

Contemplating the Unexpected

by Paul MacCready

Extrapolating trends from the recent past allows us to predict with some confidence that the next 50 years will see more new technology developed and used by humans, and more species driven to extinction by humans, than throughout the entire prior course of human history. Simultaneously, the human population will double. If we want to superimpose an even more elaborate forecast onto this "baseline" forecast, we must also take into account the impact of unexpected and unprecedented developments in technology, and in institutional and cultural areas. While it is possible to anticipate some of these developments, it is also obvious that in the year 2041 (when some in this audience will be the age of some of the speakers, and some of the speakers will, through novel medical advances, still be around) the global situation will represent a new ballgame, played according to rules we may not yet have begun to imagine.

In this session, we explore this future with a group of leading scientific innovators and science-fiction writers, whose irrepressible free-thinking will lead us in unconventional directions. Our approach is not to look at many topics—there are simply too many to encompass—but rather to focus on several of especially high priority.

Naturally, it is impossible to foresee everything. An ideal treatment of "the unexpected" would be able to identify the new and future equivalents of the theory of evolution, the fossil-fuel internal-combustion engine, airliners, satellites, nuclear energy, the transistor and computers, and the polio vaccine, to give but a few outstanding examples. But even now, our

somewhat cloudy crystal ball lets us see that we can expect certain emerging technologies to have equally enormous consequences. One of these is genetic engineering, with its potential to treat existing life forms and create new ones. Another is communication and information technology, to connect each of us to one another, to transcend language barriers and let everyone access all information, and, incidentally, to let Big Brother access each of us. We can foresee, and hence predict, some consequences of these advanced capabilities, but certain results are totally beyond our powers to forecast.

Also beyond our ability to predict, or at least to pinpoint in time, are what we might call events mediated by nature. Some are inevitable, some can be prevented, and some can be predicted, but others are fundamentally unpredictable. Examples are the impact of a giant meteorite such as may have helped end the age of the dinosaurs; success in the search for extraterrestrial intelligence; global warming; agricultural trauma; AIDS-like diseases; a magnitude-8 earthquake rocking southern California.

But leaving aside the undoubted impact of such external events, we can say without question that the most important force on Earth is the human mind. This mind now dominates the course of our planet's future—a responsibility that was once thought to be the prerogative of capricious gods. This human biological device of fantastic complexity is now becoming somewhat understood, but also becoming computer interfaced, expanded, and redefined. In our session we will consider some of the implications of our growing capacity to understand and perhaps ultimately to modify and redefine the nature of both human and artificial intelligence. We will also look at some of the baggage carried by the human mind: at the role of culture, rooted as it often is in ancient institutions, as well as at habits, appetites, prejudices, and our inherent resistance to change. We need technology if we are to achieve a desirable, sustainable world, in some comfortable accommodation with Earth's flora, fauna, and limited resources. But we must beware being lured by technology's benefits into letting technology assume the role of master rather than servant. Serious questions that previously were debated mostly by philosophers now become critical for us all: the meaning of life, the relationship between humans and other species, and the destiny of humans on and off the Earth. □

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