

# Modern Maturity

## A question of ethics

BY ANDREW KIMBRELL

In 1988 the U.S. Patent and Trademark Office granted an exclusive patent on a genetically engineered animal—the first-ever commercial patent of its kind. This in essence reduced such animals, living and breathing flesh, to the status of manufactured products like machines and medicines.

Since then scientists have continued to snip, insert, recombine, rearrange, edit, program, produce and clone the DNA of microorganisms, plants and animals at a breathtaking rate.

This biotechnological activity creates profound and difficult ethical questions. Should succeeding generations of children grow up in a world where the genetic codes of plants, animals and humans are interchangeable and living things are programmed as engineered products with no greater intrinsic value than automobiles or toasters? Scientists are crossing species boundaries at an ever-increasing rate, inserting human genes into animals and animal genes into other animals and plants until many recent achievements sound more like science fiction than science fact.

And what of the human body? Scientists are already using gene therapy in an attempt to cure various diseases. Yet many

are concerned that in the near future genetic engineering will be used as a sophisticated type of cosmetic surgery to change an individual's height, weight, skin color, even IQ.

And what about scientists' ability to clone humans and make identical copies of human embryos? While these breakthroughs could create some opportunities for the fertility industry, they clearly represent a potential threat to concepts of human individuality and dignity.

Genetic engineering's benefits and risks are perhaps most graphically demonstrated by the U.S. Human Genome Project, a \$3 billion NIH and Department of Energy research program that aims to decipher the more than 100,000 genes that make up the human genome, which carries the information of our most intimate common heritage. The project offers hope that scientists can ultimately identify the genes responsible for certain pernicious diseases and in so doing be able to treat these diseases with some sort of gene therapy.

The project, however, may also reveal each individual's genetic predisposition to physical and psychological problems. Although this information can be valuable in helping make pri-

vate medical decisions, it raises a unique question of privacy: Should an employer, insurance company or the government also have access to an individual's genetic readout? Should a person's genetic predisposition to a condition or disease such as schizophrenia, alcoholism or breast cancer be used to make employment or insurance decisions?

Clearly we are looking at a whole new world of potential discrimination. "We have to be aware of the really terrible past of eugenics [the study of hereditary improvement by genetic control] where incomplete knowledge was used in a very cavalier and awful way, both here in the United States [starting in the early 1900s many states passed laws to sterilize the 'unfit'] and in Nazi Germany," said James Watson, former head of the Human Genome Project and co-discoverer of the DNA structure. "We have to reassure people that their own DNA is private and that no one else can get at it. We're going to have to pass laws to reassure them." Unfortunately, to date no such laws are anywhere near passage.

Before we allow the biotechnology industry and the scientific community to push society headlong into the biotechnology revolution, the American and international communities need to scrutinize the long-term environmental, economic and ethical issues this powerful new technology raises.

We now know that when society commercialized the nuclear and petrochemical technologies, it did so without first resolving the hard questions about the ultimate impacts. As a result we're now confronting a huge environmental and societal bill that includes undisposable nuclear waste, toxic dumps, acid rain, the greenhouse effect, and ozone depletion.

We can only hope the world's leaders learned from these mistakes and will carefully consider the damage before it's too late. Only through this kind of foresight can we ensure that humans dictate the growth of technology rather than technology dictating the future of humans.

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