



Regenerative Design and a Science of Qualities

Dr. Daniel Christian Wahl

Here Daniel builds on the theme of the previous article and shows how health is an emergent property of complex dynamic systems – sustainability is not enough. We need systemic regeneration. His book is also reviewed in this issue.

Your body, your family, your community, the team you work with, as well as, cities, economies and ecosystems, can all be understood as complex dynamic systems. Generally speaking, all systems with more than three interacting variables are complex dynamic systems and better described by non-linear mathematics and circular rather than linear causality.

Understanding the dynamics of change within complex dynamic systems has critical implications for our understanding of health. Conceiving of health as an emergent property of complex systems can inform salutogenic - health-generating - design. This approach is needed to move beyond sustainability by creating diverse regenerative cultures that are elegantly adapted to the bio-cultural uniqueness of place.

All complex dynamic systems are fundamentally unpredictable and uncontrollable. In 2001, at Schumacher College I had the good fortune to be mentored in my understanding of complexity theory by Prof. Brian Goodwin, co-founder of the Santa Fe Institute of Complexity and one of the most influential theoretical biologists of the 20th Century.

With Brian's help, I understood why we need a fundamental reorientation of scientific enterprise - away from striving to predict, control and manipulate (a science of quantities) and towards the anticipation of ambiguity, humility in the face of uncertainty, and the aim for appropriate participation. To respond appropriately to the mess we are in, we need to learn how to facilitate the emergence of whole systems health. To do this effectively we need a science of qualities (Goodwin, 1999) and also an economics of qualities (Capra & Henderson, 2013).

A crisis of perception, authentic wholeness and appropriate participation

Faced with multiple converging crises - all of them rooted in what Gregory Bateson and Fritjof Capra first called a crisis of perception - humanity is challenged to redesign the human presence on Earth. We need to transform our current degenerative and exploitative impact into a regenerative impact on communities, ecosystems, regional economies and the biosphere as a living and constantly transforming whole.

The presence of health can best be conceived of as a scale-linking emerging property of complexity. From this perspective, health is seen as the 'pattern that connects' (Bateson, 1972) individual, family, community, ecosystems and planetary wellbeing into 'an authentic rather than a counterfeit whole' (Bortoft, 1996 & 1971). Ultimately healthy individuals need healthy communities and ecosystems, and their health - in turn - depends on and creates a healthy biosphere and the ecosystems functions that provide the basis of our planetary life-support system.

Additive (counterfeit) wholes are built up from their parts - in a mechanistic way. We tend to think of them as objects (parts) out there, separated from all the other parts. By contrast, an emergent (authentic) whole *comes into being in relationships through the act of participation* (process).

In authentic wholes - like individuals, ecosystems, and the biosphere - emergent properties such as health and sustainability depend on the sum-total of all participations (processes) within the interconnected holararchy (Koestler, 1989). The participating agents are not objective parts outside of the whole, rather they are subjective participants in the 'co-dependent arising' of self and world (part and whole).

In authentic wholes neither the parts nor the whole are primary. They bring forth each other. Every "thing" or every action - *and inaction* - becomes an intervention that changes everything. In this dynamic way of seeing, we all participate in co-creating the future, either consciously or unconsciously.

There is no observer independent reality out there to be described objectively and hence - at best - science is an inter-subjective consensus making activity. Once we become consciously aware of our own agency in complex systems we become co-designers of our common future.

To design for whole systems health is the only appropriate response to understanding our participatory agency and with it our responsibility for the world we bring forth together.



Large-scale ecosystems regeneration on the Loess Plateau, Hou Jia Gou, Shaanxi, China (Before 1995, After 2009)
Reproduced with permission of John D. Liu & The Environmental Media Project

Through scale-linking regenerative design we can restore health and wellbeing to individuals, communities, ecosystems and the planetary system. We can actively regenerate the living body of Earth!

Does this sound overly complex or too intellectual? Bear with me! Humanity's future depends on a more widespread understanding of the difference between real and counterfeit wholes. In order to respond appropriately to the complex and interconnected challenges we are facing - as one species - we urgently need to understand the nature of participatory wholeness. This will inform how we can facilitate the emergence of healthy wholes within wholes.

An authentic whole is precisely not *the* whole - not an object that can be pointed at - but a subjective presence that emerges out of the act of participation and distinction of self and world (being and environment). In *The Tree of Knowledge*, Humberto Maturana and Francisco Varela (1987) described this act of 'distinction' as the cognitive process of "structural coupling" that simultaneously brings forth self and world - organism and environment.

