the state. Irrigation and other measures would prevent a recurrence of the dust-bowl syndrome and had maximized the productivity of the richly fertile soil. Nevertheless, Nebraska was still "blessed" with more than its share of transient dust. The incomparable Nebraska sunsets are often attributed to this relatively high concentration of dust particles blown about by the famed Nebraska wind. Just such a wind and just such a particle of dust had now successfully conspired to enter Gail's right eye, with the wrongful intention of inflicting great physical suffering upon her. And she knew very well, as a contact lens wearer and a veteran of countless "contact attacks," that she had indeed contracted a piece of dust in her eye, underneath her right lens.

"Christ!" Tears flooded her right eye, and she blinked it frantically. It hurt extremely. She would have to wash it out. Self-conscious of how her face looked with a tear-laden, half-closed right eye, Gail approached Mrs. Glenn, the pageant coordinator, and asked if she knew where the women's restroom was. Mrs. Glenn approached the young company head who stood listening in front and whispered to him. He pointed to a metal door on the side of the plant building and whispered a few brief directions. Mrs. Glenn returned to where Gail stood futilely massaging her sore eye, pointed out the metal door, and repeated the directions she had received. Tears spilling down profusely, Gail walked straight for the nominated door, more by pained sense of direction than by sight, and entered the building. She walked through what she had been told would be the lunchroom. All she knew was the sharp pain in her eye; she didn't see, or care about, the crude benches and tables or the vending machines that together comprised the plant lunchroom. She mounted the stairs at the end of the lunchroom and turned to her right down the wide concourse as she had been told to do. She hardly saw where she was walking, her eye hurt so much. The restrooms were supposed to be on the left. The blurry sight of a door marked "WOMEN" only a couple feet down a dim hallway appeared to her on the left. Gail turned into the hallway and pushed open the door to the women's room.

(continued in the next issue)

Evaluating Animal Research

A REVIEW OF ANDREW ROWAN'S
OF MICE, MODELS, AND MEN:
A CRITICAL EVALUATION OF ANIMAL RESEARCH
(Albany: S.U.N.Y. Press, 1984)

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The past ten years of debate about animal research have made at least one thing clear: progress in this field, indeed, good arguments about the issue, will require a blending of scientific acumen and philosophical sophistication. Philosophy without science is empty; one cannot, for example, draw specific conclusions from the harm principle unless one has a clear and objective understanding of whether a situation causes harm. If the subject is an animal, intuitions and analogies with human suffering can be seriously misleading; a scientific study involving the animal's physiology and ethology can be much more successful in making such determinations. Contrariwise, science without philosophy is blind; a description of the history of a test, its strengths and weaknesses, and the numbers of animals involved, does not, by itself, generate a conclusion about animal welfare.

Early works, such as Singer's Animal Liberation, provide a sustained development of the philosophical arguments but are viewed with suspicion by the scientific community because (to cite the most respectable reason) his ignorance about animals shines through many of his specific complaints. The work of Dallas Pratt provides a great deal of hard data about the scientific merit of many common laboratory procedures but lacks the general framework within which ethical judgments about those procedures can be deduced and defended. Andrew Rowan's new book, Of Mice,

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Models, and Men: A Critical Evaluation of Animal Research (hereafter, OMM) is an attempt to meet the demand for a work in which these two elements are combined to provide a rational and scientifically respectable evaluation of research involving non-human animals. (Bernard Rollin was perhaps the first to do this, but his book, Animal Rights and Human Morality, is broader in scope and, as a result, contains less specific information of the sort that makes Rowan's book so valuable.) Scientists may be angered at his attacks on many widely held assumptions about basic research and testing, and advocates of animal welfare may be dismayed at the refusal to issue a much broader condemnation of research involving animals, but both groups must recognize the necessity of bringing together scientific analysis and philosophical inquiry.

