From the President

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Making Connections…

Off hand, I am not sure I can think of a more diverse biological discipline than ecology, or at least one that encompasses the study of so many variables interacting in so many different ways. Because it is the study of organisms (including humans) and their interactions with other organisms and the environment (the history of which is neatly described in Edward Kormondy's article in this issue), studying ecology can captivate students' interests as they view nature at the macroscopic level, to which they often most easily relate. However, it should come as no surprise to biology teachers that learning about ecological processes can call upon one's understanding of molecular, cellular, genetic, and physiological processes and challenge a student to think in larger scales of time and area while applying their knowledge of the physical sciences, mathematics, and statistics. Teaching ecology provides teachers with the opportunity to engage students in systems and computational biology, modeling, and analyzing emergent properties as outlined in the AAAS *Vision and Change* report for undergraduate biology or in NRC's *Framework for K–12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*. Doing so requires that students not see ecology as a descriptive science involving collecting and identifying alone, as I recall ecology was portrayed in many of my undergraduate classes, but as an experimental science that poses an additional set of challenges and requires some different methodologies, especially if field work is involved.

This issue, which is focused on ecology, reflects those characteristics and offers models for and examples of activities and laboratories that can be used in a variety of classes. The activities anticipate the needs of teachers preparing for the *Next Generation Science Standards* by immersing students in science practices as they plan and conduct investigations in the lab or field. This issue also illustrates another characteristic of ecology, a fundamental one that students should learn quite early – interconnectedness. Scanning the titles in the table of contents immediately brought this to mind in several ways. Besides the scientific interconnections that are the study of ecology, I found a personal connection to almost every article. Growing up in a fifth-floor apartment and attending an urban university, watching squirrels collecting nuts was an enjoyable "field work" experience for this future ethologist (I still stop to watch them). My introductory biology instructor was involved in biological control research (ichneumon wasp parasitoids of aphids; Sullivan, 1972), and I learned much of my ecology and behavior from related examples. He also provided me my first experience with laboratory research and a hint of what earning a doctorate would entail. My wife earned her doctorate studying RNA polymerase from wheat germ, and perfecting techniques to extract DNA from wheat germ was a graduate-level inquiry experience back then. When I joined Oklahoma State University, my office was next to the lab that was developing the FETAX assay (Bantle & Sabourin, 1991) for use in ecotoxicological testing, which forms the basis for one of the exercises described in this issue. Two of my colleagues conduct research involving honey bee behavior and ecology at very different scales (Abramson et al., 1996, 2010; Baum et al., 2011) and share a talent for mentoring undergraduates and conducting outreach. I remember learning about the ink-following behavior of termites during a conversation with a friend and co-investigator while I was observing his science methods class so that I could learn about pre-service teacher education. I fondly recall sampling stream invertebrates in my undergraduate ecology and graduate aquatic entomology and limnology classes, and I appreciate the investigation in this issue that describes an approach that makes an inquiry experience with benthic invertebrates more accessible to students.

My personal experiences do not make these articles better, nor are they why they appear in this issue. These articles were selected for their quality and relevance to our readers in blind reviews. However, thinking about my connections to these articles reminds me of how we all share a variety of relationships not only with our environment, but also with our colleagues and members of this association. Such relationships help us grow professionally, promote the exchange of ideas, and reach consensus on what is excellence. Relating experiences also helps us engage and instruct our students. Herreid (1997/1998) describes teachers as storytellers and suggests that the best case studies are ones that tell a story and are personalized so as to connect to the reader. For many, seeing their science teachers as people and building a rapport with them plays a role in breaking down barriers and increasing their interest in pursuing success and retention in the sciences. This is also true for mentoring (Howard Hughes Medical Institute, 2006), where failure to build relationships can lead to attrition from the sciences, especially for those groups underrepresented in particular science disciplines (Johnson, 2007). On the other hand, engaging students in research in a collegial environment contributes to students' interest and retention in sciences.

So take the time to read and enjoy this issue, adapt and adopt the techniques described, share your thoughts with a colleague (or an author), and help build the connections for you and your students.

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