

## Economies that become part of Nature

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### Nature in the gaps



An interesting general problem with theories is that they need not be correct so long as they seem profitable. Any kind of theory leaves it to nature to fill lots of gaps. Today's popular alternative economic theories have a very

notable gap, proposing ways our economy might live within its physical limits, without proposing how investment would stop its customary use of profit to continually multiply the search for how the economy can exceed all physical limits. I think that's been the main gap nature has been unable to fill for us.

Traditional economic theory is that you can't run out of resources because investment is always increasing the resources invested in finding new resources to replace those being used up. By adding %'s to investment you add %'s to the resources invested in finding more resources and the use of resources can increase exponentially. The theory works fine, in fact, and has also been quite profitable for centuries.

Continually using more of your resources to multiply your search for new resources to use up, however, just isn't sustainable. It automatically results in a whole system tragedy of the commons. Doing something about that still seems missing from the world of alternative economic thinking is another part of the problem. The apparent reason is not that people have not brought it up, but that it has been quite hard to understand and unfortunately also profitable not to. We need to stop ignoring it.

It's very curious that people have hardly noticed that nature is simply full of systems that work quite like free market economies, like populations of cells or organisms that develop systems of mutual that link their complementary differences, forming bodies and ecologies. They frequently start-up their development with periods of run-away growth, with the environment filling in new resources for them as they grow and develop.

Not all, but quite a number, don't come to climax with destabilizing internal conflicts and environmental tragedies, despoiling their own niche. The successful ones somehow "form a system" and stabilize at the peak of their vitality. They don't do what we're

headed for, collapsing in exhaustion at our peak. They become part of their environment instead, like magic. To mimic how that's done we'd have to study it.

Scientists may often say "there are no systems, just pressures", and dismiss the idea. That might come from the reliance of science on using equations for pressure rules to represent them. The difference between natural economies and equations is that they have parts that are actively learning as they go, and so representing them as controlled hides what makes them change. Their parts are self-animating, actively responding to their surroundings and to how each other are each changing, so local rules develop inside the groups, often to avoid pressures from outside. That part of being made of living things is hidden from view by representing them with equations. They're opportunistic systems.

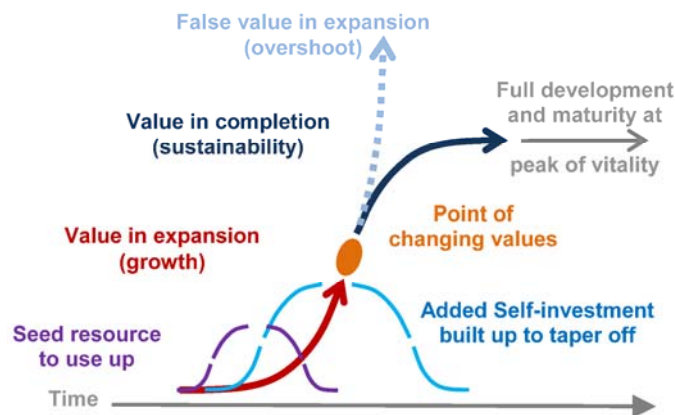
The dilemma for science has been its need to have its terms well defined, and it's hard to find what defines complex and living systems.

One response is to start by first just learning how to identify them and then start from scratch finding what general things one can be highly confident of while accepting that you don't know much about how what is inside them works.

Our own bodies are collectively run market organization of individually living cells of many kinds, for example. The

cells exchange complementary services through the blood stream and nerve system networks, releasing what they make and taking what they need like floating "messages in a bottle". It's a terrible control system, but seems to work because each part is giving what stimulates the system to give back what it needs.

A freshwater pond ecology uses the water to link populations of widely varying species that create their own niches and exchange complementary services. A work place serves as a medium for exchange in which a business organizes, providing a place where groups of individuals work out with each other how to make their jobs work and create an organization that works as a whole.