It is perhaps inevitable that no work which tries to satisfy two such disparate goals will be as successful at either as a book which restricts itself to one or the other. Thus, Rowan's account of the scientific merit of animal research often relies on citations rather than analysis when it comes to details, and his philosophical arguments are nowhere near as sophisticated or complete as those to be found in Regan's work. Since Rowan is by training a scientist rather than a philosopher, it is unsurprising that there are problems evident in the latter sphere. Nonetheless, there is much of value in OMM for philosophers, scientists, and the interested public alike, and the specific criticisms I shall discuss in this review should always be read against the backdrop of a general admiration for Rowan's project and his treatment of the issues. At the very least, I would wish that every member of my institutional animal care and use committee would take the time to study and discuss this work.

The position Rowan defends, like his approach, falls between two more familiar points. Some people in the animal welfare movement may object to one of Rowan's basic assumptions, i.e., that research on animals can often be justified. Rowan also offers sharp criticism of some of that movement's claims about the benefits (or lack thereof) of such research. An early section on "mis-statements and misrepresentations" (pp. 26-9) and all of Chapter 12, "Animal Research: A Case for the Defense" (pp. 179-85) challenge some of the sweeping claims which are

sometimes associated with arguments about animal welfare. This balance certainly enhances Rowan's credibility in the eyes of researchers.

However, supporters of current research practices will not find an all-accepting colleague. The basic theme of the book is a sustained criticism of many specific procedures and assumptions and of the bureaucracy which perpetuates them. For example, Rowan criticizes the LD50 test and its validity as a measure of toxicity but also claims that "in LD50 tests, the main problem is political and bureaucratic" (p. 214). This claim is followed by a list of specific changes the regulatory agencies should be making to correct these wrongs.

One of Rowan's stated goals is to put the debate about animal research in proper context. This generally involves an extensive historical survey; the nature of biomedical research, the development of the antivivisection movement, the use of animals as research models, the use of primates in the laboratory, the dispute about "pound seizure" and the development of the Draize test are some of the things introduced by an historical account of their development. In other cases, such as the use of animals in education or psychological research, the context is provided by a careful and well-balanced attempt to provide reasonably accurate statistics about the numbers of animals affected. It is likely that any reader will find some of this material familiar and perhaps even trite and some of it more detailed than the subject requires, but the remarkable wealth and accuracy of the information insures that much will be educational and useful. At the very least, these sections of the book are a valuable source of well-documented and accurately presented background information, an essential resource for anyone who deals with these issues. Of course, there is inevitably some oversimplification (his survey of the philosophical debate from the 17th to the 19th century covers two and a half pages), but the basic points are well presented.

One of the most striking features of Rowan's arguments is their unusual specificity; one would be hard-pressed to find any general statements at all about animal research in this book. Instead, one finds painstaking distinctions among topics and issues that are all too often lumped together

under a vague label such as "animal research," "alternatives to animal research," or even "the LD50 test." This specificity is both a strength and a weakness.

It is all too common to find debates in which the participants are labeled either "for" or "against" the use of animals in research. As Rowan ably points out, any discussion of this topic ranges over such a wide variety of questions that it is gross oversimplification to try to apply the same arguments to all of them. Reasons against (or in support of) the use of animals in education must be different, at least in detail, from arguments against the use of the LD50 test or other aspects of toxicology testing. Moreover, arguments against the use of animals in high school science fairs will not speak to the question of practice surgery for veterinary students. Rowan's book is an extensive catalogue of the myriad ways in which animals are used in the laboratory and the different goals, justifications, and objections associated with the different uses.

This sort of comprehensive survey comes at a price. With so many topics covered, the reader may become numbed by technical data and numbers and by an occasional lapse into jargon--for example, "one member is looking at the response of peritoneal macrophages to irritant-induced release of chemotactic agents" (p. 226). This is really a minor complaint, though, since for the most part, Rowan does an admirable job of presenting information accessibly. Without the numbers and technical data, the work would lose much of its unique value.

Most of the topics covered are absolutely central to the debate. In a few cases (most notably, the entire chapter devoted to the "pound seizure" issue), Rowan seems to devote the same time and energy to an issue that is currently "hot" but not as fundamental as some of the others covered, but the essential areas nonetheless receive adequate attention.

