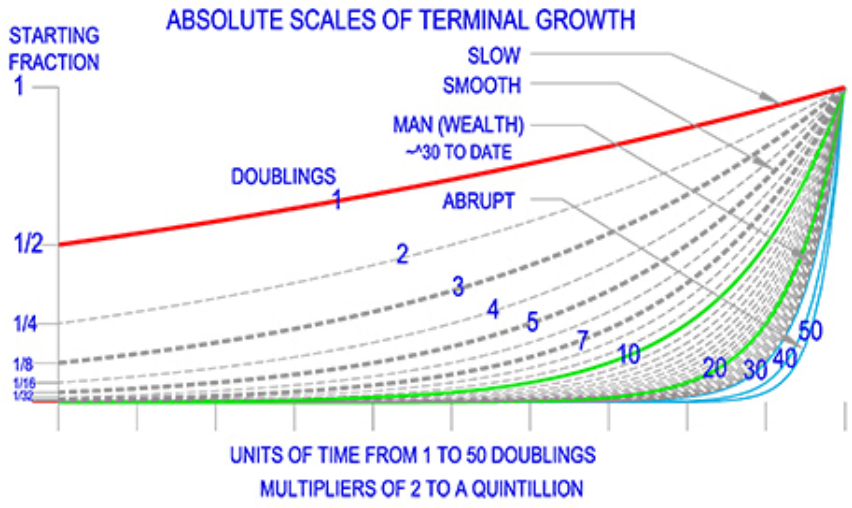
Don McNeil
P.O.Box 312
Wyalusing, PA 18853

Dear Don,

Well, it is getting more difficult to keep up correspondence as the global audience for understanding the complex natural world begins another swing in the right direction. Wouldn't it be nice if it swung far enough to actually hit something! Still H.T. Odum, and many others ran into the difficulty of speaking to people in strange language too, but made a lasting contribution. The change in intellectual climate now is that people are starting to explore a little again, and I'm getting some of the input I've always needed to focus my attention on what works for others rather than just entertaining myself by hitting them over the head with alien images!

I too notice that driving around the countryside there are a lot of places that don't seem to be changing at all. My little home town isn't much different, and the little towns I drive through on the way to my son's college clearly haven't changed in a long time, or in some cases, even painted. The numbers tell a different story though. For natural systems the 'good life' *begins* more or less at the end of growth as the system turns from growth toward stability, not *ends* there. Here's one more way to ask the question of whether we're at or past that turning point in the steady 600 year explosion of modern civilization. I've been wanting to do this little graphic for a long time, but just never got around to it.



So, what's your guess as to the scale of doubling needed to turn a fertilized egg into a mature human adult? or the multiplication of human productivity in the growth economy since it started around 1500? There are some estimating uncertainties to consider if one were to really study it, but the former is around

P. F. Henshaw 680 Ft. Washington Ave, NY NY 10040
synapse9.com

(212) 795-4844

2^25 I think, and the latter, if we manage to stabilize, will be around 2^32, a difference of 2^7. What that says is something like we're building our global life-support system to be 128 times as complex as the human body… The word 'complex' is undefined here, of course, but I think any consistent definition would yield similarly useful interpretations of the absolute scales of order and complexity concerned.

As far as strategies for making the human system emulate the best in nature I have various ideas for how critical masses of receptive groups could cause self-reinforcing feedback switches to change the direction of the system as a whole. That general model I would expect to read about in Forrester, von Foerster or Odum (Bertalanffy, Boulding, Weiner, Weinberg, Fuller or Ashby too, among others). I perhaps haven't given W.T. Powers a sufficient chance, but from a short effort at "Making Sense of Behavior" it seems to me he that his use of the word 'control' is the classical one that has been the root of much evil as far as I can tell. You seem to see something else there too, which wouldn't surprise me, but I just didn't see it.

It's not that a classical point of view toward control is so wrong, nor to say that other system thinkers are free of it. The problem I see is not holding all the many other natural points of view at the same time as well. Only when you integrate views from many directions, particularly including both views from inside and out, do you get a whole picture of any subject. With the human habit of arguing the 'correct' view in which all perspectives are discredited except the one left standing, it's amazing that man has made any progress with thought at all and our present pinnacle of unconsciousness taken only 60,000 or so years to accomplish! Nature just does some things slowly it seems... or maybe something happened along the way that held us up.

The problem with the 'inside' view is that in addition to being 'clearly wrong', also makes people very queasy. It makes it look like all the forms of nature are 'out of control' and most thinkers run from that so fast they don't notice that sometimes things work quite well that way. Jumping back to an 'outside' view and trying to impose external controls is not the only means of collaborating with independent things available, though. You can also selectively feed the cybernetics within them that you prefer, using a kind of half-breed control/nurture strategy (what I think my odd air current patent does, that the PTO hates so profoundly but can't rid themselves of). Sometimes there are numerous other levels of engagement with independent systems ('control' strategies), like petting your cat or dog just for the pleasure of it [*while petting, just repeat the words...you are under my control, you are under my*....]. :)

You commented that "The universe is surely neither deterministic nor stochastic but rather (meta-)cybernetic at its core". It's odd that that kind of simple self-critical observation has been both the source of many of the great questions of science and is generally avoided like the plague. When the evidence at hand clearly shows that your explanations are lacking, it gives you a reverse image of the explanations that would fit better. It's my sense that physics has more or less regularly used that method of discovery, like in finding the atomic world and lots of other things, figuring out generally what to look for and then going out to find it.

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You then say “From that principle, much could be derived”. I entirely agree. Applying that kind of negative image was one of the things I was doing when I was studying air currents, closely observing all manner of smooth explosions of new form with nary an equation or hint of any kind of noise in sight. Equations simply don’t pre-exist the physical things they describe, so it must be something else that’s happening! How to map direct observations of rapidly evolving systems to a communicable model is then one way of facilitating conversation about them.

You’d want a model that connected with all the different ways of identifying and organizing the records of system behavior, and there may be a lot of unexplored ways of finding and interpreting systems that will need to be included later. My time model for identifying natural systems and recording and connecting observations about them () looks like it fits well with your spatial toroid models (), for example. They could be interpreted as representing the exact same information. The one has all spatial & relationship dimensions curled up and hidden (perpendicular to the page in this case) except for the trace of a single measure over time. The latter represents the system as a static structure of all its spatial and relationship connections, with as many expressed dimensions as measures perhaps, except with the time dimension curled up and hidden. One necessary part I don’t think either represents well, though, are the places of ‘hierarchy’ and ‘heterarchy’. I would show the ‘eddies’ immersed in, and their threads interspersed with, mediums of free exchange considered as ‘connecting gaps’. I find it more generally consistent with the data to have the little eddies swimming freely rather than embedded in larger eddies, though the latter is quite correct when smaller scale and larger scale systems develop integrated and coevolving structures. I just don’t think that’s the general case, and my diagrams get hopelessly tangled when I try to represent the various disparate levels of interconnection as fixed structures, so better as gaps with a footnote. There may also be other aspects of systems to include in the full description that just don’t fit any simple iconic diagram. I guess we’d need to maintain a list of ‘stuff unavoidably left out while looking for a better model’.

So, anyway, I’ve been enjoying your stimulating ideas and great historical scope of the larger discussion. Our letters might be entirely undecipherable to others but I have lots of other stuff like that on my web site and no one complains! Would you mind, and think it interesting, if I made them available as .pdf’s.

Cheers,

Philip F. Henshaw

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