

# Geneticists Fear Creation Of Biological Time Bomb

The potential for misuse of knowledge has always been nightmarish. But with the recent developments in genetics, the threat of disaster has never been so real.

In fact, for the first time in the history of modern science, research workers concerned with molecular biology have called a halt to their studies for fear of the consequences.

And for the first time scientists are questioning their common, and generally unspoken assumption, that the acquisition of knowledge is always an absolute good, requiring no justification or ethical sanction.

More than 200 eminent scientists recently concluded an urgent conference at Davos, Switzerland, on the immediate dangers and projected future benefits of genetic engineering.

Researchers have realized that their latest achievement -- the cracking of genetic codes -- has opened the way to the designing of new bacteria which are potentially more dangerous to mankind than the atomic bomb.

In 1953 at Cambridge University, Dr. James Watson and Dr. Francis Crick discovered that the pattern of all life forms is determined by a double-helical molecule of deoxyribonucleic acid (DNA). Genes are molecules of DNA, units of heredity.

Since then scientists have found ways of cutting the long molecules into shorter pieces and recombining them. These splicings are then incorporated into bacteria to create new microorganisms whose potential for causing disease in plants, animals, and man is yet unknown.

In 1969 when three biologists at Harvard Medical School announced to the world that they had succeeded in isolating a pure gene from bacterium, it was not without some misgivings. Although they felt their discovery could be used to cure such hereditary diseases as hemophilia, they warned of the dangers of government misuse of the technique. They feared they were unleashing on the world the same kind of mixed blessing as nuclear power.

They were not alone in their fears. Soon after the announcement Maurice Wilkins 1963 winner of the Nobel Prize for medicine, warned

that the isolation of the gene could lead to the development of a major germ weapon. "It is the kind of thing you cannot trust society with," he said.

Again in 1972, Australian microbiologist, and Nobel laureate Sir MacFarlane Burnet said he would, if he could, stop all experimental efforts to manipulate the genes of viruses that inflict death or grave ill-

nesses in people. The danger he said, was the inadvertent creation in the laboratory of sub-species of a devastating virus against which humans would have no immunological defences.

"The possibility for good in these experiments are trivial improvements in vaccines, and not worth the risks," Burnet said.

Despite the past warnings from scientists in the

field, it was not until this summer that some kind of positive action was taken to look seriously at the potential consequences of genetic engineering.

In July of this year, 11 American researchers, including Watson, declared they were halting certain experiments in genetic manipulation of bacteria. Their reason: if they do not stop they may accidentally loose upon the world new forms of life -- semi-synthetic organisms that could cause epidemics, resist control by antibiotics, and perhaps increase the incidence of cancer.

In a letter published in Science magazine (the magazine of the American Association for the Advancement of Science) and in Nature, the British counterpart, they urged colleagues around the world to stop experimentation with bacteria whose biological properties cannot be predicted in advance.

The group, chaired by Paul Berg, chairman of the Stanford University department of biochemistry, is buying time to consider hazards before rapidly developing research grows too large to be controlled.

According to Berg, the embargo is "the first I know of in our field. It is also the first time I know of that anyone has had to stop and think about an experiment in terms of its social impact and potential hazard."

Many are unoptimistic about the embargo holding. One National Institute of Health (U.S.) scientist says, "Anyone who wants will go ahead and do it." Although, he adds, the technique requires a moderate degree of sophistication at the present, it will be a "high school project in a couple of years."

Others are uncertain whether the ban will be observed by countries interested in the new technique's considerable potential in biological warfare. For example, many millions of dollars were invested at the U.S. Army's biological laboratory at Fort Detrick, Maryland on trying to improve on the lethality of viruses and bacteria harmful to man.

Controversy already surrounds every proposal put forth at the conference in Switzerland.

Scientists at the University of British Columbia

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