

# Comparative Analysis of Radical vs. Incremental Change: A Conversation in Whole Systems Design E. Christopher Mare – Autumn 2002

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Introduction: *Change* – such a powerful word. For relatively conservative or rigid people who may prefer to keep things just as they are, indefinitely, this word must invoke deep anxiety and resistance. How unsettling to change the status quo! For other, more mutable people, change can be “freedom from the known,” a growthful transformation or welcome ticket out of a stagnant, deteriorating, or otherwise unhealthy situation. In any case, we can be sure that the only thing that is unchanging in life is change itself. With that in mind, we would do well to understand it, accept it, and learn to use it creatively.

Given Hypothesis: *There are two kinds of change: radical and incremental.*

Initial Personal Interpretation: *I propose that ‘incremental’ change – that is, change proceeding in gradual, graded steps – is not possible in the realm of living systems, and is only operable in mechanical systems. Further, the notion that time (and by inference, change) proceeds incrementally, in gradual measured steps, is an illusion induced by dependency on mechanical systems. Furthermore, ‘radical’ is not the most useful word to accurately describe the kind of change that would be the opposite pole of incremental change. If these reproofs can be demonstrated, then the hypothesis will be considered invalid.*

Comparative Analysis: As a place to begin, I want to substitute for a moment the word ‘change’ with a synonym – ‘evolution.’ Darwinian evolution, a theory that has been accepted as the referential standard, is a working model of incremental change. According to this theory, random mutations take place in the genetic structure of organisms. Some of these mutations will assist the organisms in becoming better “fitted” to their environment than will other mutations. The organisms with better fitted mutations – that is, those “most fit” – will naturally have an advantage over less fit organisms and so will produce more offspring (as the theory goes). These offspring will carry the better-fitted genes to their offspring who also will be naturally selected for survival by further random mutations, and so on, *ad infinitum*. Thus it is theorized that Life experiences slow, gradual, steady, *incremental* evolution; the evolution is happening because of sequential cumulative mutations in the genetic structure.

One might call this a ‘mechanistic’ point of view; and that comes as no surprise, given the industrial fervor that was brewing in the age when this theory concurrently appeared. According to the scientific establishment of the time, organisms – including human beings – were regarded as machines. Life was a random chemical accident, and the Universe was running down. In this kind of intellectual climate, any vitalistic or soul-like theories regarding the evolution of Life needed to be vigorously condemned in favor of mechanistic theories. We’re still living with the consequences of this mechanical overshadowing.

As thinking in the 20<sup>th</sup> century progressed, however, Darwin’s theory became increasingly untenable, for a number of reasons: Archaeological fossil finds were piecing together a picture quite different from Darwin’s incremental evolution, a picture in which it appeared that new species would suddenly burst onto the scene in what came to be called “discontinuous leaps,” as a consequence of a new theory called “punctuated disequilibrium.” The mounting evidence in no way supported the theory of gradual, sequential, cumulative, *incremental* change.

Consider, for example, the sudden burst that was the proliferation of mammals. After the demise of the dinosaurs some 65 million years ago, and coincidental with rapid climatic change, the small, furry, warm-blooded creatures found wide open ecological niches to exploit and fill; and so, teleologically, the branch of *Mammalia* ramified at an accelerated pace until the niches were filled. This was a *discontinuous leap* (that would have seemed ‘radical’ at the time) occurring as a consequence of *punctuated disequilibrium*. This is the way of Nature: evolution is not at all incremental but rather *opportunistic*, and *co-evolving* with an environment that is itself in a continuous flux of change.

Or how about an individual person’s life? Is there anyone here who would say that their life has changed gradually, consistently, *incrementally* over the course of their years? My observations inform me that most people tend to resist change at all costs, clinging to the known and familiar until it becomes absolutely impossible to persist, until change becomes the only available option. Many people even resist necessary change after that, waiting until a crisis of some kind *forces* them to act, at which point the change will occur rapidly, often abruptly, alas sometimes catastrophically.

As a personal example, I wanted to quit smoking tobacco for years. At first I thought I would gradually cut down, incrementally, until I had eliminated this habit altogether. This proved to be impossible as my smoking fluctuated wildly around a given mean. Real change only occurred when my options and denial had run out and I was compelled to give them up, completely, once and for all – a discontinuous leap. Then all at once the air got fresher, the sky bluer, and the cherries cherrier, etc.

I could go on and on citing examples, but this is not a thesis. I just wanted to support my claim that incremental change is unknown in living systems, in the realm of Life generally. Instead, change occurs in what has been called “discontinuous leaps as a consequence of

punctuated disequilibrium.” This is natural change – it seems to happen all at once, in clusters, or focal points, or convergences, or synchronicities – and there are principles of Whole Systems Design that work with this kind of change.

Now I’m picturing the insides of a clock. One gear turns against another pushed by the tension of a spring until enough spokes have been turned to effect the movement of a larger gear, and the hands rotate. Steadily, rhythmically, incrementally the gears turn – tick, tock, tick, tock, tick, tock – and time marches on...

Now I’m picturing in my mind the cascading sequence of a digital counter. One by one the bits line up in a row of parallel nand-gates until the decimal is reached, at which point a meta-gate is triggered and all the nand-gates reset to start the sequence all over again. Once again: steady, rhythmical, incremental change.