Gregory Bateson was the first to point out that the unit of survival is not the individual or the species, but the individual, the species *and* their environment (in Macy, 1994). "It is far more appropriate to view organisms as members of an indifferentiable whole that has never dissolved into discrete entities" (Holdrege, 2000).

If we want to learn how to participate appropriately in what A.N. Whitehead called "life's ongoing exploration of novelty", we need to understand that life is a fundamentally interconnected whole - a process of 'interbeing' that we have conceptually separated into organisms and species. The human micro-biome project has demonstrated that we carry more non-human than human cells within us and on us. We are a walking symbiotic ecosystem within symbiotic ecosystems!

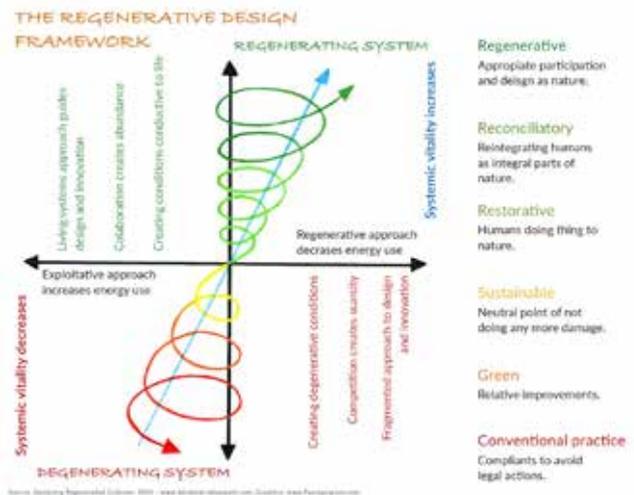
Sustainability is not enough, we need regenerative design for systemic health

Depending on where we start the count, humanity has a long track record of degenerative impacts on the planetary life support system. If we start the history of destruction with the advent of anthropogenic deforestation, extractive farming and erosive tilling of the soil, the story begins some 8,000 to 5,000 years ago. If we begin the count with the advent of mining and quarrying, our history of destruction goes back some 3,500 to 2,000 years. With the advent of the industrial revolution - only 250 years ago - we can observe a step-change in degenerative practices that have caused an anthropogenic mass-extinction and brought us to the brink of apocalypse.

Some people still believe that creating a sustainable human presence on Earth is the domain of a few do-gooders and idealists. Yet, the bio-physical reality of *now* is that we have only a few years left to avoid that our grandchildren will have to act as the hospice workers of a dying humanity on a severely impoverished planet with a radically different climate regime.

Only a transformative response to climate change, resource depletion, biodiversity loss, environmental degradation, and unsustainable inequality will herald the beginning of what Thomas Berry called the Ecozoic. Simply being sustainable is no longer enough! We have done so much damage already that the primary focus of human industry from here on out has to be effective regeneration of ecosystems and planetary health.

Bill Reed (2006) offered a framework for shifting our mental model which describes the continuum of shifting from 'business as usual' - falling just short of breaking environmental laws and regulations, to green - the self-congratulatory practice of doing a little less damage than the rest, to sustainable - what William McDonough called "a hundred percent less bad, and



The Regenerative Design Framework, adapted with permission of Bill Reed and reproduced from *Designing Regenerative Culture*, by Wahl 2016; Illustrator: Flavia Gargiulo, 2016

on to restorative practices - still in the mind-set of man as the manipulator of natural systems.

Only once we reintegrate humanity into the community of life and overcome the false dualism of nature and culture, will we be able to co-create truly regenerative practices. Regeneration is a necessity if we hope to co-create a healthier and more vibrant planet on which all of humanity and all of life can thrive, not just survive.

Design for Interbeing: salutogenesis and the importance of scale-linking design

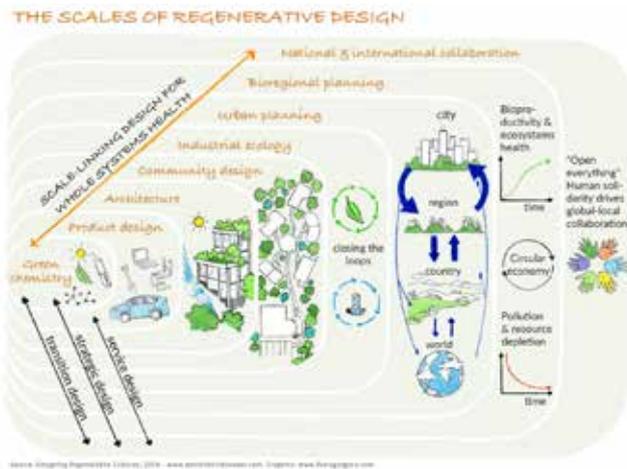
To respond to the current emergencies we need a framework for the practice of salutogenic or health generating design. This can be provided through a science of qualities and a better understanding the participatory nature of our 'interbeing'. We need to become conscious of our agency in holarchically structured complex dynamic systems within systems.

