

## The Next Move

A column on the impact of science on human nature, today and tomorrow.

Up to the present generation, the human organism was the legacy of the biological evolution of the species, a process so slow that there can have been no fundamental changes in human nature throughout the tides of history, indeed only gradually on the time scale of prehistory. The impact of science and technology on the human environment - such matters as the political significance of the Bomb, the chemical pollution of our atmosphere and water supplies, the economic upsets and opportunities of automation - is the main currency of intelligent discussion. But almost nothing has been said concerning the impact of science on man himself. Yet the last decade has seen enormous advances in biological science. These can only reinforce what medicine has already started, the revisions of human nature, building on an evolutionary legacy towards goals that have not been generally discussed, largely for lack of intelligent understanding of the process and its possibilities. It is unthinkable that man could refuse what medicine can offer to blunt the hardships of existence, from pain and disability and the prolongation of individual life. Since he will not bow to blind fate, man must accept the responsibility for the power to revise it, and in this very generation this power includes the planned redirection of human nature, his own body and in due course even his brain.

Discussions of such matters must steer between shortsightedness and sensationalism. Very little scientific effort is particularly directed at human modification, except in the narrowest sense of medical relief. In a sense our deepest concerns may be for the possible perversion of powers that are achieved almost coincidentally to other advance, and righteous people will not wish to identify themselves with perversions. But this will not keep them from happening.

To anticipate them does mean the exercise of imagination in looking for trouble from developments that have not yet quite happened, and in some cases may **never** occur in spite of the apparent **rigor** of our predictions. We are then trying to guess at the next move in a game in which we do not know the rules, our adversaries or even our own purposes; but somehow move we must.

In this column, many of these topics are bound to be bizarre, even shocking. We do not know how to react comfortably to matters of life and death, much less to inquire about their exact boundaries. However, there is no better way to illustrate the significance for human policy of a piece of scientific advance than its bearing on what is, and what is not, within the realm of technical possibility projected within reasonably foreseeable time limits, say the next few decades. I hope none of my discussions will be confused with advocacy; almost the only measure I am prepared to advocate is discussion itself.

Every week's scientific news tells of scientific advances that sharpen our perception of future prospects. From time to time we also see major strategic shifts, like the breathtaking onslaught on the genetic code. My purpose is a broader expression of the scientific outlook from the standpoint of an investigator still deeply enmeshed in a fair range of investigative problems, not at all to recount the latest advances at the instant it is reported - this is the proper function of the science news reporter. There are also a number of books and articles that cry out for notice, comment and criticism. The main topics I would see for early discussion include:

Genetic code - how will its elucidation bear on human affairs:

Organ transplantation - opportunities and problems

Artificial organs - opportunities and problems; the "merging" of man and machine

Selective breeding in man - is there a eugenic problem; does the advance of medicine insure the deterioration of human fitness; what are the implications of proposed answers

Genetic deterioration - environmental forces

Control of development - Huxley's Brave New World; what are the scientific expectations

World population - can objectives be rationalized

The evolutionary trend in man - where is the species heading; how do we obtain scientific evidence in this field

Extraterrestrial life - the solar system and the cosmos

Brain-computer analysis - how does the brain compute

- what intellectual functions can be expected of computers (N.B. I believe computers do "think", contrary to most of my colleagues, and am eager to expose an unfashionable view)

Human behavior, its developmental control, and its further evolution ( on some topics like this I would either collaborate with or defer to some of my colleagues)

Science and ethics - (at the very least science is deeply involved as the means of responsibility: discerning the consequences of our actions). It also helps show what are some of the sources/<sup>of</sup>and limitations on human judgment.

(a scientific view of the continuity of personality;  
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Life without end--(what are fundamental obstacles to immortality;  
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(is this a pernicious goal

Systems of scientific communications - is it cheaper to repeat an experiment than to find whether it was done before?

Planning in scientific research - how reconcile specific social needs and the search for knowledge

Book reviews - Teilhard de Chardin; Waddington; Huxley; Ettinger; Ellul

Attached are a group of writings at every level of technicality. Some of these are typical of possible columns (of course attention to context is needed for actual use).

An advantage of a column format is that the items can overlap but be related to one another. One of the hardest parts of more serious writing is to answer the need for tight organization, and to finish the whole work, say a book, in a consistent mood, uniformly up to date. Shorter pieces on partly disconnected topics should be enough less demanding (at least to my temperament) to make the project seem at least possible.

Not every column needs to be as sombre as this list implies. There are many anecdotes worth telling that do not carry a world-shaking message.