Industrial Ecology, Biomimicry and Ecological Economics –

Some Thoughts on the Interrelationships between these Areas of Study

Some strands of thought in ecological economics aspire to the “abolition of scarcity”. Inasmuch as many human wants are not really essential needs but just culturally-conditioned wants, the grim focus on inevitable scarcity (in contrast with the postulated near infinite nature of wants) found in mainstream economics ***can*** perhaps, be softened and “rolled-back” to some degree.

In a more hard-headed ecological economics view, though, scarcity is more “re-conceived of” than abolished. It is not always clear *what* *exactly* is seen as scarce in *mainstream* economics. In *The Skeptical Environmentalist* , Bjorn Lomborg, rather inanely, asserted that the “only scarce good is money with which to solve problems”. *Prima facie*, that is a quite ridiculous statement; but it could be interpreted, somewhat more charitably, as being an assertion that what is scarce in the world is financial capital (suitably deflated to normalize its purchasing power) and the capacity that such financial capital offers to fund the building and installation of new manufactured capital assets. The obsessive focus on labour productivity in mainstream economics might suggest that mainstream economists also see “labour” – the other hyper-abstract factor they typically provide for in their “production functions” and symbolized by the letter “L”, alongside the equally-hyper-abstract compendium of financial and manufactured capital symbolized by the letter “K”- as being scarce. This too, is an odd proposition in a world full of unemployed and under-employed people, but given that skills valued by others are unevenly distributed in the global population and that many of us would prefer more leisure than we tend to succeed in getting, it might make some sense to claim that labour-hours of sufficient skill are indeed a scarce resource.

In contrast to this though, Herman Daly has argued, rather cogently, to my mind, that the most important and scarcest factors relevant to our wellbeing today, are in fact, stocks of critical natural capital assets, sinks that can safely absorb our many and noxious waste products, and the integrity biodiversity and resilience that allows natural ecosystems to provide us with the many “fund-services” (to use the term coined by Georgescu-Roegen) we derive from those systems.

If that is so, industrial ecology and biomimicry can be thought of as the strategic (and applied level) response of scientists, engineers and technologists who “get it” - that is, who accept the insight from this strand in the ecological economics literature, and want to tackle the problems of scarcity of natural capital in a very “hands-on” way, rather than to simply design incentives to induce others to tackle them.

So what is it, particularly, about the industrial ecology / biomimicry approach to design and “production” of goods and services that fits in so well with the principles of ecological economics ? Natural, biological systems, that is systems which have evolved ***without*** human beings playing a significant organizing role, and the organisms found in those systems, seem to have evolved to be very

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frugal in their energy usage. They appear, in general, to impose a relatively modest disruptive impact on neighbouring systems and organisms. Furthermore, most types of biomass, both animal and vegetable, decay rapidly back into useable inputs for other organisms at the end of their lives. This frugality in energy usage and easy recyclability, and the property these systems and organisms have of not significantly disrupting the fitness of their immediate environments as locations for other systems and habitats for organisms of other species, economises on scarce low-entropy matter-energy, just as modern ecological economic thinking suggests we should do in the activities we undertake to meet our needs and wants as human beings. Ecosystems relatively undisturbed by human beings, and the physiology of non-human organisms, especially species with a long history of evolution, constitute ready-at-hand blueprints for want-satisfaction activities that are in general, rather less wasteful of low-entropy matter/energy than many of the typical manufacturing, service delivery and industrial agriculture processes we human beings have devised for ourselves, especially, those we have devised over the last 250 years in which we have become very adept at extracting and burning fossil fuels at a rate far in excess of the rate at which fossil fuel stocks form, and a rate far in excess of the rate at which the atmosphere can absorb additional greenhouse gases without beginning to behave differently.

In my view, helping to marshal the collective political will to change some of the rules of the economic game, and designing effective and well-tailored incentives to encourage sensible innovations and adaptations, are all useful, indeed necessary things to do, but they are not, on their own sufficient. Likewise, developing technologies for making goods and delivering services that are more frugal, in their entropic consequences than the ones we have now, are useful, indeed necessary and yet also, on their own, not sufficient. Securing the long-term wellbeing and sustainability of life on earth requires better technologies as well as the incentives for them to emerge. It also requires incentives for better technologies to be widely adopted, and incentives for inferior technologies to be abandoned. Thus not only are the topics and methodologies of study connoted by the terms ecological economics, biomimicry and industrial ecology philosophically in harmony with one another, progress in all three areas, and wide public recognition of the insights of such progress, is necessary for the attainment of resilience and long-term sustainability.