

Tensions with the New Biotechnology

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Peter Schwartz, chairman of the Global Business Network and author of *The Art of the Long View*, wrote recently that,

For any given technological innovation, three facts hold true: (1) Its inventors can never completely foresee its eventual impact; (2) some element of the population will welcome it; and (3) some element of the population will object to it. What a perfect recipe for uncertainty!

And a pretty good recipe for acrimony, distrust, and unsteady public policy.

Consider agricultural biotechnology, a major research and commercial commitment of my company. Depending upon which side of the debate you're on, biotechnology will either produce miracle foods or it will create "Frankenfoods." It will either reduce the use of toxic pesticides or it will destroy the Monarch butterfly. It is either our best hope for feeding a hungry world or it will unleash dangerous unknowns into the food supply.

Schwartz is certainly right: throughout history, the introduction of new technologies has been met with concern or controversy. Mechanized factories, electricity, cinema, radio, television, pasteurization, smallpox vaccination, fluoridation of water, and even the use of margarine have all generated fears, concerns, and debate. Martin Van Buren, while he was governor of New York, wrote a letter to the president of the United States predicting that the new form of transportation called railroads would raise unemployment, devastate the economy, and leave the country's defense in a shambles. (In this case, he was writing in support of federal protection for the Erie Canal—vital to the economy of New York and to the prosperity of the canal industry. This level of economic interest and public concern has since complicated many such debates.)

Those of us in industry can take comfort of a sort from such obvious Luddism. After all, we're the technical experts. We know we're right. The "antis" obviously don't really understand the science, and are just as obviously pushing a hidden agenda—probably to destroy capitalism.

What we've learned from the controversy surrounding agricultural biotechnology is that very few of the mental and emotional predispositions of either side have much validity. The debate has been characterized by the language of

opposites and extremes—with the assumption that agricultural biotechnology is an either/or proposition—either we fight it or it will engulf us.

What is true is that there are great benefits to be had by society from agricultural biotechnology, and at the same time there are real concerns about how it will be used and what effect it might have.

Here are a few discoveries to date:

First, there are sincere people of good will on both sides of the question. There are opportunists on both sides as well. But in a communications culture where the news media—both traditional and “new” media—attempt to explain serious issues with a cartoon-like simplicity, it is often too great a temptation to demonize corporate executives and stereotype biotechnology opponents. Yet there are sincere people in corporations who believe what they are doing is right, and there are sincere biotechnology opponents who fear what these new technologies might do or might become. A first step is to recognize that sincerity—and build on it.

Second, there are idealists on both sides of the issue. There’s no question that companies like Monsanto expect to make money by introducing new technology. But we’re also convinced—and deeply believe—that these new sciences hold great promise for the world, in developed and developing nations alike. We believe that this is good technology, that it’s safe, and that it’s useful.

One plain fact that virtually everyone can agree on is that the technologies that support agriculture today aren’t sustainable. Biotechnology can make a useful contribution to agricultural sustainability by putting beneficial attributes into seeds. And farmers worldwide know exactly what to do with seeds—no special training is required. Biotechnology can reduce water use, chemical application, soil erosion, and carbon emissions into the atmosphere.

Agricultural biotechnology can also improve human health, adding protein, vitamins and other nutrients to food crops—something of special importance in less developed nations where malnutrition is chronic. This is not a recent vision. As early as 1962, in a speech at the commencement exercises at Washington University in St. Louis, Monsanto executive Carroll Hochwalt discussed the scientific revolution and envisioned an application of biotechnology: “It is entirely conceivable,” he said,

. . . that, through the manipulation of the genetic information at the molecular level, a crop such as rice could be “taught” to build a high protein content into itself, literally working a miracle of alleviating hunger and malnutrition.

Agricultural biotechnology also offers advantages to environmental protection and sustainability—reduced reliance upon pesticide applications, utilizing plants to produce pharmaceuticals and plastics, and reduced reliance upon fossil fuels in the agricultural production process.

Third, we’ve learned that there is often a very fine line between scientific excitement and confidence on the one hand, and corporate arrogance on the other. We’ve been working with biotechnology for twenty years. We think we know

something about the subject, perhaps more than most other people. When we think that about ourselves, it's not hard to give people the impression that we don't much care what they think—that our job is to teach (or preach) and theirs to listen respectfully.

And knowing a lot about the science, it was natural for us to see this as a scientific issue to be decided by scientific experts. We didn't listen very well to people who insisted there were relevant ethical, religious, cultural, social, and economic issues as well.

There is a huge difference between food as science and food as culture. Food occupies an important place in many cultures and countries well beyond the necessity of sustenance, and carries an almost inexpressible emotional resonance. Much of the discussion of biotech is incomprehensible unless this is understood. In addition, developments like agricultural biotechnology can immediately raise questions about human safety, the sufficiency of government regulation, environmental safety, the right to know what your food contains, the effects on traditional farming and rural life, and the involvement of corporations like Monsanto.

As scientists around the world begin to understand the genomes of people and plants, they are creating a new approach to nutrition—one based on a scientific understanding of the interactions in living systems. These new discoveries bring unprecedented insight for nutrition and human health. But the need to construct a bridge between traditional cultural views of food and newer, more science-based approaches is all the more apparent.

Which leads to the fourth thing we've learned—science and technology will always be handicapped in a wired, “sound bite” world. The very language, care, and precision of science works to its disadvantage in the public arena. Over the centuries, scientists have evolved a very precise language to describe to each other what they mean. The word “theory,” for example, means one thing to scientists and something quite different to the public. “Risk” is another word with very different connotations for scientists and the public.

Complicating the language problem is the difficulty of reducing scientific concepts and explanations to sound bites on the nightly newscast, or even paragraphs in the newspaper or on a web site. The growth of the worldwide web has brought unparalleled access to information and communication—but little of it is “peer reviewed,” and bad information can be circulated very quickly. Errors in information databases can remain in circulation for a very long time.

Fifth, we learned that there's a big difference between a debate and a dialogue.

Agricultural biotechnology has mostly been a subject of debate. In a debate, someone is going to “win,” and someone else is going to “lose,” and the question of who wins and who loses may depend more on clever tactics and “debater's points” than on the underlying merits. Debates are characterized by attack and counterattack, by thrust and parry.

Dialogue, however, is about questioning, listening, reflecting, and understanding. Substance takes priority over form. Common ground and common interests are sought and acknowledged. Differences are carefully and thoughtfully considered.

Agricultural biotechnology is too complex and far too important to be resolved by debate. What's needed is a process that respects multiple points of view. We continue to believe that agricultural biotechnology can bring important benefits to people around the world. Good, safe and useful products responsibly developed have been and will be brought to market. But there are also legitimate concerns about biotechnology, and we have to work sincerely and diligently to address and resolve those concerns.

We have committed to having a dialogue with a wide range of people and groups with a stake in agricultural biotechnology. But we've stopped debating. Disagreements about the meaning and value of biotechnology will remain, at least in the immediate future. It's our hope that these disagreements can, through dialogue, become a source of creative solutions.

Philip Handler, a past president of the National Academy of Sciences, pointed out some years ago that there is something welcome in this process. "There must be a continuing tension between the development of technology and its deployment within our society," he said.

Technologists must be free to continue to invent and design in ever more imaginative, creative ways. But the so-called technological imperative—that which can be done, will be done—is not an inviolable natural law. And it is indeed for the larger society to determine whether or not whatever it is, will be done. Ω