zations is making the very same mistake that made the Scopes trial necessary; namely, the suppression of free expression of ideas. Your coverage of testimony given before a committee of the California State Department of Education (*ABT* 34 [7]: 411–415) presented a thorough report of our present view of the origin of life (that is, evolution). Is the absence in your report of any pro-creationist view intended to lead us to presume that no such testimony was offered?

I suspect you are following in the footsteps of the planning committee for the NABT national convention, which chose to omit any reference to creationism in the printed program. We tend to excuse that by saying that creationism is "unscientific." That kind of excuse for suppressing the free exchange of ideas is akin to the claim of "heresy" used a century earlier. If the only evidence for creationism comes from the Bible, surely the NABT membership deserves to know it. If, on the other hand, creationists use natural phenomena as a basis for their view, we should be permitted to hear that, too.

The best way to eliminate error is to permit the light of honest investigation to shine on it. That's the way science has progressed this far. We must be careful not to be so zealous in the protection of some dogma that we stifle the open forum.

G. H. Brown
1122 W. St. Gertrude Place
Santa Ana, Calif. 92707

The editor comments:

We presented the statements representing the views of a high percentage of our membership and the majority of the NABT board of directors. Omission of mention of other testimony was not intended to disparage other remarks; it's just that we could not possibly present the complete testimony and that we did want our readers to be aware of the views presented by outstanding scientists.

ABT cannot operate as an open forum in the same sense that lay magazines and newspapers operate. *ABT* is a science-education magazine for teachers of life sciences. The editors hold that those articles and reports that are published should reflect modern scientific data and theories. This means that every person who proposes a theory or writes an article will not necessarily be provided an open forum for his views. A high percentage of the materials directed to *ABT* are not accepted, because they do not meet the criteria of our referees for publication.

Reader Brown is unfamiliar with *ABT*'s record. As far as we know, we were the first journal of our kind to open its pages—more than two years ago—to the creationists, in the belief that biology teachers should become familiar, in detail, with the creationist view: see "A Challenge to Neo-Darwinism," by Duane T. Gish (*ABT* 32 [8]: 495–497), and subsequent letters to the editor from creationists. And we have had to resist attempts to shut off debate in these pages: as G. H. Brown says, there *are* people who will not tolerate "heresy."

ABT had nothing to do with the printing of the convention program; but the program itself is testimony to the willingness of NABT to examine the matter openly. A creationist's convention paper appears elsewhere in this issue of the journal.

NABT, *ABT*, and G. H. Brown are in fundamental agreement as to the need for an open forum.

WHAT PRACTICES ARE CRUEL?

George Russell has made an eloquent and timely plea for more humaneness in studying live animals in the classroom (*ABT* 34 [5]: 254–257). His advocacy of introducing more wonder and compassion into biology-teaching has great merit. He rightly insists that we should keep firmly in mind the question whether the result of a student experiment "justifies the agonies inflicted on a sentient creature."

But, to my mind, he spoils his argument because he cites, as two examples of animal abuse, the pithing of frogs and the dissection of earthworms. (His third example, of nutritional deprivation of mammals, is more convincing.) The frog and earthworm examples represent either misplaced criticism or extremist views. Pithing a frog and killing an earthworm, when properly done, are completely humane. No "agonies" are involved for the animal. With proper procedures these deaths should be instantaneous and virtually painless. Certainly, a teacher who cannot perform these techniques correctly should not attempt them, and it *does* require training to learn them. It is my opinion that these procedures and, indeed, painless killing of small mammals, such as mice, have a rightful place in the high-school classroom—always providing that (i) the killing is done by an adult experienced in these techniques and (ii) a minimum number of animals is used and, where feasible, a multiplicity of uses is sought. For instance, from a single animal it is possible to obtain many segments of intestine, the heart, diaphragm, gastrocnemius muscles, abdominal skin, liver, and kidneys—enough material for a whole class.

In my experience examples of improper use of animals in classrooms are relatively rare. However, significant problems do exist and, indeed, are common in extracurricular activities, such as science fairs and similar competitions. The alarming extent of the problem is detailed in a report of eight recent science fairs, which shows that, of the youngsters who used small mammals (gerbils, hamsters, guinea pigs, mice), the *majority* inflicted pain or lingering death on the animals. These projects included botched-up, unsupervised surgery and endless simplistic demonstrations that well-known harmful agents do, in fact, cause suffering and death. Typical were projects in which students, working at home, administered to small mammals insecticides, lead, or toxic

drugs or exposed them to disease organisms or freezing temperatures until the animals died. Of the four projects that involved exposing small mammals to cigarette smoke, three were continued until the animals died and the fourth until the animal became blind. In several cases nutritionally inadequate diets were fed to small mammals until they, too, became blind or died. Frequently the projects were very badly done. Supervision was usually cursory or nonexistent. Despite their inhumanity, none of these projects was banned from exhibition; indeed, several received prizes. (Animal Welfare Institute, 1972: *Information Report* 21 [3]: 1–6.)

