

Evolution Sticker Shock

BY HUNTINGTON F. WILLARD

Only four years after the successful mapping of the Human Genome — the 3 billion bits of DNA that make up our Code of Life — the most striking outcome for genome scientists like myself has been an awareness of the relatedness, at the most fundamental genetic level, of all of God's creatures. Imagine the shockwaves then in learning that in Cobb County, Georgia the school district has put stickers on biology textbooks declaring "Evolution is a theory, not a fact." This is not just a shot across the bow of modern scientific thought; this is a body blow right smack in the middle of our double helix.

While there's plenty of room for adults to disagree on matters of religion *or* science, this debate pits a small minority of evangelical believers in the literal word of the Creation against 150 years of scientifically generated data. Those who won the battle for stickers in Georgia (who are making similar efforts in many other states around the country) would claim scientific validity for something they call "intelligent design," a theory that holds that biologically life is so irreducibly complex it cannot be explained by natural selection acting on DNA over millions or billions of years, and must therefore be the product of an Intelligent Designer, namely God.

Despite the obvious objection that intelligent design is not science because it cannot be tested by the usual accumulation and comparison of scientific data, its proponents have begun to gain traction. According to a report in *Science* from earlier this year, proposals to encourage the teaching of creationism

have been advanced in 37 states since 2001.

Organized religion *per se* is not to blame. After all, most Protestant denominations, Jewish traditions, the Catholic Church and eastern religions do not view evolution to be in conflict with their notions of faith. From their point of view, evolution represents one more miraculous, divinely ordained process for creating life in all of its wondrous forms. But, creationists are having none of it.

The case for evolution has been told and retold. Calling evolution a scientific "theory, not a fact" is a bit like calling the Old Testament "part of the Christian Bible" — true enough, but misleading. Gravity is a fact, explained by theories of gravitation. Evolutionary change, too, is a fact and can be seen in action most tellingly in the same Galapagos Islands where Charles Darwin first developed his thoughts on natural selection in the mid-19th century. Evolution lies at the heart of biology and is seamlessly and continuously linked to health research to better understand conditions such as AIDS or SARS or Mad Cow or bird flu or Parkinson's or Alzheimer's or cancer or heart disease. Every biomedical experiment, every tiny advance, every major breakthrough ultimately connects to the principles first postulated by Darwin. We see them played out in nature again and again, whether we're watching finches in the Galapagos or viruses under the microscope. We can now measure the amount of genomic variation within and between species, generation after generation. This is the process of science: collecting data to guide our thinking as we strive for objective explanations of ancient phenomena.

Right now, evolution is a major component of our country's National Science Education Standards and the Scholastic Achievement Test, as most thoughtful scientists believe it should be. Are we prepared to imagine a science curriculum that dilutes or eliminates the unifying principle of biology in the service of non-scientific ideology? Those stickers are a worrisome step in that direction.

Without question, we scientists are culpable in this state of affairs. Most of us are too consumed with our next scientific thought to take a breath and engage with the taxpayers who, we hope, will applaud our latest discoveries. But, at least to date, the public may not be with us on this one. A Gallup poll conducted last month found that only 35% of respondents believe evolution is well-supported by evidence. That number is not an indictment of evolution, but of the scientific community. We have failed to make our case. It is incumbent upon us to educate policy-makers, integrate evolution into our science curricula, educate our children about the nature of scientific reasoning, distinguish between the natural and the metaphysical, and recognize those teachers and mentors who *do* communicate scientific ideals to their students and the public.

The alternative is to do profound damage to the future of science and medicine. The consequences of choosing to allow personal and non-scientific ideology into our science classrooms would be profound. Nothing less than our own evolution is at stake.

Huntington F. Willard is director of the Institute for Genome Sciences & Policy at Duke University.