Guest Editorial

Why Anthropocentric Biology?

Why does so much of what is presented at the NABT conventions, and what we see in textbooks and other learning materials, center on a single species: *Homo sapiens*? At St. Louis this fall, nearly half of the convention program focused entirely or partially on humans. For example, the expensive and arguably worthwhile human genome project was the topic of a general session, again. The obligatory AIDS general session was there and so was a workshop on DNA fingerprinting and the criminal scene. Many new and revised textbooks, laboratory materials and high-tech programs or apparatuses on exhibit were in part or entirely centered on human biology. The quantity of sessions and presentations on the species and the large-volume marketing of human biology materials suggests that many biologists favor teaching about humans and that we, as instructors, cater to students' proclivity toward such teaching. Why? Are we just shortsighted or is anthropocentric biology too seductive to avoid?

Before I continue, let me expose my bias. We—*Homo sapiens*—are a flawed species, one not doing impressively well in our self-appointed, bumbling stewardship of the planet. Humankind is the most destructive breed yet to evolve. In fact, if left to a vote of all other species, *Homo sapiens* would most certainly be thrown off the planet, with prejudice, by a landslide margin that would make even modern Republicans envious. Compared to us, the nonhuman world is much more interesting, significant and vital.

I know human biology is what kids think they want. It seems more pertinent to their own narrow experience, and perhaps to their teacher's experience as well. Human biology is easier to teach in the sense that students pay attention more readily. I know that well because I teach a short course in human nutrition to nonmajors. Nonetheless, the anthropocentric focus of the biology curriculum scares me, and from some discussions at St. Louis, others also.

If we focus intently on humans, we risk reinforcement of the juvenile belief that our species is all-important, the center of all things, all activities on Earth. Students can decide (do decide) falsely that we are the master species, apart from, not a part of, the biosphere. At worst, this fallacious decision can be taken to grant them, and humanity, license to run roughshod over the Earth. Their conscience is not troubled and the focus is on the short-run benefit, not the long-term consequence. At the least, it fosters the opinion that it is OK not to "take care of it" because our technology skills will "fix it" or "clean it up," as we can develop solutions to the problems we have caused. Deluded students may believe it is without consequence, indeed quite tolerable, to overpopulate the planet with *Homo sapiens*. It is the collective fault of all biology and life science teachers if we allow such unfounded belief to continue and even grow.

Is it not our job to lead students toward environmental responsibility with the discovery of the significance of other species and biodiversity? Is it not our charge to challenge their belief systems? To broaden students' narrow world, and limited scope? To show them we coevolved with other life on Earth and hold no license to ravage and destroy? As an example reference, *The Diversity of Life* by E. O. Wilson (1992) suggests an environmental ethic, shows the value of biodiversity, and explains evolution.

What responsibility does the anthropocentric curriculum have for the disturbing misconceptions students and adults hold about science (see the *ABT* editorial by Randy Moore, January 1994, documenting the "dismal state of science education")? For example, does the human focus in biology courses contribute to the belief held by 41% of adults that we did not develop from earlier species of animals? Or that 35% of adults presume humans and dinosaurs inhabited Earth simultaneously (ibid)?

Do we spend so much time in biology on topics such as human anatomy and physiology or human inheritance, disease and diet that we slight not only other animal species but entire kingdoms that we evolved with and mutually share the biosphere? Does the anthropocentric focus cause us to neglect fundamental topics of evolution like speciation, natural selection and extinction?

Understanding evolution of all species, which is of course the indispensable, highly-documented and undeniable cornerstone theory of biology, requires knowledge of these topics, and related ones including geologic or deep time. How many teachers use something like Mark Twain's wisdom to illustrate the tiny, insignificant moment humans have spent here? According to Gould (1987), Twain wrote:

> *Man has been here for 32,000 years. That it took a hundred million to prepare the world for him is proof that that is what it was done for. I suppose, I dunno. If the Eiffel Tower were now representing the world's age, the skin of paint on the pinnacle-knob at its summit would represent human's share of that age; and anybody would perceive that the skin was what the tower was built for. I reckon they would, I dunno.*

Or a very useful reflection from John McPhee, also in Gould's book (1987):

> *Consider the earth's history as the old measure of the English yard, the distance from the king's nose to the tip of his outstretched hand. One stroke of a nail file on his middle finger erases human history.*

These kinds of quotes stir our young students' gray matter and challenge their preconceived notions about our longevity and importance. Most human biology courses, or general biology courses with a human focus, probably do not—perhaps cannot—do this well. If additional incentive to teach evolution of populations is needed, see such publications as Michael Clough's (September 1994) article in *ABT*, and the small book *Voices for Evolution* available from the National Center for Science Education in Berkeley, California.

