BIOLOGY LEADERS
LOOK AHEAD


On 22–24 March 2000, the American Institute of Biological Sciences, in conjunction with the Smithsonian Institution, hosted a conference entitled “Biological Challenges for the New Millennium.” The speakers, among the greatest living biologists, were asked to consider the notable achievements of their fields in the 20th century and how these achievements have set the stage for new directions and fresh discovery in the 21st century. For those who attended, these presentations offered a moment of profound reflection, when a century of biology was put in context, and one’s own small place and future could be seen on an immense canvas and in a brighter light. A New Century of Biology, edited by John Kress, tropical botanist at the Smithsonian Institution, and Gary Barrett, landscape ecologist and AIBS president in 1998, is a collection of essays, each authored by a different conference speaker, based on all but one of the presentations given at this meeting.

In the introduction, Barrett and Kress outline their overarching goal for the book: to address the processes that transcend all levels of biological organization and to emphasize integration among these levels. Each chapter author takes up a process to highlight (energetics, Gene Likens; development, Marvalee Wake; regulation, Lynn Margulis; behavior, Gordon Orians; diversity, Edward Wilson and Thomas Lovejoy; and conservation, Ghillean Prance and Daniel Janzen), giving a somewhat balanced approach among disciplines. I do not think this book truly synthesized the transdisciplinary accomplishments of biology, as envisaged in the introduction—there is little connection among chapters, with authors all developing their own themes independently. Nonetheless, each chapter illuminates a different view of past and future challenges in biology, and all are well worth reading.

The foreword, by Ernst Mayr, reminds us that biology is a young science, and that, although we have made remarkable advances in understanding processes—how a neuron fires or the nature of a gene, for example—the grand challenges still lie in knowing complex systems, such as the developmental system, the central nervous system, or the ecosystem.

Lynn Margulis, in the opening chapter, admonishes the community of biologists and stops us in our tracks from comfortably reflecting on a century of achievement. If we are to understand clues to the complexity of life, we can no longer generally ignore bacteria. In Margulis’s new century, bacteria will inform us about metabolic repertoires we have hardly considered, and we will learn that they hold amazing new collections of pathways. Genome sequences will reveal the degree to which life on earth has evolved as a result of microbial “genetic pack rats,” borrowing lots of genes from other organisms, such that our current