News and Views

ACUBE Presidential Address: Evolution is Good Science

Buzz Hoagland
Indiana State University
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I recently had the privilege to represent ACUBE at an invited-only conference to discuss the status and future of teaching evolution. The National Conference on the Teaching of Evolution was funded by the National Science Foundation and hosted by the University of California Museum of Paleontology 5-8 October 2000. This conference was unique in that it brought together, for the first time, representatives from greater than 50 professional associations and societies who have a vested interest in the teaching of evolution. This four-day event was a real eye-opener.

After spending many hours in intense discussions with geologists, physical anthropologists, K-12 educators, members of the media, and other biologists, I realized how narrow my views on evolution and evolution education have been. My mantra, Dobzhansky’s “Nothing in biology makes sense except in the light of evolution,” needs revision.

Partly because evolution is intellectually challenging, and partly because I believed that many undergraduates are not interested in evolution, I am guilty of giving evolution short shrift in many of my courses. Have I ever asked students enrolled in my courses if they are interested in learning about evolution? No. Did I know that when Time Magazine places a cladogram of human evolution on their cover, sales increase significantly? No. Will I change my courses? Yes. I am a science educator, and evolution is good science.

There are numerous reasons why students should learn about evolution. First and foremost is the fact that evolution is good science. And, because of its inherent richness, a curriculum designed with evolution as its unifying theme is a mile wide and a mile deep. The very nature of evolution invites students to participate in the broader aspects of scientific inquiry. They learn to formulate questions, generate hypotheses, test hypotheses, ... in short, undergraduates who study evolution participate fully in the process of science.

The study of evolution can also assist undergraduates as they begin to develop a worldview. Through an understanding of the processes and patterns of evolution, students can more knowledgeably address questions of their own origin, origins of other organisms, origins of life itself, and origins of planets, solar systems, and the universe.

Many undergraduate students express sincere concerns about overpopulation, the loss of biodiversity, the use of pesticides, and emerging infectious diseases. Each of these issues is more fully understood through an understanding of evolution. Evolution is good science.

So, how do we as biology educators facilitate improved student understanding of evolution? First, we need to know what our students know and do not know about evolution. How do we obtain this information? Ask them. It may also be helpful to know that the majority of U.S. citizens (55-75%, depending upon which survey one reads) do not accept evolution. This may be a result of our failure to teach evolution or our failure to teach evolution in ways that students can truly understand its enormous significance. Second, we must ensure that evolution is the unifying theme in biology courses, and that students learn and understand its central position in science. Third, we must be proactive in our effort to improve understanding of evolution science. For example, WGBH (the PBS station that produces NOVA) is developing an eight-hour, seven-installment program entitled Evolution is Happening that will air during the fall 2001. Preceding the broadcast will be a $1-2 million advertising campaign. We need to begin discussing strategies about how we can take advantage of this program and media blitz to improve evolution education in our home institutions and communities. This is a once-in-a-lifetime opportunity to propel evolution onto center stage. Fourth, we need to embrace those educational practices that are founded in sound pedagogical research. Inquiry-based learning appears in national and state K-12 science curriculum standards and frameworks and should play a central role in undergraduate evolution education. Having made this pronouncement, I am well aware of the fact that this will only occur when the appropriate resources and necessary support are made available. The National Academy of Science has produced numerous resources for improving science and evolution education and they are available from the National Academy Press (NAP) website. NAP titles that I have
found particularly useful include: *How People Learn*\(^2\), *Inquiry and the National Science Education Standards: A Guide for Teaching and Learning*\(^1\), and *Teaching About Evolution and the Nature of Science*\(^4\). The American Society of Naturalists has published a useful document entitled *Evolution, Science, and Society*\(^5\), which is available from their website as a PDF document. *Good Science, Bad Science: Teaching Evolution in the States*\(^6\), also known as the Lerner Report, was published in September 2000 and is available online as well. This report evaluates state K-12 science standards with respect to their treatment of evolution.

There are also numerous online resources available and in the development stage. One member of the Society for the Study of Evolution has received significant NSF funding to develop an online journal of Evolution Education and include a wide variety of educational resources as well. This website is currently in the development phase and should be available in 2001. The NSF has also funded a project by the AAAS to develop a national digital database that will be available in 2001-2002. WGBH is building an evolution education web site to accompany the Evolution is Happening series. The Executive Committee and the editors of *Bioscene* are committed to keeping the membership informed of the availability of these types of resources as they become available.

In conclusion, I am excited about the future of biology education, especially evolution education. I am pleased that we have chosen evolution education as our theme for our 45th Annual Meeting at the University of Nebraska, Kearney. And I am also pleased that ACUBE has adopted the Evolution is Good Science resolution and that we will proudly display this statement on our website.

**Notes:**

1 - http://www.ucmp.berkeley.edu/ncte/
2 - http://www.nap.edu/catalog/9853.html
3 - http://www.nap.edu/catalog/9596.html
4 - http://www.nap.edu/catalog/5787.html
5 - http://www.amnat.org/meagher.html
6 - http://www.edexcellence.net/

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**In Memoriam**

**John Bliese**

*1977 Honorary Life Member*

John C. W. Bliese, 87, of 107 E. 27th St. died Monday, Nov. 27, 2000, at St. John’s Center in Kearney, NE. He was born March 10, 1913 in Waterloo, Iowa to August and Caroline (Kolm) Bliese. He graduated from East Waterloo High School in 1931 and received his bachelor’s degree in biology from Iowa State Teachers College in 1935. He received a masters degree from Columbia University in 1936, and his doctorate in economic zoology from Iowa State College in 1953. He also receive additional schooling at the University of Southern California, the University of Michigan, State University of Iowa, Colorado State College and the University of Colorado.

He taught biology and physical sciences at Cedar Falls High School and at Teachers College High School, both in Cedar Falls, Iowa. He was an instructor of biological sciences at Cornell College in Mount Vernon, Iowa, and Iowa State College in Ames. He moved to Kearney, NE, in 1953 where he was a full-time biology professor at Kearney State College until retiring in 1983. He served as head of the biology department from 1962 to 1966. He also lectured about birds and led tours on crane viewing.

John was a member of the Nebraska State Education Association, National Education Association-Retired, National Retired Teachers Association, American Scientific Affiliation, International Crane Foundation, Whooping Crane Conservation Association, North American Crane Working Group, National Audubon Society, Nature Conservancy, Nebraska Statewide Arboretum, and the Nebraska Chapter of the Wildlife Society. He was also a member and past-president of the Big Bend Audubon Society, Nebraska Academy of Sciences and the Nebraska Ornithologist Union.

He received the Honorary Life Membership Award from ACUBE in 1977, the Johnny Appleseed Award in 1982 the Howard Juhl Conservation Award in 1982, the Kearney State College Distinguished Service Award in 1985, Admiral in the Great Navy of the State of Nebraska in 1987, the National Audubon Society Visionary Award in 1992, and the Crane Conservationist of the Year Award in 1994.