

A Scientific Breakthrough

IN THE GREEK LEGEND, Prometheus stole the fire from the gods and was punished for his daring. Zeus chained him to the top of a mountain and sent vultures to feed on his liver. Having already stolen fire and the secrets of the atom, science is now on the verge of unlocking the secret of creating new forms of life. In 1973, biochemists found that it would be possible to join the genetic material called DNA (deoxyribonucleic acid) from different species and transplant the resulting product in living cells. With such recombination and transplantation it may be possible to change the genes of plants, animals or even human beings and thus to manipulate them at will. Genetic manipulation has untold potential for good as well as harm. It may be used to combat certain diseases and increase the food supply. But it may also create and infect the world with new diseases and cause catastrophes—a kind of latter-day wrath of Zeus.

The first group of scientists who worked on all this recognized the perils and asked the National Academy of Science to call for voluntary restraints on research and experimentation until their potential could be evaluated. In 1974, Dr. Paul Berg and his colleagues, backed by the Academy, called for a moratorium until the National Institutes of Health, which fund most DNA research in this country, could issue guidelines on how to safeguard against potential hazards. With the lure of potentially fabulous benefits, considerable interest on the part of U.S. Army biological warfare laboratories, industrial and international ambition and competition, the moratorium was not an easy thing to ask for. It was clear that voluntary

restraint of the Promethean impulse would be in its way a scientific breakthrough of its own.

Nevertheless, the breakthrough has now occurred. Dr. Donald S. Frederickson, on behalf of the National Institutes of Health, issued "Guidelines Governing Research Involving Recombinant DNA Molecules" the other day. They ban experiments with highly poisonous substances and carefully prescribe essential safeguards for laboratory work with others. The safeguards require very expensive laboratory facilities, but that, in turn, guards against uncontrolled proliferation of DNA experiments. Much as astronomers must often travel to a distant, expensive observatory for more complex work, biologists will be able to undertake certain experiments only in a limited number of expensive laboratories.

Not everyone is happy with the guidelines. Some scientists feel that it is idiocy to attempt the curbing of scientific pursuits. Others believe all research that might lead to genetic manipulation should be prohibited. The guidelines steer a narrow but, apparently, safe course between these extremes. In the end, they only extend the age-old medical admonition of *primum non nocere*—first of all, do no harm—to a new frontier of potential discovery. The prognosis is good: The two-year moratorium, which preceded the guidelines, seems to have been observed all around. Foreign scientists, including the Soviets, appear to be receptive to the idea of proceeding with caution. The U.S. guidelines are likely to be accepted as a model by the World Health Organization and other international scientific organizations. The U.S. scientists who urged this breakthrough—and worked hard to achieve it—deserve gratitude and congratulations.