The Next Big Thing

Arthur T. Johnson

Appeared in volume 10.2 (summer 2006) issue of the IBE Newsletter

"Technology is neither good nor bad. Nor is it neutral." This quote by Melvin Kranzberg expresses the idea that technology is all-affective. No matter what technological advance we talk about, the advance, once made, changes life for all. The change may be good, and it may be bad, but its bottom line is very often dependent upon how we are willing to use new technology.

At our 2006 IBE meeting in Tucson we learned about artemesinin, synthetic-biology, standard genetic parts, biology-inspired design, and ethics. It was an interesting combination. As you might imagine, lots of people had things to say about ethics, especially when prompted by the winning essays in the student bioethics essay contest that IBE had sponsored. You can read these essays for yourself in this and subsequent newsletters.

Bioethics discussions almost have a life of their own once they get started. The discussion at the IBE meeting was no exception to this, and had to yield to time constraints before it had run its course. Most of the comments were about genetically-modified organisms and how they were either good or bad, acceptable or unacceptable, and there was a certain smug tone to remarks about "others who don't understand about GMOs."

Of course there is really never any resolution to these discussions because absolute right or wrong answers are generally conceded not to exist. However, hubris often accentuates irony and many in the room did not really realize that GMO issues were now out of the hands of the developers. GMOs are now able to be patented, so there is nothing we can do about that. Commercial interests have trumped scientific and altruistic interests, so that is largely out of our hands. Promises of less herbicide use have proved to be false, blocks of non-GMO crops that were supposed to have been planted to kill pests in the conventional way (and so delay evolved immunity to genetic modifications) were not planted), and farmers growing plants that show evidence of commercialized genetic modifications must pay whether they planted the crops or not. Legally and commercially the GMO-bioethics game is over.

On the other hand, there are issues on the horizon for which ethical discussion is more than hot air. The case of artemesinin is an example. Our keynote address was about producing this drug to cure malaria by genetically-modified microbes. Producing this drug in this way is not an issue. However, what happens after the drug becomes plentiful and cheap? Will it be abused? You bet! Will it eventually lose its effectiveness? You can count on it! Are there other drugs that can be used in its place? None known. The bioethics discussion therefore, should concern the way the drug is used to maintain its effectiveness for the longest possible time. Biological engineers

should know enough about biology (and human nature) to avoid the unintended consequences inherent when dealing with living things.

Or take the winning bioethics essay (appearing in this issue). That essay emphasizes the centrality of human free will. However, recent research results have sown that human actions were actually planned before they were consciously known. The only choice, then, is whether or not to carry out preplanned actions. This has been termed free-won't rather than free-will. Furthermore, there are now being designed prosthetic neural devices meant to correct defects in basic brain processes. It doesn't take much imagination to see where this is headed: with time, higher level brain functions may be performed by complex electronic circuits. At the same time, there are scientists and engineers trying to produce computers with emotions. As the human becomes more machine-like, and the machine becomes more human-like how are they to be distinguished? What are the ethical issues in this Deus ex machina situation?

Are technology advances, and especially advances in bio-technology always good? How do we know? What will give us the ability to judge?

IBE as an organization should be looking for those issues and those realms for which ethical discussions could make a difference. There are the issues of tomorrow, the realms largely unknown to an unimaginative public, the questions where real leadership is necessary to guide the directions of bio-technology. It is here that IBE can make a real difference.