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Dear Don,

There's lots I might use from your draft paper on defining systems, but more on that below. In looking to see if I could explain the source of my objection to HT Odum's principle of maximization I found a nice history of biophysical economics and enclose the pages covering Odum, Georgescu-Roegen and an overview of present day Ecological Economics, also found at: (http://www.eoearth.org/article/Biophysical_economics). I've actually only skimmed that latter pages. I note this school of thought is still missing any discussion of the development cycle (¸¸.·´ ¯ `·.¸¸) and that systems study concerns their being autonomies, and how they're self-designed, evolving and quite out of our direct control.

I guess my main objection to the idea of maximization is that environmental limits being as being quite invisible to evolving individuals and that at the beginning one's environment always appears limitless. Systems respond to external limits only when they run into them. The question is whether systems might also sometimes be responding to internally chosen limits when they switch from growth to climax.

While I'd grant that there might be a maximum feasible energy throughput for any one or type of system, it seems only a wild guess that that is also any system's natural climax of development. Isn't it the main characteristic of systems that they're NOT like water in always seeking their own level and fitting their form to whatever is around them? Odum also says maximum energy is what makes economic value. It might be only a guess though, since 'better fit' in a complex way, rather than 'maximum energy throughput' seems to better identify systems offering superior environmental services (and earn a higher economic price in the market). Perhaps his linking of Darwin, Lotka and entropy are valid, but then I find the firm evidence that maximization is not what organisms do, brings that *all* into question.

Perhaps the maximum energy principle shows that a human can not entrain enough energy to jump off the earth by itself, and escape earth's gravity, but I don't think it says what a human has to do while freely roaming the earth within it's limits. Perhaps it shows that there's a minimum necessary energy throughput for any given environmental service and thus a valid proof that 'real' economic growth has absolute theoretical physical limits, but it doesn't tell us when or how, or what the best kind of climax would be.

There's no doubt that a growth system starts with increasing energy throughput, and that does taper off and end at some point. I don't observe or see in the

discussion any demonstration that such limits a system approaches during their asymptotic period of stabilization and refinement necessarily produce a maximum potential throughput of energy and are thus possibly controlled by energy resource limits. Things just don't always eat till they're stuffed, or grow till they fall over and can no longer reach the food source. No doubt, development can't go beyond some energy throughput limit, but there are a lot of other factors that influence what to do with the energy resources at hand. The broad pattern I see is that system climax is a period of finishing the details of what it's growth began, completing a design, not maximizing a flow.

In the broadest sense, I think it may come down to whether a system is considered to have an inside or not, with the Darwin-Lotka-entropy model basically describing causation as external to the system, a matter of events going down hill on a landscape of gradients with preformed channels that are only revealed by the movement of things on them. I think that fails because the demonstration that the channels even exist is entirely tautological. I don't think systems are primarily expressions of their environments at all, but originate spontaneously as circumstantial loops of behavior that multiply, feeding on their environments and responding in complex ways when they bump into each other. To me limits are more expressions of a system's own processes of discovery, and that complex internal choices have a major role that's being ignored entirely.

On other things, I have finally figured out how to conveniently scan our correspondence to .pdf format (I bought the new version of the program), but haven't put the pages on my website yet. I'll probably get to it sometime but other things have been a priority. Yes, I agree, I should put the © on them when I do.

The new visualization tools are also sometimes called Qualitative Data Analysis, or Data Visualization, or Visual Modeling Environments. One of the cool applications is the Visual Thesaurus - http://www.visualthesaurus.com/. It's powered by ThinkMap and I wrote them to ask if they'd license it cheap to independent systems researchers...but they wanted 10 grand to license a developer version instead...

There's a whole field of qualitative research software I know little about. A couple links to new data collection and display methods are:
http://www.palgrave-journals.com/ivs/journal/v5/n4/
http://www.qsrinternational.com/
http://services.alphaworks.ibm.com/manyeyes/browse/visualizations/
http://www.pages.drexel.edu/~cc345/gallery/ - with free software
http://www.gapminder.org/ - fantastic animated distributions of world data.

I think you should really consider going back online, you know. It's only the hassle you make it, and still is a rather open forum with much better research tools than before, and allows as much anonymity as you like.