Natural System Economies, Business Model & Growth path  
First Starting Things Up then Perfecting & Integrating Them

Families are also natural system economies in their own right, organized around their own internal networks for exchanging complementary services, operating as whole in being a resource for each part and interacting with its environment. All four of those examples of “uncontrolled” natural system economies grow by the success of their learning parts, take care of themselves operating as wholes in making use of their larger environments while being generally responsive to their own limits. It seems so common.

Tracing how natural-system economies work is challenging. They change everywhere at once by different processes, for example, so wherever you look the great majority of the important business is somewhere else. You can see the principles at work, though. It’s the self animation of the parts that does it, that fits all the parts of such systems together. They fit by using search and adaptation for linking their complementary parts, ‘foraging’ for opportunity and ‘dodging’ hazards building up layers of new organization as they go. It produces regularly accumulating whole system change.

One way to both identify where that’s happening and find out what’s doing it is illustrated in the figure. Their history curves display when and where they start from a seed resource and a kind of “viral” development. Natural system economies, large or small, generally begin with a seed resource and a “run of luck” for having “a germ of a good idea” of creative relationships in their environment. What steers their development is how their parts use some of their product to develop, self-investment. It’s also called “auto-catalysis”, for how the process catalyzes its own development, a kind of “bootstrapping” that nature uses to begin virtually everything. The parts of systems flock to new opportunities for change, just as our financial system does, steering business investment. Financial investment and individual creativity guide the economy’s natural organizational steering processes. It is what directs the search strategies for new system structures and relationships.

Whether for internal or external reasons the period of start-up growth runs into complications, and the process switches direction. It’s called the “point of diminishing returns” since it’s when a system either stops investing as much in self-expansion, or stop succeeding as much. Any process of changing by ever bigger steps alters its own environment.

What’s most unusual for systems that are going to mature and stabilize at a peak of vitality is that the switch is to completing and refining their designs, before running into external limits. That’s like when building a house using the last load of lumber to build a roof, instead of more walls. That way such systems end their own self-investment cycle with making

themselves into a secure new kind of environment for their parts.

**There is a great complexity involved in completing and perfecting things, but it’s of a different kind than the great complexity involved in substituting new resources faster and faster in pushing growth beyond comfortable limits. You could call them quantitative and qualitative growth or outward and inward growth. One might also find other kinds of complexity that those characterizations don’t fit, so I usually say it’s “starting” and “finishing” things. The important realization seems to be that everyone knows a good bit about that already, both with things we see work especially well and others where they don’t turn out well at all. So, what I noticed as a systems scientist is that it’s possible we could learn how to start and complete economic plans, by closely watching ourselves and the natural economies we’re familiar with for applicable examples.**

As far as inventing new things, our economic system is clearly very good at whole system learning. All the parts look for ways to connect and avoid conflict with each other, creating changes everywhere at once that work together. It’s the basic sign of a natural system economy. One of the things one can know for sure is that no part can know their contribution to what other parts will use them for. It’s one of the main ways “nature fills the gaps” and takes care of things out of sight. The risk is creating gaps of unfinished business that the rest of the system can’t keep up with.

Nothing in the gaps



It’s the means of switching to completing the economy to provide a secure home on earth that solves the problem of our needing to keep running ever faster to just stay in one place. That’s what the other alternative economic models don’t

address yet, how to end the endless multiplying search for new resources to use up ever faster, that keeps our economy from stabilizing and becoming a part of nature.

How to solve shows in what plants do when after the growth spurt they get from their seed resource they switch to seasonal growth and becoming a part of their environments. That’s also what people do with any project they successfully tackle. Starting with expanding it and at the limits of manageable scale turning to finish and perfect it. That’s also what people do in their own growth, switching from outward growth to inward growth. First our bodies switch from exponential growth in the womb to maturing the scale of our bodies when we then develop our skills and mature our minds.

