New economic model a deliberate fraud

by Carol White

In volume 225 of *Science* magazine, four economists, Cutler J. Cleveland, Robert Costanza, Charles A. S. Hall, and Robert Kaufmann present an economic model pretentiously labeled *Energy and the U.S. Economy: A Biophysical Perspective*. The authors correlate national energy use to Gross National Product, which they relate to labor productivity.

Their point of view is adequately expressed in their summary, which I quote in part: "A large portion of the apparent increase in U.S. ernergy efficiency has been due to our ability to expand the relative use of high-quality fuels such as petroleum and electricity, and also to relative shifts in fuel use between sectors of the economy.

"The concept of energy return on investment is introduced as a major driving force in our economy, and data are provided which show a marked decline in energy return on investment for all our principal fuels in recent decades. Future economic growth will depend largely on the net energy yield of alternative fuel sources, and some standard economic models may need to be modified to account for the biophysical constraints on human economic activity."

The authors appropriately introduce the question of quality in considering energy use, identifying petroleum as a higher-quality energy resource than coal in the production of power, and raising the question of nuclear energy as a replacement for both. They do so, however, in order to give credibility to what is, in fact, a devious attack upon advanced technology.

They present a number of studies which show the correlation between both output per worker and Gross National Product, and energy use. They offer these to contradict those studies which purport to show that labor intensity can be substituted for capital intensity. They make the correct point that "a large component of increased labor productivity over the past 70 years resulted from increasing the ability of human labor to do physical work by empowering workers with increasing quantities of fuel, both directly and as embodied in our industrial capital equipment and technologies."

And they write: "Changes in natural resource quality affect the ease and cost of fuel and matter throughput in human economies because lower quality resources nearly always require more work directly and indirectly to upgrade them into goods and services. Technological change can counter changes in natural resource quality to varying degrees, but historically, many technical advances that have lowered unit labor costs have been realized by increasing the quantity of fuel used directly and indirectly to perform a specific task."

This of course will have appeal to developing sector economists struggling to oppose the imposition of austerity upon their nations under the guise of "appropriate technology." Nonetheless, their aim is precisely to give cover for International Monetary Fund demands that countries in Asia, Latin America, and the Mideast stop developing nuclear power. What other explanation can be given for their citing the fact that a recent survey of 40 nuclear power plants shows that they will eventually cost an average of seven times their first cost estimates if they are to be completed?

They cite this without mentioning that this cost overrun occurred for purely political reasons as the environmentalist movement was able to repeatedly delay construction of these plants in a period of rising interest rates, etc.

The systematic blunder

It is important to identify the key systematic blunder of the authors, as opposed to their deliberate ideological misdirection of the unwary reader. They assert that their so-called correlation between energy use and productivity demonstrates that negentropy in economic processes is necessarily a local and temporary phenomenon, located in the broader tendency toward entropy. Thus they write:

"The human economy uses fossil and other fuels to support and empower labor and to produce capital. Fuel, capital, and labor are then combined to upgrade natural resources to useful goods and services. Economic production can therefore be viewed as the process of upgrading matter into highly ordered (*thermodynamically improbable*) structures, both physical structures and information [emphasis added]."

The point is made clear by the fact that they correlate the following productive industries (sic!) with energy use, in the order of increasing energy use and increasing so-called productive output: wood containers, forestry and fisheries, iron ore mining, real estate, government, and finally households. Not surprisingly with these as their criteria, they agree with President Reagan that we are in the midst of an economic recovery from the 1980-82 recession.

Without criteria which can distinguish productive labor from overhead, they will never locate those critical investments in technology which guarantee continued negentropic development of real productivity. These, of course, are located in precisely those areas which do not appear on their charts, the capital goods sector, and particularly that section of it which produces capital goods for the capital goods sector itself.