Genetic engineering, altering the inherited characteristics of an organism in a predetermined way, by introducing into it a piece of the genetic material of another organism. Genetic engineering offers the hope of cures for many inherited diseases, once the problem of low efficiencies of effective transfer of genetic material is overcome.

Another development has been the refinement of the technique called cloning, which produces large numbers of genetically identical individuals by transplanting whole cell nuclei. With other techniques scientists can isolate sections of DNA representing single genes, determine their nucleotide sequences, and reproduce them in the laboratory. This offers the possibility of creating entirely new genes with commercially or medically desirable properties.

While the potential benefits of genetic engineering are considerable, so may be the potential dangers. For example, the introduction of cancer-causing genes into a common infectious organism, such as the influenza virus, could be hazardous.

We have come to believe that all human beings are equal; but even more firmly, we are taught to believe each one of us is unique. Is that idea undercut by cloning? That is, if you can deliberately make any number of copies of an individual, is each one special? How special can clones feel, knowing they were replicated like smile buttons. "We aren't just our genes, we're a whole collection of our experiences," says Albert Jonsen. But the idea, he adds, raises a host of issues, "from the fantastic to the profound."

When anesthesia was discovered in the 19th century, there was a speculation that it would rob humans of the transforming experience of suffering. When three decades ago, James Watson and Francis Crick unraveled the genetic code, popular discussion turned not to the new hope for vanquishing disease but to the specter of genetically engineered races of supermen and worker drones. Later, the arrival of organ transplants set people brooding about a world of clanking Frankensteins, welded together made from used parts.

Already there are thousands of frozen embryos sitting in liquid nitrogen storage around the country. "Suppose somebody wanted to advertise cloned embryos by showing pictures of already born children like a product," says Prof. Ruth Macklin, of New York's Albert Einstein College of medicine, who specializes in human reproduction.

Splitting an embryo mat seem a great technological leap, but in a world where embryos are already created in test tubes, it's a baby step. The current challenge in reproductive medicine is not to produce more embryos but to identify healthy ones and get them to grow in the womb. Using genetic tests, doctors can now screen embryonic cells for hereditary diseases. In the not to distant future, prenatal tests may also help predict such common problems as obesity, depression and heart disease. But don't expect scientists to start building new traits into babies anytime soon. The technological obstacles are formidable, and so are the cultural ones.

Copies of humans are identical, but are the people the same? Probably not. For a century scientists have been trying to figure out which factors play the most important role in the development of a human personality. Is it nature or nurture, heredity or environment? The best information so far has come from the study of identical twins reared apart. Twins Jim Springer and Jim Lewis, separated at birth in 1939, were reunited 39 years later in a study of

twins at the University of Minnesota. Both had married and divorced women named Linda, married second wives named Betty and named their oldest sons James Allan and James Alan. Both drove the same model of blue Chevrolet, enjoyed woodworking, vacationed on the same Florida beach, and both had dogs named Toy.