Economics, Energy and the Ecology of Healthcare

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Contemporary American business is overwhelmingly invested in continued economic growth. Cheap energy is the backbone of long-term economic stability. Our excessively high consumption of energy in the U.S. continues to degrade the vitality of our planet because production, consumption and waste have a negative impact on the environment. This basic environmental concern is complicated by the fact that modern industrial economics 'externalizes' the true cost of energy by ignoring the cost of extraction, production and transportation of coal, oil and nuclear resources. In other words, the cost of a barrel of oil is driven by demand on the world market, not by the true cost of its production and distribution.

This story becomes more complex when an environmental lens is used to look at the costs of energy. Waste removal, restoration of the earth and the effects of the buildup of carbon dioxide in the atmosphere are all externalized from economic calculations. These costs are usually shifted, by government regulations, away from privately held corporations and assigned directly or indirectly to tax-payers. When one trains the even wider lens of human health on the issue of energy, the story becomes even murkier. Where are the costs of environmentally-caused diseases calculated in our system? Who pays for neurotoxic damage caused by mercury deposited in our food chain by coal-burning power plants? The price of a barrel of oil certainly doesn't carry this burden, nor does a gallon of gas nor our electrical bill. In a very real sense, our healthcare system is part of the externalized cost of our energy consumption.

When natural resources are auctioned off at discount rates and foreign oil is kept artificially cheap through military industrial strategies, little economic stability in human or ecological terms results. Indigenous populations are often left to suffer negative health consequences from sloppy industrial development. The poverty and ecological damage found in Nigeria, an oil rich country, is an example of how little true economic stability is gained from fossil fuel extraction in third world countries. The trauma of Chernobyl offers another potent example.

Other externalized costs of our energy use include loss of biological diversity, loss of ecosystem integrity, loss of atmospheric and climate regulation, and loss of the energy that comes from sunlight converted into usable energy by forests and agricultural practices. The intrinsic functions nature performs are often incalculable in

Criteria for Ecologically Sustainable Medicine (ESM)

Ecologically sustainable medical practices are:

- Safe and harmless
- Clean and non-toxic
- Cost-effective
- Non-polluting
- Adaptable and flexible
- Renewable
- Protective of the quality of life on earth, the environment and earth's natural resources
- Synergistic with human health and global well-being
- Connected with the web of life

A sustainable future requires a healthy balance between societal needs and our planet's health.

economic terms. Gretchen Daly, in her research at Stanford University, has done considerable work creating ways to evaluate economic value for nature's services. Even though Daly and others have developed excellent methods for calculating the real value of the environment, we continue to omit this and the impact of degradation from standard economic calculations.

The Economics of Energy

A 'steady-state' economy will utilize naturally sustainable energy sources, such as solar and wind, and will require dramatic limits human energy consumption, particularly in the first world. While this may sound utopian, a number of ecological thinkers including Paul Hawken (1994), Eugene Odum (1998), and Herman Daly and John Cobb Jr. (1987), offer detailed visions of society with a healthy economic/ energy balance. To reach this healthy economy, we shift energy consumption from fast growth, boom and bust usage patterns to steady state or sigmoidal, growth and utilization. (See Boom and Bust by Dr. Kreisberg, *Symbiosis*, Vol. 2. No. 1.)

Odum, a preeminent ecologist, offers a number of principles that help us understand the long-term effects of energy consumption from both an economic and an ecological perspective, offering insight into the dynamics behind a steady-state economy. For a more detailed look at these principles, please see Odum's book, *Ecological Vignettes.*

The true value of energy to society is the net energy, which is after the energy costs of getting and concentrating that energy are subtracted. By "concentrating" Odum here refers to manufacturing and refining processes. Cheap gas at the pump seldom has to do with the true costs of production. In order to understand the real value of our energy storage and capacity, we must include these externalized costs in our calculations. Subsidies in gas prices as well as our current investment in the military in the Middle East are part of the true costs of energy.

Many calculations of energy reserves that are supposed to offer years of supply are calculated as gross energy rather than net energy and thus may be of much shorter duration than often stated. Because so many of the real costs of energy are not included in our calculations of our energy reserves, Odum argues that we have no real understanding of the true global reserves of fossil fuels. Our calculations are wholly dependent on continued economic growth fueled largely by advancing technologies and a blind faith in progress.

Societies compete for economic survival by Lotka's Principle which says that systems win and dominate that maximize their useful total power from all sources and flexibly distribute this power toward needs affecting survival. Our nation's economy and our energy policy continue to maximize energy and resource inflow from energy sources with high external costs while ignoring low concentrated sources such as the direct energy from the sun. This increased utilization of stored energy from the earth has generated vast amounts of corporate and personal wealth and helped the U.S. become the world's superpower.

During times when there are opportunities to expand one's power inflows, the survival premium by Lotka's Principle is on rapid growth even though there may be waste. In ecological terms, industrial development has seen two hundred years of rapid colonizing growth, requiring consistent new energy sources including fossil fuels and agricultural lands. The generation of considerable long-term nuclear waste as well as CO_2 emissions are examples of wastes from rapid growth.

During times when energy flows have been tapped and there are no new sources, Lotka's Principle requires that those systems win that do not attempt fruitless growth but instead use all available energies in long-staying, high-diversity, steady state works. The oil embargo of 1973 and 1974 provided a nice example of this principle. Fuel efficiency improved dramatically. European and Japanese cars doubled their gasoline mileage. Falling prices for gas in the 1980's, however, caused efficiency to decline. We continue to have the technology to produce cars that will get as much as 100 mpg, but with little incentive and artificially cheap oil, the free market will not embrace this technology.

