

## THE PROMETHEAN CONDITION OF VIABLE TECHNOLOGIES

Nicholas Georgescu-Roegen

### ABSTRACT

Many species use tools to achieve some useful purpose. Some even make their tools. But only homo sapiens sapiens makes tools to make tools, to make tools . . . For these tools, which are in fact detachable organs, we have come to tap in staggering measures resources from the bowels of the Earth, for we need both energy and matter in a special state to which we refer as "available." Two essential points are ignored in the recent din about the energy crisis. First, that matter matters too, perhaps even more than energy, in the condition of our existence. Second, a supply of available energy, however ample, is not necessarily capable of sustaining our current industrial fever. To use any environmental energy we need a bridge between it and our internal productive activity. In other words, we need a technology conceived as an interrelated set of feasible recipes. A recipe is feasible if it can actually be used to attain some goal. To put a man on the Moon or to bake bread are feasible recipes; to vaccinate people against cancer is not (yet). However, a technology, although consisting only of feasible recipes, may not have the specific quality of viable species or of a heart. To wit, a heart pumps blood not only to feed itself but also to feed all other organs of the same body.

As curious as it may seem, during the entire life of the human species there have been only two viable technologies. The first was based on the mastery of fire, the legendary gift of Prometheus. Its support was wood fuel. As is characteristic of any viable technology, it speeded up the consumption of fuel, so that by the later part of the seventeenth century there was a crisis of wood, entirely similar to the present crisis of fossil fuels. The wood crisis was solved, as by miracle, by Prometheus II -- two mortals, Thomas Savery and Thomas Newcomen, who invented the heat engine. On that gift is based the viable technology within which we are still living.

The problem now is whether and when a Prometheus III will come to get us out of the present muddle. No one can answer that question for sure. Therefore, the unquestionably best strategy is to try to gain as great a time lead as possible. The implication is that we must practice a conservation compatible with an acceptable survival of all humanity, without ignoring the needed development of those nations that are now in economic and social distress. But conservation is not the job of a single nation, not even of several nations. It is the job of all nations together. We thus see that although there undoubtedly is an energy crisis, the far greater crisis is that of man's wisdom.

To arrive at the result formulated in the title of this contribution I found it almost imperative to examine how mankind has made use of energy ever since the dawn of history. By doing so I expected my endeavor to be consonant with the theme of this conference. But there was an additional reason for my choice. On the one hand, from all we know at this time a crisis of energy for modern technology looms large in the not too distant future. On the other, it happens that a systematic survey of the evolution of how mankind has used energy in the past casts new lights on the nature of viable technology and hence on that crisis and its possible unfolding.