As these systems are inherently dynamic, evolving and changing they need to simultaneously be thought of as processes within process with critically interdependent emergent properties: the health of individuals, the health of communities, ecosystems, bioregions and ultimately biospheric or planetary health (see Wahl, 2006).

Yet we need more than just a framework, we need a re-design of the story we tell about who we are and the way we assign meaning to our lives and to life as a whole. We have to follow the root causes of the current crises up-stream, all the way to the crises of perception that have led us to believe we are separate from each other and destined to fight against one another and against other species for survival in the face of scarcity, rather than thrive as *one* humanity appropriately participating as "mere members in the community of life" (Leopold, 1949).

We are capable of co-creating abundance for all of humanity and the whole community of life, yet we need a new story for humanity - a story where we are no longer 'masters of nature' but regard ourselves as humble apprentices of nature. We have to learn biomimicry's central lesson: "Life creates conditions conducive to life" (Benyus, 1997).

To do this successfully we have to reintegrate our own biological being into the wider living process that contains us. We need to connect to our innate biophilia (Wilson, 1986) and create what Andreas Weber has called a "new enlightenment" (2013). Our wellbeing as living embodied biological beings depends on the wellbeing of our larger ecological self - the living body of Earth.



The Scales of Regenerative Design, reproduced from *Designing Regenerative Culture*, by Wahl 2016; Illustrator: Flavia Gargiulo, 2016

Charles Eisenstein framed this shift in our guiding narrative as the transition from the 'story of separation' to the 'story of interbeing' (2013). This is a shift away from a mis-understood Darwinism rooted in the zero-sum game of Victorian economics and the degenerative systems it created.

It is a shift towards the creation of non-zero-sum cultures rooted in the understanding that in the mid- to long-term the success (health) of the individual depends on the success of the community of life and the health of the planetary systems as a whole. As we aim to create diverse regenerative cultures carefully adapted to the bio-cultural uniqueness of the bioregions they inhabit, we will have to pay attention to supporting salutogenesis at local, regional and global scale.

Integrative whole systems design for regeneration and systemic health links the scales of green chemistry and materials science, to product design, architecture, community design, urban and bioregional planning, industrial ecology and circular economies, all the way to networks of collaboration at the national and international scale.

The practice of health generating design at and across different scales will help us to design for positive emergence - aiming to regenerate the emergence of health without being able to predict or control the systems we participate in.

In doing so effectively at local, regional and global scale, regenerative enterprises and business ecologies are beginning to emerge that will leverage synergies and win-win-win solutions by creating collaborative advantage rather than competitive advantage.

In my recent book - entitled *Designing Regenerative Cultures* - I explore in some detail how we can switch from our current degenerative practices to regenerative ways of being in the world. Through more than 250 guiding questions I help the reader to investigate how he or she might participate in supporting the emergence of whole systems health.

Humanity's design brief has been clearly stated by Buckminster Fuller when he challenged us:

"To make the world work for 100% of humanity in the shortest possible time through spontaneous cooperation without ecological offense or the disadvantage of anyone." By applying a science of qualities through scale-linking regenerative design, we might just be able to do so in time.

Daniel Christian Wahl PhD originally trained as a zoologist and has been focusing on sustainability and sustainable communities since 1998. He was director of Findhorn College between 2007 and 2010, during which time he helped create the MSC in sustainable community design. He is a member of the International Futures Forum and a fellow of the RSA. During his MSc in Holistic Science from Schumacher College Daniel worked closely with Brian Goodwin and Stephan Harding. In 2006 he wrote his PhD in Natural Design under Seaton Baxter at the University of Dundee. Working part-time for Gaia Education, he has co-authored their UNESCO accredited online course in Design for Sustainability. Daniel free-lances internationally as a consultant and educator and also collaborates with the research working group of the Global Eco-village Network. Since 2011 he lives on Majorca. Daniel co-founded Biomimicry Iberia in 2012 and works part time on transformative innovation for the University for the Balearic Islands. His first book 'Designing Regenerative Cultures' was published by Triarchy Press in 2016 (see review on page 55)

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