Brave New World?

The one consistently natural thing is to try by intelligence and imagination to improve on nature.

BRIGID BROPHY,
WRITER

The new electronic independence recreates the world in the image of a global village.

MARSHALL MCLUHAN,
MEDIA ANALYST

Modern technology
owes ecology
an apology.

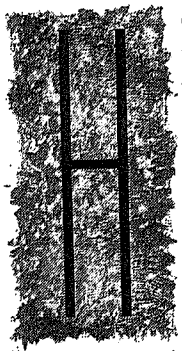
ALAN M. EDDISON,
POET

Ours is a time of the machine, and ours is a need to know that the machine can be put to creative human effort. If not, the machine can destroy us.

DOROTHEA LANGE,
PHOTOGRAPHER

Marvels of the Future

Michael Rogers



ow do you like the early-morning clatter of all those personal helicopters carrying people to work? What's the latest news from the colony on Mars? Does your voice-activated typewriter have trouble spelling "futuristic"? All those things were part of the brave new world predicted a half century ago for the 1980s, and their obvious nonexistence should give pause to the wizards of futurology and those who buy their wares. Anyone who tells you that a whole new technology is about to be invented is simply casting a spell. But we do know something about the technology already in place and the directions it is likely to take in the decade ahead. And we can be certain that it is going to change our lives.

In the '90s, the average consumer will begin to encounter the first fruits of the gene-splicing techniques invented about 15 years ago. Scientists are producing carrots and celery that can hold their crispness so much longer than conventional varieties that they might be sold as prepackaged snacks. And they are tinkering with a tomato that stops ripening the moment it is harvested. If farmers can harvest at peak ripeness without fear of spoilage, today's tasteless pale tomatoes can be packed off to the oblivion they deserve.

By the end of the decade, genetic engineering should change the face of livestock farming. The barnyard will be filled with gene-spliced farm animals—hogs that yield low-cholesterol pork and cows that produce a new kind of milk from which pharmaceutical companies can extract such beneficial drugs as insulin or growth hormones. Already the U.S. patent office has received dozens of proposals for such creatures. Researchers in both the United States and Japan are working on more efficient catfish and trout, ones that will grow larger faster and consume less food in the process. Consumers may shy away from

genetically engineered food as weird and even dangerous, so scientists are developing special testing plans to guarantee the quality of these new and unknown breeds.

Altering hogs and cows is nothing, of course, compared with human genetic engineering. Earlier this year [1989] the first non-human genes were spliced into cancer patients, but only as tools for research. Sometime in the early '90s, the first true human gene transplant will take place, most likely as a last-ditch effort to save a child born with a fatal genetic illness. During the decade, researchers will discover more and more human genes and the traits they govern. Some may cause disease; others may simply determine the shape and kind of person we become. As science learns to alter those genes, some profound questions will arise: what constitutes a disorder, as opposed to mere differences in personal characteristics? Should genetic engineers fix nearsightedness, say, or a propensity to put on weight or lose hair? And if so, why stop there? Do you want your baby to have blue eyes or brown, blond hair or dark? The '90s won't introduce technology capable of making such choices, but we may have to decide whether we want to work toward that goal.

Robots have been the stuff of popular culture for so long that we think of them mostly as fun. In the 1990s they will finally become practical outside the factory. Granted, they won't perform the wondrous stunts they do in sci-fi movies; the first generation of "real" robots may seem a bit crude. But by the end of the decade, robots will be performing tasks far from the assembly lines where they are most useful today. We may well encounter tiny robots cooking hamburgers in fast-food restaurants, mopping up shopping malls, even delivering meal trays in hospitals.

Two factors are pushing the development of robotics: technology and economics. Artificial intelligence is the key to a successful robot, but some of the simplest tasks for a human mind are difficult for a robot. One example: the ability to look at the corner of a room, where walls and ceiling meet, and know that the corner goes in, not out. Easy for humans, very tough for real-world R2D2s. But new neural-network computers, which more closely resemble the human brain, look particularly promising for teaching robots how to adapt to their surroundings. Neural networks may someday give robots enough artificial sense to, say,

vacuum the carpet in a simple office without knocking over the water cooler, at least not more than once.

Economics is the key to the acceptance of robots. As declining birthrates lead to a shortage of entry-level workers in much of the industrialized world, researchers are designing robots that can manage at least portions of such jobs as burger flippers or hospital orderlies. The robot orderly, for example, can deliver meals and prescriptions to patients; it still can't make the bed. Fast-food robots will probably cook and package food; humans will still greet the public at the counter and, aided by computer chips in the cash registers, make correct change.

