

The Collapse of Complex Systems

by

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We talk about energy depletion, global climate change, overpopulation and a host of other problems, but these are only symptoms of the true problems. In focusing upon these symptoms, we do not look at the larger problem and so are in no way prepared to begin seeking a solution. What is really happening is that a complex system is approaching a systemic breakdown due to flaws in fundamental conceptions. So long as we do not change our concepts of prosperity and economic growth, and so long as we do not take into account the true costs of environmental destruction and worker exploitation, the breakdown will proceed. In the meantime, we will simply be dealing with the symptoms instead of curing the disease.

It is in the nature of complex systems to grow and burgeon until fundamental flaws bring their downfall. Complex systems are rather susceptible to sudden, large scale change. They handle slow and subtle changes smoothly, but quick, large scale change does not leave a complex system an adequate opportunity to adapt. Complex systems are like heavily loaded diesel trucks on a downhill run: they require more braking distance than smaller vehicles. Sudden change tends to stress a complex system precisely where its fundamental flaws make it the weakest. Without adequate time to adapt to the change, the result is a systemic breakdown.

Systemic breakdowns tend to progress unpredictably. You can see my article about North Korea for a sample of this (**Drawing from Experience, Part 1**, Pfeiffer, Dale Allen; in *The End of the Oil Age*; Lulu Press, 2004; <http://www.lulu.com/allenadale>), or Dmitri Orlov's excellent material on the collapse of the USSR (**Post-Soviet Lessons for a Post-American Century & Our Village**, Orlov, Dmitri; in *GRITS; Grassroots Ideas to Survive*; Lulu Press, 2005; also archived at <http://www.survivingpeakoil.com>). There is simply no way to anticipate a systemic breakdown. You can hazard guesses about some of the effects and prepare for those; but you can be sure that you will run into something unforeseen, and that the effects you did foresee will be complicated by other chains of effect beyond your ability to forecast.

Even if there was a true technofix for energy depletion, the chances are that it is already too late to implement it. The time for technofixes was back in the 1970s and 1980s. Now we are already at the hairpin curve at the bottom of the mountain, and the brakes on our diesel haven't even been engaged yet. We had over thirty years to make the necessary transition. Instead, we went on a mad binge of consumption and accumulating wealth. So now we have to pay the fiddler.

Beyond this, even if there were a perfect technofix for energy depletion *and* time enough to implement the fix, this would not solve the fundamental problem of which energy depletion is just a symptom. If we solve the energy problem, then the more basic flaws that infest the complex system we call our civilization will simply fester up in some other way. And the longer we put off addressing the underlying fundamental flaws, the more serious the symptoms will be, the more difficult it will be to resolve the true problems, and the more disastrous will be the systemic crash.

Consider treating pneumonia as a cold. You might be able to clear up the cough and sinus condition temporarily, only to have the untreated infection claim the patient. The civilization we live in is simply a complex form of ecosystem. As such, it obeys all the laws of ecology. Increased energy availability will result in population growth, given there are no other immediate limits to environmental carrying capacity. Already, the world population is almost twice again more than the carrying capacity of the planet without hydrocarbons.

Should we find and implement the perfect technofix, population would continue to grow. The adoption of conspicuous consumption (otherwise known as the American lifestyle) by more and more people will result in graver problems. And the eventual population crash will be even worse.

And for those who say that a technofix would work if we also practiced conservation, I submit that it is impossible for our current socioeconomic system to conserve. For one thing, conservation could endanger the economic growth upon which this system is so dependant. And even if we did succeed in conserving energy in some ways, Jevon's Paradox implies that total energy consumption will still increase (see http://en.wikipedia.org/wiki/Jevons_paradox).

This is why scientists and engineers have been warning us for over a decade not to expect technofixes.

Our problems are too complex, and they result from basic conceptual flaws that lie outside of the realm of science and technology. It is too late for technofixes. Even if it existed, a technofix would only be a temporary fix. And, in any case, our efforts would be much more effective if we were to address the fundamental problems instead.

In order to avoid systemic breakdown, we must change our concepts of prosperity and growth. We need to stop measuring our health in terms of dollars, or we need to incorporate true social and environmental costs into those dollars. We must forge a new socioeconomic system not based on conspicuous consumption and constant economic growth.

We need to begin restructuring our lifestyles, our households, our neighborhoods, and our communities. We need to adapt for self-sufficiency and sustainability. And while we are doing this, we need to evolve some new criteria for measuring prosperity, and a new respect for our environment and for each other. These are things that we can undertake at a grassroots level, and which will do the most good in the long run.

When we talk about peak oil, then we must either hope for a technofix or head for the hills armed for survival. But when we realize that peak oil is only a symptom of the true problem, then we also realize that neither technofixes nor personal escape will really solve our problems. So let us state once and for all: the problem is not peak oil or energy depletion, nor global climate change, nor overpopulation. The problem is the collapse of a complex system due to fundamental conceptual flaws.

When we have focused upon the real problem, then we can begin to contemplate a solution on the grassroots level, based on the development of a localized, sustainable socioeconomic system that makes the environment and community an integral part of the equation both on the social level and on the individual level. Then, and only then, can we begin to solve the problem.