That 4pg piece went out with a couple improvements you suggested. Thanks. I didn't remember to replace 'structure' with 'process' though, but maybe I'll have a chance of a final edit when they approve it. I prefer not to use confusing words like 'heterarchy' for audiences that would be unfamiliar with it, and hope the more accurate 'informal hierarchies' works better. I did leave in the 'edge of

chaos' phrase because it was referring to one of the ideas of the modelers, and I'd like them to use my technique to see if they can find that phenomenon in the real world. I think the question of where the creative moments are in systems is a great subject. That it's sometimes at a time of dangerous instability (the 'edge') is perhaps a conceit as you suggest, or more what happens if you ignore all your steering opportunities until panic sets in. I myself find the physical evidence to say that the most dramatic structural changes happen at times when there is no commotion at all, at moments of deep quiet. Understanding that is difficult, but anyone who asks can see that growth begins and ends at moments where nothing is changing except the system's entire way of changing…

On systems decline, I perhaps have let myself ignore the study of the second half of the life cycle curve, the destabilization and decay periods, as I term them. Stan's discussion of senescence includes the continual degradation of structures of all kinds from the moment they're made I believe, which I would more closely associate with the broad principle of entropy. During the lifetime of organisms their cybernetic processes maintain their systems at a high functional level for a long time, and then begin to a more accelerated break down and then decay themselves. I think that aspect of aging and death is more specific to the understanding of complex systems than to entropy, in the same way as their growth in the first place is not produced by some vague principle of 'syntropy'. The pattern of decline I observe is usually sigmoid, but then for organisms clearly always reaches a point of more sudden change in death. I suspect that that sudden event is also sigmoid, but at a different level(s) in the hierarchy. There are a lot of questions that would need to be explored by evidence we don't have yet it seems. One other kind of system that seems to have a sudden end property are human institutions, like the Soviet Union completely caving in all at once, or the collapse of the drug world in NYC in the early 90's. Great big strong and durable things just vanish when they loose credibility it seems.

I appreciate that you keep emphasizing the value of the major work of Weinberg, Powers, Odum and von Foerster. One of my reasons for 'cherry picking' ideas from them and others, but going my own way with them, is my desire to make systems thinking a more natural way of experiencing the world and less an esoteric subject. I certainly don't have much evidence that I know how to do that, however, but do feel strongly that if systems thinking is not useful to ordinary people it won't be useful to science either. There's also my need to include a couple insights that are simply missing from the approaches of the old masters, like why is nature so creative and eventful if everything is supposed to always be running down. I think observing that eventfulness generally comes from things that begin and end, not things that are continuing from before, is a better answer. When you look it seems to be that the formation of loops produces explosive autonomous behavior. So, I'm eager to cross fertilize, but I guess I'm also picky.

On your draft, In reading it I knew you'd get to a nice synthesis, but it did take some patience while you worked out other stuff. I particularly liked your aside of drawing a parallel between "function, form, content, and control" with "process, structure, substance, and governance", the abstract and the practical. I've been thinking about the relation between 'process' and 'structure', and now your parallel suggests expanding that to the relation between function and form.

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It seems like it might be helpful to consider them as orthogonal views of the same thing. Process is an evolving change over time(¸¸.·´ ¯ `·.¸¸), and one of the things that are evolving are the cross sections of the process seen as structures in space, abstracted from time. If you trace the loops in a behavioral structure you always have to jump backwards in time to finally connect them.

I also found your list of the universal aspects of systems and a systems view of things solid and fairly complete. What I would do with them though is include something like them as a list of discoveries you might make about any physical system object that you may be studying, i.e., as place holders for certain kinds of notes on one's system's inquiry notepad.

One that seems missing is that same one I wanted to introduce into the graphic icon representation of the toroid as a system, that systems rely on both direct connections, and indirect ones through mediums of free exchange. It's the kind of linkage that resource pools allow that is what I think makes natural systems different from machines, that their mode of both internal and external communication tends to be by 'messages in a bottle', scattered possibilities cast adrift, rather than cues of necessities standing in line.

Another defining characteristic of systems, of course, is the developmental sequence of how they evolve itself, that systems structures are cross section snapshots of evolving processes artificially frozen in time. System messages never actually travel in circles, for example, but always in spirals, that we render as circles when we simplify our diagram to not show how it is in constant change.

All the best,

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