These activities are a travesty of science. To my mind these are biologic "experiments" of the kind that, in the words of Joseph Wood Krutch (quoted by Russell), "fails to promote reverence for life, and encourages a tendency to blaspheme it."

Russell states what I gather to be an antivivisectionist stand. What I am saying is quite different. I defend the right of professional scientists, like myself, to engage in animal research work for the purpose of gaining new knowledge. But an increasing number of veterinarians and biomedical scientists deplore the recent tendency of high-school students to conduct unrestricted experimentation on warm-blooded animals. We, the scientists and teachers who wish to preserve the good name of medical science, should raise our voices to see that these improper juvenile activities are stopped. Support should be withdrawn from those competitions that fail to achieve proper standards of animal use.

F. Barbara Orlans
7035 Wilson Lane
Bethesda, Md. 20034

George K. Russell comments:

I am convinced that the killing of animals in high-school and college biology courses serves no useful purpose, no matter what the circumstances. In my view, the onus is on Barbara Orlans to show that the killing of animals is necessary and that the experiment or demonstration could not be performed in some other way. In addition, the issue is greater than the humane treatment of animals. Even if frogs and earthworms could be killed "instantaneously," what about the effects of such killing on the sensibilities of the students?

My article represented a plea for a new pedagogy based on living experience of and respect for plant and animal life. Students will not feel admiration or respect for an animal that has just been killed for their use. The shocking abuse of animals in high-school science fairs is a direct result of attitudes developed in classroom experiences. I sincerely hope that many teachers will recognize the need for a new approach and will work toward the development of a pedagogy based on some of the ideas expressed in my article.

SUGGESTIONS FOR CONTRIBUTORS

STYLE. *American Biology Teacher* would rather receive an ill-written article containing worthwhile ideas than a stylistic masterpiece that says little: our editors can mend bad writing in a good cause. However, we do hope for clear terse prose, free of jargon. Sensible advice for writers will be found in the *CBE Style Manual* (3rd ed.) of the Council of Biology Editors and in *How to Write Scientific and Technical Papers*, by Sam F. Trelease.

In matters of punctuation, abbreviation, and the like we follow generally the CBE manual and the University of Chicago *Manual of Style*. Our spellings are usually those preferred in *Webster's Third New International Dictionary* and its abridgment, *Webster's Seventh New Collegiate Dictionary*.

Technical measurements are in metric, not English, units.

Avoid footnotes of any kind. References to the literature are made on-line (not by means of superscripts) within the text. If only one, two, or three works are cited, each is given in full, in the form "A. B. Smith, 1969: *Elements of Biology*, 4th ed., Jones Publishing Co., New York" for a book and "W. X. White and Y. Z. Green, 1965: 'The Inquiry Process,' *Journal of Pedagogy* 7 (2): 53-56" for an article. If four or more works are cited, they are presented at the end of the article as a bibliography arranged alphabetically by authors' last names, in the following forms for books and journals:

SMITH, A. B. 1969. *Elements of biology*, 4th ed. Jones Publishing Co., New York.
WHITE, W. X., and Y. Z. GREEN. 1965. The inquiry process. *Journal of Pedagogy* 7 (2): 53-56.

(Note punctuation and spacing; the lowercase style for titles, and no quotation marks; and the full names of periodicals and publishers.) Reference to the bibliography from the text takes the parenthetic form "(Smith, 1969)"; if the same title is cited a second time this short form is repeated or, better, the reference is recast as, for example, "Smith also says . . . ." The aim is to disburden the text of apparatus—*ibid.* and its relatives. Within text or bibliography a reference may be made precise by adding, for example, "p. 123-145" or "ch. 8." Responsibility for exact quotation lies with the writer, not the editor.

MANUSCRIPT. Double-space on one side only of standard (8½-by-11-inch) erasure-resistant bond paper, allowing 1½-inch margins all around. Avoid line-end division of words.

ILLUSTRATIONS, ETC. Photos should be glossy prints not less than 5 inches wide. Other kinds of illustrations should be rendered in black ink on heavy paper, preferably with labeling done expertly on a transparent overlay. Key each illustration, on the back, to its legend ("caption") written on a separate sheet—being sure to mention credits, including "photo by author." Tabular material, too, must be presented on separate sheets—regardless of length. Within the body of the manuscript simply indicate relevance at the proper place, as, "see fig. 1" or "see table."

GENERAL CONSIDERATIONS. The editor welcomes letters of inquiry describing, in some detail, articles he may wish to see. Manuscripts that arrive unannounced may be considered but will not be returned unless accompanied by a stamped, self-addressed envelope.

We acknowledge receipt of manuscript immediately. During preparation of articles for the press we expect authors to answer queries promptly and to observe deadlines rigorously. Authors will be given two opportunities to make changes: substantially on a copy of the manuscript as edited, minimally on galley proofs.

Offprints may be purchased at prices that will be quoted by the printer.