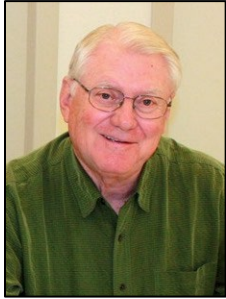


GUEST EDITORIAL

Society Needs a Biology that Includes Natural History

David J. Schmidly, Professor Emeritus and Past President, Texas Tech University

(Current Address and Title: Research Professor and Past President, the University of New Mexico)



“Write and speak with appreciation for all that you have been gifted. Recognize that politics with no biology, or politics without field biology, or a political platform in which human biological requirements form but one plank, is a vision of the gates of hell.” These words, written by literary critic and writer Barry Lopez, who also is a Distinguished Scholar at Texas Tech, warn us of the consequences of a world society without a robust science of natural history (Lopez, B. 2001. *The Naturalist*. Orion Autumn 2001:38–43).

Yet, just a year before Lopez’ article, an editorial appeared in the most prestigious journal for higher education warning of the demise of natural history at American universities (Wilcove, D.S., and T. Eisner. 2000. *The Impending Extinction of Natural History*. *Chronicle Review*, *Chronicle of Higher Education* 47(3):B24). The authors wrote that the “deinstitutionalization of natural history looms as one of the biggest scientific mistakes of our time, perpetuated by the very scientists and institutions that depend upon natural history for their well-being.”

Many of the predictions made by Wilcove and Eisner have come true. It is well documented that teaching and research in natural history have been on a steep decline curve at the same time we are witnessing a dramatic threat to the earth’s biodiversity.

Why would higher education go so far as to lose a field of science that provides some of the purest facts about our natural world? Scholars who have written about this blame factors such as the ascendancy of the hard sciences in the era of the atomic bomb and Sputnik, the separation of people and nature associated with the desertion of the farm for nature-impooverished cities and suburbs, and more recently the widespread appeal of reductionism in science and a certain “technophilia” that have accompanied the rise of molecular biology together with powerful, institutionalized pressures to deliver fast results and garner large research grants.

All of this adds up to a serious consequence for society should, in fact, natural history disappear from American universities. What’s at stake is the continued vibrancy of ecology, of animal behavior and botany, and much of molecular biology, and even of medicine and biotechnology.

The late Carl Woese, a molecular biologist and a member of the National Academy of Sciences, warned about a society that permits biology to become an engineering discipline that is focused on changing the living world without trying to understand it (Woese, C. 2004. *A new biology for a new century*. *Microbiology and Molecular Biology Reviews* 68 (2): 173-186). To quote Woese, “A biology obsessed with reductionism that strips the organism from its environment, ignores its history and evolutionary flow, and shreds it into parts to the extent that a sense of the whole – the whole cell, the whole multicellular organism, the biosphere – is effectively gone is a danger to itself.”

We need a biology that teaches us to live in harmony with the rest of the living world, not one that is a distorted and incomplete reflection of that world. Society needs to appreciate that biology is here to understand the world, not primarily to change it. Natural history, with its focus on the whole organism in its living environment, using the powerful tools and understanding of molecular biology is one of the best ways to achieve this understanding. That is why we must teach students about both.

The cornerstone of natural history research and education for the past 200 years has been the specimen collections associated with governmental, private, and academic-affiliated natural history museums. The voucher specimens housed in these collections constitute most of society's scientific knowledge about the diversity, distribution, and life history of North American wildlife, and they are a key link to understanding the impact of climate change in our country. The field expeditions that produced these collections have constituted the basis for educating generations of professional, scientific naturalists. Unfortunately, these collections also have steadily declined as funding and support for natural history collections has waned over the last 50 years.

So, in lieu of all of this, how does natural history education and research stack up at Texas Tech University? The Natural Science Research Laboratory (NSRL), which is a Division of the Museum, has contributed significantly to the research and education mission of the University, placing Tech front and center in natural history research and education in the U.S. Consider the following accomplishments:

- The NSRL houses four major collections—the Mammal Collection, the Bird Collection, the Invertebrate Collection, and the Genetic Resources Collection—and these collections benefit TTU by increasing the University's visibility and reputation for excellence in teaching, research, and publication.
- The Mammal collection houses about 121,000 specimens, ranking it 5th in size among academic-affiliated collections and 8th among all mammal collections in the U.S.
- The Genetic Resources Collection, which contains >340,000 samples of tissues, blood, and DNA from >95,000 specimens of mammals and other taxa, is among the largest genetic resource collections in the U.S.
- Since 2000, faculty and students associated with the NSRL have produced >350 natural history publications utilizing the specimens of the NSRL.
- Since 2010, 60 TTU graduate students received a combined 200 years of training and education, and 38 graduate degrees were granted, as the result of NSRL-based research and education activities in natural history.

And, just as significant, through its various academic departments, TTU continues to offer courses in natural history, including all of the "ologies," as well as specimen-based field work and expeditions. Everyone associated with Texas Tech University and the NSRL should be proud of its approach and achievements in maintaining an emphasis on natural history research and education.

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