We make that same step to perfecting things before they become unmanageable with most things we

manage personally. With over sized projects like building a whole civilization, though, we rely on following rules, and our rules are mostly only confirmed by being profitable at the moment.

The popular alternative models for free market economies still include the flaw that causes our economy to push us to search for new resources and talents ever more frantically to survive, and prevents us from using our resources to secure our place on earth and become a part of nature. It's that the rule of financial accumulation, having a minimum guaranteed return and continually adding the returns to investments. There's nothing wrong with either unless connected to the other. Together they cause any system into something like a Ponzi scheme, raising the stakes by multiplying competitive stimulus till it breaks down. In a steady-state economy that would drive increasingly productive people to take ever more from others. Of course, in a failing growth economy, continually intensifying competition while ever more rapidly shrinking the resources to compete over, would be even worse.

For example, the "economic democracy" idea proposed in World Watch this month by David Schweickart<sup>1</sup>, has many interesting ideas. The model for democratically run businesses would still be using the same rules for growing self-investment that cause private money choices to drive ever multiplying competition. Having that flaw also puts his scheme in very good company. The same one mars seemingly all the popular alternate economic models, such as the "transformative technology" ideas of Paul Hawken and the Lovins's in *Natural Capitalism*<sup>2</sup>, the "transformative governance" or "sustainable development" ideas behind the models of Herman Daly<sup>3</sup> in *Beyond Growth* or Gus Speth in *The Bridge at the Edge of the World*<sup>4</sup> or H.T Odum in *A Prosperous way down*<sup>5</sup>. It's even in the critically well-received *Prosperity without Growth*<sup>6</sup> proposal, by Tim Jackson of the U.K.'s Sustainable Development Commission.

What's missing is a correction for how private, institutional, and government money management is used for auto-catalytic money growth, driving endless growing obligations and competitive stimulus. It causes us to multiply unfinished projects needing ever more changes to maintain the growing imbalance. If one can have only finite physical wealth, can you still have endless multiplying ownership? It's enough to drive a Sorcerer's Apprentice<sup>7</sup> caught up in it crazy!

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There's an elegant certainty that points to a solution. It was first discovered by JM Keynes and then further studied by Kenneth Boulding, and then used by me to point to the riddle of how natural-system economies take good care of themselves. Perhaps those who read chapter 16 in Keynes' *General Theory*<sup>8</sup> or Boulding's last chapter in *A Reconstruction of Economics*<sup>9</sup>, or my papers, were embarrassed to not quite understand or hesitant to ask the noticeable "dumb questions" it raises. The question is how to arrive at "peak money". It comes to a simple choice, either a) investment stops growing because conditions are so bad that returns on investments don't materialize, or b) healthy returns are earned by investments and recycled as spending, instead of being used to accumulate ever more investment until (a) occurs. Successful economies end their own investment cycle. I hope that's a simpler way to say it, since clearly no one listened to Keynes and Boulding.

When presented with an approaching certainty, the main question becomes how to respond in a smooth timely way. Steering problems are like that. If you see a necessity for a change in plans coming you do two things. One is to start thinking about what would need to change and the other is to start looking for when to do it. I like to use the analogy of paddling a canoe, skiing down a mountain, or driving a race car. When you see a turn coming you first mentally prepare a move to make and then wait for the earliest opportunity to do it smoothly. That both makes it fun and upstage nature's alternate solution for responding to the turn too late, having you capsize, tumble or crash. Practical ways to phase in workable rules to resolve that start with what can be defined with certainty, that investment needs to be steered to making the earth sustainable rather than creating multiplying short term narrow financial gains. One could use scientific measures to qualify the tax status of investments according to long term sustainability. The main "meta-rule" is that you'd allow exceptions only if they don't invalidate the main rule. You'd start today with what we know for sure, that we've got

to have our economy become part of nature. Perhaps the first sweeping step in defining what that means might be recognizing the necessity to redefine fiduciary responsibility, to be for business choices to reflect the whole interests of their public shareholders in building a peaceful rather than ever more agitated world.

