An Interdisciplinary Approach to Evolution Education

Mark Terry

When two other high school teachers and I put our heads together in 1974 to plan a joint study of evolution in our humanities and science classes, we didn't realize we were launching a forty-year project—but that's just what we did. Rather than delivering a curriculum set in stone, teachers of biology, history, English, visual arts, theater, and other disciplines have come together each year since then to map out a fresh unit on evolution. No two years have included the same set of readings, discussion topics, projects, and labs. As a result, teacher interest and involvement remain high, and faculty excitement fosters student engagement. This spring, students at the Northwest School—a private school in Seattle, Washington, serving almost 500 students in grades 6–12—will meet Darwin in the latest version of the unit, first conceived of all those years ago. In what follows, I'll briefly review the history of this interdisciplinary project, highlight its success, and offer suggestions for how similar approaches can be incorporated in many different course settings.

The collaboration began at the Oakwood School in North Hollywood, California, where English and history were already joined in a multi-year team-taught humanities program. Bringing biology into the picture for a couple of weeks by knitting together the nineteenth-century science of Darwin and Wallace with the changing worldviews of the time seemed a good idea. Including classic comparative anatomy labs, readings from Darwin, and discussion of the Scopes trial via Inherit the Wind was an immediate success with both faculty and students. (The early years of the unit were bracketed by the two significant “creation science” court cases in Arkansas, Epperson [1968] and McLean [1981]. These headline-generating trials readily demonstrated the unit’s Current Events relevance.)

The three teachers who initiated this approach at Oakwood (including me) moved on to found the Northwest School, where the unit has had an unbroken run since 1980. (For a description of the 2014 evolution unit, see Diving into Darwin 2014.) Northwest tenth graders all take a nineteenth-century focused humanities course along with a general biology course, so the unit has served both. A history or art teacher popping up in a biology class, or vice versa, always grabs student interest. Over the years, dozens of faculty have brought their particular expertise and perspectives to this program, weaving together material from art history, politics, religion, poetry, literature, theater, US history, and world history.

Success and Impact at the Northwest School

There’s no question that the success of this program at Northwest has been built in part on the requirement that all tenth-graders take the same humanities and biology courses during the same year, and on a schedule that assures large blocks of time (90-minute humani-
ties blocks some days, 90-minute biology labs and a scattering of 45-minute discussion periods each week). But collegiality and mutual interest matter the most. Across disciplines, faculty members trust and rely on each other, and express enthusiasm about each other’s contributions to the whole. Contrary to expectations, successful planning and implementation do not require a lot of time. With the unit up and running on a yearly basis, one or two joint planning periods in the weeks before are sufficient to make everyone’s role clear and to launch a new idea or two.

Details of the program were described in two articles published in 2005. “Art and evolution” (Terry 2005a) emphasizes the use of visual art throughout the unit and “Tending the tree of life in the high school garden” (Terry 2005b), a chapter from a volume that contains many other great evolution education ideas, details our historical approach. Our use of visual art in the evolution unit was also featured in a recent monograph on the value of drawing across a wide range of disciplines (Strauss 2013). For a description of some further contributions Northwest School has made to national efforts to improve evolution education, see Terry 2012.

We have been heartened and encouraged by the number of our graduates who have pursued careers involving evolutionary biology, and see this as suggestive that our approach to Darwin has been influential. Examples include two young women now completing evolutionary ecology PhDs, one at Princeton and the other at Wake Forest (who does most of her research in the Galápagos); a vertebrate paleontologist who is also an associate professor of anatomy at the Northeast Ohio Medical University; two paleoecologists, one who is an assistant professor of biology at Oregon State University, the other an assistant research professor at the University of Cincinnati; a paleontologist Teacher-Scholar Fellow in the Geology Department of Cornell College in Iowa; a children’s book author who has portrayed her pirate heroine as a naturalist wondering “What would Darwin think?” (Lorayne 2014; http://www.piratesstilly.com); and a sought-after scientific illustrator whose artwork now graces the pages of paleontological journals, *National Geographic*, *Scientific American*, and medical presentations. (You can see some of Mesa Schumacher’s [class of 2004] work at www.mesaschumacher.com.)

Equally satisfying are the many comments we have received over the decades from graduates (not just those who pursued science) who remember the evolution unit fondly. Musicians, journalists, social workers, homemakers, athletes, and civil servants are all equally likely to bring up the experience when reminiscing about their high school years. And it’s not uncommon for faculty to receive an e-mail along the lines of “Did you see this?” or “What do you think of this?” from an alum when something about evolution, creationism, or a new fossil find hits the national news.

