Roger Henri Charlier. Analyzes the global problem of providing electricity by tidal energy. Demonstrates the advantages of using the ocean as an energy source and looks at the possibilities of building tidal power schemes in developing countries. Van Nos Reinhold, 1982, 351 p., illus., $28.

**THE UNFOLDING UNIVERSE** — Patrick Moore. Tells what has been happening in astronomy from the launching 25 years ago of Sputnik I — the start of the Space Age. Compares our knowledge today with that of 1957. Discusses the events, the new theories and techniques and the new knowledge and understanding of our universe that has been gained in the past 25 years. Goes on to discuss the next 25 years. Crown, 1982, 256 p., color illus., $17.95.



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