It appears that if we could switch to the natural way of



The Sorcerer's Apprentice driven mad!

completing things that last and integrating with our real world. That would end our accelerating expansion to refine systems worth keeping. It's an idea for how to avoid the fatal trap so well described by Joe Tainter in *The Collapse of Complex Societies*<sup>10</sup>. The long history of complex societies collapsing seems clearly associated with sophisticated problem solvers running into diminishing returns for their own methods of solving problems, and that becoming a trap. **It's a way for them to get tricked into turning their best solutions into their own worst problem..** Diminishing returns for any direction of development is as reliable a principle as gravity, making the trap of trying to solve it as a problem perfectly inescapable. It's a passive cause, but a real hazard, and we might take it as an opportunity, to see what else is possible, rather than fight it.

**We get caught in doing things like using efficiency to sustain growth and how it multiplies the rate of the whole system using up every usable resource. We get caught and don't notice that contradiction partly by things like promoting efficiency in the name of "sustainability" attempting to solve the problems it actually makes worse, for example. What we really need is to stop changing plans ever faster so efficiency can then be applied to making really reliable long term plans work smoothly.**

When pushing the limits, even intending to just push the "safe limits" by only exerting the "maximum safe pressure" on nature seems quite dangerous. It would also push economies to grow to their point of maximum constraint from nature, and leave all their parts with strictly minimized freedom to change. This is the problem with applying the maximum energy principle to your own life support system. It's better to make sure you have a good roof on the house rather than continuing to build walls till you see a storm coming. It's inevitable. To maintain the freedom of the parts and be part of a living world, the system as a whole needs have "comfortable limits" that leave room for lots of other things we can't presume to control.

One of the most obvious things humans are not in control of is the diminishing quality, and so increasing cost, of our own depleting resources. The physical trap of "profiting from scarcity"<sup>11</sup> as diminishing resources become priced as increasingly scarce necessities is another way we get caught in the same trap. When you see walls of natural complexity approaching on needs to consider it as a "steering problem", threatening disaster if begun too late. That makes the initial choice easy, start looking for how and when to do it as a first priority. Presently the world consensus is to never pause growth for anything, and we are already in major difficulty with no main stream thinking about how it would end completely begun.

As far as my own contribution, I have various things linked from my Synapse9.com website archive. The main source of learning for how to do it seem more likely to be in the end anyone's own original observations about how changes in their own lives begin and end. Every kind of project whether making dinner, or building a career and rising to the top of the ladder in business, begins and ends with those different kinds of accumulation, starting and finishing, and enjoying how nature is needed to fill in the gaps. It's observable in processes of lasting developmental change as they begin and end, generally, whether planned or unplanned. To make these choices we need ways **to understand what things just start ever more unfinished business, and looking for signals to begin simplifying and completing things to make them refined.**

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<sup>1</sup> D. Schweickart 2009 "A New Capitalism—or a New World?" World Watch. Sept/Oct. [Link](#)

<sup>2</sup> P. Hawkin, E. Lovins, L.H. Lovins 2008 Natural Capitalism

<sup>3</sup> H. Daly 1997 Beyond Growth

<sup>4</sup> G. Speth 2008 The Bridge at the Edge of the World

<sup>5</sup> H.T. Odum 2001 A Prosperous way down

<sup>6</sup> T. Jackson 2009 Prosperity without Growth. UK

Sustainable Development Commission. [Link](#)

<sup>7</sup> W. Disney 1973 The Sorcerer's Apprentice

<sup>8</sup> J.M. Keynes 1935 The General Theory of Employment, Interest and Money

<sup>9</sup> K. Boulding 1967 A Reconstruction of Economics

<sup>10</sup> J.A. Tainter 1988 The Collapse of Complex Societies

<sup>11</sup> P.F. Henshaw 2009 "Profiting from Scarcity" The Oil Drum. [Link](#)