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Replication of DNA Molecules Shouldn't Be a Moral Issue

MOLECULAR BIOLOGY emerged from its academic sanctuary to challenge public consciousness in one of the epochal news stories of 1967—the experimental replication of virus DNA molecules.

The event was headlined by a misleading cliche, "the creation of life," and editorialized about in terms of its implications for the purposeful control of human biology. This kind of journalistic exaggeration may serve a useful purpose by attracting public attention to one of the most important scientific advances of our time. At the same time, to focus on DNA replication as an issue for moral debate is to ignore the whole thrust of scientific study of life.

These particular headlines are simply out of date. They were anticipated 140 years ago by Wohler's discovery that carbon-containing "organic" molecules, previously thought to be unique to living organisms, could be studied and synthesized in the laboratory.

The material basis of human life is shared by all terrestrial life and is based on a universal chemistry. This fact may or may not have disturbing moral implications, but it is hardly new. Prof. Kornberg's discoveries about DNA simply emphasize how true it is.

THE MORAL ISSUE remains unchanged: how to transcend the narrowly material aspects of man's existence represented by a body not very different from that of the lower animals.

Such a moral issue is a concern, but not a special concern, of the scientist, whether in the laboratory or as an expert consultant for public policy. He must answer a much more pragmatic challenge: to forecast and help bring about the most constructive human benefits from this new knowledge, and to educate the public and himself broadly enough to foresee the less obvious malicious side-effects.

First, it is essential to work of consolidation and further advance that lies ahead before many practical applications can be brought to fruition.

The most predictable of these is the chance to manage calculated modifications in the blueprints of existing viruses. This in turn will deepen our understanding and control of the factors that determine the capacity of a virus to cause diseases, to attack different species of host animals or to provoke immunity for protection against more serious attack.

ONE OF THE next major steps would be the actual chemical synthesis of a DNA molecule in accordance with the investigator's design. What has been accomplished so far is the replication or copying of an existing blueprint found in nature.

A further step even closer to a true creation would be the invention of new virus-like agents, still emulating the principles already displayed by naturally evolved forms. As revolutionary as this may seem, it would still be no more than a gradual extension, to the molecular level, of the domestication and intelligent breeding of wild animals and plants.

Exciting advances in this direction have come recently from the laboratory of Prof. H. G. Khorana at the University of Wisconsin. To make a viral DNA would be a thousand-fold extension of the steps he has pioneered, a task that now seems one of unachievable complexity. However, we had the same outlook about the possibility of synthesizing a protein ten years ago. By 1966, a group of Chinese chemists had accomplished the chemical synthesis of the protein, insulin.