Now I’m picturing another mechanical system: an industrial city in a western democracy. Does change in this system occur incrementally? Well yes, it’s certainly intended to. That’s the purpose of elections: on a regular basis the people are supposedly given the opportunity to make steady, rhythmical, incremental changes. Is this process effective? Probably not; for, despite the rhetoric, change occurs far too slowly to keep up with fluctuating conditions and events.

The whole city is constructed like a machine, and so changes in infrastructure can only occur incrementally by replacing worn out or dysfunctional parts or by adding new parts, all in accordance with the established procedures of zoning and coding laws – but, just as with elections, the *essence* of the machine never actually changes. Even with so much technical effort there is still a steady, rhythmical, incremental *decline* – degradation, deterioration, and dissolution. All machines eventually, inevitably must face the Second Law of Thermodynamics, succumb to entropy, and begin to break down.

Maybe that’s enough of a discussion to convince the reader that the word ‘incremental,’ when describing change, is best reserved for *mechanical* systems; and conversely, the opposite pole of incremental-mechanical change is the kind of change experienced by the evolution of *living* systems, and this kind of change is accurately described as “discontinuous leaps” arising within a context of “punctuated disequilibrium,” or something to that effect.

Is this image of evolutionary change as experienced by living systems accurately invoked with the use of the word ‘radical?’ Probably not. Radical is a word that carries a lot of emotional baggage with it. ‘Radical’ conjures up the associated images of ‘reckless’ or ‘revolutionary’ (as compared to evolutionary) or even ‘unconstructive’ or ‘counter-productive.’ Historically, where can there be found examples of change that can best be termed ‘radical?’ During wars or revolutions or other crises? Etymologically, all these uses of the word are misled, for ultimately ‘radical’ is derived from the Latin *radix*, meaning ‘root.’ To be radical really means to return to the root. Are you ready for that?

Chaos Theory teaches that as a system approaches a point of maximum disequilibrium, conditions are ripe for that system's spontaneous leap to a new level of refined order. But the leap is not guaranteed. The crucial moment of decision takes place at what is called a "bifurcation point," a branching in the road. If the system is able to successfully maintain its *autopoiesis*, its self-organization, then it will be able to make the discontinuous leap of evolutionary change and reach a higher order. If it is unable to maintain autopoiesis at the bifurcation point, then it will tend to rapidly disintegrate and disperse, and that evolutionary trajectory will come to an end.

The so-called 'world system' may be fast approaching such a bifurcation point today. Runaway feedback is pushing the system into overshoot, deleteriously stressing subsystems, and creating conditions of increasingly unmanageable disequilibrium. If the so-called 'world system' is able to successfully negotiate the bifurcation point ahead then we will see a spontaneous, discontinuous leap to a new level of refined order – what we will probably call a leap in consciousness. If the system is unable to maintain self-organization at the bifurcation point, then it will most likely disintegrate and disperse into numerous decentralized subcomponents. In either case, change is inevitable.

As active agents and facilitators of change, what can we do to influence the results at the coming bifurcation point? Where would be our point(s) of intervention?

According to the principles outlined in this brief essay, it may be best to *encourage* the spontaneous, discontinuous leap by *adding to* the disequilibrium. That means actually *increasing* the rate of runaway positive feedback thus *accelerating* the system's inevitable drive into overshoot. It seems paradoxical, but in these days the way to promote lasting positive change – a spiritual regeneration of the planet, if you will – may be to actually support the exploitation and exhaustion of remaining forests, fisheries, topsoils, aquifers, oil reserves, mineral stores, biodiversity, cultural inheritances, etc. I don't consider this approach to be 'radical' (a return to the root); it's simply applying and working with natural principles, for once the resource base has been depleted, the so-called 'world system' will be unable to maintain self-organization and so will begin to dis-integrate. Then management of resources will return to more local systems (maybe this is a return to the root?).

I believe that dealing with the chaos of the day by diligently, conscientiously working for incremental change will be totally ineffectual in the long run. Elections, ballot measures, initiatives, non-violent resistance, rooftop gardens and water catchment systems, etc. – while all noble and well-meaning efforts in their own right – are assuming that lasting positive change can be effected by working *within* the system; that is, by incrementally adjusting and fine-tuning the specifications, ratings, and operating values, and interchanging the various parts of an entropic mechanical system so that it continues to function without breakdown. I think Nature is moving much faster than that.

And what if the system itself – in this case, global corporate consumer capitalism – is beyond repair or remediation? What if it is an anachronism, a concept relevant for another day and age now long past. What if its very purpose, the very reason that it was constructed in the first place, is to do just that: exploit, consume, and deplete the living essence and resource base of the planetary entity as quickly and efficiently as possible? Then efforts at incremental change are just forestalling the inevitable. We may as well put our energy into pushing this system into overshoot, and then concentrating our attention on designing and creating viable post-collapse options.

In one sense, that's what the ecovillage vision is all about. It's not so much competing for status with established structures in the current context as it is designing and creating viable, alternative patterns, in fertile ground, for the post-collapse context. Metaphorically, the greater ecovillage vision could be compared to the small, furry, warm-blooded mammals of 65 million years ago – then as now the next pending phase of evolutionary growth – just waiting for the dinosaurs to clear out so that they can burst onto the scene in a discontinuous leap of punctuated disequilibrium and fill in some ecological niches.

*A Commentary by E.C. Mare, 13 November 2002,  
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