

Dear Editor:

Tina Santopalo's letter to the editor, "Stop Condoning Cruelty to Animals" in the Nov./Dec. issue of the *ABT*, raises many serious questions about biology education, but one is of paramount importance. It is assumed that dissection of animals desensitizes its practitioners. Since it is possible to operate on animals without pain or discomfort in the same way that is possible to do so in human medicine we must assume that dissection is neutral. If it desensitizes, the fault is not with dissection but with its practitioners. There is no better way to become sensitive to how living organisms respond than to work with them. Our response to Ms. Santopalo's criticism must not be to stop involving our students with living things. Many biology teachers already use preserved animals and models to avoid criticism. *If critics truly want people to become more sensitive to living things they should be encouraging more experience with them, not less.*

The current discussion about animal rights deals with a much larger question than whether procedures are humane. The concern is about the right of animals to live their own lives and any conclusions one draws must apply to all our interactions with animals, not just educational use. If we decide to use animals for any purpose, then, surely, developing understanding which will benefit both man and other animals must rank very high on any list of ethical practices, certainly far ahead of hunting and fishing for example.

Many critics do not have the biological knowledge to appreciate that humane vivisection is possible and important in developing biological understanding. For educational purposes, animal handling, anesthesia, dissection and experimentation

Editorial

Crimes Committed in the Name of Biology Education

What crimes have we committed lately? I do not mean crimes against the laws of the nation, but rather crimes against our students. There is no criminal intent in these acts; they are crimes of thoughtlessness, laziness and omission. Not crimes of passion, these are instead crimes resulting from an absence of compassion. Many are minor crimes:

- Procrastinating about grading papers.
- Blaming administrators when we could solve at least some of the problems ourselves.
- Failing to keep up with advances in biology. (It's easier to use last year's lesson plan.)
- Allowing ourselves to be distracted, and thus using our precious class time for nonbiological topics.
- Assigning busywork.
- Worrying about what the students will do to the equipment instead of what the equipment can do for the students.
- Not incorporating living organisms into lessons because they are a nuisance to maintain.
- Spending more preparation and class time on what we know and like best and slighting other topics. (Could this be the reason why most students arrive at college with little knowledge of, or enthusiasm for botany and microbiology?)
- Resisting change merely because it takes effort to change.
- Encouraging memorization instead of stressing understanding.

These minor crimes are common, and we need to work to avoid them. But what are the major crimes? They

are readily identified by their serious adverse effects on the lives of our students, and generally involve some combination of turning students off to biology and diminishing their self-confidence.

We all have had students who performed poorly, even though they seemed to have ability. Sometimes it becomes obvious that a previous teacher has given them so much negative feedback in science that they have become convinced they are incompetent in that subject. Have we done this to some of our own students?

Our students are probably all in the twelve-to twenty-year-old age bracket . . . that is, they are at a time in their lives when genuine self-confidence is often low. Have we tried consistently to add to their feelings of self-worth? Or have we unintentionally made them feel stupid and unwanted?

If we are guilty of some of these crimes, we have many good defenses against prosecution. We are overworked, underpaid, and must deal with too many students on too small a budget. (On some days, a temporary insanity plea might be appropriate.) Or, we may rationalize our laziness and/or poor preparation with the "it's always best to let the students figure things out for themselves" attitude. But in the years to come, our society will require more good biologists and better informed citizens. Producing these individuals will require us to work harder to lead, inspire and teach our students. We can ill afford to discourage our students by our "criminal" behavior.

Dan Wivagg
Associate Editor

can be conducted in very humane ways that develop sensitivity. The primary obstacle in preventing this kind of instruction appears to be lack of understanding by teachers about proper procedures and the resultant inability or unwillingness to take the time to be certain that students understand the meaning of the responses they see in the animals they are studying. If an animal has reflex responses during anesthesia these need to be understood so the student becomes *sensitive* to the animals, *not ignored or misunderstood so desensitization occurs*. Helping students understand these responses can also result in some of the most meaningful and relevant teaching we do. *Ignoring them* can only produce a more desensitized public, including doctors and nurses. Many teachers simply can't be bothered with these problems and teach biology courses that give little understanding about what it means to be alive. If living organisms are used and teachers show respect for them, rather than killing them in the back room, students develop some respect for them too! If an animal is worth sacrificing so we can learn from it, we should learn as much as we can from it and living organisms are much more meaningful than preserved ones.

