

Genetic Blueprints Aren't Mere Utilities

■ **Biotechnology:** We can't let a few conglomerates control the codes of life and trade them as commercial goods.

By JEREMY RIFKIN

The recent announcement that American Home Products and Monsanto Co. are merging to create one of the world's largest life science companies has focused public attention on a revolutionary change taking place in the global economy.

We are in the midst of a historic transition from the Industrial Age to the Biotech Age. While the 20th century was shaped largely by spectacular breakthroughs in physics and chemistry, the 21st century will belong to the biological sciences. Scientists around the world are deciphering the genetic code of life. After thousands of years of fusing, melting, soldering, forging and burning inanimate matter to create useful things, we are now splicing, recombining, inserting and stitching living material into commercial goods.

Genes are the raw resource of the new economic epoch. Molecular biologists around the world are mapping the genomes of many of the Earth's creatures, from the lowliest bacteria to human beings, creating a vast genetic library for commercial exploitation. Gene technology is already being used in a variety of business fields—including agriculture, animal husbandry, energy, construction materials, pharmaceuticals, medicine and food and drink—to fashion a bioindustrial world.

Global life science companies are maneuvering to control the new genetic commerce. Typical of the trend is the bold decision by chemical giants like Monsanto, Novartis, Hoechst and Dupont to spin off or sell part or all of their chemical divisions and anchor their research, development and marketing in biotech-based technologies and products.

The concentration of power is already impressive. The top 10 agrochemical companies control 81% of the global agrochemical market. Ten life science companies control 37% of the global seed market. The world's 10 major pharmaceutical companies control 47% of its market. Topping the life science list are 10 transnational food and drink companies whose sales exceeded \$211 billion in 1995.

At the heart of any public discussion of the new genetic commerce is the issue of patenting the genetic blueprints of millions of years of evolution. The economic and

political forces that control the genetic resources of the planet will exercise tremendous power over the future world economy, just as in the industrial age when access to and control over fossil fuels and valuable metals and minerals helped determine control over world markets.

In the years ahead, the planet's shrinking gene pool is going to become a source of increasing monetary value. Multinational corporations already are scouting the continents to locate microbes, plants, animals and humans with rare genetic traits that might have market potential. After locating the desired traits, biotech companies are modifying them and seeking patent protection for their new "inventions."

Corporate efforts to commodify the gene pool are meeting with strong resistance from a growing number of nongovernmental organizations and countries in the Southern Hemisphere, which are beginning to demand an equitable sharing of the fruits of the biotech revolution. While the technological expertise needed to manipulate the new "green gold" resides in scientific laboratories and corporate boardrooms in the North, most of the genetic resources needed to fuel the new revolution lie in the ecosystems of the South.

Southern countries claim that what northern companies call "inventions" are really the pirating of local genetic resources and the accumulated indigenous knowledge of how to use them. The life science companies, on the other hand, argue that patent protection is essential if they are to risk financial resources and years of research and development bringing new and useful products to market.

The patent issue is likely to become a question of increasing public concern as a result of the stunning breakthroughs in the government-funded Human Genome Project. It is expected that in less than eight years, nearly all of the 60,000 or so genes that make up the genetic blueprints of the human race will have been identified and become the intellectual property of transnational life science companies. Such firms also are patenting human chromosomes, cell lines, tissues and organs. PPL Therapeutics, the life science company that cloned the sheep named Dolly, has applied for a patent that includes cloned human embryos as intellectual property.

The increasing consolidation of corporate control over the genetic blueprints of life, as well as the technologies to exploit them, is alarming because the biotech revolution will affect every aspect of our lives. The way we eat, the way we date, the way we have babies, the way we raise and educate children, the way we work, even the way

we perceive the world around us and our place in it, all of our individual and shared realities will be deeply touched by the biotech revolution.

What might it mean for subsequent gen-

'The economic and political forces that control the genetic resources of the planet will exercise tremendous power over the future world economy'

erations to grow up thinking of all life as mere invention, where the boundaries between the sacred and the profane have all but disappeared, reducing life itself to an objectified status, devoid of any unique quality that might differentiate it from the strictly mechanical?

Life patents strike at our core beliefs about the very nature of life and whether it is to be conceived of as having intrinsic or mere utility value. The last great debate of this kind occurred in the 19th century over the issue of human slavery, with abolitionists arguing that every human being has "God-given rights" and cannot be made the commercial property of another.

Like the antislavery abolitionists, a new generation of genetic activists is beginning to challenge the concept of patenting human life, arguing that human genes, chromosomes, cell lines, tissues, organs and embryos should not be reduced to commercial intellectual property controlled by global conglomerates and traded as mere utilities.

The battle to keep the Earth's gene pool an open commons, free of commercial exploitation, will be one of the critical struggles of the Biotech Century. "Genetic rights," in turn, is likely to emerge as the seminal issue of the coming era, defining much of its political agenda.

Jeremy Rifkin is author of "The Biotech Century: Harnessing the Gene and Remaking the World" (Tarcher/Putnam, March 1998).