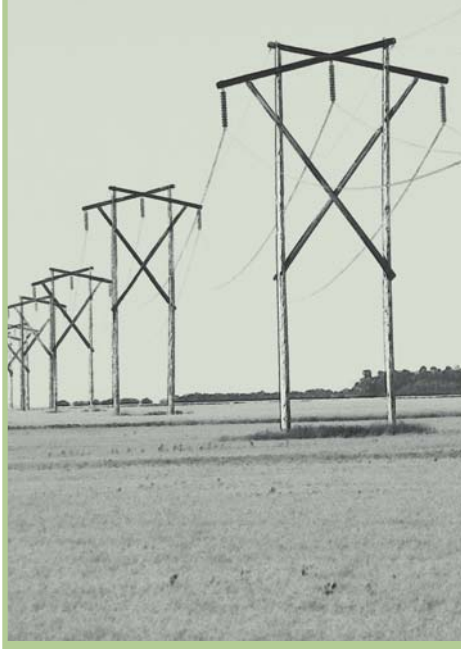
High quality of life for humans and equitable economic distribution are more closely approximated in steady state than in growth periods. Rapid growth periods tend to provide economic gains mostly for the wealthy and for corporations. Real improvements in the quality of life for the majority of people will be gained through stability and diversity of economic development at the community level. Herman Daly and John Cobb, Jr., (1984) describe steady state economics as a shift from individualistic values to community values. Community values are strongest at the local level, promoting the availability of satisfying and useful work for members of the community, security for members of the community with access to biological and social necessities, access to the qualities that make life varied and stimulating, and stability in the community itself.

Even in urban areas more than half of the useful work on which our society is based comes from the natural flows of sun, wind, waters, waves, etc. that act through the broad areas of seas and landscapes without money payments; an economy, to compete and survive, must maximize its use of these energies, not destroying their enormous free subsidies; the necessity of environmental inputs is often not realized until they are displaced. The value of the natural world is just beginning to be fully appreciated by modern industrial society. It has slowly begun entering into economic equations. Unfortunately, since much of the discussion of the environment has been about catastrophic loss of biological diversity and environmental carrying capacity, many people simply want to ignore the ecological imbalance modern industrial society created. Others do not believe there is a problem. A sustainable future requires a healthy balance between societal needs and our planet's health. Environmental devastations may provide the stimuli necessary to promote action necessary to bring about healing and well being.

Systems in nature are known that shift from fast growth to steady state gradually with programmatic substitutions, (while) other instances are known in which the shift is marked by total crash and destruction of growth systems before the emergence of the succeeding steady-state regime. The question is not which is better — fast growth or slow growth. The question is whether we will use our capacity as an innovative species to make the essential changes required to limit and stabilize our patterns of energy consumption, moving from fast growth to stable, slow growth. Will we develop a cleaner, healthier environment and improve community and personal health by choice? Or will we make the shift by surviving catastrophic destruction, in which life on this planet suffers huge negative consequences of war, famine or natural disaster before humans take the required steps towards a more steady state economy?

The Economics of Medicine

Modern technological medicine, while offering the potential for great miracles, consumes vast amounts of resources, contributing significantly to the fast-growth, boom and bust economy. Our personal and planetary health



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is at increased risk for sudden catastrophic collapse because of the economic system in which it is embedded. A striking feature of fast growth economy is that it inhibits more sustainable development due to its over investment in intensive, cheap, profit-based production. Current mainstream solutions to heart disease, discussed in this issue of *Symbiosis*, are a good example of how much money can be spent on technological solutions—by-pass operations—versus more sustainable solutions such as those offered by Dr. Ornish's program. While technological solutions may be successful in the short term, by-pass surgery does not necessary fix the real problem. In fact, it might not even help the patient feel better. What it does is remove the threat of sudden loss of life, albeit temporarily in most cases.

A healthcare system that improves the quality of life must be affordable for individuals and economically viable for society. It must be equitable—providing access to everyone. These effective, affordable medical solutions already exist. Many of them are available as practices of Ecologically Sustainable Medicine (ESM). What prevents us from using these techniques more widely is an economy addicted to perpetual growth and profitability. A sustainable medical system, on the other hand, should produce only modest levels of wealth for the providers. In economic terms, this means growth only at the rate of inflation.

ESM and the Choice for a Sustainable Future

Ecologically Sustainable Medicine facilitates sustainable health for persons, communities and the environment due to its emphasis on low-tech, low concentrated energy utilization. ESM offers solutions that support community stability. Because ESM considers experience in the natural world essential to healing and good health, ESM provides a proper dialogue between personal and planetary health. Sustainable healthcare must de-emphasize continued investment in technological progress. Offering ESM practices as the primary strategy of health intervention will limit wasteful use of concentrated energy sources. More energy intensive, technologically advanced solutions can be reserved for life threatening situations. ESM promotes an energy policy that lowers energy consumption for healthcare drastically, limiting the negative consequences of high energy utilization on the health of our planet.

In ecological terms, energy, medicine and economics must all find a sustainable balance. In terms of energy use, this requires a shift to renewable resources such as solar or wind. In economic terms, this means shifting economic priorities away from perpetual growth initiatives towards steady state investments that do not require externalized costs. In medical terms, we must limit our investment in prolonging life and reduce our aggressive research agenda into more advanced, technological medicines. We must learn what 'adequate' healthcare looks like. We must distribute healthcare equally to all people. Medical practice cannot utilize too great of a share of natural resources.

Economic sustainability is good for the planet and good for our health. Ecologically Sustainable Medicine promotes steady state economics and more sustainable energy utilization. The benefits of ESM far outweigh the risks. Seeking healing through ESM is an investment in a sustainable future, for ourselves, our communities and the world we live in.

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