Conclusion

Wee, sleekit, tim’rous, cow’rin beastie,
Oh, what a panic’s in thy breastie,
Thy need not start away so hastie
With bickering brattle,
I would be loathe to run and chase thee
With murd’ring pattle.

—Robert Burns

Despite recent advances in technology and increasing societal concern for animals, animals continue to be exploited and killed in large numbers so that students can learn about their structure and function. Dissection may not be without its merits from an educational standpoint, if well implemented, but it appears from student surveys that it usually is not. When one considers the associated costs—animal suffering and death in the supply trade, disruption of wild animal populations, messages that tend to undermine rather than reinforce respect for life and concern for others, rising costs of animal carcasses (as compared with alternatives with longer shelf lives), exposure to potentially harmful chemicals, and greater time expenditures in preparing and presenting various animal-based exercises—the balance clearly falls on the side of abandoning dissection, at least in its current form.

One possible reason for dissection’s continued prominence in life science education is tradition. Today’s biology teachers, science administrators, legislators, and parents were taught using animal dissections. Dissection is a familiar, comfortable, tried-and-true teaching method.

Dissection has a veneer of “real science” to it. Because it involves once-living animals, it gives the illusion that it is that much closer than a simulation to real-world,
“cutting-edge” science. This impression is commonly conveyed in the comments of students who have participated in dissections (e.g., Solot 1995; Barr, in press). But while careful observation is an important part of a scientist’s vocation, the dissection exercise is devoid of the hypothesis testing that defines the scientific process.

Dissection persists because it is a readily available way for a teacher to bring a student closer to a once-living organism. Who can fault a teacher for wanting to do that?

If an educator feels that student contact with the internal structures of once-living animals is essential, then he/she should seek out ethical sources of animal (or human) cadavers. If an educator views anatomy and physiology as an essential part of the curriculum, then he/she has an enormous range of proven materials—from computer simulations to student self-study modules—from which to choose. But if the educator wants to teach both the life and the science that comprise the life science discipline, then he/she will provide students with opportunities to do inquiry-based, scientific studies of living organisms. Students will be given the chance to ask questions about life that are meaningful to them. They will learn how to conduct a scientific experiment from start to finish—not by merely being told how it is done, but by doing it themselves, with guidance and encouragement.

This, of course, is not a revolutionary idea. The National Science Education Standards are unequivocal in their support of inquiry-based learning, and many teachers are using a variety of creative life science learning modules that emphasize learning by doing (see chapter 2). But for the most part, life science education today remains mired in the textbook, the lecture, and the “cookbook” lab, and in the morbid study of dead or dying organisms. The time has come to unite inquiry-based, active learning with respect for the integrity of life and the planet on which it has evolved. This is the future of life science education.