Ms. Santopalo has learned to work with humans in her profession of nursing by practicing on them. She claims that she would have learned nothing from dissecting animals in her anatomy and physiology courses that would have contributed to these skills, so she refused to participate. I hope this is not indicative of what happens in most anatomy and physiology courses but I suspect it is more common than most of us would like to admit. The number of nurses who have withdrawn blood from my arm, placed a cotton ball on top of the needle, *pushed down on it*, and withdrawn the needle are in the majority. Sensitivity while working with living things begins when one understands what one is doing and is comfortable doing it; it never develops in those individuals who learn to put up with procedures they do not understand!

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Dear Editor:

I wish to respond to Tina Santopalo's recent letter to the editor [Stop condoning cruelty to animals, *ABT*, 47 (8), 454]. First, let me say that by publishing the letter—even though

it was not written by a biologist or biology educator—*ABT* exhibited an admirable degree of tolerance and set an "equal time" precedent that most other journals would do well to emulate. Second, the specific objections to *ABT* publishing policy—advertisements for a dissection guide and directions for an experiment—raised in the letter show that Santopalo knows very little about the audience of *ABT*. It is not the intent of this letter to correct her ignorance of the interests and needs of biology teachers.

Santopalo's arguments against animal dissection and experimentation are really quite poorly researched, and they approach a knee-jerk appeal to the emotions rather than a rational case for humane treatment of animals in the biology classroom. For example, the statement that "my classmates seemed more interested in making hamburger out of the animals than in learning anything about biology" suggests that the problem was with the teacher rather than with the activity. It is obvious that less than optimal classroom control was being exerted and that the teacher approached the dissection(s) in a very ineffective manner. This is more a cry for better teaching than an argument against dissection *per se*.

Further, the letter strongly implies that dissection specimens are dispatched cruelly. Most cats sold for dissection come from humane society sources; they were to be destroyed anyway. Perhaps Santopalo feels that those animals are more humanely killed by starvation and semi-trucks or that their remains are more usefully disposed of in the local landfill. Organs used for dissection are typically slaughterhouse materials, yet Santopalo does not establish that she is a vegetarian. Similarly, lower vertebrates (frogs and fish) are also food items, and proper preservation for dissection requires more careful handling (and much less mutilation) of the living animals than one typically observes in commercial aquaculture operations.

A final inaccuracy is revealed when Santopalo asserts that medical students should study their profession exclusively in clinics and hospitals or from computer simulations. First, gross anatomy courses in most medical schools utilize cadavers rather than preserved animals for dissection. Second, very few patients would sign surgical releases if they thought that their physician might still be learning the rudiments of anatomy in the operating room. Last, computer simula-

tions, while they are useful adjuncts to the total teaching process, can present only a limited sensory experience; video-interactive software still requires dissection during filming!

My main objection to the letter, however, lies not in the above arguments and fallacies. Santopalo says that she is a nurse; although whether she is licensed, registered or a student is not specified. While nurses are health care professionals, they are not scientists. At best, they may be considered biotechnicians. One problem faced by science education today is that technicians feel, because their training is so highly specialized, they are qualified to render philosophical judgments concerning the methodology of a scientific field. The animal rights movement (as well as the creationism movement) is dominated not by professional biologists but by laypersons, technicians and scientists from other disciplines.

Dissection is a method integral to the traditional paradigm of anatomy; animal experimentation is integral to the paradigm of physiology. Perhaps one day, computer simulations will replace these techniques in the paradigm of biology. However, paradigm change will occur from within the discipline as new methodologies are perfected. Change will not come from outside as emotional and uninformed individuals complain.

Biology teachers should, however, consider Santopalo's criticisms carefully. Are our students mature enough to perform meaningful dissections and experiments, or would simulation be more effective? Do we treat our specimens as what they are—the real basis of our subject? Thoughtful treatment of animal dissection and experimentation in the classroom can help minimize negative student reactions to biology (such as those evidenced by Santopalo).

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Correction

Because of an editorial transposition of terms in an article by Daryl Miller, "Etymology in the Biology Classroom," (Vol. 48(1), January 1986, page 45), there is an error in a list of root suffixes for biological terms. *Troph* is the correct root suffix for a turning, not *tom*, *tomy*. *Tom*, *tomy* refers to a part or segment as in *myotome*. We regret any confusion caused by this oversight.