The more serious problem is that the discussion is often fragmented; separate discussions of chronic and acute toxicology studies, for example, can lead one to lose sight of the elements they have in common, namely, that any test which is necessary to insure the safety of any substance is thereby

justified. Similarly, the conclusions to be drawn about any one of the topics covered tend to focus on the particular aspects of that topic. Thus, in research in psychology, some of the conclusions (pp. 147-8) involve a challenging list of ways to reduce animal suffering in psychological research. What one would like, in addition, is a stepping-back and an evaluation of the similarities and differences between the problems posed, say, by psychological and biomedical research, by education and testing, and so on. That sort of question would force a more careful analysis of the connections between technical specifics and philosophical generalizations.

The fragmentation is to some extent reflected in the organization of the book. It would certainly seem more natural, for example, to include the chapters on toxicology testing in Section II, thereby grouping them with the other chapters which explore specific uses of animals. Chapters 11 and 12, on concerns of the animal welfare movement and responses to some of that movement's charges, do not fit very well in that section and would cohere more easily with the material in Section IV. Such organizational problems may reflect a weakness in the conception of the connections between the various topics.

As suggested earlier, the philosophical elements of Rowan's arguments are the weakest aspect of the book. In fairness, it must be reiterated that Rowan's goal is not to give a sustained and single-minded philosophical argument for a specific feature, and he does succeed in highlighting those points at which standard philosophical arguments become relevant to a scientific discussion and vice versa. However, Rowan's discussion of "The Moral Question" is almost completely contained in one chapter, and more than half of that chapter is an historical survey. As a result, only about three pages (pp. 257-60) are devoted to a discussion of the philosophical arguments. All of this will be useful --and accessible--to the non-philosophical reader who may be considering this debate for the first time but will not provide any new material for those with any familiarity with the topic. Moreover, references to "apparent philosophical sophistry" (p. 259) put the entire theoretical underpinnings of the issue in a stereotypically negative light.

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Rowan occasionally touches on other issues about which philosophy has much to contribute. The discussions of scientific method, of consciousness, and of the definition of suffering are the most obvious examples. One cannot help but think that a better understanding of the "apparent philosophical sophistry" in these areas would have resulted in a stronger and more sophisticated analysis. As it is, Rowan's remarks tend to be somewhat vague and unsatisfying.

Perhaps the best way to sum up the style, tone, and substance of OMMM is to note that it exemplifies the position that is championed by the Scientists' Center for Animal Welfare (SCAW), the official line of the Humane Society of the United States (HSUS), and that portion of NIH that is promulgating new regulations governing animal welfare. That is, Rowan is part of a movement which is firmly rooted within the scientific community but which is cognizant of and sympathetic to the need to raise serious moral questions about the use of animals in research. The philosophical arguments which justify those questions are less important in this context than the fact that the questions are being addressed.

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Opinion

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In an earlier "Opinion" column (BTS I/3, Summer, 1985), I stated, "the processes extinguishing the gods, tribes, and species are the same." This view suggests that to protect gods may be required of us if species are to be protected. It also suggests that measures for the protection of species and nature, if successful, may also protect the gods. Can any dour atheist accept these relationships? And how can we protect gods or God, given that they are rather convincingly believed to be dead? If the gods are not alive, or are not products (projections, according to one view) of present cultures, or are old gods, much recent writing holds that they cannot be made real for us, cannot be brought to have real bearing upon our lives. Certainly this must be the case, if these gods or this God are truly dead, although such a viewpoint is not quite the same as would be a view which held that the gods might in their own time and at their discretion, not brought back by us, reappear. Probably they will not be forced into existence overtly nor, more deceptively, through the making of so dismal a worldly situation, including the extinction of species, that the gods must (we insist) intervene if they exist and are either just or compassionate. We shall probably not be able to force the gods to reappear, or to save nature by driving nature to the wall and extinguishing species altogether. Somehow we must ourselves relent.

Still, the processes that have destroyed the gods, tribes, and species are largely the same. The habits of mind and practices of secular scientific culture (reduced substantially to economy) have drained the world of much of its color and abundance. This culture, abetted by the demands and accusations made of God by Sade, Stirner, Marx, and others, traced out in the historical account provided by Albert Camus in The Rebel, has in other hands proceeded from a debunking of the