By the late '90s, improved robots will be inexpensive enough to serve as aides for the disabled, giving even quadriplegics the ability to feed themselves and perform office work. Not all robots will be so benign. Another model in production is a security guard designed to wander deserted warehouses and signal a human guard when it encounters intruders. Such robots may, before decade's end, commit homicide: at least one American firm has designed an armed security robot capable of firing a weapon.

And the long-promised home robot? This little electronic servant, capable of delivering a frosty beer from the fridge, picking up the kids' toys and washing the occasional window, probably won't be a mass-market item in the '90s—unless we modify our homes to accommodate them. Every room would need to have tiny radio beacons to tell the robot where it is, and staircases would need special construction for easy robot access. Sound unlikely? Perhaps. But in 1890 a person might have thought it unlikely if he or she had been told that the entire urban landscape of the planet would be modified to accommodate the automobile.

The 1990s will see almost a reinvention of television—not through improved programs, as many might wish, but through the melding of TV, the computer and the telephone into something almost entirely new. Children of the 21st century will likely be surprised to hear that there were once computers that didn't plug into telephone lines, telephones without video screens and television sets that merely showed programs without viewer interaction.

Television will be transformed in stages. The first step is high-definition television (HDTV), a vast improvement over current broadcasting that will match the quality of motion pictures. Japan has begun offering HDTV on a limited basis, and some European countries will start within two years. The United States, yet to choose an official HDTV system, may lag slightly. But by the mid- to late '90s, HDTV should be an emerging consumer product worldwide.

An information-entertainment combination should arrive in the home by the early to mid-'90s. A powerful mixture of television and computer technology, the systems will use shiny platters similar to compact discs to display photographs, moving video, computer data and printed text. By the end of the decade, the new equipment should be widely available, costing as little as $200. Already companies as diverse as IBM, Philips, Sony and Apple Computer are rushing to tap the market.

What will these new players do? Consider the interactive travelogue disk: you tour London, complete with narration and moving video, just as with current television. But through a small remote control, you can ask the program to show you only museums, or gardens, or whatever your particular interest. If you want to know location, hours and admission price for a particular attraction, you request a screen of text with all the information you would find in a conventional travel book. The subjects of interactive disks could range from sports instruction and home-repair tips to an enormous variety of entertainment.

You can already buy small video telephones, with built-in screens and cameras, that transmit still images over regular telephone lines to anyone else with a video telephone. Later in the decade telephone companies will begin to replace their conventional wires with fiber-optic cables that carry vast amounts of information—forging the final link between computers, telephones and television. In the United States, for example, fiber-optic cables may first deliver high-definition television, as well as full-motion, full-color video telephone reception. But with fiber-optic cables, television will become truly interactive. Whenever you care to see a particular TV film, for example, you can request it directly from a central data bank, day or night. Electronic catalogs will show you a

demonstration of, say, a vacuum cleaner on your screen—and even let you browse through the instruction manual. Interested in buying? Place an order by pushing a button on your remote control.

One '90s prediction seems safe: the pace of change will exceed that of the '80s. Each of the products described here already exists, at least in laboratory prototype, and technology now races out of the lab more quickly than ever before. If there is anything truly speculative about the '90s, it may be not what technology will bring—but rather how human beings will adapt to the most rapid change the species has ever experienced.

Activities

1. With a partner, make a list of developments in technology discussed in this article under the following headings:
   - genetic engineering
   - robotics
   - communications technology

   Make a fourth list of technological changes planned for the future which you have heard about and which do not fit under one of these headings.
2. Write an introduction to an essay that will argue strongly that genetic engineering is a positive or negative step for the future. Read your paragraph aloud to two of your classmates and have them identify your thesis statement.
3. Write a journal entry recounting some of the ways your life has been affected by changing technology. Mention some things that please you and some that don't.
4. With a partner, write a dialogue between a human and a computer which illustrates what you think would be a communication gap between the two. Present your dialogue to another partnership.
5. With a partner, research and prepare a report on one way technology is being developed to enhance our quality of life and another way in which it threatens our individuality and privacy. In your report to the class, indicate whether you feel the advantages generally seem to outweigh the disadvantages.
6. In a group of three, make a list of things you know computers are now doing or that you hope they will be able to do. Discuss whether these functions represent progress. Be prepared to report on your discussion to the class.