**Trying the Northwest approach at your school**

Northwest School was founded with a commitment to cross-disciplinary studies, anchored in the blending of English and history in its humanities program. Ninth-graders, for example, are introduced to the history of the sciences and comparative religions. Our approach to the evolution unit fits right into this overall educational approach. We recognize, however, that such large collaborative endeavors are difficult in many school settings. That said, even a single instance of cross-disciplinary effort, experienced during a single period, can have a positive effect on learning. Students take notice when teachers they usually see...
in separate classes collaborate to create an activity that they obviously think is important. Such a break from the routine can rally enthusiasm and interest.

With that in mind, here are some ideas built on our experience that could be tried in a single class period (each assumes one member of the “team” will be a biology teacher):

- **American History** faculty have much to offer to enrich the biology curriculum, and vice versa. For example, they can collaborate in a study of Social Darwinism in the Gilded Age. Just comparing statements by Andrew Carnegie, William Graham Sumner, and others leads to a rich discussion of the intertwining of ideas and society.

- **American History** faculty can also join in a study of the important court cases that have dealt with evolution in the public schools. *Scopes, Epperson, McLean, and Kitzmiller* make an excellent set. Students can read and discuss material relevant to trials and decisions, most of which is readily accessible on the NCSE website (http://ncse.com).

- **Current Events** or **Media Studies** faculty can cooperate in studying the use of the word *evolution*—and even the concept itself—in advertising and popular media. For all the apparent difficulty that much of the American public has in understanding or accepting evolutionary science, “evolution” has been used to sell everything from perfume to automobiles. How is the word used? What are the sorts of visual images attached to the concept?

- **English** faculty can join in a close reading of fiction or poetry that shows a “Darwinian” influence, such as Stephen Crane’s *Maggie: A Girl of the Streets*. Tennyson’s phrase “Nature, red in tooth and claw” is quoted all the time; when was it written, in what context, and what else did he say?

- **Math** faculty can introduce quadratics along with a study of Hardy-Weinberg principles in population genetics. Population genetics simulations can easily generate “Aha!” moments for students who haven’t quite understood natural selection, and it can be stimulating to see quadratics at work in the real world.

- **Theater** faculty can help stage a reading of portions of *Inherit the Wind* and lead discussions of the relationship between the various movies, the original play and the Scopes trial itself. Students can explore how well attitudes of the fictional characters reflect those of the people of Dayton, Tennessee, in the 1920s and of historical figures involved in the trial.

- **Visual Art** faculty can introduce students to the transition to realism in Western art, away from the depiction of nature to symbolize religious or political ideas. Students can easily recognize this difference looking at images from a medieval bestiary in contrast to the amazing eighteenth-century art of Maria Sibylla Merian.

- **World History** faculty can use the lives of Darwin and Wallace as examples of class distinctions in Victorian society. Short biographies of these two will show that despite their very different backgrounds, both men were interested in the same questions and independently came up with remarkably similar ideas.
• **World History** faculty can also cooperate in introducing Ernst Haeckel’s great contributions to biology as well as his reactionary promotion of the Great Chain of Being as a racist social/political ideal. Similar to the consideration of Social Darwinism, this can deepen students’ understanding of the cross-fertilization of language and ideas. Science never happens in total isolation.

• **World History** or **Literature** faculty can develop a joint study of origin beliefs, comparative cosmogonies. Reading a series of intriguing creation stories, each one deeply believed in its home culture, is inherently interesting, but also helps put the science/religion “divide” into a much larger context.

**Deepening Understanding**

Our understanding of evolution progresses amid strong crosscurrents of social, political, artistic, and philosophical ideas. This is as true today as it was in the nineteenth century. When evolution is taught in our schools, most often it is kept under guard in the single box of biology class, and of course we hope that the science is taught thoroughly and well in biology. But opening that box even a little bit through an interdisciplinary effort can give both students and teachers an opportunity for more engagement and deeper understanding.

**References**


**About the Author**

Mark Terry is a member of the science faculty of Northwest School in Seattle, which he co-founded and where he served as Head of School from 1983 to 1990. He has taught in public and independent secondary schools in Washington, Oregon, California, and New York. His work in evolution education was recognized by the AIBS and NABT with their Evolution Education Award in 2011.

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