I wonder, does our anthropocentric biology curriculum somehow sustain classroom pseudoscience such as the

oxymoronic "creation science?" Maybe not, but abuse and misuse of science and the science classroom, with an underlying agenda to introduce religious dogma into the academy, is growing, not subsiding in our public schools nationwide; and the warlike struggle to keep it out does not always go well (see Gillis 1994). "Creation science" will just not go away. Those who endorse it might gain ground if evolution is ignored for a myriad of reasons including fear of inciting public controversy over discussions of evolution, particularly of the family Hominidae, in the anthropocentric biology class. The pressure on teachers is real. Still, we must be cautious with any biology curriculum that may cost us during this continuing siege on science.

One goal of the human-centered curricula often seems to be to train and ultimately produce more Ph.D. research biologists and more physicians. However, Ann Gibbons' (1994) recent overview in *Science* disputes a need for more of these highly trained graduates of specialized schools. Academic research jobs are increasingly hard to come by and industry is not a deep-pocketed answer. Medical school applications, but not positions, have increased significantly this decade; but is there really a need, a role, for even more physicians?

Instead, we need to do a better job of educating nonscientists, the students who will go on in law or business, drive a cab or truck, build homes or roads, even venture into politics. It is these students who must understand how science, not just human biology, functions; the kind of questions science can help answer, and the kind it cannot. They must know about global biodiversity—how it got here and what it will take to keep it here.

For many reasons, few high school or college teachers take their students into the field, especially in anthropocentric biology courses. Accordingly, students too often think biology is done primarily in a stark laboratory, finding and memorizing parts of a preserved animal or plastic model of a human. How many adults still equate biology to dissecting a frog and labeling the human anatomy? Alternatively, how many equate it to identifying, sampling, observing, questioning and experimenting in the field? How many students or adults even know scientists do these things, other than a few famous dinosaur bone seekers? When asked to envision a scientist, most people see a neatly kept person indoors in a white lab coat researching some human disease. What they do not envision is a zealous individual outdoors in field garb attempting to understand how organisms interact and how they became what they are, where they are. To appreciate the richness and importance of biodiversity, we must get students out of the classroom and laboratory and into the biosphere.

What percentage of biology students, high school and college, ever actually get into the field to experience all the nonhuman species?[1] How many AP courses focus on human genetics, physiology and anatomy, and on cellular and molecular biology? How many deal with field biology or ecology?[2] How many presentations or workshops at the St. Louis convention dealt with some aspect of field biology? Answer: about 35 of 220, or 16%. Is this really the direction we want for a national biology curriculum? I don't think we should ignore *Homo sapiens;* we just should not worry about them so much and get off our anthropocentric center.

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[1] I received my B.S.Ed. degree in biology at a large southwestern university. Never during my four years as an undergraduate did a biology class venture into the field. Never. I am now a bench scientist and laboratory teacher.

[2] I have trouble with the rationalization that academic budgets thwart broad-range curricula and limit us to "topics human." Like our own spending, except for departments and schools not individuals, education budgets reflect priorities and values. It may not be easy, but these budgets, like personal ones, can be revised to support priorities and values.

References

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Letters

ABT Authors Praised

Dear Editor:

This note is intended to be a staunch fan letter in praise of your editorial and Joe McInerney's book review in the Nov/Dec, 1994 issue of *The American Biology Teacher.*

You two are doing a great job in the professionalism of biology teachers, whether with tongue-in-cheek humor or with observations on major issues that impinge on biology teaching.

What you are doing is most important. My heartiest congratulations!

Arnold and Hulda Grobman
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More on Political Correctness

Dear Editor:

The processed tree carcasses of pages 452 to 454 of the *ABT* (Volume 56, No. 8) were a welcome ending to this week.

Believe me, from a bulimic, follicle-challenged, chronologically gifted, X chromosome-oppressed human American, I enjoyed it all.

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